

MEDITERRANEAN TRANSPORT AND LOGISTICS IN A POST-COVID-19 ERA: PROSPECTS AND OPPORTUNITIES

Centre for Transportation Studies for the Western Mediterranean (CETMO)

Coordinator

European Institute of the Mediterranean (IEMed)

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The **MedThink 5+5** is a network of think tanks that encourages dialogue and research to promote regional integration in the Western Mediterranean, as a part of a wider Euro-Mediterranean region.

The network emerged in 2016 on the initiative of the IEMed in coordination with think tanks and public diplomacy institutions, building on a mandate from the Summit of Heads of State and Government of the 5+5 Dialogue in 2012. This unique platform, composed of more than 30 institutions from Portugal, Spain, France, Italy, Malta, Morocco, Mauritania, Algeria, Libya, and Tunisia, contributes to dialogue, exchange, and joint research on crucial sub-regional areas of cooperation.

Working to strengthen the Western Mediterranean Dialogue, the MedThink 5+5 offers the unparalleled possibility of increasing ownership of policy-making processes. It allows research institutions to transfer their messages to decision- and policymakers, while improving understanding of key challenges, needs and trends that have an impact on sub-regional cooperation.

POLICY STUDY

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The **European Institute of the Mediterranean (IEMed)**, founded in 1989, is a think and do tank specialised in Euro-Mediterranean relations. It provides policy-oriented and evidence-based research underpinned by a genuine Euromed multidimensional and inclusive approach.

The aim of the IEMed, in accordance with the principles of the Euro-Mediterranean Partnership (EMP), the European Neighbourhood Policy (ENP) and the Union for the Mediterranean (UfM), is to stimulate reflection and action that contribute to mutual understanding, exchange and cooperation between the different Mediterranean countries, societies and cultures, and to promote the progressive construction of a space of peace and stability, shared prosperity and dialogue between cultures and civilisations in the Mediterranean.

The IEMed is a consortium comprising the Catalan Government, the Spanish Ministry of Foreign Affairs and Cooperation, the European Union and Barcelona City Council. It also incorporates civil society through its Board of Trustees and its Advisory Council.



The **Centre for Transportation Studies for the Western Mediterranean (CETMO)**, is an independent non-partisan Think Tank and non-profit International Cooperation Organisation created in 1988 under the auspice of the United Nations, with the objective of sustaining improvement of Transport and Logistics and Socio-economic development.

CETMO belongs to, participates, and collaborates with an extensive network of over 215 organisations facilitating Mediterranean Cooperation.

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Policy Study

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FOREWORD

Séren Florensa

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European Institute of the Mediterranean
(IEMed)

In the Western Mediterranean Basin, as in other regions of the world, the COVID-19 pandemic has prompted governments to take severe measures to curtail socio-economic activities over the last months. Consequently, movement restrictions and the reduction of trade flows have severely impacted the transport and logistics sector. This major disruption caused by the COVID-19 to the transport system calls for a pause to analyse the priorities for the future and to build on lessons learnt to guide the recovery of the sector with the aim of improving its resilience and fostering its modernisation to boost growth, innovation, and competitiveness.

Before the pandemic started, the transport and logistics sector was embedded in a process of transformation to adapt more efficiently and resiliently to the effects of climate change, while trying to harness the new technological possibilities brought in by the fourth industrial revolution. A renewed vision of globalisation, amid trade wars and tariff escalations, had also been gaining a foothold over the last years. The pandemic has just accelerated these trends while compelling the actors of the sector to adapt to new behaviours and practices in terms of travel, business, urban transports, leisure, etc. In fact, the fragility of global supply chains and the disruption of commercial routes, the increased and unavoidable reliance on digital means, the renewed and strengthened focus on sustainability, all highlighted by the COVID-19 crisis for over a year now, are critical contemporary factors that call for a deep reflection on the prospects, opportunities, and challenges that await the transport and logistics sector in the context of a post-COVID-19 Western Mediterranean.

Analysing how the COVID-19 pandemic has influenced to a lesser or greater ex-

tent transport trends and open processes, whether it will change priorities, refocus targets or serve as a stimulus to definitely embrace the green and digital revolutions, is crucial for the transport and logistics sector to continue playing its major role as driver of the socio-economic development and regional integration of the Western Mediterranean in a context of recovery. Knowing with certainty what new medium and long-term scenarios will emerge from the pandemic is a difficult task. This prospective exercise is nevertheless essential to help the sector better prepare and adapt itself to the post-COVID-19 realities, notably with useful inputs likely to guide the cooperation and public policies that will shape the future of the sector in the subregion.

The European Institute of the Mediterranean (IEMed) and the Centre for Transportation Studies for the Western Mediterranean (CETMO) have taken on this challenging task by launching an important and timely initiative aiming at generating knowledge and food for thought regarding the new possibilities and potential post-COVID-19 scenarios that may arise in the close future for the transport and logistics sector in the Western Mediterranean. Untitled **“Mediterranean transport and logistics in a post-COVID 19 era: prospects and opportunities”**, the initiative’s declared ambition is to contribute to informing the reflections and decisions of the actors and policymakers of the sector in the region.

This publication is the outcome of the work undertaken in the framework of this initiative that gathered experts from different professional backgrounds and Euro-Mediterranean countries to discuss the impacts of the COVID-19 and the future of transport and logistics through multisectoral and multidisciplinary

lenses. Building on the networks of the CETMO and the IEMed, the publication offers a unique combination of complementary perspectives and analyses, as well as valuable policy recommendations that will undoubtedly generate interest among Western Mediterranean policymakers.

This publication, released as a policy study, comes within the framework of the MedThink 5+5 network of Western Mediterranean think tanks. Since its inception in May 2016, the network provides a multidisciplinary platform of debate associated with the Western Mediterranean Forum, also known as the 5+5 Dialogue, with the aim to foster regional integration by informing the discussions of experts and policymakers on key issues of the subregional agenda. Based upon the mandate conferred on the IEMed by the Valletta Declaration of the Western Mediterranean Forum from October 2012, the MedThink 5+5 network, which is coordinated by the IEMed, has organised during all these years different annual fora and thematic seminars where experts from the whole of the region analysed the factors underpinning economic, human, and sustainable development, as well as security and stability in the Western Mediterranean.

Considering transport and logistics as one of the most important sectors structuring cooperation, socio-economic development, and regional integration in the Western Mediterranean, the MedThink 5+5 network has been committed to fostering debate and knowledge-sharing on the issue, building upon the support and expertise of the CETMO as Technical Secretariat of the Group of Transport Ministers for the Western Mediterranean (GTMO 5+5), bringing experts, academics, and practitioners closer to the policymaking.

As an example of this commitment, the MedThink 5+5 network, in collaboration with CETMO, organised with leading experts, policymakers and stakeholders a first thematic seminar related to transport, which was held in Nouakchott (Mauritania) on the sidelines of the 9th Conference of Ministers of Transport of the 5+5 Dialogue countries in December 2018 under the title *“The road towards integration: transport and logistics in the Western Mediterranean: Tools and projects for the implementation of a multimodal network in the 5+5 area.”*

Following this first edition and building upon the present initiative *“Mediterranean transport and logistics in a post-COVID 19 era: prospects and opportunities”*, the MedThink 5+5 network, together with the IEMed and the CETMO, organises a second thematic seminar dedicated to the transport and logistics sector in Malta. Taking advantage of the 10th Conference of Ministers of Transport of the 5+5 Dialogue held on 10 October 2021 in La Valletta (Malta), the seminar, entitled *“The Western Mediterranean Transport and Logistics Sector in the post-COVID-19 Era: Seizing New Opportunities, Accelerating Transitions”* is conceived as the natural extension of the discussions taking place in this policy study.

In this context, this Policy Study seeks to serve as a tool to inform and guide the reflections and discussions of the ministerial gathering of the 5+5 Dialogue members, as well as future initiatives and policies. Finally, by disseminating the research done by selected scholars and experts within the framework of the joint initiative led by the MedThink 5+5 network and CETMO, the publication aims at constructing a regional collective intelligence, which, by defining priorities and devising regional and transnational policies and strategies, can really pro-

mote the adaptation of the transport and logistics sector to the post-COVID-19 Western Mediterranean.

This publication comprises all the thirty articles that were commissioned within the framework of the joint initiative led by the MedThink 5+5 network and CETMO. With the aim of giving a clear picture of the Mediterranean realities calling for more regional cooperation on transport, each of these articles try to look at the political, transnational, environmental, social, and economic impacts on the transport and logistic sector triggered by the COVID-19 pandemic from different multidisciplinary angles.

In particular, the first chapter includes seven articles that delve around four cross-cutting topics in relation to the transport and logistics sector in a post-COVID-19 context, namely geopolitics, regional integration and international trade, sustainability, and digital revolution. The second chapter encompasses four articles that seek to analyse the functioning and priorities of the current

transport and logistic systems while drawing some policy recommendations to better prepare and adapt the sector to the post-COVID-19 realities. From chapter three to chapter seven, fifteen articles seek to assess the socio-economic impacts of the COVID-19 pandemic to different transport modes, namely road, rail, maritime, air, and urban transport, while identifying some lessons learned and drawing conclusions that may serve to face future disruptions with greater coordination. Moreover, the bulk of these articles will shed some light on the ongoing adaptation processes of each of these transport modes to the digital revolution, the decarbonisation challenge and the processes of vertical and horizontal integration. The last chapter, which comprises four articles, focuses on how the COVID-19 pandemic hardly hit logistics chains worldwide and affected the distribution of goods in key sectors of activity, while analysing the opportunities and challenges to improve the current multimodal logistic systems by grasping the scope of digitalisation and sustainability processes in a post-COVID-19 era.

Chapter 1

GLOBAL AND REGIONAL TRENDS

COVID-19 appeared at a time when global society was beginning to consciously face the fight against climate change as one of the great challenges to guarantee the survival of the planet. Furthermore, there was also the beginning of the fourth industrial revolution concept, linked to the digital revolution and new ways of integrating technology into societies. It will be interesting to see how COVID-19 will influence these transport trends and open processes, whether it will change priorities or, serve as a stimulus for greater awareness and implementation.

One of the first effects of COVID-19 on the transport and logistics sector was the visibility of the fragility of global supply chains. This opened a public debate on the need to change the prevailing supply chain models in order to make them more robust and reliable, and reduce their dependencies. Furthermore, it is interesting to reflect on what changes, on a geopolitical and governance level, can be derived from all of these approaches, and whether these changes are transitory or, here to stay.

Mediterranean Logistics Post-COVID-19: Opportunities Come with challenges

Anwar Zibaoui

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Mediterranean Chambers of Commerce and
Industry (ASCAME)

We are facing a challenge that will change the world. As countries take essential measures to protect their populations, no sector remains immune to change. Closed borders, telework, travel bans and confinement. The coronavirus outbreak is redefining how we stay connected. And with a fifth of the planet already isolated, it is imperative to keep the flow of goods so that critical supplies can get where they are needed. The global logistics industry faces its biggest challenge.

The COVID-19 outbreak has increased the importance of supply chains in responding to needs in real time and in the transportation of goods, whether in managing the increase in online retail demand or maintaining the supply of medical supplies and fresh products. The COVID-19 pandemic has shown that logistics needs to evolve to build stronger supply chains. We all depend on them to achieve food security, health and stability, as their mission is to keep people safe and businesses operational, while customers adapt to the new challenges.

Trade keeps the world connected. Maritime transport, where 80% of the goods and 50% of the oil consumed circulate (UNCTAD, 2018), is of vital importance in global geopolitics. In addition, transport and logistics promote cooperation and development. In developing countries, competitive logistics would help solve migration, radicalisation or job creation problems. Without a doubt, economy is an essential lever to fight poverty, inequality, and solve desperate socioeconomic conditions.

The pandemic has made the fourth industrial revolution a reality for millions of people. The contours of a new hor-

izon are being configured. The digital future will create new opportunities for people, companies and governments. But if mismanaged, it will also bring new threats, polarisations between societies or divergent economies. The current economic models need to give new answers, since the existing measures are not enough. More economic integration, emergency plans and realistic solutions are needed to solve endemic problems.

The magnitude of the challenge makes the existing measures insufficient. Without an effective logistics sector, the economy cannot develop. An efficient logistics reduces costs in export, import and distribution in the domestic market. It is the lever for growth and competitiveness. Internationalisation requires emphasising the overall performance of distribution and supply networks, but also the regionalisation of sectors that benefit from geographic proximity and economic complementarity.

Furthermore, the sector is committed and has reacted by prioritising critical medical supplies, keeping the flow of fresh products and improving the use of technologies. The effort to maintain trade has been global. Governments and airport authorities across the world are implementing strict guidelines, such as increased disinfection, while protecting the safety and health of the workforce. We must thank workers and companies in the sector for their creativity, innovation and dedication to keep the supply chain operational, agile and robust in this time of crisis.

Beyond the immediate challenge, initiatives must be urgently promoted to make trade flows more robust. The construction of digital platforms will be

crucial to adapt to this new type of crisis in the long term. The digitised supply chain, in addition to the global network of ports, terminals and economic zones, will guarantee the transportation of cargo from one place to another through just one click. New technologies are driving online logistics and enabling smarter commerce, with more efficiency throughout the supply chain and greater visibility and transparency; in turn allowing the movement of goods to be optimised and redirected to where they are most needed.

This pandemic comes at a key moment. The global logistics sector is booming, with a greater demand for service from customers, the emergence of new competitors, the review of logistics processes and their incorporation into the digital revolution. Great challenges await us, such as the use of big data to efficiently manage logistics flows or the implementation of online platforms that optimise the volumes of cargo transported.

Logistics is one of the main columns of support for the continuous development of economies and its indicator of global competence. The increasing internationalisation of operations requires a special emphasis on the global performance of distribution and supply networks.

Trade logistics, or the ability of countries and companies to export products to international markets, is a key ingredient for economic competitiveness, growth, and poverty reduction. Poor logistics performance creates a sunk loss for producers and consumers alike, and results in a net loss of resources. Improved trade logistics, on the other hand, would give a positive

boost to the economy at a time of fragile recovery from the global recession. Logistics is necessary to flourish the economy and even the population to survive. For example, transportation and logistics directly affect the price and local availability of food. In developing countries, the impact of transport and logistics are between 20-60% on the prices of food delivered (World Bank, 2012). They constitute for some countries 40% of the cost of imported wheat. So, at a time of high prices for food and raw materials, enhancing and improving the logistics sector is necessary. Competitiveness is also the result of reduced transport time and costs.

Global trade is shifting, and the centuries-old model that saw maritime powers located in the Western world control cargo flows through is giving way to a more multidirectional and multimodal future.

In this new dynamic, China begins to exert a greater influence on world trade. The launch of the New Silk Road, an initiative with an investment of multi-trillion dollars, aims to reshape intercontinental trade through a new network of land and sea connections between Asia, Europe and Africa, based on the old trade routes. The Mediterranean holds the key. China's expansion to gain supremacy in the region's ports does not stop growing.

2000 years ago, the first concept of free port was created between Chaldeans, Phoenicians and Carthaginians to facilitate trade. But the Mare Nostrum runs the risk of losing its leadership despite its advantages. The Mediterranean is located right where Asia, Europe and Africa are very close to each other, which makes this sea not

only a neighbour for nearby regions, but also for the world.

In addition, both in the Mediterranean and worldwide, the weight of the sector is important. Logistics must be effective because, without this, the economy cannot develop. Efficient logistics will contribute to reducing the total cost of products for export, import and distribution in the domestic market. It is simply blood for the economy and a real lever for growth and competitiveness.

The maritime power model that has been carrying cargoes across the high seas for centuries is giving way to a more multidirectional and multimodal future. The world shipping map will change. It is necessary and urgent to bet on the 2030 Agenda and on a sustainable model. 23% of CO₂ emissions are attributed to transport (World Bank, 2016), so the common priority is to move towards greater efficiency and eco-sustainability throughout the Mediterranean region.

The shipping industry needs to set its own challenging but achievable voluntary CO₂ reduction targets for the maritime sector or risk targets being imposed. Shippers are under increasing pressure to respond to the climate change challenge. "They must understand, monitor and report their supply chain carbon footprint in order to meet their reporting and regulatory obligations," said GSF (Global Shippers Forum, 2015). "However, they are dependent on the shipping industry to provide accurate data on emissions and the GSF believes urgent action is now needed to agree targets. It is crucial to select a measure that will incentivise technical and operational measures to reduce CO₂ and not

simply pass on additional costs to shippers" (GSF, 2019).

The Mediterranean has more than 450 ports and terminals, represents 30% of world maritime trade by volume, and is the leading tourist destination in the world (UfM, 2016). It is the point of confluence of three continents (Africa, Asia and Europe), where 500 million people live. From this new situation, a large platform with unique characteristics may emerge to facilitate world trade.

This strategic location is unique to facilitate global trade and logistics. But the regional economic potential needs to be unlocked. For this, we must bet on integration and build a unified strategy that encourages investments, construction, modernisation and management of infrastructures, that also allows growth and competition with another region.

It is urgent to develop the interconnection of the South, create a communication network efficient land, air and maritime transport, and promote multimodal corridors. Here the Mediterranean corridor should be paramount. The region has a great potential to build up intermodal solutions engaging maritime and railway resources with other modes of transport to increase its global freight volumes and viability. What remains to be done is to promote and maintain emerging intermodal demands through the provision of a legal framework and financial or regulatory incentives, so as to foster intermodal transport, which can only come true with a regional alliance and its partnership with Europe. A roadmap is needed to allow a more efficient and sustainable growth of intermodal operations.

After the COVID-19 pandemic, globalisation is wounded. For this reason, we recommend going towards the regionalisation of the economy, betting on the sectors that benefit from geographic proximity and economic complementarity. Regional economic integration and the creation of a common Euro-Mediterranean Economic partnership must be objectives to be achieved to face the new and post-pandemic challenges.

The economic and social importance of logistics and the awareness of its shortcomings in the Mediterranean, require a strategic vision shared by public and private actors. A national and regional policy articulated with professional players that integrates the other strategic objectives (ecological transition, industry, regional planning, ...) is also needed, as well as a sustainable organisational approach and logistical planning of the territory, articulated with a new industrial policy reoriented on European, Mediterranean and African exchanges.

The pandemic has made the 4.0 industrial revolution a reality for millions of people. The contours of a new horizon are being configured and the digital future will create new opportunities for people, companies and governments. It is crucial to support logistically the relocation of a certain number of industrial activities, by encouraging the local Mediterranean economy and industrial clustering and by strengthening shorter, more reactive and more resilient supply chains. A new industrial and logistics cooperation, more balanced between Europe and the Mediterranean, is also essential.

For the Mediterranean and Europe to regain sovereignty, logistics must be

taken into account at the highest level of the State, with adequate governance and resources. The success of the sector cannot be proven without the incorporation of women into qualified jobs, especially in fields that are traditionally male dominated.

Betting on Mediterranean integration would change trends and benefit everyone. It would attract international companies, increase exports, and boost the creation of local jobs and businesses. Closing the existing gaps between two Mediterranean shores will not be easy but achieving it would mean a more effective transport network, more trade and development. The region has the capacity and ambition to become a key player on the international logistics scene.

The investment needs in Mediterranean region in the sector are estimated to be around 2% of GDP, a sum that the public sector cannot cope with and the contribution of the private sector will be necessary.

To reach a successful conclusion, it is necessary to overcome the obstacles and work to deepen the partnership in order to better control the challenges of development and favour reforms in this regard, strengthen the capacity of international institutions to take risks in financing infrastructure and facilitating the access of financial organisations and operators betting on a greater role of the private sector could help in this way.

25 years after the launch of the Barcelona Process, and provided the necessary mechanisms to accelerate the planned terms for the entry into force of the Euro-Mediterranean Association, the transport and logistics sector

is considered an economic pillar and an important factor for this integration of all priority action projects.

The need to invest in the Mediterranean logistics sector is a driving force for development, which could be more if several elements, such as the development of infrastructure, the private sector and the complementarity of networks between both sides, are reinforced. Joining the dots across so many Mediterranean countries is not easy. The result would be a more effective transport infrastructure, more trade and development, and a stronger and more united Mediterranean.

Moreover, we need to strengthen cooperation on transport legislation and develop infrastructure to connect the two sides of the Mediterranean Sea. Transport is a key vector for achieving closer market integration and contributing to regional integration, economic growth, employment, tourism and increased regional trade. In the context of profound change in the Mediterranean region, transport cooperation between the EU and its neighbours is crucial and needs to be supported.

Relations in the field of transport between the European Union and its southern partners were formally established in 1995 with the Barcelona Process. The key priority of this cooperation is the achievement of a safe, sustainable and efficient transport system in the Euro-Mediterranean area.

The future of the region depends on the ability to adapt to new realities, build bridges, create meeting spaces to transform this threat into an opportunity and turn weakness into strength. This would allow properly facing the challenges, creating a common future by adding capabilities and applying this synergy to the search for new paths.

The task of making this sea a great platform capable of competing with other regions will be difficult but not impossible. This can only become a reality in an alliance between both shores in this Mare Nostrum.

It is time to act to reposition the Mediterranean as the great logistics platform for east-west flows and as the best option to channel cargo between Asia, Africa and Europe. Logistics has never been as important as today.

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The Sustainability of Transport and Logistics in the Mediterranean

Eduard Rodés

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The concept of sustainability, although opened to many interpretations, can be understood as based on two elements. The first is the transport network, which is, at European level, fundamentally structured by the work carried out in recent years by the European Commission (EC) on the Trans-European Transportation Network (TEN-T) and which necessarily conditions that of its neighbouring countries, and therefore by extension Mediterranean countries. The transport network is one of the three networks that are essential for economic and social development. The second element is made of the energy and telecommunications networks, which are elements of the digitalisation process. The transport network is dependent on the other two, both in terms of efficiency and sustainability.

The efforts to advance the concept of sustainability are based on the approval by the United Nations (UN) Assembly of the 2030 Agenda in September 2015, structured by the 17 Sustainable Development Goals (SDG). Sustainable development cannot be understood without simultaneously taking into account the interrelationship between the different goals. Spending more time trying to scrutinise the aspects related to Goal 13 on climate change, or Goal 9, which deals with industry, innovation and infrastructure in this article would not be wise, as they depend to a broad extent on the other 15 goals and their mutual interactions to reach the targets. It is most likely that the problem to solve is not pollution or sustainability but the consequences we are facing from our actions in the past two centuries. The underlying problem is our way of life and the habits we have acquired. This is where the COVID-19 pandemic has forced our

societies to look at themselves in the mirror. It can now be understood that another way of organising our societies is possible and that everything is more ephemeral and fragile than previously thought.

Sustainability has become one of the critical factors in shaping the policies of all countries. The United Nations, with its Agenda 2030 initiative, and the European Union (EU) with the Green Deal, has set the course for a low-carbon society in 2050. The COVID-19 has further strengthened the need to carry out this sustainability revolution. The road ahead will not be easy and will inevitably lead to drastic changes in the configuration of the transport and logistics sector.

A World in Transition

The COVID-19 appeared in the middle of a period of strong transition. Time will tell if there is a change of cycle, leaving behind the silicon and information period, and moved towards robotics, artificial intelligence, and simulation models in virtual environments. Now, the systems we are developing are prepared to aggregate much more data than we have ever had. The programmes can analyse it and simulate scenarios on which to base decisions, much more accurately than those we would have been able to make without their help. This transition is taking place in the three networks previously identified (transport, energy and telecommunications) and as a result of their evolution.

The Energy Transition

The Mediterranean, like the rest of the world, faces the need to seek out renewable energy sources. The con-

sumption of hydrocarbons and energy produced with fossil fuels is reaching the end of the cycle. Governments face the need to seek alternatives that will maintain economic activity while reducing the environmental impact of emissions. Energy efficiency and the progressive penetration of renewable energies must enable economic reactivation in the short term and, at the same time, allow for the consolidation of the value chain associated with their deployment. They are also the pillars of decarbonisation, which gives a boost to the rest of the sectors while improving business and industrial competitiveness through a downward price path.

The energy transition also promotes the implementation and development of new technologies, which are fundamental for managing the demand for electricity and the supply of security in a 100% renewable system, in an industry segment in which the Mediterranean has the potential to acquire leading positions.

The development of hybrid plants allows for more flexibility. Different types of technologies can coexist in the same system, which can already be seen, for example, in wind power plants utilising solar panels. In such cases, the energy can be distributed using the same connection point and the access capacity already granted, provided that the technical requirements are met.

According to the Observatoire Méditerranéen de l'Énergie (OME), "it is estimated that energy demand per capita will increase by 62% in the Southern and Eastern Mediterranean countries by 2040 (using 2018 as the reference year). The Mediterranean re-

gion is also experiencing intense industrialisation and growth in tourism, putting additional pressure on available energy resources" (UfM, 2019).

These regional challenges, if adequately addressed, can be turned into business opportunities that can contribute to a sustainable energy transition. The Mediterranean is rich in renewable energy sources, such as wind, sun and water. Therefore, it has the potential to promote the transition to more sustainable and low-carbon energy systems. There is also the potential to increase energy efficiency through the development of new technologies that allow, for example, energy-saving and storage. Moreover, the development of gas and energy transmission interconnections will lead to the progressive integration of energy markets in the region, which is an opportunity for countries to better address the energy security challenges.

The problem is addressed from various perspectives depending on the "community" from which it is analysed. The most visible today is the city, which is currently undergoing a process of significant changes due to the evolution of distribution caused by the rapid growth of e-commerce (further accelerated by the COVID-19).

Ports have initiated determined shifts towards an energy transition in their territories. This has led to the emergence of professions such as officers in charge of the energy transition. The working programmes go through the different elements that make up energy consumption and their sources of production.

The first issue is a legislative framework that has been developed to force the transition while maintaining a certain

rate of deployment. A second point relates to savings and efficiency policies, as these are aspects that can be applied immediately and with excellent results if used correctly. A third issue relates to energy sources, and significant changes have already been made in recent years in this regard. Gas has played a leading role in the last ten years, and during this period gas-powered ships have been built, supply systems for trucks have been developed, and some tests with port machinery have been established.

One of the critical aspects that condition the implementation process of low-sulphur fuels with low CO₂ emissions is the possibility of the Mediterranean being declared an Emission Control Area (ECA). This is one of the most rapidly changing scenarios for the future. The Mediterranean will be an ECA area no later than 2024, as decided at the meeting of the Contracting Parties to the Barcelona Convention (COP21) held in December 2019 in Naples. The agreement will lead to the presentation of the proposal at the Marine Environment Protection Committee (MEPC) of the International Maritime Organisation (IMO) in 2022.

This is a significant challenge for the shipping companies, which have been working on the emission reduction aspects for years. In 2018, the IMO adopted Resolution 304(72) on the initial strategy for the reduction of greenhouse gas (GHG) emissions from ships, which set a reduction of 40% by 2030 and 70% by 2050. The lifespan of a vessel is approximately 30 years, so times should be calculated taking this into account (IMO, 2018).

Today's large fuel families are also in transition. Liquefied natural gas is

evolving towards biomethane and hydrogen, biodiesel to second and third-generation biofuels, liquid petroleum gas to biogases, and bioethanol to synthetic ones. In all cases, it will be necessary for ships to dedicate more space to storage, as the energy power is lower, and they will need a higher quantity for a result similar to what is attained using traditional fuels.

Maritime transport in the Mediterranean is considered to be "Short Sea Shipping", which in turn represents 80% of the world's fleet and one of the main contributors to air quality in port cities. Ports in the Mediterranean are generally located in big cities and operate alongside them, seeking a balance between the advantages of having a port that provides a service and the disadvantages of port-related operations. What is clear is that Short Sea Shipping is configured as a network in the area in which it operates. Ships from the Southern Mediterranean work with the countries of the North and vice versa. Therefore, the regulations that will be implemented will necessarily affect practically all operations. It seems clear that governments will use coercive measures to force a rapid move towards carbon-neutral solutions.

At present in Spain, gas is at the forefront with a prepared infrastructure that will make it possible to reach 2035 without the need to invest in this concept. For operators, it is profitable because they must bear a significant initial investment to adapt their ships. Still, the cost of fuel is more economical, allowing a return on investment in a relatively short time.

In recent months, hydrogen has been gaining ground as an alternative to

traditional fuels in maritime transport for several reasons. It is abundant and available everywhere. In a fuel cell, the generated waste is O₂ and water. As a fuel, it has zero emissions, is not toxic, is not a greenhouse gas, can be produced from renewable resources, and is a source for other fuels such as e-fuels and blue fuels. We will have to get used to new nomenclatures such as "Green Hydrogen" produced from renewable energies or "Blue Hydrogen" generated from gas, which generates CO₂ in the production process that is captured and stored in underground deposits. Hydrogen has the disadvantage of being difficult to store and transport, and involves complementary elements such as ammonium, ethanol and octane. Ammonia stands out as it is a substance that does not contain carbon in its molecule and therefore does not generate CO₂ emissions during its decomposition reaction, besides being the second most-produced chemical compound worldwide after sulphuric acid.

Research is currently underway for the subsequent decomposition of ammonia for its use with catalysts. These include graphene, which due to its characteristics could be an ideal candidate. From a Mediterranean point of view, it is clear that energy sources based mainly on solar energy and gas provide a significant competitive advantage, as the changes that are expected to occur are relatively rapid.

The Digital Transition

To understand what is happening in telecommunications systems, it is worth analysing the role that they have played during the pandemic. It is no longer a question of seeing how technology evolves in the field of communi-

cations and how it will affect us. It is about realising that society has been re-structured around a different way of making and maintaining relationships, driven at this time by the pandemic, which, we all assume, will remain as a new form of interaction. The pandemic has accelerated the digital transition, thus reconfiguring human and environmental relationships. At the expense of proximity, some interactions have been enhanced and our environmental impact reduced. During this period, a reasonably high level of educational activity has been successfully maintained. International projects have been supported, many people have teleworked, and the reality is that it seems that quite a few will continue to do so, even if only partially, for the foreseeable future (if not forever). Interestingly, none of this would have been possible without a significant development in digitalisation.

Two clear consequences of this pandemic have been the drastic reduction in mobility and the exponential increase in e-commerce and door-to-door sales. All of it was possible, based on a working system supported by telematics and the digitalisation of documentation and associated information. Everything that was being developed in the world of transport has accelerated rapidly, and where before everyone was putting obstacles in the way, now everyone is looking for solutions. If something could be done telematically, it was done, whether it was administrative boards or family meetings. Some changes will be more disruptive, such as the 5G technology that will allow exchanges of information in real time. This is understandable as there will be no latencies in communications. This is linked to the important development of robotic processes.

Another essential aspect linked to the energy network is its management and use. The “Smart Grid” concept is based on a form of efficient electricity management that uses computer technology to optimise the production and distribution of electricity, to better balance supply and demand between producers and consumers, and to improve the security and quality of supply following the requirements of the digital age. Better energy management will make it possible to create energy communities that will self-manage their production and consumption. Initiatives in this direction are being considered in the Port of Barcelona itself, but the idea goes further. This capacity for knowledge and management that a computerised world allows gives rise to different systems of governance, dependence and resilience. Fortunately, it is not a question of technologies that are difficult to access for the countries of the Mediterranean basin, which already have the necessary energy and know-how.

Digitalisation has a fundamental impact on transport. Advances in digital mapping systems, fleet and transportation management and the development of mobility management networks are transforming its landscape. Each transport system has its network. For land transport, the European Commission is working with the “Intelligent Transport System”, which enables an integrated system of information for traffic, safety, efficiency and sustainability. In short, it is working on the efficient management of the transport network based on the mass collection of data and interaction with the vehicles and drivers themselves.

In the maritime world, the Safe Sea Net, the vessel traffic monitoring in EU

waters, managed by the “European Maritime Safety Agency”, is gaining importance. Through it, it is possible to monitor the movement of ships in the Mediterranean, which in turn makes it possible to control environmental aspects with the Clean Sea Net service. The European Commission has continued to improve single window systems with a new initiative born at the height of the pandemic, namely the “EU Single Window Environment for Customs”, which aims to facilitate the actions of the various public administrations involved in the clearance of goods entering and leaving the Union.

The ports have entered a period of digitalisation of all their operations and territories. The Internet of things (IoT) has made it easier to have a massive amount of information available, which in turn has made it possible to create a knowledge base on which to support much more efficient management systems. Ships have become sophisticated centres of sensors and data generators, producing and transmitting information from anywhere, often in real time. At the same time, advances in satellite communications are improving connectivity, allowing for massive increases in the volumes of data transferred at an ever-lower cost.

The Transition of the Transport Network

Finally, the transition of the transport network, supported by infrastructure and physical characteristics, and which include ships, trains and trucks, and structured around energy and information, needs to be addressed. When talking about transport in the Mediterranean, we need to discuss what the European Commission defines as the Motorways of the Sea and Short Sea

Shipping. The Commission is considering the creation of a single European maritime space and, in a way, a Mediterranean space. For the Commission's Motorways of the Sea Coordinator, Kurt Bodewig, the second pillar of the three pillars of its strategy stresses the need to ensure smooth maritime transport by improving multimodal connectivity, and thus ensuring better connections to the TEN-T corridors and better links with neighbouring countries (European Commission, 2020). This programme was launched in July 2020. It reflects the principles of the new legislature of the European Parliament adopted in June 2019, and the guidelines set by the President of the European Commission, Ursula von der Leyen, and the "Green Deal" programme, which is already setting the agenda for all the countries of the Union. It is important to note that the transport sector has been dramatically affected by the measures to contain the pandemic. The continuity of services has been ensured by transport workers under challenging conditions, showing that their role is critical in serving the essential needs of the population. By extension, the transport sector will also be crucial in supporting the post-COVID-19 economic recovery. This will particularly rely on the maritime and port transport sectors, with cruise, ferry and Ro-Pax operators being the most affected.

The sector faces two significant challenges: on the one hand, an evolution towards a concept of mobility as a service, which implies the integral management of information systems and means of transport oriented to the service of mobility; and, on the other, and always under the same principles, synchro modality and the physical Internet. These challenges are two new

ways of visualising freight and passenger transport in which digitalisation, and clean energies will play a fundamental role.

Conclusions

The transitions in the energy, telecommunications and transport networks pose a disruptive change in the transport sector. Companies will have to reconfigure their strategies because they will have to change their means to adapt to the new situation, and management systems will be increasingly based on the digitalisation of operations, with artificial intelligence applying to their day-to-day activities. This brings about new opportunities for companies and the entry of new players from different markets. These new players may have competitive advantages over the rest, something that has already been witnessed in other sectors. Mobility will continue to be a fundamental element in development but will be adapted to a new reality that has emerged from the COVID-19 pandemic. Companies will have to reconfigure many of the professional profiles to adapt them to the new reality and to favour the new skills that will be required for a circular economy. These are what we call "Blue Skills". Training to cope with this transition will be a crucial factor in facilitating that transition.

Energy prices will change very significantly. Solar energy will gain prominence, giving a competitive advantage to countries with deserts, where solar energy performance is very high. This is an excellent advantage for the Southern Mediterranean countries. These price fluctuations will doubtlessly cause instability for a certain period.

Sustainability becomes the driver towards economic recovery. The challenge of building a new sustainable society will mark the agendas and efforts of the post-COVID-19 generation, which is much more open and aware of the challenges that we will have to face.

It is too soon to know how the COVID-19 will affect public transport. It still seems that the pandemic will last for some time, although more hope has

emerged with the emergency approvals of the new vaccines in some countries, which should help overcome it. Transport will change, above all, because it already had to change with or without the COVID-19. It will do so with environmentally friendly mobility and be more adapted to serving people and goods thanks to non-polluting fuels and artificial intelligence digitalisation processes. Change is on the Blue Horizon ahead, so let us sail towards it sustainably together.

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The Impact of the New Global Regionalism on Production, Transport and Logistics Systems

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The Commitments of the G20-2020 to Relaunch Global Development

In the Final Leader's Declaration of the G20 Summit (2020), chaired by Saudi Arabia and held in Riyadh on 21-22 November 2020, the heads of state and government made, among other things, specific commitments for the sectors of international trade, transport and travel, investments in infrastructure. Important commitments, it must be said at once, also for the prospects for relaunching development in the Mediterranean area.

For example, in point 12 of the document, relating to trade, the commitment to maintain the full opening of the markets is clearly stated: "Supporting the multilateral trading system is now as important as ever. We strive to realize the goal of a free, fair, inclusive, non-discriminatory, transparent, predictable, and stable trade and investment environment, and to keep our markets open" (p. 3). Also in point 13, on transport and travel, a similar commitment is stated, aimed at ensuring the maintenance of the system's openness: "We commit to ensuring that global transportation routes and supply chains remain open, safe, and secure, and that any restrictive measures related to COVID-19, including for air and sea crews, are targeted, proportionate, transparent, temporary, and in accordance with obligations under international agreements" (p. 4). In point 15, on investments in infrastructure, it is explicitly recognized that:

Infrastructure is a driver of growth and prosperity and is critical to promoting economic recovery and re-

silience. We endorse the G20 Riyadh InfraTech Agenda which promotes the use of technology in infrastructure, with the aim of improving investment decisions, enhancing value for money, and promoting quality infrastructure investments for the delivery of better social, economic and environmental outcomes (p. 4).

Very significant the reference made to the role of institutional investors, to multilateral development banks MDBs, as well as to the compliance with the principles on the quality of infrastructure investments in the same point 15:

"In line with the G20 Roadmap for Infrastructure as an Asset Class, we welcome the G20/OECD Report on the Collaboration with Institutional Investors and Asset Managers on Infrastructure Investment, which reflects investors' view on issues and challenges affecting private investment in infrastructure and presents policy options to address them. We look forward to exploring options to continue this work in a flexible manner and without duplications with other initiatives, with the participation of interested MDBs and international organizations. We will advance the work related to the G20 Principles for Quality Infrastructure Investment (p. 4).

These specific sectoral commitments are part of a broader framework of strengthening collaboration between states that the G20-2020 summit confirmed as the only way forward to tackle the effects of the global pandemic crisis, "to overcome the current challenges and realize opportunities of

the 21st century" (Final Leader's Declaration of the G20 Summit, 2020). The value of this orientation, which introduces elements of positivity in a framework of international competition hitherto characterized by strong geopolitical and geoeconomic tensions, had been recognised and sanctioned by similar commitments undertaken, for instance, at the XII summit of the BRICS coordination (Brazil, Russia, India China, South Africa, however all member states also of the G20) held in Moscow on November 17, 2020, a few days before the G20 summit. After recognising the G20 coordination role "as the premier forum for international economic cooperation and coordinated action to overcome the current global challenges" (XII BRICS Summit Moscow Declaration, 2020, par. 50), the BRICS states, which are also very active in the Mediterranean area, have confirmed the commitment to intensify their initiatives in the main areas of recovery: strengthening of trade, investment policies in infrastructures, digital economy and energy. In particular, with regard to the infrastructure sector, the decision was taken to organize a data and information center, participated by the five member states, with a "Common Data Room" (Point 57) to have a continuously updated and shared picture of the main requests and projects of infrastructural interventions in order to activate a prompt collaboration with private operators (Public-Private-Partnership - PPP) and in particular with the banking world.

Finally, it should be emphasized that the Final Leader's Declaration of the G20 Summit (2020) also recalls the importance of some signs of recovery in the world economy, although the forecast framework for the near future remains marked by great uncertainty. Thus, point

number 4 of the document states:

While the global economy experienced a sharp contraction in 2020 due to the impact of the COVID-19 pandemic, global economic activity has partially picked up as our economies gradually reopened and the positive impact of our significant policy actions started to materialize. However, the recovery is uneven, highly uncertain and subject to elevated downside risks, including those arising from renewed virus outbreaks in some economies, with some countries reintroducing restrictive health measures (p. 1).

A Safe Recovery but Full of Uncertainties

This combination of elements of uncertainty and elements of safe recovery at this stage characterises the forecasts of the major economic centers with reference both to the evolution of the economic systems as a whole, and to the specific sector of transport and logistics. Here are some significant examples.

International Monetary Fund (IMF)

According to the latest report of the International Monetary Fund on economic growth (IMF, 2020), published on 13 October 2020, the world economy will record a contraction of -4.4% in global GDP at the end of 2020, slightly less severe than the -5.2% expected at last June. For 2021, on the other hand, a rebound in international activity is expected with + 5.2%, provided that the virus gives respite. Otherwise, the data will be much worse. Between now and 2025, it is estimated that the total loss

of production in the world will amount to 28 trillion dollars: an unprecedented slowdown for the improvement of the average standard of living of the world population. In providing these data, the IMF highlights two important elements: first, projections assume that containment measures due to the pandemic will continue in 2021 and that transmission of the virus will end everywhere by the end of 2022; the second, however, that the economy remains subject to the risk of "setbacks".

With regard to the situation of individual states, the IMF emphasises (2020) that each country faces different economic reactions which have a lot to do with the experiences made in pre-COVID situations. Hence the assessment that Europe, and especially the Eurozone, as happened in the previous economic crisis, this time too seems to be losing ground in the recovery phase with respect to the United States and China. In fact, according to the IMF, the gross domestic product of the euro area this year will fall by -8.3%, while in the United States the loss will stop at -4.3%, almost half. Among the advanced world economies, the only exception with the plus sign is China, which will even register + 1.9% at the end of the year. By the end of 2021, the US will have lost one point of GDP, the Eurozone almost three, while Beijing will have a rebound equal to +8.2 percent. According to IMF chief economist, Gita Gopinath, "This crisis is however far from over...The ascent out of this calamity is likely to be long, uneven, and highly uncertain" (2020).

EU Commission

The Annual Strategy for Sustainable Growth 2021, presented by the European Commission on 17 September

2020, opens the document with these forecasts: "Despite the strong, coordinated and innovative response, both at national and at EU level, there are many uncertainties that still remain, in particular, on the duration of the crisis and how exactly it will affect our lives and our economies" (European Commission, 2020b). According to the European Economic Forecasts of summer 2020, the economy of the euro area will contract by -8.7% in 2020 to then record a recovery of +6.1% in 2021, while the EU economy will contract by -8.3% in 2020 and then grow by +5.8% in 2021" (European Commission, 2020a).

Srm-Intesa Sanpaolo

Regarding the maritime transport sector, the estimates presented in the seventh Annual Report "Italian Maritime Economy 2020" by an authoritative Italian specialised study center "Srm-Intesa Sanpaolo", show an overall decline of - 4.4% for 2020, followed by an increase of +5% for 2021 (Srm-Intesa Sanpaolo, 2020). The Report analysed the impacts of COVID-19 on the logistical-maritime system and the various aspects with which the phenomenon is manifesting itself: from the reduction of the passages in the Suez Canal to the new configuration of world traffic, up to the most recent trends in maritime flows of the international trading.

In detail of the container segment - "the closest proxy to international trade as it mostly expresses manufacturing traffic"- (Srm-Intesa Sanpaolo, 2020), the expected reduction in 2020 is equal to -7.3%, with a total of 742 million twenty-foot equivalent unit (TEU) handled in world ports, a figure that brings back the volumes of 2017.

In other words, the virus has taken away the sector's last four years of growth, although a rebound of +10% in 2021 and +6.6% in the 2022 is foreseen. Then extending the forecasts to 2024, container handling in ports should grow at an average annual rate of +3.5% to reach 951 million TEU at the end of the four-year period. At the global area level, the recovery is evaluated in the following terms: Europe at + 2.3%, Africa at + 3.3%, Far East at + 3.9%, Middle East at + 4.5% and North America at + 2.3%.

The Italian Maritime Economy Report (2020) highlights, in particular, that the Mediterranean still represents a privileged transit route for container traffic, concentrating 27% of the approximately 500 global scheduled services by ship. Specifically, the Suez Canal in the first five months of 2020 no longer recorded the sustained (double-digit) growth of 2019: against a +7% increase in ships transit (oil sector ships + 11%, dry sector + 42%), container-ships recorded a decrease amounting to -15%. The causes of this decline are mainly two, both attributable to the pandemic crisis: the decrease in the loads handled by ships and the reduction in the oil price which has led many container ships to pass through the African Cape of Good Hope to save toll costs: 52 megaships, equal to 5.1% of the total, preferred this last route in the period March-June 2020. This choice led the Suez Canal Authority to introduce a toll discount of 17% for the container-ships heading south, and of 50 to 70% for the US East Coast-South Asia and South East Asia route. Other significant phenomena have emerged in relation to an increasing use of the Arctic route (Northern Sea Route - NSR) which in the period between January-April 2020 recorded an increase in pas-

sages equal to + 15% compared to 2019 (the most active carrier is the Chinese company COSCO) as well as the practice of "slow steaming": again with a view to saving costs, the ships traveled the routes at a slower speed.

Also significant is the high number of "blank sailing" - routes canceled due to lack of cargo - which involved all the main routes (Srm-Intesa Sanpaolo, 2020). The phenomenon reached a value of 2.7 million TEU at the end of May 2020, equal to 11.6% of the total hold capacity. Srm-Intensa Sanpaolo (2020) estimates 7 million TEUs lost globally by 2020. The COVID-19 had a significant impact also on the great Chinese "Belt and Road Initiative" project: out of 2,951 projects worth 3.87 trillion dollars, 20 % is "seriously affected" (to consider that the import-export between the countries touched by the BRI represents 65% of the trade volume with the European Union). At the same time, there was a significant increase in rail transport on the China-Europe route and vice versa. In July, the number of freight trains reached a record of 1,232 trains, with a + 68% on July 2019. The Srm-Intensa Sanpaolo document (2020) reports that according to the Chinese railway authorities, "transport by train has had a decisive role in stabilizing the chain of international logistics interrupted by the pandemic".

Globalisation - Regionalisation: Profound Changes in Supply Chains

On the occasion of the official presentation of the Report on Italian Maritime Economy 2020, the director general of the Italian center Srm, Massimo de Andreis, highlighted an element that is of

particular importance for the Mediterranean area, namely the regionalization of globalization. In the report (2020), De Andreis states:

We highlight how the pandemic is changing the geography of world economic relations seen through the lens of maritime traffic. The China-US trade clash seen from the Pacific route, the slowdown of the Belt and Road Initiative and Chinese exports, the impact on the Suez Canal and the emergence of alternative routes are elements that also directly affect the Mediterranean scenarios... We are in a phase of regionalization of globalization and the strategic importance of investing in ports and logistics that are efficient and integrated with European networks clearly emerges.

The regionalisation of globalisation is a process that has now become the subject of careful and widespread evaluation at international level for its complex geopolitical and geo-economic implications, in the latter case also with reference to a different organisation of the global value chains currently underway.

On a general theoretical level, scholars ask, for example, what relationship exists between the two processes: that of economic globalisation and the creation of regional economic spaces. And the most shared conclusion is that the two processes are strongly combined with each other. In fact, it is the globalisation process - with its pushes to open and interchange, with the reduction of costs and tariffs, the organization of supply chains beyond the borders and the integration of markets (according to the Bretton Woods prin-

ciples) - which has spread development in the most diverse areas of the world, fostering awareness of the values and opportunities present and to be seized in the various regional systems, consequently induced to promote their autonomous processes of economic development.

On the other hand, this is the point that emerges clearly, as the individual states have for some time now referred to global processes in their development policies, in the same way the new regional realities also refer to these processes within which they try to best represent their needs, find their own conveniences, fit in. In other words, as globalisation produces regionalisation, so, vice versa, regionalisation further strengthens and qualifies the processes of global integration. The so-called "regional world", or, with an even more precise expression, the "new order of regional worlds" (Barbieri, 2019), is not, in essence, a less globalised world; it is, instead, a world in which globalisation is further consolidated and it is as if forced to assume new principles, values, guiding elements, to recognise the role of new protagonists. It is in this new framework that all actors, public and private, are required to be able to build new ways of interacting with each other, and to identify and pursue new approaches to individual and collective growth.

This process of geopolitical and geo-economic regionalisation emerged for some time, well before the pandemic crisis; but certainly the COVID-19 crisis is destined to accentuate it even more. In evaluating the possible responses of multinational companies to the shock and risks of the pandemic crisis, a recent Report by the Economist Intelli-

gence Unit - EIU (2020) highlights that one of the main consequences will be the regionalisation of global supply chains. "COVID-19 will fundamentally reshape trade, accelerating the trend towards shortening supply chains. Just-in-time manufacturing using global suppliers will give way to a greater focus on use of regional supply chains, strategic use of inventories and a new approach to viewing risk in the C-suite" (EIU, 2020).

The productive and commercial advantages that multinational companies have been able to enjoy in recent years, particularly in relations with China, after this country joined the WTO in 2001, are destined to decrease considerably due to trade wars, for example between the US and China, and the rise in wage levels within the Chinese system; a situation that has already led several multinationals to relocate their supply chains to other parts of Asia. But these decisions are only a first sign of the effects that COVID-19 will produce.

This is a prelude to what will happen in other regions as global companies look to build resilience into their supply chains. By building quasi-independent regional supply chains in the Americas and Europe, a global company will provide a hedge against future shocks to their network. For those companies that have this luxury already, they have been able to shift production of key components from one region to another as lockdowns and factory closures resulting from coronavirus have unfolded. Supply chains are difficult to set up and even more difficult to move. As more firms make this decision, therefore, the shift to

regionalised supply chains will be an enduring outcome of this crisis. (EIU, 2020).

Added to this, there is the need of optimising transportation and storage for risk mitigation.

The issue of a globalised or regional supply chain is not the only tension that COVID-19 will expose. Another core decision for multinationals is the timing of production and assembly of products along the supply chain and, relatedly, the storage of either intermediate or final goods throughout this process. For the sake of efficiency, multinationals tend to optimise the logistics process of their supply chains to minimise storage costs. However, in a world of increasing uncertainty and ongoing risk, a sole focus on the efficiency of transportation and production will leave firms vulnerable to shocks. In the current crisis, companies are seeing greater value in storing inventory in strategic locations from where it can be easily accessed and delivered to customers. This approach applies to final goods but also to strategically important components, such as those that can be only sourced from one market (EIU,2020).

The EU MFF Budget 2021-2027: A Possible Response from the Mediterranean Area

Faced with these prospects, which are in part the testimony of great movements already underway, what response can come from the

Mediterranean area and, in particular, from its transport and logistics system? It is clear that a valid answer can only come if the states of the area and their international reference institutions are able to offer global players a valid, concrete, well-verifiable platform of opportunities and advantages in its contents, able to demonstrate to the world the will to overcome the serious fragmentation occurred in recent times and to resume the process of community integration of the Mediterranean area.

A great opportunity in this sense is offered, for example, by the commitments that all the states of the Mediterranean region, and not only of this area, have assumed and confirmed several times with the approval of the UN 2030 Agenda for Sustainable Development. As it is well known, the platform presents precise goals and tasks to be achieved in the economic, social and environmental dimensions and is currently in a phase of full implementation; consequently it could become an opportunity for the organisation of a common working table between all the states of the Mediterranean region aimed at identifying and defining interventions of a general and specific nature, systemic and not fragmented, with strategies and plans agreed in the main areas of promotion of sustainable common growth, among which the plans for the maritime economy, transport and logistics are fundamental.

Another great opportunity is offered by the decisions, being defined in the last months of 2020, that the European Union will be able to take with the approval of the Multiannual Financial Framework Budget 2021-2027 (MFF-Budget) and the updating of the

relative regulations, to build favorable conditions for the promotion of a real organic cooperation in the Med area. In the document, under discussion, the awareness of the need to act in this direction is clear:

The EU budget for external action to develop cooperation with Neighbourhood countries is not sufficient in comparison with the size of the needs in infrastructures and technologies to connect these regions with European network. This make it vital that it invests in areas where the Union can offer real European added value to public spending at national level. Pooling and blending resources can achieve results that EU – Neighbourhood countries cooperation should take full advantage of the opportunities the Single Market offer. Other instances when pooling resources helps us do more include catalysing key strategic investments (European Commission, 2018).

This reference to the need for connection infrastructures with neighbouring countries shows the great relevance still today of the statements that Layola De Palacio, EU Commissioner for Transport, made in 2005 on the occasion of the presentation of the Wider Europe Report:

A well functioning transport system connecting the Europea Union (EU) and the neighbouring countries is essential for sustainable economic growth and the wellbeing of alla citizens in this part of the world. Better integration of National networks will foster regional cooperation and integration not only between the EU and its neighbours

but also between the neighbouring countries themselves. Also, good transport connections in the EU as well as in the neighbouring countries are important for trade with Asia, sub-Saharan Africa or America. In short improving transport connection would be for the mutual benefit of both the European Union and its neighbouring partner countries.

The guidelines specified in these two documents confirm that the European Union, with the approval of the new multiannual financial framework 2021-2027 and the updating of the related plans and regulations, presents the concrete opportunity to give a new direction and a different boost to Euro-Mediterranean cooperation, both to be based on practices of real sharing of the strategic objectives to be pursued, on effective coordination between European policies and plans in the transport and logistics sector, national plans, the Regional Transport Action Plan (RTAP) and the related sectoral projects, the plans drawn up by the Euro-Mediterranean partnership.

In this context, it would be desirable and appropriate to launch a profound review of the approach followed so far by the programmes relating to the networks of the major Trans-European Transport Networks (TEN-T) corridors, mainly oriented to the needs of the European internal market, to project and integrate them with the related programmes of the Trans Mediterranean Network-Transport (TMN-T), already outlined for some time by the Euro-Mediterranean Forum on transport, both for the western and the eastern Mediterranean side.

To this end, the following would be useful: a) the organisation of a permanent secretariat on transport in the Mediterranean as an instrument to support the operation of the Euro-Mediterranean Forum, also on the basis of the experiences made by the The Centre for Transportation Studies for the Western Mediterranean (CETMO) structure which has been operating for some time at the service of the Group of Transport Ministers of the Western Mediterranean (GTMO 5+), b) in addition, a link between the various European funds operating in cooperation and neighborhood policies including: the Connecting Europe Facility (CEF) TEN-T fund for intermodality and logistic platforms to be extended to all Mediterranean countries, the funds for Motorways of the Sea (MoS) projects, the funds already operational at the disposal of the European Investment Bank (EIB).

A possible strategic choice of the European Union for the interoperability between the two great network systems, European and Mediterranean, supported by the consensus of all the interested states, would give a very important signal of the will to promote a common effort throughout the Mediterranean region to counter the effects of the pandemic crisis, launch effective, widespread and shared initiatives on the matter of sustainable development, offer new opportunities to major international players. There is no doubt that such a turnaround would greatly help the community of states in the Mediterranean region to react positively and effectively to the challenges of the new regionalisation processes of the global system.

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Mediterranean Sea and the COVID Pandemic: A Turning Point for Globalisation? Logistics and Global Value Chains

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In this short note, we investigate the role of international production networks during the COVID-19 pandemic. A debate has recently emerged with respect to the future of global value chains (GVCs), discussing whether excessive globalisation of production has worked as a channel transmitting the shock or as a safety net, and whether this crisis would lead to a process of *de-globalization* or of *slow-balization* (Antras, 2020), with firms reshoring production or at least nearshoring. We maintain that reshoring is not the right solution, while nearshoring could be an opportunity for the Mediterranean area.

What will happen is hard to predict, as we are not over the crisis and indeed we are in the middle of a second wave (at the moment less dramatic for countries in the southern shore of the Mediterranean), but what is sure is that the pandemic outbreak, which led the IMF (April 2020) to forecast an unprecedented -3.0% global growth and then to worsen its predictions to -4.9% in 2020 in the World Economic Outlook Update (October 2020), is likely to bring changes to the international production process.

The UNCTAD report (2020) highlights four possible (not mutually exclusive) trajectories that the international production process might undergo in the next years: reshoring, diversification, replication and regionalisation. The last of these possibilities, regionalisation, implies the re-structuring of production operations by multinational enterprises (MNEs) near-shore. This process might open up key opportunities and partnerships among the Mediterranean countries, as there might be advantages for all in increasing the links between countries on

the southern and northern shores of the Mediterranean Sea. It is therefore crucial to identify the comparative advantages of the countries in the southern shore, compare them with those of other developing and emerging countries, check the complementarities with the specialisation of the northern shore and evaluate, for firms in different countries, the pros and cons of possibly switching suppliers or buyers. These pros and cons could be very heterogeneous for different sectors, depending on the complexity and specificity of the intermediate inputs bought or sold (a component of an airplane is possibly more difficult to substitute than a component of a shirt).

Surely the "shortening" of GVCs which is widely discussed in the recent literature can bring several benefits, as the lowering of operational costs, the enhancing of connectivity and the resilience of the region in face of shocks and crises. It could also help to reduce emissions and therefore answer one of the criticisms raised to GVCs of being environmental unfriendly. On the other hand, however, nearshoring may increase exposure to local and idiosyncratic risks and decrease the benefits coming from suppliers' and buyers' diversification of GVCs. The issue certainly does not have a unique answer.

The Mediterranean Context

In 2020, countries in the southern shore of the Mediterranean were hit hard by a dual shock, the COVID-19 and the concomitant collapse in oil prices, that shaped the region's output forecast to contract to 5.2 in 2020

(Arezki et al., 2020). On the trade side, UNCTAD estimated that only in April there was a 40 % reduction in trade for the region; moreover, mobility and transport restrictions heavily affected logistics, transports and services trade, especially tourism, which is particularly important for several countries of the Area. UNWTO (2020 b) shows that international tourists arrivals plummeted by 57 percent in the first months of 2020, with peaks of over 90 percent between April and July and a dramatic fall in hotel occupancy. Air traffic shrank by almost 100 percent in June and July (see also UNWTO, 2020a). Moreover, the pandemic is having a disproportionate effect on the more vulnerable sectors of population, namely informal workers and unemployed, with the number of poor expected to increase from 178 million to almost 200 million (Arezki, 2020), also because a large share of informal workers is somehow related to services and especially tourism (restaurants, street vendors, retail shops etc.).

Let us assess the region integration in production networks before the COVID-19 outbreak. Despite the existing trade agreements, especially with the EU, the level of integration into GVCs of the southern Mediterranean countries was modest, significantly below the integration within the EU countries (Riera and Paetzold, 2020) and, excluding few cases, concentrated upstream (Ayadi et al., forthcoming; Del Prete et al, 2017). Also, the sectors involved were limited (aeronautic, automotive, textile, citrus

being the main). The apparel and automotive sectors GVCs are discussed in a recent paper by Bernhardt (2020), which evaluates, 20 years after, the consequences for Egypt, Morocco and Tunisia of entering into the trade-liberalising Association Agreements (AAs) with the EU. While all the three countries seem to have upgraded their production in the automotive GVC, in the apparel GVC, Egypt and Morocco experienced an economic downgrading, while Tunisia stands in the middle, with increased export unit values but with a decreased market share (especially after the ending of the multi-fibre agreement)¹. Moving out from low-skilled textile and apparel GVCs might not be necessarily bad, especially since this sector's demand is declining worldwide and if countries have exploitable comparative advantages in higher-technology GVCs.

Using the BACI-CEPII Dataset, we compute the Revealed Comparative Advantages (RCA) in products at 2-digit (following the Harmonized System 92 international nomenclature) across (selected) countries on the northern and southern shores of the Mediterranean Sea².

As we can see from the graphs in Figure 1, some countries on the southern shore display a comparative advantage in some products with a high technological content; for instance, Jordan has a comparative advantage in the pharmaceutical sector, Jordan

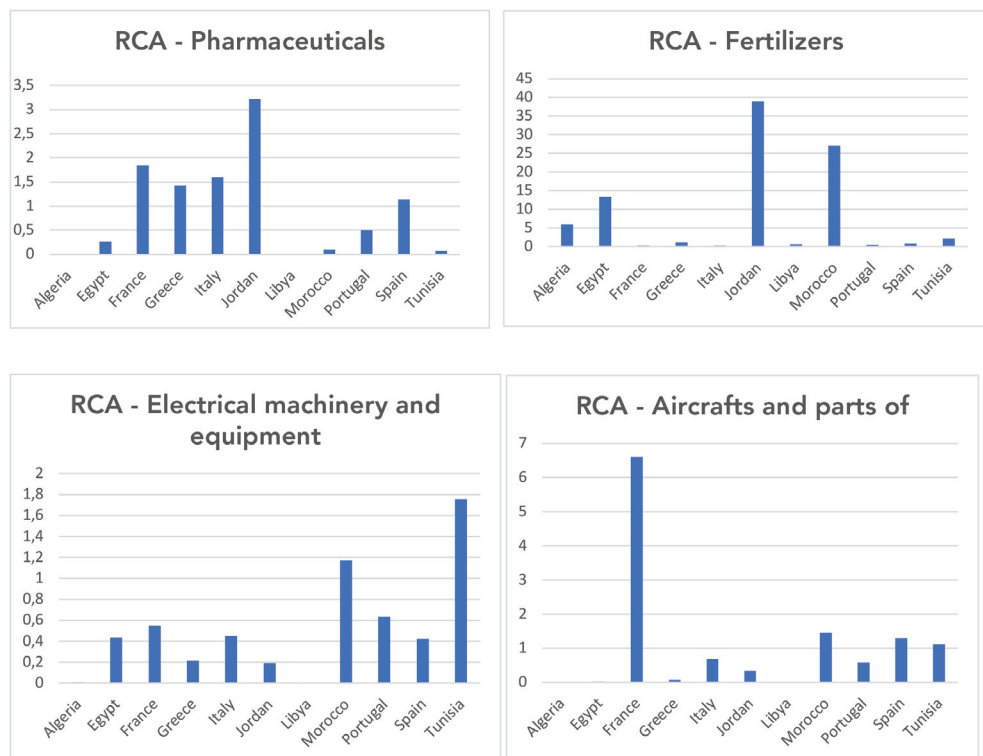
¹ Moreover, even though the automotive sector made incredible progresses for all the three countries, none of them has become a key player in the EU-bound GVC, that instead saw the countries like Czech Republic, Poland, Hungary and Slovakia gaining more importance (Bernhardt, 2020).

² RCA are computed with the Balassa Index, that looks at the share of country *i*'s exports of product *k* with respect to the world export share of product *k* and that can range from 0 to $+\infty$. A country *i* is said to have a revealed comparative advantage if the Balassa Index is greater than one.

and Morocco in fertilizers, Tunisia and Morocco in electrical machinery and equipment, and Morocco and Tunisia in the production of aircrafts and their components. This last sector is particularly important since, in the northern shore, France has a strong comparative advantage and several multinationals have moved their production to Morocco and Tunisia. These descriptive statistics seem to suggest that there are sectors that might turn out to be attractive for

possible relocations, with a potential to further integrate countries of the southern Mediterranean shore into regional or global value chains with European countries, an argument also put forward by Javorcik, (2020) and Ayadi et al, (2020). More importantly, these are sectors that could unlock and push out Arab countries from low-value segments of the GVCs, thereby reaching broader social outcomes, such as poverty reduction or social inclusion³.

Figure 1. Revealed Comparative Advantages in selected countries in the two shores of the Mediterranean



Source: Authors' elaboration on BACI-CEPII dataset

³ Reaching higher-value segments of GVCs (where usually formal firms are more present) would be key for the region given also the dualistic nature of its labour market (divided between formal and informal); it would help the already vulnerable (and more affected by the COVID-19) informal workers with little job security and no social protection to recover from the projected 3.7/6.0 percentage points increase in poverty incidence due to the pandemic outbreak (Arezki et al., 2020).

An interesting example is the aerospace industry in Tunisia and Morocco. According to Zaki (2019), in Tunisia there are 81 multinationals (e.g. Latécoère Group, Sabena Technics, Zodiac Aerospace) employing more than 17.000 people and specialising in activities with high value added, ranging from software/hardware engineering to the production of aircraft systems. Nearly 70% of total production is exported to the EU. To exploit the benefits of the Tangier freezone, many aeronautic and aerospace multinationals have also shifted their production to Morocco (e.g. Safran, Airbus/ Stelia, Boeing, Bombardier Aerospace, Eaton, UTC and Thales, see Del Prete et al, 2017). As of 2019, Morocco counted over 140 firms operating in aeronautics and aerospace, sustaining almost 20.000 jobs with a 38% local integration rate⁴. Morocco exports aeronautic components to Europe, mainly to France and a popular say maintains that “there is no single airplane in the world that flies without at least a component made in Morocco”.

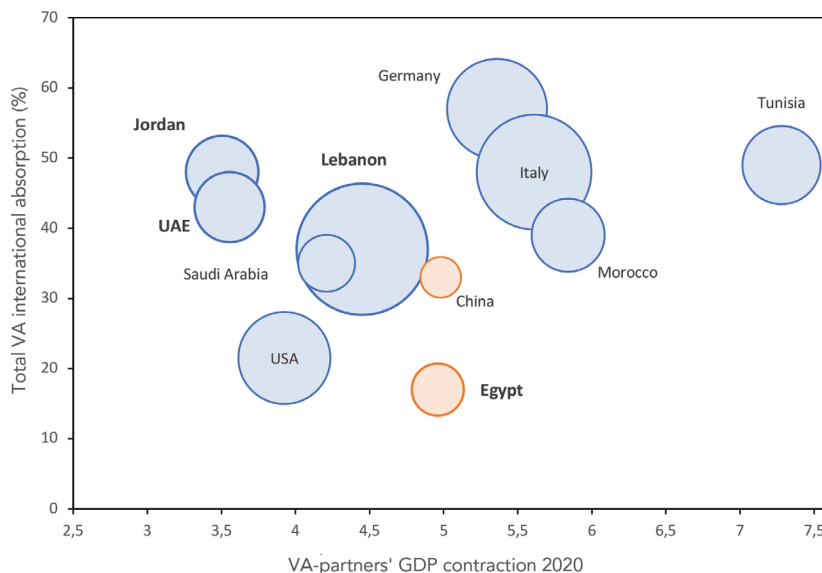
To evaluate the consequences of the pandemic and the likelihood of enhancing regional value chains, it is also important to look at the actual trade partners. Some countries in the South shore already trade more, especially intermediates, with EU countries more than with other countries in the area, while others seem to be more integrated among themselves than with Europe. The different mix impacts on the demand for specific goods and on the transmission of the shocks. For instance, from the World Integrated Trade Solution (WITS) of the World Bank, we see that Algeria’s top exporting partners in 2017 were Italy (16,3% of total country’s

export), France (12,59%) and Spain (11,66%); for Morocco (2018) the partners were Spain (23,68%) and France (22,90) and for Tunisia (2017), France (30,58%), Italy (16,47%) and Germany (11, 59%).

Let us now consider the ten main trading partners for each country and compute their GDP contraction in 2020 (due to the COVID-19 pandemic) to evaluate if having different trade partners can penalize the trade performance of some countries with respect to others. We also consider the total value-added absorption (both the domestic and foreign) as a measure of how countries are exposed to risks. We report our calculations in Figure 2. On the one hand, higher shares of value added originated and/or absorbed abroad (on the vertical axes), imply higher exposure to foreign shocks, given the size of the partners’ shocks. On the other hand, larger shocks to the trade partners (on the x axes) may affect the country more severely, given the importance of the value-added linkages.

We can easily detect two different groups of countries. The most exposed countries out of the ones we analysed are located at the top right of the chart: Italy, Morocco, and Tunisia. Tunisia is the most exposed, both as far as the GDP contraction of trading partners is concerned as well as the total Value Added used and produced abroad. The less exposed countries are placed at the bottom left. Egypt for instance, is expected to suffer mainly from partners’ GDP contraction, but has a very low share of foreign VA absorption and a positive GDP growth as well. On the contrary, the main threat for Jordan comes from a large stake of international VA absorption.

⁴ See also <https://www.tradecommissioner.gc.ca/morocco-maroc/market-reports-etudes-de-marches/0005073.aspx?lang=eng>.

Figure 2. The economic shocks from partners' GDP contraction, selected countries

Notes: Bubble size denotes own GDP contraction. Bubble colours denote sign of GDP change: red denotes GDP growth, blue denotes GDP contraction. On the horizontal axis average partners' GDP contraction for origin and destination. On vertical axis the sum of the share of VA used and produced respectively originated and absorbed in foreign countries. Data are from Eora Input Output tables for the Value-Added computations and from IMF (2020) for GDP contraction of trade partners. We included USA, UAE, China, Germany, Lebanon for comparison.

Beside comparative advantages and trade partners, another important issue in the discussion about the likelihood of enhancing regional value chains concerns the business environment that each country can offer to potential foreign investors and trade partners. This implies that it is crucial for countries of the southern shore of the Mediterranean, that today rank low in the Doing Business indicator (especially if compared to their Asian competitors), to implement policies to attract foreign capital, ameliorating data transparency, increasing state credibility, granting a sound political atmosphere and a conducive environment for new firms to start producing. Against this background, a particularly important feature is the question of logistics, which includes transport time, costs, quality (of road, rail, maritime or air infrastruc-

ture) and concerns both domestic and cross-border trade logistics.

Prospects for the Logistics and Transportation Sectors

Complex systems as GVCs and production networks are heavily dependent on efficient logistics and transportation, since the coordination of activities along the GVC as well as the exchanges of products depend so much on transports and logistics, so that according to some studies (e.g. Economic and Social Commission for Western Asia, 2017) improving logistics performance would on average reduce trade costs 10 times more than an equivalent reduction in tariffs. The definition of GVC itself implies that intermediate products cross the borders at

least twice. Hence, countries trying to benefit from GVCs participation need to address fragilities and key underlying factors of their logistics sectors. Countries of the southern shore of the Mediterranean vary substantially in terms of logistic performance; indeed, the World Bank's Logistic Performance Index (LPI) for 2018 ranks Egypt, Jordan, Morocco, Tunisia and Algeria respectively 60th, 76th, 87th, 104th and 107th out of 167 countries.

Some countries made big improvements in the recent past, such as Egypt, that exhibits high shipping connectivity, also due to the construction of the second Suez Canal line, and Morocco, with the creation of the AMDL (Moroccan Logistics Development Agency) and with the increase in the logistics training offer (from 2.500 places in 2010 to more than 7.200 in 2014-15 (Augier et al., 2019)). Morocco also improved considerably its port infrastructure capacities: the Tangier Free Zone, connected to the Tangier Med port, has grown significantly, now covering 400 hectares. The industrial accelerating zone of aeronautic, located in the Greater Casablanca area, is, on the other hand, close to Mohammed V International Airport, Morocco's main airport, which has also developed and is now serving over 70 destinations worldwide. Other countries are facing more challenges, for instance Tunisia, where port traffic has not increased since 2008 (Riera and Paetzold, 2020). When the pandemic started, it not only hit hard almost every country in the world, with lockdowns and border closures that heavily restricted the movement of good and people, but given the abovementioned endemic fragilities, it affected the southern shore of the Mediterranean even more. Ameliorating the logistics sector, in order to

become more integrated in region value chains, would be vital for the region to fully exploit its position as crossroads for all European, Asian, and African trade routes.

Conclusions

The COVID-19 crisis is unprecedented. The interconnected nature of international trade implies a high level of exposure to foreign shocks that is likely to have contributed to the fast propagation of the economic downturn. Labour intensive sectors, where workers mobility is important, have suffered more than others (Smith et al., 2020), both in manufacturing and services. Services, which were partially sheltered in previous economic crises, have been badly hit, particularly tourism and transport, more exposed to health risks and lockdown measures. Services, however, are less involved in GVCs and to a certain extent, this could explain why, in some cases, GVCs may have helped mitigate the negative effects on national economies while for manufacturing, the main mitigation channel could be the possibility of relying on foreign demand or foreign suppliers (Antras, 2020).

We highlighted that GVCs imply complex relations between firms operating in different countries. The related international activities, mainly offshoring and trade in intermediate goods, bring about efficiency gains by means of division of labour and increased specialisation, but they also mean higher interconnectedness and possibly higher exposure to risks. This is why many policy makers have started speaking about reshoring offshore facilities. Regional value chains are "geographically closer" than Global Value Chains. This could mean that the risks

are reduced, as is the pollution related to the fragmentation of production. We believe that regionalisation of supply chains, where by regional we mean the Mediterranean region, can be an efficient solution for both the southern and the northern shores of the Mediterranean. The economic cycles of countries in the two shores are not very correlated (given different endowments and specialisation), labour costs are still lower in the southern shore, even though there could be a need for skill

upgrading of workers in the South to fully exploit the opportunities. A careful analysis of revealed comparative advantages could highlight which sectors could be the basis to enhance the regional links with mutual benefits for the two shores. Regional GVCs are closer to consumer markets and more consolidated in terms of activities. They could be a solution to surf the COVID-19 crisis, without destroying the international production network, which is a vital force for the world economy.

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The COVID-19 Pandemic: What Impacts on the World Economy and the International Supply Chains? Focus on the Western Mediterranean Region

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In March 2020 the World Health Organization (WHO) declared the COVID-19 a pandemic. Since then, its spread worldwide has entailed unprecedented health, economic and social consequences for today's economies. People speak of economic shock, thus implying a major economic crisis in the mid- and long-term.

According to a recent survey by the McKinsey consulting firm, three main scenarios could emerge: a rapid recovery, a world slowdown, and a recession caused by the COVID-19 pandemic. Indeed, the scope of the economic damage caused by the COVID-19 pandemic will depend on the following conditions: how quickly the spread of this virus is prevented, in other words, the effectiveness of vaccine deployment; the efficiency of governments' economic recovery measures but also the capacity to develop joint actions at a European level, for instance; and the degree of financial and social support of governments for the most affected sectors and the most vulnerable people.

At a global scale, the COVID-19 pandemic has created disruptions both to the supply and demand that are reflected in all logistical chains. Following the closure of factories in China in the different industrial sectors (car, aeronautical, textile...) during the first quarter of 2020, a disruption has been seen throughout the supply chain all over the world. The bullwhip effect¹ has been noted in the supply chain, mainly in the food and drug sectors.

This article seeks to shed light on the impact of the COVID-19 pandemic on the global supply chains. It focuses mainly on the Mediterranean region as a major maritime route connecting Asia to Europe and therefore as one of the major trade channels in the world economy. The paper is divided into two parts. The first provides a general insight into the impact of the COVID-19 pandemic on the world supply chains and the second looks at the Western Mediterranean region and the role of ports in the global supply chains following the changes brought about by the COVID-19. We introduce the concept of digital competition and thus put forward some recommendations to the Western Mediterranean ports in order to improve their strategic position in the global supply chains in the post-COVID-19 era.

The COVID-19 Pandemic Revealing the Weakness of the Globalised Supply Chains

Understanding the Global Supply Chains

The COVID-19 has revealed the weakness of the world logistics system. Indeed, the accelerated globalisation of the economy in the last 20 decades and the growing internationalisation of exchanges have contributed to the establishment of vast and complex supply chains. These depend on dis-

¹ In logistics, the bullwhip effect refers to the difficulties found in assessing the demand of each actor of the supply chain when the volumes of orders fluctuate because of the up/down disruptions. The difficulties found by each link in the supply chain to determine its real demand for products are at the origin of the bullwhip effect in logistics. This lack of visibility compels enterprises to allocate their resources and build up stocks without taking into account the context/changes that have taken place as a result of a pandemic, an economic geopolitical crisis, and so on.

tant supply sources that are often difficult to control in contexts of health crises such as the COVID-19. Let's take as an example the pharmaceutical industry: according to the Académie nationale de pharmacie in France, 80% of the active principles used in the world would be currently manufactured in China, India and some Southeast Asian countries (Académie nationale de pharmacie, 2020). The geographical dispersion of these supply sources is bound to disrupt the activities of the actors at the bottom of the pharmaceutical industry, closest to the consumer markets.

In the last few decades, the facilitation of exchanges and the scale economies provided by containerisation (over 20,000 twenty-foot equivalent units [TEU] on a single container ship in 2020 compared to 8,500 TEU in the early 2000s) help reinforce the base of the internationalisation of trade. In addition, there is an ongoing research on optimisation of stocks from the supplier to the final client as well as an emphasis on the comparative advantages of each territory in the world (accessibility to raw materials, cost of low-skilled labour, industrial cluster such as Shenzhen, which accounts for half of the world production of mobile phones, and so on). As incredible as it may seem, the only objective of these strategic choices for the vast supply chains that are always more internationalised is to offer the final client products at increasingly competitive prices.

The post-COVID-19 crisis era is likely to question the dependence of modern economies on distant overseas suppliers, giving the impression of a loss of economic and industrial autonomy. Companies such as Intel, Proc-

tor & Gamble, General Motors and Walmart are well prepared for the potential disruptions of their international supply chain. They all have a protocol concerning the decisions to make when an unexpected crisis occurs.

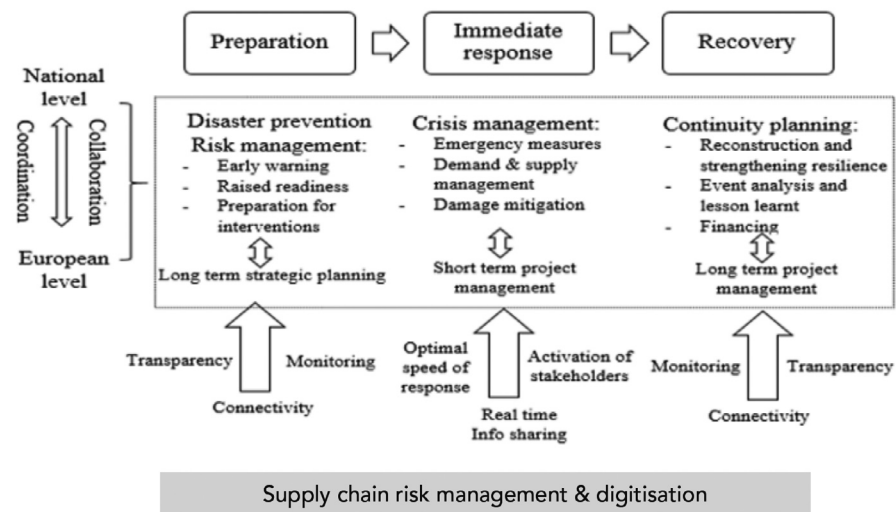
Introducing Supply Chain Risk Management

The notion of risk management is defined as the probability of an event/incident occurring. In a supply chain, this might concern diverse hazards (ruptures in suppliers, peak demand, lack of shipping capacities, and so on). These repercussions, recognised by the literature, are often formalised by the bullwhip effect concept. The COVID-19 pandemic has revealed the vulnerability of the supply chains faced with the need to anticipate and model risks before they occur.

From this point of view, the new digital technologies, such as the Internet of things (IoT), cloud computing, artificial intelligence, machine learning, 5G, and so on, can help better integrate supply chain risk management in the supply chain design. These technologies could in the future notably improve the visibility of flows within the supply chain. The increased connectivity and visibility of the international supply chain would enable the supply chain actors to assess and anticipate the risks. Such proactivity is necessary to deploy the appropriate strategies to respond to a "pandemic"-type crisis.

The figure below features a conceptual framework enabling the integration of the risk management notion and how to prepare thanks to the contribution of digital technologies:

Figure 1. The role of supply chain risk management and digitisation



Source: Prepared by the author

Focus on the Western Mediterranean Region

Towards a Smart and Inclusive Regionalisation of the Mediterranean Economies

The Mediterranean is considered an economic area marked by great disparities in terms of economic development between the two shores. With its 450 million inhabitants, it is one of the largest consumption basins. Its presence on the Asia-Europe sea route gives it a status of a sea of transit and place of passage of flows aimed at the northern range ports. The current crisis puts on the agenda of the economic policies of Mediterranean countries the issue of the economic regionalisation and spatial reorganisation of the value chain for certain strategic sectors with strong potential in terms of R&D but also of outlets in the Mediterranean during the post-COVID-19 era.

We should note that, since the emergence of the COVID-19 pandemic, the actors of the pharmaceutical industry have been concerned about the weak level of control of the logistical flows for the active principles in particular. Although R&D and industrial production are still present in Europe, the production of the active principles has long been relocated especially in China and India. In this respect, some countries including France have launched industrial projects aimed at relocating some links in the value chain of the pharmaceutical industry. Greater coordination at the Euro-Mediterranean level will be necessary to entrench these regionalisation/industrial relocation strategies.

Towards Digital Cooperation between the Western Mediterranean Ports

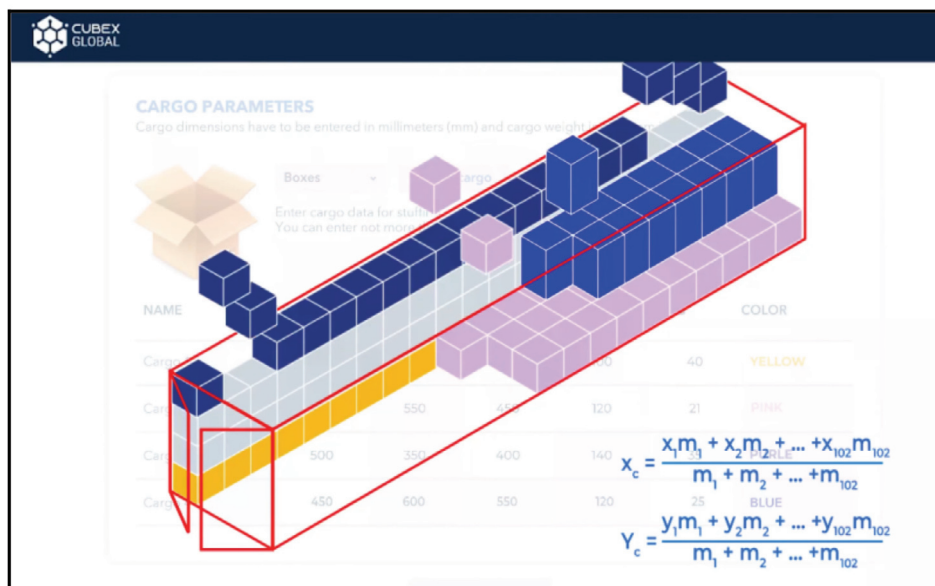
Cooperation in terms of research, development and innovation (R&D&I) fo-

cused on digital technologies and their capacity to question the existing ecosystems could be formalised under the concept of “digital cooperation”. The spearhead of this model of cooperation lies in the capacity of the actors to communicate and share data and later bring together innovative initiatives with an ecosystemic approach enabling the emergence of smart ports.

Digital cooperation based on experimentation with technological solutions will undoubtedly develop very quickly in the coming years. The COVID-19 crisis and its bullwhip effects on the international supply chains seem to strengthen the resilience of the ports and their ecosystems. This resilience could, with time, boost the innovation processes and the development at scale of new technologies (digitisation, automation, optimisation).

Recently, OneConnect Financial Technology Co., in partnership with China Merchants Group, has launched the platform project to enable exchanges and international logistics based on the blockchain technology. In a pilot test, 200 TEU were exchanged with the partner Chinese ports. The technology linking the ports has reduced the logistical import and export processes from five to seven days to only two days. The shipping and tariff costs for the enterprises have also decreased by 30% (Port Technology, 2020). Another example is that of the American enterprise CUBEX GLOBAL,² which has developed a marketplace enabling it to propose cargo capacities available inside the containers. An optimisation algorithm providing a 3D view and visual representation of optimal container internal loading.

Figure 2. Optimisation model developed by CUBEX GLOBAL



Source: CUBEX GLOBAL 2020

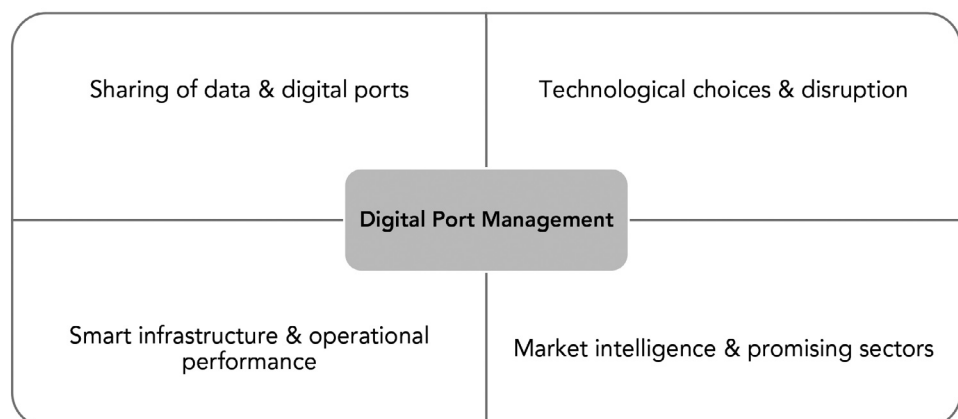
² <http://cubex.global/web/index.php#>

This marketplace has the advantage of optimisation of loading ratio of the containers and consequently of the ships for better productivity (economy of scale) and better environmental performance (reduction of externalities of maritime transport). This solution could in the long term be extended to the case of empty containers by offering this visibility in real time thanks to the digital twin of the container but also by extending its application to port terminals. In the Mediterranean, North-South trade imbalances at the level of maritime transport can be seen in the volume of empty containers moved that affect the optimisation and profitability of port operations. Solutions like the aforementioned can provide performance and productivity gains for the port terminals in the Mediterranean.

Digital twins in the ports also offer a new field of deployment of advanced digital cooperation between the port

communities. A digital twin is a replica of the port and its facilities enabling optimisation of port operations, anticipation of the arrival of the ships and more globally the reduction by over 10% of the costs of port operations. Northern range ports such as Rotterdam and Antwerp have already initiated pilot projects exploring the potential of digital twins. Solution integrators, such as those supplied by Bosch, enable the construction of tailored solutions for port communities. The ports of the Mediterranean must encourage the emergence of ecosystems devoted to innovation to accelerate port operation digitisation projects. In this respect, the Med Ports Association is an initiative bringing together 23 ports of the Mediterranean at a regional scale. Initiatives more focused on the technological and digital sections must be developed prioritising a bottom-up approach; that is, based on the needs of clients, ship-owners and shippers.

Figure 3. The pillars of digital cooperation



Source: Prepared by the author

Conclusions and Recommendations

In this article, we have introduced some lessons drawn from the current COVID-19 pandemic and its impact on the global supply chains. Shaped to meet the challenges of optimisation and scale economies, the latter have so far rarely included risk management in the configuration of logistical networks. Since the appearance of the pandemic in early 2020, logistics professionals and researchers agree that a transition towards more resilient and increasingly digitised supply chains would enable risk management to be anticipated. This anticipation would enable prevention of disruptions along the supply chain in the case of pandemic or crises of a different nature (geopolitical, economic, and so on).

In this new logic, large sea ports and regional ports will have to work together in an ecosystemic approach. A mid- and long-term strategic planning is necessary between the ports of the Mediterranean. Innovation, R&D and scientific cooperation must be the pillars of this new port management model to be implemented, in which co-operation and competition must co-exist in order to optimise the gains of

each actor while seeking an optimal collective result at the level of the Western Mediterranean region.

Finally, we can formulate the following recommendations for the ports of the Mediterranean:

- Encourage port initiatives that prioritise a bottom-up approach combining strategic voluntariness of the ports, smart cooperation and open innovation.
- Accelerate the digital transformation of the port ecosystems in the Mediterranean.
- Foster the development of short sea shipping corridors in the Western Mediterranean including the large maritime ports and regional ports from the two shores of the Mediterranean.
- Promote shared port services and a door-to-door logistics to attract ship-owners.
- Strengthen the attraction/connectivity of the port hinterlands by proposing innovative logistical services/multimodal logistical poles/innovation clusters.

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COVID-19 and the Scramble for Trans-Mediterranean Commercial Transportation Corridors: Challenges and Opportunities

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Introduction

The COVID-19 has reshuffled the deck in the strategic scramble to establish Europe-to-Africa commercial transportation corridors across the Mediterranean basin. Prior to the pandemic's outbreak, the European Union (EU) system already faced a pressing strategic challenge to form a coherent and effective policy in North Africa to respond to the increasingly significant roles played by China, Russia, Turkey, and the Arab Gulf states in the development of trans-Mediterranean connectivity. The severe economic impact of the COVID-19 pandemic could result in those actors exercising an outsized influence in reshaping the basic economic architecture and the geopolitics of trans-Mediterranean connectivity in the absence of European action.

China's apparent early economic recovery may provide Beijing a new first-mover advantage in each of the three emerging trans-Mediterranean commercial transport corridors: Morocco's West Africa-to-Western Europe corridor, an Algeria-anchored central Maghreb corridor, and the Egypt-based East Africa-to-Eastern and Central Europe corridor via the eastern Mediterranean. The existential rivalry between Turkey and the United Arab Emirates (UAE) will ensure that Turkey, along with its strategic partner Qatar, and the UAE will remain highly engaged across North Africa. Egypt's positive economic growth outlook raises the possibility that progress in establishing the eastern corridor could sufficiently surpass the other corridors to reorient commercial flows from those corridors. The manner and extent to which the EU exercises leadership in the development of trans-Mediterranean connectivity will determine the parameters

of its future geopolitical influence in North Africa and the effectiveness of the EU's efforts to develop a comprehensive partnership with Africa as a whole.

Keys Factors for Trans-Mediterranean Connectivity in the Post-COVID-19 Period

Prior to the outbreak of the COVID-19 pandemic, Morocco's West Africa-to-Western Europe corridor was the most advanced in its development while the Egypt-based East Africa-to-Eastern Mediterranean-to Eastern/Central Europe corridor was at a more preliminary stage of development, albeit with enormous economic potential. The central corridor based in Algeria was still in a formative state, with its rudimentary condition characterized by a jockeying among international actors to establish a successful corridor.

Morocco's success has demonstrated that commercial corridors only emerge where the requisite large investments in port and rail infrastructure are coupled with an industrial base anchored in a manufacturing value chain. These requirements reflect the two fundamental needs in Africa's current growth phase more generally – increased commercial connectivity to consumer markets and a larger industrial manufacturing base.

The Moroccan example (as well as the Algerian example) also shows that if the European Union system does not work effectively to partner with North African nations to meet these requirements, then EU member states playing leading roles in trans-Mediterranean connectivity will partner with actors

outside the EU system. The Egyptian example is a case wherein the already deeply entrenched positions of China, Russia, and several Arab Gulf states show the necessity of EU system involvement to ensure a European role in trans-Mediterranean connectivity.

China's apparent economic recovery from the COVID-19 pandemic would seem to place Beijing in pole position to deepen its influence over the development of trans-Mediterranean connectivity. According to Chinese statistics, China's monthly exports in November 2020 rose 21.1% year-on-year (Deccan Herald, 2020). Exceeding international analysts' forecasts, China's \$268 billion of November 2020 exports represented the sixth consecutive month of export growth. In contrast, seasonally adjusted GDP decreased by 12.1% in the Eurozone during the second quarter of 2020, with the economies of the major EU Mediterranean actors, France and Italy, having contracted by 19.0% and Italy by 17.3% respectively compared to the same quarter of the previous year (Eurostat, 2020).

Nonetheless, as this study shows, the EU retains a critical window of opportunity to impact the direction of trans-Mediterranean connectivity, as the future of Chinese investments remains far from certain in the post-COVID-19 period. China's two largest policy banks, the China Development Bank and the Export-Import Bank of China, slashed their combined lending in 2019 to only \$4 billion, compared to \$75 billion in the peak year of 2016 (Wheatly and Kynge, 2020). Ultimately, the configuration of Africa-to-Europe value chains that result from investment relationships between the Maghreb nations and their foreign partners will establish the geopolitical framework of these emerging trans-regional

commercial architectures for the years to come.

Morocco's West Africa-to-Western Europe Corridor in the Post-COVID-19 Era

Morocco's success in advancing its West Africa-to-Western Europe commercial corridor stems from the considerable investments made by Rabat and its foreign partners in the concurrent development of both Morocco's transportation infrastructure and its industrial base, anchoring Morocco's emerging trans-Mediterranean commercial connectivity in manufacturing value chains. Morocco's construction of its *al-Boraq* high-speed rail line – Africa's first high-speed rail transportation – has established Morocco's unrivaled position as an Africa-to-Europe commercial corridor. The \$2.3 billion, 362 km-long first segment of landmark high-speed line was built as a Franco-Moroccan joint venture. The *Boraq* line is linked to Morocco's new state-of-the-art Tanger Med Port on the country's Mediterranean coast, 40 km east of Tangier. In late June 2019, Tanger Med became the Mediterranean's largest port, surpassing Spain's Algeciras and Valencia ports, with a total in container capacity of 9 million twenty-foot equivalent units (TEU). The \$1.5 billion capacity expansion was supported by considerable Chinese investment (CMG, 2017), but China has so far failed to capitalize on the investment as Beijing has been unsuccessful in establishing an independent manufacturing chain in Morocco (Tanchum, 2020c).

The importance of integrating infrastructure investment with industrial manufacturing chains is illustrated by Morocco's successful automotive in-

dustry, producing over 700,000 vehicles per year and serving as the centerpiece of the country's West Africa-to-Western Europe Corridor. In 2012, Groupe Renault established a second Moroccan manufacturing plant in Tangier to benefit from the expanded Tanger Med Port and the rail link to it, producing its millionth vehicle within five years. Europe's third largest automaker presently sends six trainloads of Renault vehicles daily from its Tangier factory to the Tanger Med port for shipment (Berrada, 2019). In June 2019, French automobile manufacturer Groupe PSA, Europe's second largest automaker, opened a manufacturing plant in Kénitra, north of Rabat, because of the *Boraq* high-speed rail link to the Tanger Med port (Ennaji, 2019). In early 2019, automotive sectors sales accounted for 27.6 percent of Morocco's exports (Groupe Société Générale, 2020).

Morocco's present vehicle production led by French manufacturers Groupe Renault and Groupe PSA, is supported by approximately 200 international suppliers operating their own manufacturing plants in the country, including major firms headquartered in Germany, France, Italy, Spain, and Belgium. Some Chinese manufacturers are using the opportunity of Groupe PSA's new car manufacturing plant in Kénitra to integrate into the French-led European value chain, such as CITIC Dicastal, which is establishing \$400 million plant in Kénitra, with a capacity to produce 6 million pieces annually to supply parts to PSA Groupe (Tanchum, 2020c).

Morocco continues to extend the *Boraq* line as part of its programme to create 1,500 km of additional high-speed rails links, which are already forming the overland transportation backbone of a France-led, Africa-to-Europe industrial

chain. Rabat's highest strategic priority is to extend a high-speed rail link to Lagouira (La Güera) in the southernmost point of the Western Sahara region, which Morocco considers its Southern Provinces. Running from Morocco's Tanger Med Port across and down the length of the Atlantic coast to the Mauritanian border, the Tangier-Lagouira line will create a high-speed commercial transportation corridor from the shores of the western Mediterranean to the border of West Africa.

The *Boraq* high-speed rail line, as a French-Moroccan joint venture, is emblematic of France's role as Morocco's leading foreign investment partner as well as Paris' new push to be seen as a positive change-agent for African economic development. France provided 51% of the financing for the project with Morocco providing another 27%. The remaining 22% of the project was financed by development funds from the United Arab Emirates (UAE), Saudi Arabia, and Kuwait (Moqana, 2018). Along with France, the GCC nations – in particular the UAE – have been mainstays of foreign investment in Morocco. The *Boraq* line reflects the fact that France's main partners in facilitating Morocco's transformative infrastructure development are the UAE, Saudi Arabia, and other GCC states. The EU27 collectively is Morocco's largest trade partner, accounting for 55% of Morocco's 2019 total bilateral trade volume. Nonetheless, France's principal partners for strategic economic engagement with Morocco are Abu Dhabi and Riyadh, not Madrid, Rome, or even Berlin.

Morocco's economy is projected to undergo a 6.3% contraction (World Bank, 2020), but the contraction could be worse depending on the depth and

duration of the contraction of the EU27 economy. The EU27 comprises 58% of Morocco's export market and 70% of its tourism industry, while also accounting for 59% of Morocco's foreign direct investment (FDI) (Chtatou, 2020). China's attempt to establish its own industrial chain in Morocco by setting up an electric vehicle manufacturing plant has so far remained stalled (Tanchum, 2020c). However, the successful creation of an electric vehicle manufacturing chain would significantly alter China's position in the West Africa-to-Western Europe corridor.

France remains bereft of European partners willing to play a strategic role in Morocco's infrastructure development. Morocco is well-suited for electric vehicle manufacturing and hydrogen production, both of which are EU priorities. In the absence of strategic coordination in Morocco between France and other EU members or with the EU system, Morocco's Africa-to-Europe corridor will increasingly depend on the strategic relationship between France and its Arab Gulf partners. Instead of the EU's "five partnerships" framework for African development, the confluence of strategic interests among Rabat, Paris, Abu Dhabi and Riyadh will set the terms for Morocco's West Africa-to-Western Europe commercial corridor.

COVID-19 and the Competition for a Central Maghreb Corridor

The efforts to develop a Europe-to-Africa corridor through the Central Maghreb presently revolve around Algeria's road connectivity within the Trans-African Highway system, starting

in the country's capital Algiers. The recently formed Turkey-Italy-Tunisia transportation network that slices across the centre of the Mediterranean, creating an arc of commercial connectivity from the Maghreb to the wider Black Sea is currently the leading aspirant to form a Europe-to-Africa corridor via the central Maghreb that utilizes Algeria's connectivity. However, the main challenge emerging to Turkey-Italy-Tunisia network is being posed by China's effort to construct *El Hamdania*, a large-scale transshipment port in Cherchell.

The Turkey-Italy-Tunisia network's central hub is Italy's deep-sea port of Taranto located on the Italian peninsula's southern tip in the strategic heart of the Mediterranean Sea. Managed by Turkish port operator Yilport, the Taranto port began servicing the Turkey-Italy-Tunisia network in early July 2020. The Taranto-Tunisia segment of the network simultaneously forms the core link of a potential Europe-to-Africa commercial transportation corridor, by connecting North Africa's coast to the major markets and manufacturing centres of Italy, Germany, and northern Europe via Italy and Europe's high-speed rail systems. From Tunisia's Bizerte port, the corridor can also link by highway to Algiers, the Mediterranean coastal terminal for the Trans-Saharan Highway (Route 2 in the Trans-African Highway (TAH) system), potentially extending the Italy-to-Tunisia corridor southward into West Africa as far as Lagos, Nigeria.

The Turkey-Italy-Tunisia network is a multi-modal transportation route whose Europe-to-Africa segment extends from the network's central node at Taranto to Malta and then the port of Bizerte in Tunisia. The Taranto-Malta

maritime link is also supported by the European Union as the southernmost link in the EU's own "Scandinavian-Mediterranean Corridor," one of the nine core network corridors of the European Commission's Trans-European Transportation Network, or TEN-T, programme. TEN-T's Scandinavian-Mediterranean Corridor is the EU's central north-south transportation artery, a route spanning the Scandinavian peninsula, Denmark, Germany, Austria, Italy, and Malta. Because the Turkey-Italy-Tunisia network's Taranto-Malta segment was previously designated as TEN-T's Scandinavian-Mediterranean corridor's southern terminal link, Turkey could become the operator of the hub of what may become the most prized Europe-to-Africa corridor. By interconnecting the EU's Scandinavian-Mediterranean Corridor with Africa's Algeria-to-Nigeria Trans-Saharan Highway, the Turkey-Italy-Tunisia network's Italy-Tunisia segment potentially forms the vital link for the creation of a megacorridor spanning Europe and Africa from 60° N. latitude to 6° N. latitude.

The Turkish port operator Yilport Holding has been assembling the transformative connectivity of the Turkey-Italy-Tunisia network (Tanchum, 2020b). On July 30, 2019, Yilport committed to an investment of a total of €400 million for Taranto's renovation and expansion to 4 million TEU by 2028 (Louppova, 2018). CMA CGM, the world's fourth largest container transportation company, in which Yilport's chairman is a 24% stakeholder, began service to the Taranto port on July 10, 2020. CMA CGM's TURMED service now links Taranto and Tunisia via Malta's Freeport Terminal at the Marsaxlokk port operated by Yilport, which is majority-owned and operated by Yilport Holding. Roughly equidi-

stant between Taranto and Tunis, Yilport's Malta terminal forms an important logistics centre for the Africa-to-Europe segment of the Turkey-Italy-Tunisia corridor.

With its general focus on Italo-Tunisian-Algerian energy interconnectivity, Italy has literally laid the groundwork for the expansion of the Turkey-Italy-Tunisia corridor's extension to Algeria through the involvement of Italy's leading construction firms, such as ITALCONSULT and Anas International, Algeria's megaproject East-West highway traversing the entire length of Algeria parallel to the country's coast. Without having coupled Algeria's transportation infrastructure development with investments in local industrial production linked to a manufacturing value chain, Italy's role in Algeria's commercial connectivity remains far from certain as Turkey's military presence in Libya is increasing Ankara's political and economic clout in neighboring Tunis and Algiers.

Turkey has made a strong inroads in Algeria through \$3.5 billion dollars of investments, ranking Turkey as one of the country's top foreign investors (Tanchum, 2020b). One month into Turkey's game-changing Libya intervention, Turkey's President Recep Tayyip Erdoğan visited Algeria on January 26, 2020, where he announced the goal of raising Turkey-Algeria bilateral trade to \$5 billion. Declaring Algeria as "one of our strategic partners in North Africa," during his January 2020 visit, Erdoğan explained, "Algeria is one of Turkey's most important gateways to the Maghreb and Africa" (Hürriyet Daily News, 2020). Italy's position in Tunisia is being undermined by the sizable investments of Turkey's strategic partner, Qatar, whose approximately \$3 billion

of investments (Gulf Times, 2020) ranks it as Tunisia's second largest investor, behind France but leapfrogging ahead of both Italy and Germany (Tanchum, 2020b).

While the Turkey-Qatar partnership has gained economic and political influence in the central Maghreb, it has not secured a dominant position in the development of central Africa-to Europe corridor either. Bizerte and Tunisia's five other medium-sized ports, do not provide an economy of scale to sustain an economic corridor. With an expected 20% contraction of the Tunisian economy in 2020 (Asala, 2020), it remains unclear when construction will begin on Tunisia's proposed deep-sea port at Enfidha. In the absence of a modern deep-sea port, the Turkey-Italy-Tunisia network could become a sub-system in China's Belt and Road Initiative (BRI) architecture.

The incorporation of the Turkey-Italy-Tunisia network into a BRI-oriented central corridor may be accomplished with China's construction of El Hamdania port in the Algerian municipality of Cherchell. Following China's CITIC Construction's success in building most of Algeria's East-West highway, Algiers inked a deal in 2016 with the China State Construction Engineering Corporation and the China Harbor Engineering Company to construct El Hamdania as a massive transshipment port located about 60 km west of Algiers (Bonface, 2016). With a container capacity of 6.5 million TEU, El Hamdania could function as the hub of an Africa-to-Europe corridor linked to the Taranto port.

In July 2019, the Algerian government ratified and confirmed by presidential decree its September 2018 Memorandum of Understanding with China in

which Algeria agreed to participate in Beijing's BRI programme (Xinhua, 2019b). Slowed but not deterred by the COVID-19 pandemic, nor Algeria's changing political environment, Beijing's China International Development Cooperation Agency signed, on 11 October 2020, an economic and technical cooperation agreement with Algiers to deepen Algeria's BRI participation (APS, 2020). Nonetheless, requiring seven years of construction at a current estimated cost of \$6 billion (Agenzia Nova 2020), whether and when El Hamdania will actually be completed remains uncertain, as Algeria's economy has been forecasted to contract by 5.5% in 2020 (IMF, 2020) forcing a reduction of the planned investments of its state-owned energy company Sonatrach by 50% (Reuters, 2020b).

While a sufficiently strong recovery in energy prices could push Algeria's positive economic growth in 2021, Algiers would require an oil price of \$157.2 to balance its budget. Despite depleting its foreign reserves, Algeria has so far been reluctant to seek assistance from the International Monetary Fund (M'vida, 2020), leaving it more vulnerable to increasing its dependence on China, Russia, and Turkey.

Post-COVID-19 Advance of the Eastern Corridor: Egypt and the East Africa-to-Eastern Mediterranean Corridor-to-Eastern/Central Europe

With approximately 103 million inhabitants, Egypt has the largest population of any Mediterranean nation and the third largest in Africa. Egypt is progres-

sing toward becoming a hub for an East Africa-to-Eastern Mediterranean commercial transportation corridor that connects to the European mainland at the massive Chinese-run transshipment port in Piraeus, Greece. Piraeus' port operator China Ocean Shipping Company (COSCO) provides freight rail service through the Balkans and Central Europe to reach Austria, the Czech Republic, Germany, and Poland, extending the East Africa-to-Eastern Mediterranean corridor to the major markets and manufacturing centres of Eastern and Central Europe.

Egypt has been engaged in a programme to increase its total container capacity of its Mediterranean ports to partner with Piraeus as the dominant transshipment hubs in the Mediterranean basin. China occupies a preeminent position in Egypt's both the operation of Egypt's Mediterranean ports and their capacity expansion. The majority of Egypt's foreign trade is handled by the Alexandria port and its auxiliary El Dekheila port with a combined container capacity of 1.5 TEU. The port is run by the Hong Kong-based Hutchison Port Holdings, as a joint venture between Hutchison, the Alexandria Port Authority, and Saudi Al Blagha Holdings (Mooney, 2016). Hutchison is also developing a 2 million TEU port at the nearby Abu Qir peninsula that will start operations in 2022 (Egypt Today, 2019). The 5.4 million TEU Suez Canal Container Terminal (SCCT) at East Port Said is owned by APM (55%) and COSCO (20%) with the remaining 25% stake split among the Suez Canal Authority, the National Bank of Egypt, and Egyptian private sector participants. The SCCT services the entire Suez Canal Economic Zone mega-project in which China is the largest investor (Xinhua, 2019b).

The emerging East Africa-to-Eastern Mediterranean commercial corridor centered in Egypt is a multi-modal corridor whose African segment will be primarily based on rail connectivity as Cairo has prioritised shifting its commercial transportation from road to rail (Dornier, 2019). Egypt is creating rail connectivity with Sudan that could forge a new north-south rail corridor with the White Nile countries with whom Egypt is more closely aligned, extending southward to Egypt's partner Tanzania and the other East African countries of the wider Lake Victoria basin. This development has been facilitated by Egypt's warming relation with the new Sudanese government after the April 2019 ouster of Sudan's former strongman Omar al-Bashir and the multibillion-dollar support provided to Sudan's new government by Egypt's close strategic partners the UAE and Saudi Arabia (Abdelaziz, 2019).

On 25 October 2020, Egypt and Sudan signed a new transportation connectivity agreement that will create modern rail connections between Egypt and Sudan (Egypt Today, 2020). The first rail link of the project will be constructed with funding from the Kuwait Fund for Economic Development and will run from Egypt's southern city of Aswan to the Sudanese border town of Wadi Halfa, which presently is the northern terminus of Sudan's rail line from the country's capital Khartoum. Combined with the eventual upgrade and completion of South Sudan's rail links between its borders with Sudan and Uganda, Egypt will preside over a rail corridor that links the booming economies of East Africa to Eastern Mediterranean coast. With maritime connectivity from Egypt's ports to Piraeus, Egypt will become the multi-

modal hub for a commercial corridor extending from East Africa to Eastern and Central Europe via the Eastern Mediterranean.

China's construction of a high-speed rail line from Egypt's Red Sea port of Sokhna to its Mediterranean port at Alexandria will accelerate the development of rail transportation as the major land component of an East Africa-Eastern Mediterranean corridor. The \$9 billion tender was awarded in September 2020 to a Sino-Egyptian consortium led by the China Civil Engineering Construction Corporation (Egypt Independent, 2020). Although European firms such as Thales and Siemens have been involved with upgrading Egypt's rail system, China is playing the most strategic role in Egypt's transportation connectivity.

Still, China has not developed a production base in Egypt anchored in manufacturing value chains to dominate the commercial landscape in Egypt despite its participation in the special economic zone created under Cairo's Sustainable Development Strategy: Vision 2030. There remains a great opportunity for Europe to assume a strategic leadership role in the development of the East Africa-to-Eastern Mediterranean corridor through EU incentivization of European businesses to opening of manufacturing plants in key sectors in Egypt. Already with a surplus electricity generation capacity of over 10 GW, Egypt is one of the Mediterranean best suited nations for hydrogen production. Cairo's plans for an ambitious 61 GW of installed capacity from renewable energy resources – 32 GW from photovoltaic solar power, 12 GW from concentrated solar power, and 18 GW from wind power (Tanchum, 2020a),

could make Egypt one of the world's leading green hydrogen producers.

Despite the COVID-19 pandemic, Egypt's Ministry of Finance forecasts that the Egyptian economy will grow 3.3% in fiscal year 2020-21 (Reuters, 2020a). The June 2020 staff-level agreement between Egypt and the IMF on a \$5.2 billion stand-by arrangement to offset COVID-19's adverse economic impact will help ensure that the Egyptian energy juggernaut maintains momentum. Additionally, the Egypt-IMF agreement was bolstered by a subsequent \$2 billion loan coordinated by UAE-based lenders Emirates NBD Capital and First Abu Dhabi Bank (CGTN Africa, 2020). Egypt's large labor supply and consumer market, along with its ample energy resources, may make the eastern corridor the most attractive investment among the three trans-Mediterranean corridors in the immediate post-COVID-19 period.

Conclusions

North Africa's leading foreign partners in trans-Mediterranean commercial connectivity will be the countries that invest in infrastructure that is directly tied to Africa-to-Europe manufacturing value chains. On 9 March 2020, the European Commission and the High Representative of the Union issued a joint proposal for "a new comprehensive EU strategy with Africa," based on a program of 'five partnerships' for 1) green transition and energy access; 2) digital transformation; 3) sustainable growth and jobs; 4) peace and governance; and 5) migration and mobility. For the European Union to realise its ambition to partner with Africa based on the five partnerships framework, the EU system must materialize its values-based approach through European in-

vestments in trans-Mediterranean connectivity that create local manufacturing that participates in European value chains. In the absence of coherent European Union system policy to incentivize EU member states and European firms to cooperate in effectively partnering with North African nations, leading EU member states will partner with actors outside the union to create Africa-to-Europe corridors. Any space left by the European Union in the development of trans-Mediterranean connectivity will be filled by China, Russia, Turkey and the GCC States.

The EU system should incentivize closer coordination among member states and European firms to make investments on a strategically significant scale in transportation connectivity and in manufacturing facilities that will utilize that commercial connectivity in European manufacturing value chains. While EU values, often manifested through regulatory systems, are viewed by the Union as one of its primary contributions, these will be more readily accepted when adopted by European firms operating manufacturing production facilities in North Africa.

Automotive manufacturing is one of the key growth sectors for North Africa and trans-Mediterranean connectivity. The

EU should promote green transition through incentivizing European electric vehicle manufacturers to open production facilities in Morocco, Algeria, or Egypt to employ North Africans. North African countries are expanding their power production capacity from renewable resources as well as their infrastructure for the storage and transport of liquefied natural gas. The EU should take the lead in developing the potential of newly emerging trans-Mediterranean hydrogen geographies through incentivizing European-African joint ventures in hydrogen production from renewable energy resources and the infrastructure for hydrogen storage and transport.

The absence of EU partnerships with North African nations on a strategically significant scale will likely result in trans-Mediterranean connectivity that neither represents European values nor serves Europe's interests. The European Union's window of opportunity is now in the immediate post-COVID-19 period. The implementation of a robust partnership between the European Union and North Africa that produces Africa-to-Europe value chains will result in trans-regional architectures of commercial connectivity based on the values of the five partnerships framework that will operate for generations beyond the pandemic.

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The Health Crisis Re-Shuffles the Cards of Geopolitics in the Transport and Logistics Sector in the Western Mediterranean: The Case of the Maritime Sector

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Historically, transport has always been a key sector in the operation of the world economy. In the modern era marked by interdependence and interconnection of states, economies and world and regional trade, the transport and logistics sector takes on an increasingly important role. It is therefore the driver of development and regional integration, particularly in the countries of the Mediterranean region that have experienced a real revolution in the two last decades in terms of the evolution of their infrastructures and means of transport. The latter largely participate in the facilitation of mobility of people and goods and in the development of international trade. Thus, better transport policies as well as strengthening the transport and logistics infrastructures, be it air, port, road or rail, are necessary to the economic development of the countries of the Mediterranean basin at a domestic and regional level but also internationally. Moreover, solid modern infrastructures are essential to encourage the growth of the Mediterranean countries, their economic and social development, as well as their competitiveness in the international market. Likewise, an efficient transport sector could only enable the development of all economic sectors through a more substantial creation of jobs, greater attractiveness to foreign investment, and a social cohesion between the people around the Mediterranean Basin.

The current health crisis, beyond having severely tested the world health systems, has redefined world geopolitics. The large transport networks must readapt and adjust to the geopolitical evolutions and the new world dynamics. The relationship between politics and transport is, therefore, paramount in the contemporary world. Moreover, there is a close link between geopolitical dynamics and the large transport networks.

It is precisely the case of maritime transport and port infrastructures that have been put under strain during the COVID-19 crisis. The Mediterranean Sea is an important trade and maritime route because it serves many markets, whether regional or international. Comprising almost 87 ports with diverse specificities and activities, it has revealed the vulnerability of its activities and facilities as well as their lack of efficiency and connectivity. It is therefore clear that the maritime sector and the port activity have been impacted by the new international dynamics and that they must strengthen their resilience and competitiveness in the international market.

With the COVID-19 Crisis, the Transport and Logistics Sector is Readapting in the Western Mediterranean

The transport and logistics sector is unquestionably among the most harshly and directly hit by the crisis, whether in the Mediterranean region or elsewhere. With the almost total interruption of air connections, the reduction of maritime activities and the drastic drop in rail and road traffic, the two sectors have suffered greatly, thereby impacting all economies in the region. However, despite the great difficulties for Western Mediterranean countries, they have taken some measures to counter the impact of the virus and endeavour to re-launch the two sectors.

While the health crisis has had a devastating effect on the air and urban transport sectors, it has not completely brought an end to maritime traffic and the activity of ports in the Mediterranean (AVITEM, 2020). Quite the contrary, the

situation has enabled the maritime actors to urgently reflect on the activity and connectivity of Mediterranean ports and maritime activity. Indeed, this activity has been maintained while all other means of transport have seen their activity stop or at least drastically decrease and the urban ports have emerged as the new points of trade stability. This is explained, for example, by the need to continue to supply countries with raw materials and food products, as the value chains are dispersed in several continents and often depend on one destination. More importantly, ocean freight has even had to fill the void left by air transport to enable the transit of goods even though world maritime transport accounts for 80% of world trade. Several ports have also had to innovate to maintain the level of activity, such as in the case of Barcelona, which has diversified its port activity. Barcelona has implemented a new line, secured by the German company JSV Logistics, connecting Spain to the two Turkish ports of Gebze and Ambarli. Along with reducing delivery times for imports and exports, it should enable the development of trade relations with Turkey.

Established very recently in July 2020, the ocean freight company Anarres Shipping, based in Cyprus, launched a new maritime line in August connecting three Western Mediterranean countries, i.e., France through its port in Sète, Tunisia in Sousse, and Italy from Marina Di Carrara. This initiative seeks to bring these countries together by boosting activity in the non-priority ports of the Mediterranean region with a view to closer relations and economic integration. The effects of the health crisis have revealed the need to bring the supply chain closer. Several regions like Africa or the Mediterranean, which in the past had been supplied from Asia or the American continent, have been heavily hit by the crisis when

traditional means of transport have been paralysed. Thus, several factories are today relocating from Asian countries to North African countries. In Tunisia, for instance, several factories are under construction (Khdimallah, 2020).

In France, where ocean freight companies have found themselves in difficulty faced with the effects of the crisis, the Prime Minister has announced the provision of 30 million euros in the framework of the government rescue plan to ensure that jobs are safeguarded in the sector as well as French competitiveness (Descamps, 2020). This amount complements loans to a value of 115 million euros recently granted to them (Le Figaro, 2020).

The Grand Port Maritime de Marseille has been hard hit by the slowdown of maritime activity since February 2020. Although it has recorded a drop of 15% of its maritime traffic, and this only in the first quarter of the year (traffic of 33.6 million de tonnes compared to 39.5 in the same period of the previous year), and that for the end of the year a drop of 20% of turnover is expected, the planned investment of 57 million euros has been maintained and 6.5 million has been added to encourage the relaunch of the port and therefore trade activity (Dubessy, 2021c). Moreover, all the projects initially planned have also been resumed, such as the new Cap Janet international terminal (Econostrum, 2020), which will connect France with its Maghreb neighbours. This strategy of investment maintenance has allowed a rebound of activity even though it is still fragile. Incentive measures such as the reduction of port fees and the signing of a covenant of commitment to meet the crises with the whole port community have boosted the resumption of global maritime activity.

These brief examples, albeit not exhaustive, nevertheless have the merit of shedding light on a key element. While, in the past, Mediterranean ports operated independently of one another, favouring specific countries for their trade activity, the health crisis has shown them the need to promote better regional cooperation and bring supply chains closer. Moreover, maritime transport and port activity seem to have taken over from other means of transport mainly at a time when the COVID-19 crisis has emphasised their resilience.

How Has the Mediterranean Been transformed into a Geopolitical and Strategic Arena for Confrontation in the Maritime Sector?

The case of the Beirut port, representative of the geopolitical challenges in the Eastern Mediterranean

While Chinese companies exert their influence in several ports in the region, thereby providing access to Middle Eastern markets and opening a door to Africa, such as the case of Alexandria or Haifa in Israel, the recent explosion in the port of Beirut has stirred Chinese interest. The resumption of the management of this port has revealed a real geopolitical arm-wrestle between regional and international powers. For China, a point of anchorage in the Lebanese port would enable a maritime route to be secured, in the framework of its initiative "The New Silk Route", towards Arab countries while avoiding the obstacles found in other ports of the region because of domestic political issues. However, Leba-

non, traditionally close to the West, would probably refuse to authorise such a Chinese enterprise in its territory, despite Hezbollah's inclination to this possibility, which does not conceal its desire to reorient the country towards the East by strengthening links with China and Iran, especially because the United States has sounded the alarm about Chinese investments in the region. However, a reconstruction of the port by France, Lebanon's traditional ally, would be more feasible and less criticised by the United States. The French have also expressed their interest in the Lebanese port and have multiplied the political, social and aid actions in the aftermath of the explosion that hit this country already weakened by the health crisis, thereby consolidating France's influence in Lebanon. Meanwhile, Beijing has moved its trade activity towards the Libyan port of Tripoli.

In its search for influence in the Western Mediterranean, Turkey sees the port of Beirut as a key point of presence and, as it only has its national ports in the region, would wish to expand its presence through the Lebanese capital. Nevertheless, given the French-Lebanese relationship and Lebanon's reticence about greater influence of Ankara in the region, which it criticises for intervening in the Libyan conflict, a reconstruction of the port by Turkey is quite unlikely. Moreover, the United Arab Emirates (UAE), whose Mediterranean ambitions have led them to become interested in the port of Beirut, share French fears over Turkey. The UAE have contributed humanitarian aid to Lebanon through their company Dubai Ports World, which they often use as a geopolitical lever. The recent tensions between the countries and closer relations between other countries have been transposed to the Eastern Mediterranean region. An alignment be-

tween Abu Dhabi and Paris on the port issue would not be surprising.

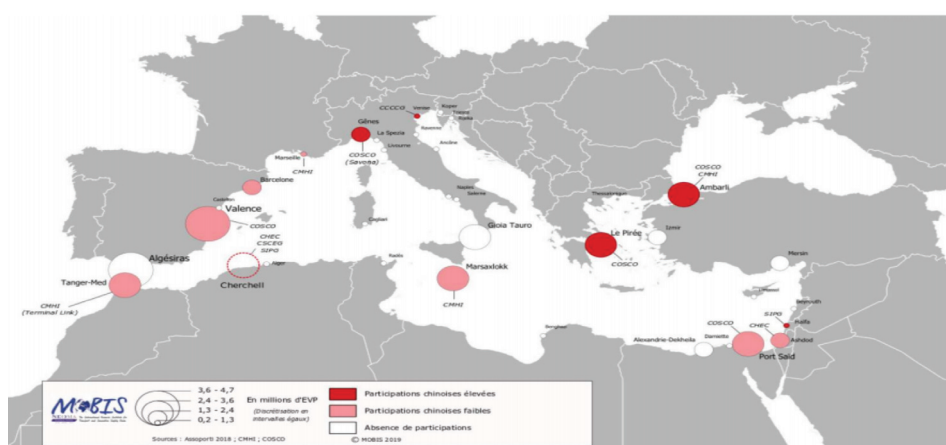
Maritime transport and port facilities: new strategic challenges of geopolitical clashes in the Western Mediterranean

The weakness of Southern Mediterranean countries opens the way to regional and international ambitions. With a weak Libya, a Tunisia with an uncertain domestic future and a cooling of relations between Algeria and Morocco, the Maghreb is weakened. Turkey's so-called neo-Ottoman ambitions as well as its desire to become a real regional power push the country to multiply the initiatives in the Mediterranean. Its intervention in Libya, which it sees as an obstacle to the Maghreb and by extension sub-Saharan Africa, explains its interest in the country. Moreover, the new world geopolitical dynamics can be seen, in relation to the

transport and logistics sector, in the south-western Mediterranean countries. China, the main country with ambitions in the Mediterranean, began its port expansion in the framework of the New Silk Routes well before the start of the health crisis. Historically, the Mediterranean area is not a prime location for Chinese economic interests. It was not until 2008, following the financial crisis and the lack of interest of certain historical partners in this region, that the Asian power showed renewed interest in this maritime space. In the framework of the New Silk Routes, China has placed the Mediterranean basin at the centre of its deployment strategy mainly with respect to transport infrastructure and port hubs through control of the Mediterranean logistics chains and maritime routes, investing considerably in the ports of the region.

With the investment of Chinese enterprises in Mediterranean ports, China has managed to impose its presence in the most strategic points of the region.

Figure 1. The presence of Chinese enterprises in Mediterranean ports



Source: J. Verny, O. Oulmaki, Th. Blayac, (2019). Positionnement stratégique de la Chine en Méditerranée : Le projet « Belt and Road Initiative ». Les cahiers scientifiques du transport (n°75). Pages 63-79.

Figure 2. Main Chinese investments in the Mediterranean

Year	Location	Projects
2008	Piraeus (Greece)	COSCO obtains the concession for 35 years of the Piraeus port: COSCO becomes main stakeholder of the port in 2016.
2013	Tanger-Med (Morocco) Marseille (France) Marsaxlokk (Malta)	China Merchant buys 49% of Terminal Links from CMA CGM
2014	Ashdod (Israel)	CHEC (China Harbour Engineering Company) is chosen to build a deep-water port
2015	Kumport/Ambarli (Turkey)	A Chinese consortium (40% COSO, 40% China Merchant, 20% CIC Capital Corporation) buys 65% of the shares in the port
2015	Haifa (Israel)	Shanghai International Port Group (SIPG) becomes the port operator
2015	Venice (Italy)	VOOPS project: a Sino-Italian consortium (with China Communication Construction Company Group) undertakes construction of an offshore terminal and a container terminal
2016	Vado-Savona (Italy)	COSCO buys 49.9% of the shares in the port
2016	Cherchell-El Hamdania (Algeria)	Decision to construct a 23-dock port with capacity of 6.5 million TEU. CHEC and CSCEG (China State Construction Engineering Group) will be the constructors and Shanghai Port the operator
2017	Valencia (Spain)	Acquisition of 51% of Noatum Port, main Spanish operator

Source: J. Verny, O. Oulmakki, Th. Blayac, (2019). Positionnement stratégique de la Chine en Méditerranée : Le projet « Belt and Road Initiative ». Les cahiers scientifiques du transport (n°75). Pages 63-79. Extrait de : <https://vdocuments.mx/document/les-cahiers-scientifiques-du-transport-n-752019-pages-63-79-2020-2-20.html>

China has recently signed an economic and technical cooperation agreement with Algiers. In the framework of this agreement, Beijing plans the construction of a deep-water port in El Hamdania (Cherchell). This major project, in which China will invest 5 to 6 billion dollars, will be one of the biggest maritime ports at world level and consolidate China's Silk Route project (Algérie Presse Service, 2020). This new project will be able to accommodate ships up to 21.500 EVP (Demmad, 2020). Moreover, it will make Algeria a regional commercial hub and will unquestionably offer Beijing an opening to an African trade corridor and greater influence on the continent.

Its Tunisian neighbour, considered an ally of certain Western powers in the Libyan issue, also enters the recent geopolitical game. With the health crisis, Tunis has recorded significant negative effects on key sectors of its economy, i.e. transport and logistics. The transport sector accounts for 7% of GDP as well as 11.5% of investments (Business France Tunis, 2020). In order to counter the attempts of Turkish and Russian influences in the country as well as the increasingly significant Chinese presence, the American ambassador met the Tunisian Minister of Transport and Logistics in October. The discussion dealt with the possibilities of bilateral cooperation¹ as

¹ <http://www.transport.tn/fr/article/240/le-ministre-detat-recoit-son-excellence-lambassadeur-des-etats-unis-damerique-en-tunisie>

well as support concerning the crisis in the two sectors at hand (Ministère tunisien du Transport, 2020). The first investment to this end, for an amount of 300 million dinars, concerns the improvement of the infrastructure of the port of Radès. It is worth recalling that in 2017 a direct maritime line connecting this port with that of Quigdao in China had been implemented by the Spanish company Transglory. Its objective is to boost trade between Northern Mediterranean countries and China and Africa. Moreover, the Chinese, who for some time have sought to secure a port in the country, ideally Zarsis or Bizerte,² are still trying and have recently confronted American hostility. However, the Chinese are persistent and continue their progress in the transport and logistics sectors in this Mediterranean country. Indeed, a meeting was held on 10 November 2020 between the Minister of Transport and a delegation of the company Huawei on the implementation of technological and digital solutions in transport infrastructure, i.e. airports, ports and urban transport (Réalités, 2020). China therefore seems very present through different channels in Tunisia despite the reticence of some of its rivals.

However, the view that powers traditionally confronted in the Mediterranean region would be the only ones seeking to impose their influence is outdated. The Gulf countries increasingly emerge as key actors in the Western Mediterranean. Although their interest mainly focuses on transport in the eastern part of the sea, today we witness a growing interest of Gulf countries in North Africa and Southern European countries. Indeed, their maritime strategy is led by

their desire for commercial and economic diversification, and the Northern and Southern Mediterranean countries offer them a strategic location of choice. The UAE are undoubtedly the most active country in the transport and logistics sectors in the Western Mediterranean. With the perpetual confrontation of powers in its traditional area of influence, i.e. the Persian Gulf, and as a result of the stagnation of the Libyan crisis and its desire to increase its geostrategic influence in the Mediterranean, the UAE have been forced to reorient their maritime strategy. In Algeria, for instance, Dubai Ports World is responsible for the management of two ports, Algiers and Djen Djen. It is also present in Spain and France in the port of Marseilles. Despite the considerable investment in diverse transport infrastructure and logistics projects mainly with a view to securitisation of the ports, the UAE are faced with their European and Chinese competitors in this region.

The UAE have indeed chosen one of the countries with the most strategic geographical positions in the region, i.e. Morocco, which in recent years has invested in ambitious transport projects that have driven it as a key actor in the geopolitical scene in the Mediterranean. It forms part of the country's commercial transport corridor between Africa and Europe as well as Africa and Asia. Morocco, having surpassed the whole of the African ports in terms of capacity, will not take long to emulate the biggest European ports on the northern Mediterranean shore, the Strait of Gibraltar or Algeciras, for instance. Moreover, this port has enabled Morocco to become a point of passage or a real maritime and commercial hub. In other words, the

² <http://kapitalis.com/tunisie/2020/09/28/maghreb-un-nouvel-enjeu-geopolitique/>

port of Tanger-Med provides the country with a significant geostrategic position and Euro-Mediterranean anchorage and transforms it into a port highly coveted by the international actors (Ministère de l'Équipement et des Transports du Maroc, 2011). Morocco is also the first African country to have a high-speed train whose extension will be able to connect Europe to Africa. The Chinese have announced their desire to participate in the extension of this rail connectivity although it is not guaranteed by France, traditionally the most important presence. With the COVID-19 crisis and the greater investment and Chinese interest in the country, France further mistrusts an omnipresence of the Asian power, thereby complicating its implementation. It is also hindered by France's lack of European partners, above all because Morocco has been very open to cooperation with other countries such as Russia through the signing of economic association agreements. Until now these countries have only invested in the energy sectors but investment in transport infrastructures should not be dismissed, especially if they decide to join Chinese or Emirati projects. Both have also shown interest in Morocco by resuming most if the air links.

However, the Emirati interest in Moroccan airport facilities has somehow been undermined since 2018. Today, Saudi Arabia and the UAE are seeking to secure their political and military influence in Mauritania through major investment in transport infrastructure and airport facility projects. In 2018, the Mauritanian authorities entrusted the management of Nouakchott airport to Abu Dhabi Airports Company PJSC for 25 years (Yabildi, 2019). Moreover, the management of the port of Nouadhibou at the border with Morocco, which had been en-

trusted to a Chinese company but seems to be crumbling, has stirred Emirati and Saudi interests, which have expressed their intention to invest. This would not only risk competing with the project of the Dakhla Atlantique port in which Morocco is so deeply invested but would also counterbalance Moroccan interests in Mauritania. Russia, which has RSW (Refrigerated Sea Water) vessels in Mauritanian waters with a competitive capacity, would also be attracted by Mauritanian ports.

Moreover, Turkey seems to gain ground in the Western Mediterranean through a rapprochement with Italy. Indeed, in July 2020, Turkey established a transport corridor bringing closer Italy but also Tunisia. Formed around a focal point, which is the deep water port of Tarento in southern Italy, a strategic place in the Mediterranean managed by the Turkish company Yilport, this corridor will enable closer trade relations between three regions, i.e. Africa, Europe and the Middle East. Along with connecting the Southern Mediterranean countries to the European countries through Italy and the rail systems, this corridor has even greater strategic interest for Turkey and Europe. From Algeria and through the trans-Saharan route, it opens the way towards sub-Saharan Africa, which Turkey increasingly covets.

In contrast to the international actors investing in the two sectors in search of influence, the European strategy turns out to be different. Little motivated by its geopolitical ambitions, Europe mainly relies on regional integration and the development of Western Mediterranean countries. Indeed, along with the countries in the north-western shore forming part of the European Union (EU), the Maghreb countries located on the southern shore are its closest neighbour-

hood. It is from this perspective that the Centre for Transportation Studies for the Western Mediterranean (CETMO) signed an agreement protocol with the United Nations Economic Commission for Europe (UNECE) in November 2018. The objective was to create an interconnected Mediterranean transport corridor and to develop all the means of transport, i.e. road, rail, port and airport networks. It will act as a link between the continent and Africa through the Western Mediterranean. However, it is true that the European countries of the region and those belonging to the Arab Maghreb Union (AMU) do not enjoy the same level of development, another reason to take this factor into account in the midst of the economic crisis. Europe will have to provide aid to the most affected countries and help harmonise the adoption of legal instruments in the field of transport. Moreover, the rupture of the world supply chains has revealed the need to bring them closer together. The agreement should insist on the development of efficient logistics and transport infrastructures that will enable the supply chains to be perfected in the region and make the Western Mediterranean countries key actors in international trade.

Conclusions

- With the weaknesses of transport revealed by the current health crisis and the fact that the maritime sector has proven more resilient than air, road and rail sectors, in the coming years the maritime sector will emerge as the one that will channel the main strategic interests in the Western Mediterranean.
- The world value and supply chains do not seem to be controlled by the different states that should integrate into

them to avoid a repeat of the difficulties experienced during the COVID-19 crisis.

- Northern and Southern Mediterranean countries, which during the crisis suffered because of their supply dependence on relatively distanced countries, have understood the need for a rapprochement. It therefore seems important to develop maritime connections between the European Northern and Southern countries to encourage regional integration as well as a socioeconomic development, mainly between the five Maghreb countries that have been severely hit by the health crisis.

Recommendations

- European initiatives aimed at the transport and logistics sector are many. However, the European strategy vis-à-vis its neighbours continues to be blurred, despite great progress. It would therefore be necessary for it to engage in a clear and defined strategy. The 10th Group of Transport Ministers for the Western Mediterranean (GTMO 5+5) Ministerial Conference could provide the opportunity to discuss the effects of the crisis on the two sectors, identify the shortcomings in terms of transport and infrastructure in order to boost activity, and implement scenarios for a way out of the crisis. The EU should also help the Western Mediterranean countries to mobilise funders, whether national or international, with the aim of strengthening the transport and logistics sector in the post-COVID-19 era.
- The strategy of development of hubs in certain towns, such as the Tanger-Med port, which has made the town of Tangier a port and maritime hub, or

Mohamed VI airport, which has turned Casablanca into a key air hub between Asia, Africa and Europe, should be continued and intensified.

- Finally, it would be appropriate to develop the motorways of the sea in the Western Mediterranean in order to enable a connection between the European ports and countries and the southern shore. This initiative

should enable an increase in the commercial flows as well as a relocation of the industrial activity in the region, thereby bringing about economic and social development. In order to back up these efforts, the development of road transport must be supported to enable connections even within the countries and boost the development of the whole transport chain.

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Chapter 2

POLICIES

The major disruption that COVID-19 has brought to the transport sector calls for a pause to analyse the functioning and priorities of the current transport system and its policies. Is this the transport system we want for the future? Has the pandemic revealed any relevant aspects to be included in the planning of the target transport system?

All the actors involved in the development of the transport system, from the administration to user associations, including managers and operators, have the responsibility to work together to identify and define the guidelines that should make the transport system a tool in favour of society. A safe, accessible, affordable and sustainable system that contributes to social integration and facilitates access to essential services.

Integrated Transport Planning, the Digital Challenge and Decarbonization of Transport

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Introductory Notes

These early years of the 21st century have brought unprecedented growth and development in human activity and society. This era has given rise to new challenges and demands, and the pandemic has added even more previously unseen phenomena.

To increase the transport sector's contribution to economic, social and environmental sustainability and respond to these demands, innovation must be at the service of the common good, as well as the environmental, health-related and functional challenges facing society as a result of climate change and all other emerging threats.

In keeping with our preferred line of reasoning, the key factors for the success of our sustainability and decarbonization ambitions are integrated transport planning, organization of transport with rail as the backbone, and a focus on public and digital transport.

To provide guidance and some initial considerations on structuring the transport system, we will underline some of our recommended principles and options.

Regarding mobility:

- Mobility that is safe, clean (without air and noise pollution), fluid, free from bottlenecks and accidents, and integrated into the landscape where it takes place;
- Mobility that is energy efficient and environmentally friendly;
- Mobility that is smart, shared, interconnected and user-centred;

Regarding systems and technologies:

- Connected and interconnected multi-

modal systems where the focus is on autonomous and automated driving modes and the widespread use of electrical propulsion and alternative, non-polluting fuels;

- Implementation of efficient co-mobility supported by complementary, collaborative systems and technologies between modes of transport, from the heaviest (i.e. trains) to the lightest (i.e. pedestrians);
- Use of digital technologies based on artificial intelligence, big data, cloud computing, the Internet of things, etc.;

Regarding infrastructure:

- Widespread digitalization of infrastructure, and construction of more efficient and eco-friendly smart infrastructure;
- Implementation of more effective and more energy-efficient mechanisms in all areas of asset management;
- Renovation/construction of new multimodal stations as integrated spaces for mobility and the promotion of complementary transport activities;
- Digital overhaul and automation of logistics areas used for goods transport, especially through the use of automatic freight couplers for reception/ training operations.

Transport System Indicators and Inefficiencies

This introductory section, which aimed to structure and clarify our thinking, will now be followed by a description of some key indicators and inefficiencies that characterize the transport system and help provide an insight into the complexity and scale of the problem at hand.

Some indicators and trends to consider are as follows:

- The world's population has grown 12-fold in three centuries, from 600 million people at the start of the 18th century to almost eight billion in the second decade of the 21st century. This is putting great pressure on the global and local economies, land use and transportation systems;
- After the Second World War, the human population trebled and there was a six-fold increase in the consumption of energy, most of which came from fossil fuels;
- The number of passenger cars in circulation grew from 40 million to one billion, with road transport leading the way and representing the biggest polluter (EU: 72%), way ahead of any other mode;
- Europe's railways (EU) carry 439 billion passenger-kilometres and 261 billion tonne-kilometres per year (2019), accounting for a market share of 7.8% and 18.7% of the total volume transported, respectively, and are a far cry from our decarbonization targets;
- Maritime transport is fundamental to the global freight transport system, but its relative carbon footprint is high, given that it accounts for around 4% of CO₂ emissions;
- Aviation is an essential, innovative sector for long-distance transport, but its carbon footprint is also very high, since it is responsible for around 14% of CO₂ emissions. New forms of mobility in this market segment are therefore crucial;
- The European transport sector is responsible for 25% of CO₂ emissions;
- The European road sector is responsible for around 26 million deaths per year, a figure that must be reduced considerably;
- Road infrastructure is currently used for 75% of the land transport of goods. It is vital that a significant portion of this be transferred to rail infrastructure;
- To achieve the objective of climate neutrality by 2050, as set out in the European Green Deal, transport emissions must be reduced by 90%;
- Today, more than three billion people in the world have a smartphone. Connected mobility therefore has plenty of potential for success.

We will now highlight the most significant transport system indicators and inefficiencies that must be addressed:

- Pollution and emissions produced by the transport system;
- The rate of road traffic accidents, the number of which is unacceptable and must be addressed;
- The high average cost of transport/passenger, according to the system's current structure, and which must be reduced;
- The low capacity of infrastructure used, given the intense use of individual transport and its low occupancy rate;
- The low energy efficiency of internal combustion engine vehicles, which have not significantly increased in the last hundred years;
- The system's inefficient global transport supply, given the modal rather than integrated approach;
- Excessive land use by the system, given the return generated, especially with respect to road infrastructure;
- The transport sector's heavy dependence on energy from fossil fuels.

We Are Very Inefficient!

In light of the above observations, it is imperative that we change our practices

and improve our performance by adopting a coherent overall vision and developing new policies to implement new solutions in terms of systems, equipment, infrastructure and transport operations.

We could keep on citing figures to illustrate the incredible growth in demand in recent years, the characteristics of the system and the transport sector's importance and its impact on our lives, but no additional arguments are required to describe the current situation.

Furthermore, in response to the purpose of this document, we must conclude which are the most important challenges involved in addressing citizens' future mobility demands in terms of infrastructure, equipment and range of services. Most importantly, we must take a holistic approach when designing and operating the transport system while keeping in mind that a digital mindset is key to designing a system that must be seamlessly implemented everywhere.

The Digital Challenge and Decarbonisation

We will now address the issue of the digital challenge in the context of the revamped transport system we need.

Communication with transport network users has evolved from personal contact to digital "self-service", which requires more online services. An increasing number of services are currently available on user portals managed directly by transport companies, infrastructure managers or third parties in collaboration with the first two. The paradigm of the Internet and social networks has given rise to new ways to access services, which prompt leading transport providers to adapt to new channels so

they can communicate with their customers.

In view of this reality, it is important to focus on investing in policies aimed at promoting cleaner, more efficient transport options to link smart regions and cities through smart modes of transport at high performance levels in terms of economic, social and environmental benefits.

To achieve this, it will be necessary to make investments and take certain measures, a list of which is provided below:

- Increasing heavy and light rail transport solutions for both passengers and freight by moving towards detection- and automation-based solutions, such as smart trains that run on smart infrastructure;
- Gradually building smart, connected road infrastructure with new materials to ensure perfect vehicle-infrastructure communication and offer additional features such as electrical charging solutions for moving vehicles;
- Making a firm commitment to the digitalization of maintenance processes, for both equipment and infrastructure in general, by optimizing their lifespan and maximizing the economic return on transport operations;
- Making a firm commitment to the renovation and construction of intermodal stations and transport coordination centres, including widespread use of digital systems;
- Streamlining and implementing integrated ticketing and payment solutions supported by digital operational and financial management systems, and potential solutions based on biometric control and contactless technology in general;

- Promoting user-friendly and barrier-free solutions for all system users, especially people with reduced mobility.

To describe our preferred approach in greater detail, we believe it is necessary to respond to the challenges mentioned by identifying specific system requirements in terms of infrastructure, transport equipment and range of services.

Requirements and Characteristics of the FUTURE Transport System

Regarding infrastructure, the following requirements and characteristics are key:

- Increased implementation of automatic traffic management systems and operational support systems;
- Widespread implementation of digital infrastructure protection systems and relevant equipment (safety and security);
- Promotion of greater energy efficiency in facilities and across all transport infrastructure management activity;
- Widespread implementation of infrastructure maintenance following a non-traditional approach based on a dense network of sensors installed mainly in infrastructure components, structures and equipment;
- Increased use of reliable new materials in infrastructure and equipment, such as materials with a regenerative capacity to minimize the risk of breakdowns and incidents;
- More widespread use of artificial intelligence, self-learning mechanisms and IoT in asset management;
- Renovation, construction and management of stations and secure interfaces to meet the needs of an increasingly complex, interconnected transport system based on contributions from different modes, which must also be adapted to respond to all kinds of crises, including those relating to health;
- Promotion of barrier-free access to stations, interfaces, trains, underground trains, trams, buses and other modes to guarantee reliable and fluid interconnections, while also promoting real-time public information on transport operations and direct and indirect commercial opportunities.

With respect to digital infrastructure management, we must focus on the following:

- **Communications**
Next-generation services on public mobile networks create opportunities for powerful, engaging applications. Network coverage and standardization are also key factors for success in this area.
- **Navigation systems**
Satellite navigation to ensure that positioning forms an integral part of all navigation systems. Deployment of Galileo and addressing integrity are crucial for transport management.
- **Analytics**
As sensor and business data develops, big data and business intelligence tools can be used to transform data into accessible information. Forecasting and planning are the main areas of application.
- **Computing systems**
Mobile computing has evolved to allow user applications to help deliver complex, IoT-based services and virtually unlimited applications through the use of inexpensive connected hardware.

In terms of equipment and the range of services, the following requirements and characteristics are key:

- Increasing the use of heavy and light smart trains, whose construction solutions, including infrastructure solutions, will be increasingly efficient, advanced and based on interconnected digital systems;
- As in the case of infrastructure, and in keeping with previous measures taken, increasing the use of systems and solutions for predictive maintenance of vehicles;
- Making significant developments in automation of transport operations;
- Ensuring the widespread use of 5G by improving the IoT and creating a more extensive commercial range of smarter transport options;
- Automating the processes associated with the movement of goods (automated robots, automatic coupling, etc.) with a particular focus on movements at logistics terminals and optimization of the costs associated with this type of transport;
- Ensuring the widespread use of digital systems supported by artificial intelligence for relationships with system users in service outsourcing, monitoring and implementation, and in the sale of products to complement transport services;
- Promoting integrated multimodal transport solutions for both passengers and goods based on digital systems and dedicated algorithms;
- Increasing shared mobility in each mode of transport and between modes while optimizing each mode's operational management systems.

Much more could be added, but we have already covered a long list of initiatives, areas of intervention and systems

to be considered and adopted in each situation.

A Holistic Approach to Transport Policy

In addition to these measures for the promotion of a new transport policy, we firmly believe that only the holistic approach should be used for strategic planning of the future transport system.

In our opinion, integrated transport planning is therefore an essential requirement and a duty that will help address matters such as overall efficiency, functional optimization of the multimodal network, transport safety, and supply predictability and stability.

This type of holistic strategic planning will make it possible to optimize the investment programmes associated with it, thus maximizing performance and the benefits for the community.

In addition, it is necessary to provide a clear definition of system objectives, as well as in-depth knowledge of each modal network, a demand forecast and the contribution ideally made by each mode to the result, i.e. transportation of a person or a load from point A to point B under the best possible conditions of comfort, safety, price and time.

Finally, it should be noted that adopting a planning methodology for each mode of transport is an erroneous approach that squanders scarce and expensive resources. It should be replaced with our preferred method: a network-to-network approach that contributes to an optimized end result in terms of cost and service quality.

The Challenge of Cybersecurity

We will now focus on a subject that is becoming increasingly relevant in light of the growing digitalization of our systems: the issue of cybersecurity.

As we all know, cybersecurity represents a complex new challenge that must be tackled, given the increasing use of digital technology and resulting real and potential weaknesses. These weaknesses must be minimized by enhancing the efficiency of protection/prevention mechanisms.

To achieve this macro-objective, the items in the following non-exhaustive list of measures are essential:

- Protecting the interoperability and integrity of transport systems, which are complex, automated and interconnected – a growing concern, given the systems approach we advocate;
- Protecting security, operational and commercial information against external and internal attacks by strengthening network security, particularly in light of the relevance of systems and critical equipment and infrastructure;
- Designing the systems architecture to meet the challenges of cybersecurity (safety by design);
- Promoting and developing strategies based on cooperation and good practices between all entities – CSIRTs cooperate in a network;
- Implementing credible, certified solutions for all elements of the systems and moving towards effective standardization.

What Type of Cooperation is Required?

Finally, we would like to touch on the type of cooperation that should be promoted among us, the countries located in Southern Europe and North Africa.

Transport solutions are naturally linked to the landscape in which they take place and will therefore always have specific characteristics that set them apart. However, what sets them apart is far less important than what unites them.

Thus, the exchange of experiences and good practices and each country's participation in standardization processes are key approaches and contributions in the construction of efficient, low-cost networks and systems.

With this cooperative vision, it will be important to promote specific discussions, especially concerning topics such as cooperation in joint innovation actions and joint projects.

Moreover, as a means of engaging in more in-depth technical discussions and sharing knowledge and good practices, an intervention within international associations such as UIC, UITP and PIARC, in particular, would be desirable to help generate an effective return.

Our coordinated action at political and technical level is a hugely important factor that must be expanded on and developed through more joint initiatives such as conferences, debate forums and projects.

It is up to us to respond positively to all these challenges presented by the new reality.

The Ethics and Politics of Transport and Mobility in the COVID-19 Aftermath

Andreu Ulied

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Multicriteria

Has COVID-19 Pushed Us Into a “New Era”?

“There can no longer be any doubt, COVID-19 has pushed us into a new Era” stated Nasser Kamel the Secretary General of the Union for the Mediterranean (UfM).

The need for a paradigm shift has been advocated by most European political documents. According to the European Union’s 2020 “Circular Economy Action Plan” for instance, over the next forty years, global consumption rates of biomass, fossil fuels, metals and minerals are expected to double, and annual waste generation is projected to increase by 70% by 2050. Half of all greenhouse gas emissions and over 90% of biodiversity loss and water stress are the result of resource extraction and processing. These numbers exemplify the highly resource-intensive “Take-Make-Waste” economic model of the world economy. Is COVID-19 hard experience going to make easier the implementation of the “paradigm shift”?

To what extent COVID-19 will actually represent a tipping point, a moment of change, when political-aims and strategies agreed years ago can be actually implemented moving us towards a new Era –as stated by Nasser Kamel? Will our future be different because of the whole world passed through the COVID-19 experience –a singular time when entire countries served as “guinea-pigs” (Harari, 2020) in large scale social experiments?

Would people, everywhere around the world, be ready to accept their intimacy being monitored in order to increase public health and security? Would citizens prefer a technocratic/authoritarian government based on data and

black-box algorithms? Would people become against globalisation and wish to reinforce old political borders and Nation-States? Are future governance paradigms up with people choices? The evolution of technology will leave us to more authoritarian or more participatory type of government? To what extent the experience of COVID-19 will change ourselves? The way we work, we move and communicate, the way we live? The policies we need? Are we moving towards a dystopia close to “Qualityland”, the novel by Marc-Uwe Kling published in 2018?

The CETMO and the IEMed launched a joined initiative to explore post-COVID-19 scenarios in June 2020. “COVID-19 has had an unprecedented impact on a planetary scale”, stated both institutions. “Economic recovery is an immediate challenge, as well as knowing what new medium and long-term scenarios this pandemic will draw”. What happens when everybody works from home and communicates only at a distance? when millions of people get used to e-commerce? While passenger transport was reduced to the minimum, as well as many global logistic chains, e-commerce was booming.

At the moment I am writing, December 2020, the COVID-19 vaccine is being mass produced by pharmaceutical industries and thousands of millions of doses are planned to be distributed early next year to the whole world population. The most likely hypothesis is that COVID-19 impact will be to accelerate already existing trends (e.g. digitalisation, from e-commerce to teleworking) but hardly inducing significant short-term changes on social values, policies and governance processes. The solution to the pandemic has been scientific and technologic, at least in the Western

World. In a moment of rising political populism, the prestige of scientists, the work of health professionals and the efficiency of the industry has been recognised. Economic policies adopted in most developed countries, particularly in Europe, learnt a big deal from the experience of the 2008 crisis. Austerity policies applied by European institutions in the 2008 crisis were easily forgotten and expansionary policies were applied instead, without hesitation, by the European Central Bank. We learnt a lot during COVID-19, we have more information and knowledge, but our values, and desires, will likely remain roughly the same.

This article further investigates tragic moral dilemmas highlighted by how COVID-19 has been handled in different countries. Even if mobility and transport, and the Mediterranean region, are always in the background of the article, the ethical and political discussions aim a wider scope.

CV-19 as Large-Scale Global Experiment

When the World Mobile Congress in Barcelona was cancelled the 12th February 2020 because of global American corporations such as Google, Amazon or Facebook, or Apple, decided not to attend, few experts were able to see the future ahead, and no politician was beginning the preparation for a "worse-case" scenario.

During months, all over world people physical mobility was restricted to just indispensable reasons. At the same time, virtual communication grew exponentially. It was a living laboratory of a different world, an utopian world working at two speeds: production based on

mass customisation and specialised freight transport, fast automatized logistics relaying on intelligent machinery or robots, and people at home, working to provide virtual services to others, moving just at a walking distance from home. Many people in large cities bought stationary bikes though Internet, and got them just few hours or days afterword's. Lucky people had detached houses in suburbs or small villages, had more time to take care of their gardens while working through smart mobile phones. The conventional criteria to assess transport and mobility policies seemed by then obsolete (e.g. most effective mobility policies can no longer be those able to transport as many people as possible, as fast as possible and at minimum cost, just if people was like freight).

Key political ideals such as decoupling economic growth from transport demand, were also tested. On 28-29 March 2019, in Nicosia, Cyprus, the MED *Urban Transports Community* co-organised two conferences on circular economy and sustainable mobility, just before COVID-19. "The shift from sectoral planning to integrated planning can provide better and more sustainable possibilities for the urban spaces, while ensuring the safety of citizens and the protection of the environment", was stated in Nicosia, involving alternatives solutions that reduce transport needs, active and low-impact mobility solutions, multimodal transport as an integrated service and optimised freight capacity through shared solutions and distributed centres.

It was a time of dilemma. The decisions people and governments took in such a turbulent times faced "tragic dilemmas" indeed. Values such as safety and security, or public health, were considered a

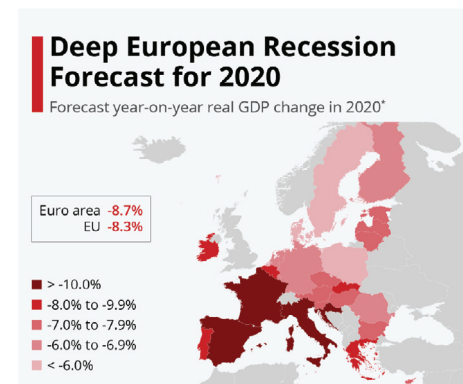
priority –the people’s right that deserved paramount protection- in most democratic countries. But concrete policies differed significantly from country to country, even among richer countries; shaped by historical legacies, political culture and social mores. In less developed countries, limiting economic activities may cause even worse impacts on people’s wellbeing and public health. Totalitarian surveillance technologies applied in Asian countries demonstrated to be more effective than citizen empowerment policies in European countries.

It was also a time of paradoxes. Political decisions that in normal times could take years of deliberation were approved in a matter of hours. New information and communication technologies were pressed into service, as well as laboratories of pharmaceutical corporations to develop a vaccine. After an initial shock on stock markets, some companies (the same first to cancel their participation on the Barcelona World Mobile Congress) began to grow rapidly. The NASDAQ index hardly reflects the impact of the COVID-19. At the same time, the reductions on GDP in Europe were enormous, particularly in Southern Mediterranean regions.

Figure 1. NASDAQ www.macrotrends.net/2489/nasdaq-composite-index-10-year-daily-chart



Figure 2. GDP forecasted in summer by the European Commission (graphic by statista)



Facing Tragic dilemmas

China, then South Korea, Hong-Kong, Taiwan or Singapore, relied on social discipline, ubiquitous sensors and powerful algorithms:

By closely monitoring people’s smartphones, making use of hundreds of millions of face recognising cameras, and obliging people to check and report their body temperature and medical condition, the Chinese authorities can not only quickly identify suspected coronavirus carriers, but also track their movements and identify anyone they came into contact with. A range of mobile apps warn citizens about their proximity to infected patients (Harari, 2020)

There are 200 million surveillance cameras in China, many of them equipped with a very efficient facial recognition technique. They even capture the moles on the face. It is not possible to escape from the surveillance camera. These cameras equipped with artificial intelligence

can observe and evaluate every citizen in public spaces, in shops, on the streets, at stations and at airports. The entire infrastructure for digital surveillance has now proved to be extremely effective in containing the epidemic (Han, 2020).

The Swedish historian Sverker Sörlin, himself a CV-19 survivor, noted in an article that there was never just one global pandemic but many, each shaped by its own national culture. Sweden opted for a calmer – and highly controversial – approach, empowering citizens. Instead of draconian lockdown, and digital surveillance, social distancing was a matter of self-regulation. Citizens were instructed to use their judgment, and to take individual responsibility within a framework that rested on mutual trust, rather than top-down control. The “Swedish model” could have been exported to countries such as Spain, Italy or Greece? In Mediterranean countries levels of social and institutional trust are much lower, societies are less disciplined and not so eager deploying digital technologies to monitor people daily lives.

“I want to stress that for the vast majority of the people of this country, we should be going about our business as usual” said Boris Johnson on March 3. Other political leaders, in Europe and America, for similar reasons, were also reluctant to anticipate bold decisions, when still the number of people potentially affected by CV-19 was expected to be small enough. From a pure economic point of view, it is understandable that public administrations hesitated so much to engage in bold measures such as restricting mobility to the minimum and stopping the economic activity of the whole country for weeks. Measures to be taken by governments to flatten the CV-19 growth curve would provoke

a drastic reduction in economic activity, which would result in a reduced welfare for “the vast majority” of people, in particular low-income classes and youngsters. The most important social benefit, obviously, was saving lives mostly from the elderly population.

After monitoring the experience in China, a group of modellers at the Imperial College London concluded that if the epidemic was not aggressively contained in the UK, half a million people would die— and more than 2 million in the US. Models such as this one helped to persuade the British government to follow much of continental Europe, following the experience of China and South Korea in putting the economy into a coma (Tim Harford, Financial Times 27 March 2020).

Donald Trump argued at the White House on 23 March that the nation might have to accept drastic public-health consequences for the sake of keeping the economic growth. A few hours later, one of his Republican allies went quite a bit further down the same path. Dan Patrick, Texas’ Republican lieutenant governor, on Monday night suggested that he and other grandparents would be willing to risk their health and even lives in order for the United States to “get back to work” amid the coronavirus pandemic. “Those of us who are 70 plus, we’ll take care of ourselves. But don’t sacrifice the country,” Patrick said on Fox News’ Tucker Carlson Tonight. The GOP official, who’ll turn 70 next weeks, went on to say, “No one reached out to me and said, ‘As a senior citizen, are you willing to take a chance on your survival in exchange for keeping the America that America loves for its children and grandchildren?’ And if that is the exchange, I’m all in.”

It is against common sense to believe that it can be economic normalcy or whatsoever while a pandemic sweep through the population. The damage to the social values of the citizens may be devastating, because the rights of the minority of elderly people were disregarded after a life of work, once retired, and therefore everybody will learn that they should expect a similar future.

Introducing New Values When Assessing Transport Policies

We know that in the new digital world our experience of distance and time changes radically. Our beliefs, which have existed for centuries, are resistant to change: but we need new concepts to better understand the new reality and support our decisions. A strong need arises for a paradigm shift on transport planning and management, just because of emerging new technologies and life styles and values of new generations.

As planes stop flying, people stop making unnecessary journeys, and streets are freed of cars, the impacts of mobility is often invisible (because taken-for-granted) become starkly apparent. One of the more spectacular visualizations of the first months of 2020 was a comparison of air pollution (nitrogen dioxide) around Wuhan before and after the strict quarantine measures were introduced. Nitrogen Dioxide is a product of the combustion of fuel. We rightly take emergency action to combat COVID-19 but not to combat air pollution caused by auto mobility, or even climate change.

We recognise that the political landscape is shifting. Nowadays, European mobility and transport policies have a comprehensive set of goals, well

beyond just reducing physical distances by faster travel. This does not mean that reducing travel time is no longer an important welfare gains, for instance to millions of workers commuting daily by public transport, to intercity rail travellers, to intercontinental air business travellers. Instead, it means that transport policies aim at improving a more comprehensive set of goals such as accessibility, sustainability, liveability and affordability.

There are important positive and negative externalities of the measures of restricting mobility to be also considered. Some analysts estimate that more lives were saved in Wuhan due to the reduction in air pollution than the numbers who have died from the virus – perhaps as much as 20 times as many. Given this fact, how much mobility should be restricted in Wuhan from now on? How much should we invest on the electrification of car fleets? How much time travellers should agree to loose in order to reduce pollution and save lives? Forcing people to stay at home generates psychological stress that should also be considered. Mobility is a human need, just like freedom, or prosperity.

A possible conclusion is the need to rethink the criteria conventionally applied in transport and mobility policies to measure “social wellbeing” (e.g. stated in official guidelines such as the 2014 European Commission Guideline applied by INEA or the EIB). After the COVID-19 we have learnt a big deal in relation to trade-offs between the value of public health, social inclusion and conviviality, on the one hand, and the value of economic growth in terms of providing those jobs people also need, and how restraining the fundamental people’s right of free movement impacts on both.

Facing tragic dilemmas, a sense of prudence and common sense would recommend to apply measures gradually, sooner than later, to begin by not so expensive measures of buying all medical equipment necessary to face a worse-

case scenario and providing right information for people to adapt their behaviour to the circumstances. This should have been the first reasonable decision on the 14th of February, after closing the World Mobile Forum.

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Inter-Modal Transport in the Age of COVID-19: UNECE Efforts to Help Build Pandemic-Resilient Transport Systems

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The Role of Transport in COVID-19 Pandemic Development, Spread and Containment

Patchwork of uncoordinated actions

In an initial reaction to the outbreak of the pandemic, many Governments closed their land, air and sea borders to non-essential traffic. These measures had as a result that tens of thousands of trucks got stuck at borders not only across the ECE region but across the entire globe which had a significant impact on the delivery of essential goods, such as foods, pharmaceuticals, medical supplies and fuels, especially for the economically most vulnerable countries which often rely heavily on imports to cover their basic needs.

The lessons learned from the immediate and short-term measures taken by Governments show that the transport sector was not prepared to operate in the conditions resulting from the pandemic. Implementing policies like stay@home, which created an increased need for consumption and a 360 degree turn towards e-business, cannot be accompanied by closing borders or imposing a series of restrictions to truck drivers. This combination created a disruption of international supply chains and therefore temporarily shortages in food, essential supplies and medicines.

Transport sector and broader economic impact

These often-excessive restrictions to cross-border and transit freight transport further aggravated the economic and social impacts of the pandemic

shock to the global economy. According to WTO figures the global economy (GDP) is projected to contract in 2020 sharply by up to 8% and global trade will decrease by up to 32% in 2020 due to the COVID-19 pandemic. The Purchasing Managers' Index (PMI), an index of the prevailing direction of economic trends in the manufacturing and service sectors recorded in March 2020 a dramatic decline in the manufacturing sectors. While railway freight transportation which has a number of distinctive comparative advantages such use of less manpower over long distance, efficiency and environmental performance suffered less, at least in the UNECE region, the road freight transport sector on the contrary was hit hard. According to International Road Transport Union (IRU) data, revenue decreased by 40% during the confinement period (in comparison to 2019 figures). Many transport operations including transport of automotive parts, clothing, flowers and construction materials almost came to a complete stand still during confinement.

Vulnerabilities of international transport systems revealed

In less than no time the extreme vulnerability of international transport systems to outbreaks of communicable diseases became apparent. Also in the post-COVID-19 era however the world will likely remain extensively interconnected and will further rely on seamless and efficient transport and logistics systems. As communicable diseases have occurred repeatedly in the past two decades, like H1N1, H5N1, MERS, SARS, Ebola, and will likely continue to manifest themselves in the future, a global initiative is needed to enhance international cooperation and coordination among inland transport authorities and in doing so strengthen

the preparedness and resilience of countries to possible future outbreaks.

UNECE Sustainable Transport Division – Immediate Responses

Border crossing facilitation initiatives

When countries around the world began closing borders and imposing lockdowns, the global supply chains were deeply affected. Perhaps you, yourself experienced a lack of basic goods at the supermarket or pharmacy. With customers buying in bulk out of fear, shops struggled to restock their shelves.

There are various UN Conventions, such as the *Customs Convention on the International Transport of Goods under Cover of TIR Carnets* (TIR Convention, 1975), the *Convention on the Contract for the International Carriage of Goods by Road*, (known as CMR and its additional protocol, e-CMR), the *International Convention on Harmonization of Frontier Controls of Goods* (or Harmonization Convention) that govern the transport of goods across borders, ensuring a smooth and efficient transit through customs. As countries implemented strict border measures, the usual, internationally agreed upon regulations and conditions, which apply to transport were set aside. This crisis not only led in some cases to shortages in food and other essential goods it also resulted in social impacts where transport professionals including truck drivers, customs and border officers often got stuck for days in a row at border clearance posts, exposed to possible COVID-19 contagion given the often precarious infrastructure and sani-

tary situation at many land border crossings across the region.

The UNECE Sustainable Transport Division took a number of initiatives to ensure that borders continued to let goods through:

- In February 2020, UNECE, in partnership with other UN Regional Commissions and partner organizations, established an Observatory on border crossing status due to COVID-19. This online platform collects and illustrates, on a systematic basis, information about the status of inland freight border crossings, including policies and regulatory requirements in place. The main objective of the Observatory is to be an information-sharing platform for transport sector stakeholders, providing information on measures imposed by different Governments enabling transport companies to adapt their itineraries and transport solutions accordingly. The Observatory, as of October 2020, is a platform that provides updated information on the current border crossing status in 174 UN Member States.
- In parallel, UNECE put in place an “Open the borders” campaign to keep the borders open for transport of goods. On 16 April 2020, the Executive Secretary of UNECE and the Secretary General of IRU sent a joint letter to all Heads of Customs authorities calling on them to consider the application of specific measures and good practices to minimize the impact of COVID-19 on the international supply chains.
- eTIR International System: UNECE and IRU have been working on an electronic version of the TIR system allowing for a paperless and contactless operating environment while continuing to ensure the safe and secure

transport of goods. In the midst of the COVID-19 crisis it was decided to accelerate the implementation of the eTIR international system contactless environment to assist in countering the spread of the virus. The United Nations (UN) Secretary-General's report¹ entitled "Shared responsibility, global solidarity: Responding to the socioeconomic impacts of COVID-19", mentions: "Innovative tools such as UN eTIR/eCMR systems and other tools that allow the exchange electronic information without physical contact and facilitate the flow of goods across borders should be used". Furthermore, after the initial call to implement eTIR (7 April 2020), 17 Governments and the European Union (28 Member States) responded positively.

- Implementation of the United Nations Development Account (UNDA) project on "Transport and trade connectivity in the age of pandemics: UN solutions for contactless, seamless and collaborative transport and trade". The project promotes the implementation of United Nations solutions, including standards, guidelines, metrics, tools and methodologies to immediately help Governments, including customs and other border agencies, port authorities, and the business community world-wide, to keep transport networks and borders operational, to facilitate the flow of goods and services, while at the same time containing the further spread of the COVID-19 virus.

Offering a platform for multi-stakeholder cooperation and coordination

Establishment of an Informal Multidisciplinary Advisory Group on Transport Responses to the COVID-19 Crisis

At its eighty-second annual session (Geneva, 25–28 February 2020), the Inland Transport Committee (ITC) "Requested the UNECE secretariat, in close cooperation with the Bureau, with the support of interested Governments and key stakeholders to conduct necessary research on provisions in existing frameworks and new needed areas of work to promote cooperation between transport authorities in the field of counteracting the effects of emergency situations of cross-country nature, including epidemics and pandemics, and present this information to the Working Party on Transport Trends and Economics (WP.5) for consideration of further steps and for inclusion to its programme of work."

In response to this tasking, and as the pandemic further evolved, the secretariat established, under auspices of the Working Party on Transport Trends and Economics (WP.5) an Informal Multidisciplinary Advisory Group on Transport Responses to the COVID-19 Crisis which had its first virtual meeting on 9 June 2020 and its second on 8 September 2020 as part of the thirty-third session of WP.5. Based on inputs received from Governments and other stakeholders during these Multidisciplinary Advisory Group sessions and based on guidance received from WP.5 in September 2020 and the ITC Bureau at its session in November 2020, a working document has been prepared by the secretariat and submitted to Inland Transport Committee for consideration and possible endorsement of next steps. Inter alia, the report identifies a set of lessons learned

¹ <https://unsdg.un.org/sites/default/files/2020-03/SG-Report-Socio-Economic-Impact-of-Covid19.pdf>

for international inland transport and for the customs and border management sector.

Lessons learned for international inland transport include:

- The importance of immediate coordination in response to the outbreak and the effective ongoing coordination at regional, national and international levels.
- The importance of efficient supply chains and keeping goods moving.
- The need to collect and feed evidence and data into decision making.
- The digitalization of processes has made them contact-free and safer and more efficient.
- The need for clear communication to the public and to operators on changes to procedures and new rules.
- Engagement across sectors (e.g. health, transport, customs, business) has been crucial in using an evidence-based approach to decision making.

Lessons learned for customs / border management include:

- Need for enhanced preparedness – use of electronic services, risk management (selectivity and profiling before conducting physical checks), non-intrusive inspection (NII) equipment, availability of disaster response/mitigation plans and business continuity plans.
- Need for enhanced coordination – use of a whole of government approach, Coordinated Border Management (CBM), coordination with neighbouring countries and/or at regional levels, especially in case of pandemics.
- Streamlining and simplifying Customs procedures – green lanes for freight traffic.
- Transparency of documentary requirements – all necessary information should be publicly available.

The report also identifies several possible recommendations for consideration and possible endorsement of the ITC at its 84th Session in February 2021.

Discussions in the framework of the Working Party on Transport Trends and Economics (WP.24)

In order to understand the impact of COVID-19 on intermodal transport and logistics, the Chair and Vice-Chair of WP.24 with support of the WP.24 secretariat organised and held a virtual Friends of Chair meeting to discuss those impacts and the lessons learned in the industry.

WP.24 continued the discussion on COVID-19 and intermodal transport and logistics at its 63rd session held on 28-30 October 2020. The discussion focused on the developments and impacts from the evolving pandemic, response measures taken and their assessment as well as prospects for freight transport. WP.24 confirmed the lessons learned exchanged during the Friends of the Chair meeting. It confirmed and called for recovery measures which would create the necessary conditions to increase competitiveness of intermodal transport in particular versus road transport. It warned of unwarranted freight transport subsidies which may distort the transport market and slow down its transition to a more sustainable one. WP.24 recognized that the pandemic has pushed governments to increase the importance they give to the digitalisation of transport documents. WP.24 underscores that digitalisation should be an integral part of the very much needed transport optimization process in both operations and infrastructure. WP.24 endorsed, during its

63rd session, a Handbook for national master plans for freight transport and logistics which, among others, show-cases these transport optimizations processes. The handbook will be published in the spring of 2021.

WP.24 also recognized that the pandemic may bring about more diversification and local sourcing for supply chains. Such a development may have a positive impact on freight transport in a medium term.

Bringing these considerations together, in order to support a further development of intermodal freight transport – a development very much needed to continue freight transport system transition to a more sustainable one, as well as one which would be more resilient to emergency situations such as pandemics – WP.24 approved a resolution on strengthening intermodal freight transport. The resolution proposed by WP.24 has been adopted at the 83rd Session of the Inland Transport Committee in February 2021.

Measuring the Transport Impacts of COVID-19

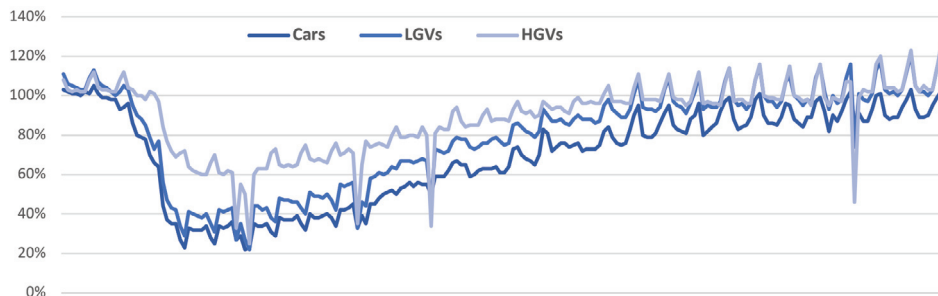
Official annual statistics remain a vital benchmark to track progress over time, but the COVID-19 crisis has also forced policy makers and statisticians alike to consider new types of data sources. With some traditional surveys, censuses and even some administrative data sources either hampered or completely unavailable, statisticians have been forced by events to try to measure transport and mobility in different ways. There has been an emergence of “flash” indicators, often based on either mobile network operator location data

or tolling/vehicle measurement sources, to allow reasonably accurate data to be released on a monthly, weekly or even daily basis. These indicators may not always have the label of official statistics, but when produced to a high degree of quality by official statisticians, they provide a useful, trusted source of data in a timely fashion. Since the crisis began, the ECE secretariat has been monitoring transport impacts through the production and maintenance of a wiki of short-term official statistics sources relevant to transport monitoring. At the time of writing, there are more than 150 sources linked to pages from almost every ECE member State. These data cover a wide range of transport topics.

Measuring changes in road traffic levels

The use of vehicle counters and, in some cases, toll data have substantially increased their prominence during 2020. The number of vehicles per day on key corridors can be a very pertinent proxy for overall traffic levels, and aggregating multiple points with other information can provide a useful index that can be comparable to vehicle-km. Data can also be obtained from tolling data on main highways, as is the case in Germany. Figure 1 shows an index of different traffic types on roads in Great Britain. The data are an index based upon an equivalent day in the first week of February 2020, for cars, Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs). Data are not seasonally adjusted, and so public holidays are clearly visible as dips. The graph shows that car traffic was consistently lower than goods vehicles throughout the lockdown period.

Figure 1. Changes in road traffic levels in Great Britain for different vehicle types compared to 1st week of February 2020.



Source: UK DfT

These traffic trends are also visible in data for other countries. For example, Germany's truck toll mileage index at its minimum on 30 April 2020 was 15.6 per cent lower than the baseline, whereas an index measuring total land mobility hit a low of 59 per cent below the baseline. Similarly, in the United States of America, the daily passenger Vehicle Miles Travelled index hit a low of 60% below the baseline on 12 April 2020.

Measuring changes in road safety

With record falls in road traffic levels in many countries, there has been great interest in the impact on road traffic accidents. The secretariat found relevant monthly data for twenty ECE member States, and in addition data for some sub-national entities such as New York City, Greater London and Northern Ireland. The impact on road traffic accident numbers has varied considerably by country, with some countries seeing record decreases in fatalities while others seeing insignificant changes from the baseline or even small increases. Comparisons across time are challenging as provisional data are typically collated on a different basis to finalized annual numbers. Therefore, data have only been

compared with previous years' provisional monthly data. Figure 2 shows the change in fatalities between April-June 2019 and April-June 2020 for all available countries with monthly data, with a negative number indicating a decrease. Users are strongly advised to consult country sites linked to on the online wiki prepared by UNECE in order to understand the limitations of these provisional numbers.

Figure 2 shows that most countries did see a year-on-year decrease in traffic fatalities in the second quarter of 2020, with many experiencing over a 30 per cent reduction. These falls in fatalities are undoubtedly good news, but also need to be considered in the context of record falls in traffic in many countries, which were typically much larger (as evidenced in the traffic data above).

Public transport

When public transport data are based on ticket or card swipes, or entry/exit sensors, it is often possible to publish weekly or even daily passenger figures with a short time lag. This is the case for countries including Denmark (Copenhagen), Portugal (Lisbon), the United Kingdom of Great Britain and Northern Ireland (London Underground) and

United States of America (New York City subway). Figure 3 shows weekly passengers on the Copenhagen metro as an index compared to the average number of passengers on weekdays in the eighth and ninth weeks of 2020.

Figure 2. Reductions in road traffic accident fatalities, April-June 2020 versus April-June 2019. Available countries only.

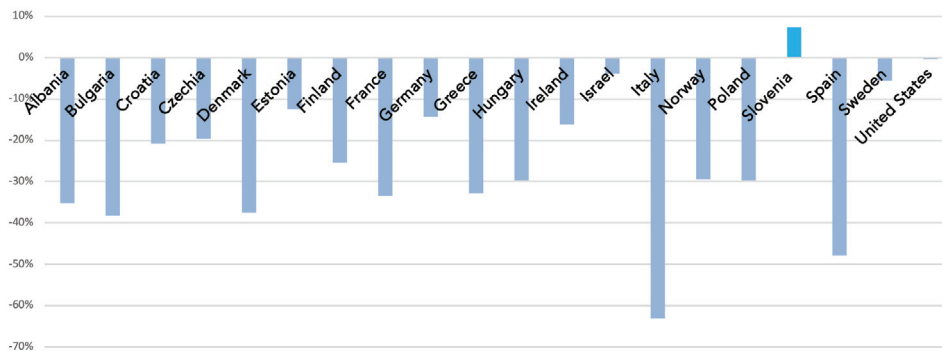
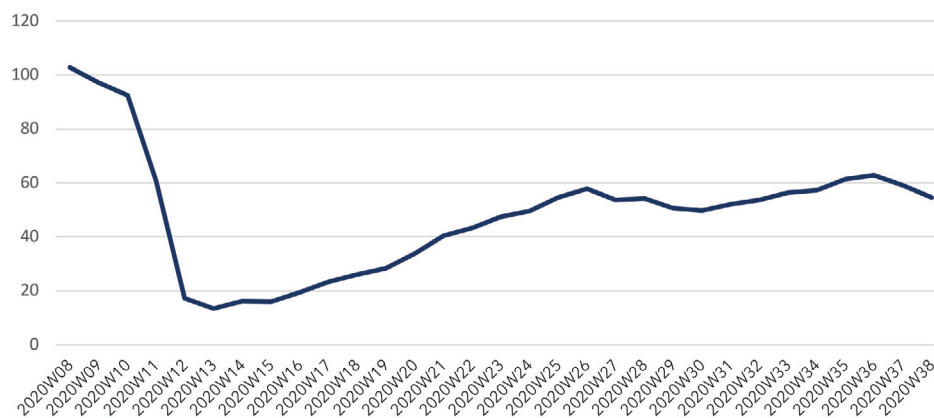


Figure 3. Index of Copenhagen Metro usage on a weekly basis, 100=average



Source: Statistics Denmark

Intelligent Transport Systems

Intelligent Transport Systems (ITS) have the potential to revolutionize mobility, changing everything from the way we move and communicate to how we design transport legislation and regulate vehicles. ECE offers a unique platform for shaping the legal framework and ensuring the

safe introduction of future technologies. Since 2004, the ECE Transport Division has led the discussion on ITS and in 2012 it formulated a Road Map for promoting ITS.

Practically all UNECE Inland Transport Committee (ITC) Working Parties have been and are dealing with Intelligent Transport Systems. For example:

The Global Forum for Road Traffic Safety (WP.1) is establishing a formal group of experts to prepare a new convention on the use of automated vehicles in traffic.

The World Forum for Harmonization of Vehicle Regulations (WP.29) promotes ITS matters on-board of vehicles, such as Lane Departure Warnings Systems (LDWS), Advanced Emergency Braking Systems (AEBS) and on-board diagnostics (OBDs) to name just a few.

Intelligent and automated transport systems tend to reduce the frequency and duration of human-to-human contact (social distancing) while in transport and thus reduce the likeliness of contagion of communicable diseases.

Possible way forward in turning inland transport systems more pandemic resilient, ongoing UNECE activities

At regulatory level:

- As its eighty-third session in February 2021, the UNECE Inland Transport Committee mandated the continuation (under WP.5 auspices) of the work of the informal multidisciplinary advisory group on developing transport responses to the COVID-19 and similar international crises.
- In 2021, the Advisory Group will continue to build on the work done in 2020, in particular it will:
 - Continue to identify specific measures/ tools to be developed aimed at increasing the resilience of the inland transport system to future pandemics, including through the development of, e.g. Emergency plans/ protocols highlighting for instance which transport net-

works and border crossings should be kept operational when confinement measures need to be put in place;

- Explore the development of a stress-test mechanism to evaluate the resilience of various ECE (and other) Conventions to identify where amendments can/should be made in order to turn these legal instruments more pandemic proof.
- As per its original mandate, in close coordination and cooperation with other UNECE Working Parties under ITC auspices, the Group will continue to explore whether a new international regulatory regime for the inland transport sector in case of epidemics, pandemics and other cross-border emergency issues is needed or whether making amendments to existing legal instruments administered by ECE and other stakeholders suffices.
- As per the recommendations of its 2020 report, it will explore whether efforts need to be undertaken towards the development of a uniform, broadly accepted certificate (similar to the one in Annex 3 of the Green Lane Communication) that certifies that the driver is a transport worker and, as such, waived from border crossing restrictions.

At the level of existing United Nations legal instruments / Conventions:

- Consider introducing e-health certificates for crew and/ or passengers, such as to the existing UN transport conventions and their electronic/digital applications such as eTIR, eCMR etc.
- Consider developing rules for transiting and cooperation among transport authorities in case of pandemics/ cross-border emergencies, such as amendments to the

Harmonization Convention, e.g. by means of an additional annex.

- As referred to above, conduct stress-tests on the various ECE Conventions to identify where amendments can/should be made in order to make them more “pandemic-resilient” (i.e. TIR/ eTIR, CMR/eCMR and the Harmonization Convention) to be undertaken by relevant Working Parties.

At the level of digitalization:

- Continued support for transport/ trade digitalisation: raise awareness globally and if possible, accelerate the digital implementation possibilities of various of the already existing transport legal instruments in the inland transport sector: TIR/eTIR, CMR/eCMR, the URL/ eURL consignment note for rail transport etc. A focus on digitalisation and automation could turn out effective pandemic mitigation tools as direct human contacts in clearance processes are no longer needed. Online training modules on the use of these digital instruments could be developed and deployed across the world with the support of the relevant ECE Working Parties (WP.30, SC.1, SC.2, WP.24 etc.). Here it should be noted that an eLearning module on deployment of the eTIR international system is being developed with the support of the Organization for Security and Co-operation in Europe (OSCE).

At the level of continuous regional and inter-regional/ inter-governmental dialogue/ information exchange:

- In accordance with the tasking of the UNECE ITC at its eighty-third session, continue the organization of multisectoral meetings as necessary (involving also the maritime and aviation sectors, including through the

specialized agencies IMO and ICAO) to share experience, and regularly review and discuss cooperation across modes to prevent international spread of communicable diseases through transport in the future and enhance regional and inter-regional coordination to facilitate border-crossings. This could as well be an agenda item as part of existing ECE intergovernmental platforms.

- Build on and further strengthen the Transport, Health and Environment Pan-European Programme (THE PEP) initiative, jointly led by UNECE and WHO Europe which in the wake of the COVID-19 pandemic has established a Task Force composed of representatives of member States, international organizations, civil society, academia and other stakeholders. The initiative aims at developing principles for environmentally sound and healthy transport systems based on sustainability and resilience and will explore long-term and strategic changes for the sector.
- Following the recent publication of a UNECE publication on “Intermodal Transport in the Age of COVID-19 – Practices, Initiatives and Responses, Building Pandemic Resilient Transport Systems”, the development of further resource materials gathering experiences from transport authorities in the ECE region and beyond in responding to the COVID-19 crisis is being considered.

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(SC.1); the Working Party on Rail Transport (SC.2), the Working Party on Inland Water Transport (SC.3); the Working Party on Transport Trends and Economics (WP.5); the Working Party on Transport Statistics (WP.6); the Working Party on the Transport of Dangerous Goods (WP.15); the Working Party on Intermodal Transport and Logistics (WP.24) and the Working Party on Customs Questions Affecting Transport (WP.30).

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Initiative on Transport Prospects and Opportunities in the Post-COVID Era: The AMU Region

Infrastructure Directorate of the General
Secretariat of the Arab Maghreb Union

Introduction

Since the outset, the goal of the Arab Maghreb Union has been to gradually work towards the free movement of people and goods between the Maghreb countries and unify legislation in economic matters with a view to achieving economic integration.

The desired Maghreb integration cannot succeed without advanced infrastructure. The AMU countries have invested heavily in multimodal, road, rail and air transport infrastructure and implemented far-reaching regulatory reforms to facilitate private sector involvement and encourage investment.

Since its creation, the General Secretariat of the Arab Maghreb Union has made huge efforts towards promoting regional cooperation in the field of infrastructure, especially across the different transport modes, by carrying out feasibility studies and drawing up regional agreements in the field of land, rail, maritime and air transport with a view to achieving intra-Maghreb connectivity.

Despite its late arrival in Africa, especially North Africa, COVID-19 is rapidly spreading and resulting in an unprecedented global economic recession and widespread social deprivation.

The Maghreb countries reacted quickly to their first COVID-19 cases. The measures taken have helped limit the impact of the disease and the AMU countries are now dealing with the economic and social consequences of this health crisis.

Measures Taken by the AMU Countries

The Maghreb governments reacted quickly to contain the spread of the

epidemic by taking appropriate measures in the various regions as the pandemic developed. These included:

- Closure of schools and universities
- Cancellation of air and sea links
- Closure of borders
- Cancellation of sporting events
- Closure of restaurants, cafés and night clubs
- Implementation of lockdown measures
- Social distancing on public transport and locking
- Mobilization of public administrations

Social and Economic Consequences

This pandemic has had profound social and economic consequences for the countries of the AMU, as in all countries around the world. The measures to fight COVID-19 have had serious economic and social repercussions and compounded the difficulties faced by poor and vulnerable communities, but the situation is less tragic than in the West.

The World Bank has predicted that Africa will suffer its first recession in 25 years. The continent's economy is expected to contract by between 2.1% and 5.1% in 2020, compared to 2.4% growth experienced in 2019. The hardest hit sectors are air, sea and road transport, freight transport and logistics, tourism, oil and gas, and wholesale and retail trade. COVID-19 has turned the transport sector upside down, from aviation and logistics to public transport.

The Transport Sector in AMU Countries: Post-COVID-19 Challenges

Transport plays a key role in the Maghreb countries and each country's transport sector is characterized by the implementation of transport economic restructuring, major reforms designed to demonopolize and liberalize transport activities, a commitment to the development of international transport, and the establishment of tools, mechanisms and procedures to facilitate the movement of goods and people.

Aviation Sector

- The critical importance of air transport in conducting diplomacy and business, the growth of the economy and the development of trade have thrust this sector into the spotlight. Although this is not the first crisis experienced by the aviation sector, it has undoubtedly caused the most damage in a relatively short period of time.
- The aviation industry supports more than 6.2 million jobs in Africa and accounts for 2.6% of the continent's GDP, or nearly 56 billion dollars, according to a statement from IATA, AFRAA, UNWTO, the World Travel and Tourism Council and the Airlines Association of Southern Africa (AASA). This observation also applies to the Arab Maghreb countries, where employees have been dismissed at certain companies and there has been a drastic reduction in flights.
- On the financial side, an overall decline of 287 billion euros in airline turnover compared to 2019 has been announced (according to the same source).
- In general, airlines around the world have only about three months of cash liquidity. However, this rule does not apply to Africa, where most companies have just a few weeks' worth of liquidity. The liquidity crisis

has therefore become a real concern that could push many African airlines into bankruptcy.

- The 10 largest African airlines include three Maghreb companies (Royal Maroc, Air Algérie and Tunisair) and, according to a study by the International Air Transport Association (IATA), the drastic reduction in traffic has grounded between 80% and 90% of the global aircraft fleet. The consequences for the AMU countries will be as follows:

Algeria

The suspension of flights due to COVID-19 could cost the Algerian economy 3.1 billion dollars, while air passenger traffic is expected to fall by around 8 million passengers.

The reduction in the number of passengers will result in revenue losses for Algeria of around 800 million dollars and will threaten 161,800 jobs.

Morocco

The suspension of flights will cost the Moroccan economy 4.9 billion dollars. Air passenger traffic will see approximately 11 million fewer passengers.

The reduction in the number of passengers will result in revenue losses of around 1.7 billion dollars and will threaten 499,000 jobs.

Tunisia

The suspension of flights will cost the Tunisian economy 1.2 billion dollars. Air passenger traffic will see approximately 3 million fewer passengers.

The reduction in the number of passengers will result in revenue losses of

around 600 million dollars and will threaten 92,000 jobs.

Recommendations for the Aviation Sector

- Restore passenger confidence: in a survey conducted by IATA, feelings of fear and uncertainty, psychological strain and the drastic measures proposed by different countries for activities to resume were all cited by travellers as reasons for their lack of confidence. The study, carried out in 11 countries around the world, showed that only 14% of passengers would be willing to board a plane once restrictions are lifted. In addition, 46% would prefer to wait one or two months, while 40% would wait six months or longer.
- Ensure political commitment to support the civil aviation industry and take appropriate action.
- Standardize all initiatives proposed for the African civil aviation industry.
- Develop a comprehensive, unified response strategy that takes account of the interests of all stakeholders in the African civil aviation industry.
- Create regional funds, such as an African common fund controlled by African heads of state and governments, to deal with the impact of COVID-19 on the African civil aviation sector.
- Use all available funding sources to support the African aviation industry.
- Implement measures to allow airports and air navigation service providers to resume operations.
- Ensure multilateral cooperation at regional and continental level.

Public Transport (Road and Rail)

- Formal and informal public transport sectors in Maghreb cities have been

hit hard, as lockdown and prevention measures have had a major impact on people's mobility.

- All cities have experienced a reduction in public transport, which has limited demand, reduced the supply of public transport and, to some extent, favoured non-motorized transport.
- The sustainable future of cities is under threat from the rise in the number of private vehicles, which is expected to have a significant impact on congestion, emissions and social exclusion.
- The formal and informal public transport sectors are facing severe financial difficulties due to the reduction in demand for transport and services. Most formal and informal operators are on the verge of bankruptcy. They have suffered a sharp drop in revenue from fares due to social distancing measures, reduced economic activity and people's risk-averse attitude towards public transport, all of which have undermined their ability to recover operating costs.
- To compensate for public transport revenue losses, some cities have negotiated an increase in fares, which has an impact on users.

Recommendations for the Public Sector

- Provide the public transport sector in cities with rapid, comprehensive support to (i) prevent massive job losses, (ii) prevent disruption to public services that can increase the social exclusion of vulnerable populations, and (iii) avoid hampering the efficiency of cities.
- Define sustainable funding schemes to compensate for revenue losses from social distancing and new mobility protocols while avoiding long-

term fare increases, in particular by studying the possibility of allocating funds to support urban transport operations.

- Consolidate, formalize and structure the informal sector with a view to increasing its resilience.
- Improve governance, funding and capacity building by (i) strengthening land use management and transport planning in cities, and (ii) designing funding mechanisms to ensure the long-term financial viability of urban transport operations and guarantee that they are affordable for users, especially the most vulnerable groups.
- Support a modal shift from private vehicles to high-capacity transport systems, primarily by planning an integrated multimodal transport system with adaptable and resilient modes of transport.

Cross-Border Trade

- Disruptions to cross-border trade, especially factors such as the slowdown in demand, the drop in commodity prices, supply chain bottlenecks, rising freight costs and export bans, have likely played a role in the downturn in trade in North Africa.
- Most governments are seeking to strike a balance between limiting the long-term spread of the virus and facilitating emergency and essential trade. COVID-19 could be around for some time, and governments will be required to adapt and innovate to facilitate new, "safer" means of carrying out cross-border trade.

Maritime Transport

Maritime transport, which plays an essential role in globalization and is responsible for moving more than 80% of the world's raw materials and goods, is

suffering the effects of the pandemic due to both the economic slowdown and the lockdown measures imposed by most countries.

The measures taken in some countries require ships to undergo a 14-day quarantine before being allowed to dock, while other ports have simply closed down. Crew changes have also been banned, which has put personnel in a very difficult situation. Meanwhile, passenger transport has virtually stopped in many places.

This decline in activity has brought ship orders from shipowners to a halt and reduced shipyard activity.

On 19 March, Kitack Lim, Secretary-General of the International Maritime Organization (IMO), alerted governments to the risks associated with the decline in shipping: *"In these difficult times, the ability for shipping services and seafarers to deliver vital goods, including medical supplies and food, is central to responding to, and eventually overcoming, this pandemic (...) I urge a practical and pragmatic approach, in these unusual times, to issues like crew changeovers, resupply, repairs, survey and certification and licensing of seafarers."*

On 24 March, the International Chamber of Shipping (ICS) sent an open letter to the governments of the G20 countries calling for increased protection of the supply chain to allow it to fulfil its essential mission for people and businesses.

On 25 March, the United Nations Conference on Trade and Development (UNCTAD) also called for supply chains and maritime traffic, including to landlocked countries, to be kept open and

protected, since the global maritime transport industry is vital for people during these times of crisis. It also called for ports to accept crew changes, as around 100,000 crew members around the world need to change shift every month.

On 26 March, Ursula von der Leyen, President of the European Commission, said, "The free movement of goods and services is therefore our strongest, and frankly, our only asset to ensure supplies can go where they are needed most".

AMU, Activities and Roles

- Active participation in the PIDA-PAP 2 process (2021-2030): establishment of a list of priority projects.
- Organization of online seminars.
- Development of a digital policy within the AMU Secretariat to respond to and cope with the pandemic.
- Monitoring of the epidemiological situation of the pandemic in AMU countries through statistics and analyses of its evolution and the sharing of information with member states.

Responding to the COVID-19 Crisis: Effects of Employment on Infrastructure Development

As in the rest of the world, the Maghreb countries have been experiencing extraordinary circumstances since the start of 2020 because of the spread of COVID-19, and no one knows how long the situation will last.

Some key sectors are already experiencing a sharp slowdown due to the pandemic. Tourism, air transport and

the oil sector are being directly affected. However, the visible impacts are not expected for several months, depending on how long the pandemic lasts.

Estimates by the International Labour Organization (ILO) indicate that unemployment will rise significantly. Based on different scenarios relating to the impact of COVID-19 on global GDP growth, preliminary ILO estimates show a rise in global unemployment ranging from 5.3 million (best-case scenario) to 24.7 million (worst-case scenario) from a baseline of 188 million in 2019. The medium-case scenario suggests an increase of 13 million (7.4 million in high-income countries).

While these estimates are highly uncertain, all figures point to a substantial rise in global unemployment. By comparison, the global financial crisis of 2008-2009 caused unemployment to rise by 22 million.

The impact on employment will result in major income losses for workers. Overall work income losses are expected to be between 860 billion and 3.44 trillion dollars globally. The loss of work income will translate into less consumption of goods and services, which will have a negative effect on the sustainability of businesses and the resilience of economies.

Emergency Preparedness

The term "preparedness" can be defined as the knowledge and ability of governments, response organizations, communities and individuals to anticipate the occurrence of many different likely, imminent or current disasters, and to respond to them and recover

effectively. Preparedness is the product of a combination of planning, resource allocation, training, exercises and organization to create, maintain and improve operational skills based on risk assessment.

Emergencies call for long-term investment without immediate results. However, the more is spent on preparation, the easier it will be to respond to emergencies and control their scale.

Infrastructure obviously heads the list when it comes to fundamental measures in emergency preparedness plans. Without roads and railways connecting different parts of the country, it would be very difficult to meet the population's medical needs. And without electricity supply and ICTs, it would be impossible to contact people and alert them to danger.

Importance of Infrastructure

Infrastructure plays a crucial role in development. In transportation systems, energy production plants, ICTs, and water and sanitation systems, the services that enable society to function and the economy to thrive are provided through infrastructure. For that

reason, they are at the core of efforts to achieve the Sustainable Development Goals. Whether they concern health, education, hygiene or other sectors, most of the Sustainable Development Goals involve improvements in infrastructure, which plays a fundamental role in each of the three dimensions of sustainable development: the economy, the environment and society.

Infrastructure should not be viewed as a set of individual resources, such as a power plant, hospital or water supply network, but rather as different components that make up a system and work together to offer considerable potential to strengthen the three pillars of the Sustainable Development Goals mentioned above.

Infrastructure should be seen not as a goal in itself, but rather as a means of delivering essential services. As pointed out by Jo da Silva, founder and director of international development at engineering consultancy Arup, "We need to make a shift to thinking about infrastructure as what it does – protects, connects or provides essential services – not what it is. It is infrastructure that is brokering our ability to manage finite resources and get those resources to where there are human needs."

Chapter 3

ROAD TRANSPORT

Road transport played an important role during the emergence and expansion of COVID-19, ensuring the supply of essential goods. Some measures were adopted to deal with unexpected and unimaginable situations before the pandemic, such as the closure of borders. However, international associations involved in the sector are calling for lessons to be learned from what happened, in order to face future disruptions with greater international coordination and more forceful measures to support the sector. These measures should help to increase its resilience.

Digitisation is expected to be one of the bases of this future resilience, as an unavoidable tool for gaining safety, efficiency, and modal integration. So far, some steps have already been taken, but without achieving widespread use. It remains to be seen whether COVID-19 provides the necessary impetus to consolidate and extend its implementation and use. Nonetheless, the effectiveness of digitalisation, in particular, and of road transport in general, requires the existence of internationally harmonised regulations and standards that do not act as barriers to transport and trade.

COVID-19: KEY Lessons for the Road and Transport Community

Patrick Malléjacq

Secretary General of Secretary General of
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José Manuel Blanco Segarra

Secretary of PIARC Technical Committee
1.1 Performance of Transport
Administrations



Consequences of the COVID-19 on the HELLASTRON Network in Greece (Attica Tollway, Metamorphosis East Plaza on 5 March and 2 April, 2020 (from Bill Halkias presentation at PIARC Seminar held on 8 April 2020)

This text is based on an earlier article published in PIARC's *Routes/Roads* magazine and on PIARC COVID Response Team's full Technical Report.

Introduction

The COVID-19 pandemic is a global health and societal emergency that required immediate and effective action in multiple dimensions. In this context, road transport, which is an essential service critical to maintaining the movement of key workers, goods, supplies and services, has to remain operational. Effective crisis management requires cooperation and coordination among several stakeholders, including government decision-makers, road owners and operators, public transport, logistics and mobility providers, and emergency services, while keeping the concerns and safety of employees and road users and customers at the forefront.

PIARC (World Road Association) moved quickly to establish a formal COVID-19 Response Team (CRT) tasked with organising the rapid sharing of knowledge and practices between its members on the impacts of, and responses to, the pandemic and

the associated economic and social crisis. As early as March 2020, the PIARC COVID-19 Response Team organized a series of webinars for practitioners and experts to share their experience, knowledge, and some of the most effective responses that are emerging. It is recognized that, while current practices are not yet fully validated, and what works in some parts of the world may not be relevant globally, these shared experiences can be valuable tools during crisis management, where a good idea now could save lives, improve business resilience and minimize service disruption both now and in the future.

This article presents some of the key observations and learnings from these webinars. They are detailed in a Technical Report which PIARC published in December 2020, available as a free digital download to all.

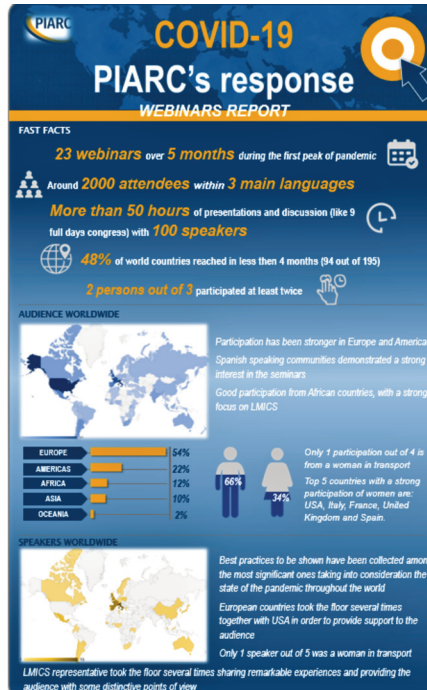
PIARC COVID-19 Webinars

A total of 23 international webinars were held between 25 March and 29 July 2020, in English, in French and in Spanish. They provided an overview of the current situation with COVID-19 in

different countries; the issues faced by road operators and administrations; best practices from relevant PIARC reports; emerging planning, operational and customer service responses.

These webinars included presentations from about 100 speakers from all parts of the world and touched on all areas of relevance for road operators and administrations.

Figure 1. Summary of PIARC COVID-19 Webinar Activities



Source: Valentina Galasso for PIARC COVID-19 Response Team

PIARC is also very proud that the following international partner organizations agreed to take part in its webinars and could share their specific experience and projects.

Figure 2. Other Bodies Involved in PIARC COVID-19 webinars



Source: Figure from Christos Xenophontos (USA) & Valentina Galasso (Italy) presentation, PIARC webinar 29 July 2020

A dedicated area of PIARC's website has been created with copies of all the videos and presentation slides from all the webinars. This valuable information is accessible to everyone, for free, in French, English and Spanish. In addition, two Bulletins summarizing the findings from the webinars have been published and are available in PIARC virtual library, and a detailed Technical Report was published in December.

Impact of COVID-19 on Roads and Road Transport

The current global COVID-19 pandemic has struck the entire world in 2020 and is having multiple and acute impacts over and above a conventional disaster. As of early October 2020, the number of global cases surpassed 36.2 million with over 1.05 million deaths. This crisis is as much an economic collapse and a social catastrophe as it is a public health emergency, which has brought with it a dramatic slowdown in business activity, the standstill of international travel and large increases in job furloughs and lay-offs. Global GDP by the end of 2021 is expected to be 6.5% below pre-COVID-19 levels and the time horizon for full recovery of some sectors is 2022-2024.

Policy goals around COVID-19 have evolved over the year 2020 in many countries. First half of the year was marked by what the IMF has called "The Great Lockdown", a widespread and intense slowing in economic and social activity, and restrictions on personal mobility and travel to such an extent that in April half the World's population were asked or ordered to stay at home. Containing the infection remains a challenge and is vitally im-

portant. Decision makers are also trying or have tried to re-open economies, lifting or replacing national lockdowns with localized measures. The challenge is to guarantee the health and safety of workers and customers, while restoring business and consumer confidence and providing the right economic and fiscal stimulus.

To assist in the analysis of this process, PIARC's COVID-19 Response Team had identified three phases that would follow the first lockdown:

- **Reopening**, with risks carefully managed until vaccine and more effective therapeutic treatments are available. Partial or full short-term or localized lockdowns in many countries are still happening; life is unlikely to get back to "normal" in the immediate and near-term future.
- **Recovery** of national and local economies. Expected to extend well beyond 2021, this will involve accelerated infrastructure delivery, technology research and other tools of economic stimulus and industrial strategy.
- **Reimagining** on how transport system will meet future needs, reflecting the impacts, challenges and opportunities of COVID-19 and other agendas; transforming and future-proofing transport infrastructure and services towards 2025 and beyond. This phase has already started.

Experience has shown that these phases can actually happen simultaneously, not one after the other, but they remain a good framework for analysing priorities and options. Indeed, the pandemic is still raging in many parts of the world. Public policies continue to evolve about COVID-19 containment and about fostering recovery. Last but not least,

the perspective of effective vaccines is a strong hope signal for the year 2021.

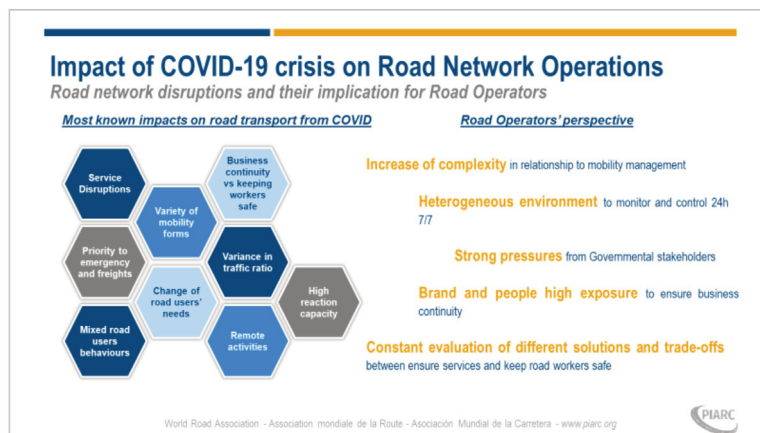
Strengths and Resilience of the Road Sector

Roads have remained open during the pandemic. Road transport has been able to maintain connectivity and to pro-

vide a lifeline to even the most remote places. This is true of passenger traffic as well as of freight traffic. This, in itself, is a major success for road administrations and operators.

Road operators have been impacted in all aspects of their work. The figure below shows the most well-known impacts on road transport and the perspective of road operators:

Figure 3. Impact of COVID-19 on Road Network Operators



Source: Figure from Valentina Galasso (Italy) presentation at PIARC webinar 29 July 2020

Road networks are a fundamental component to the effective running of the economy and the pandemic has highlighted the strategic and essential value of road transport for social and economic survival and the unavoidable need to protect roads and their management to ensure mobility. PIARC's series of webinars has made it possible to identify a number of good and noteworthy practices that have been implemented by different jurisdictions across the world.

The measures to prevent disease transmission have had big impact on road and transport management and also

on the supply chain. Comparing pandemics and other hazards, the environment in which business continuity management is carried out is quite different because the challenge when pandemics is to continue road and transport management activities effectively with limited and restricted human and material resources while taking measures to cope with infectious diseases. And it should be noted that the occurrence of pandemics and other types of disaster may overlap. So, as CRT report has stated "in the post-COVID-19 era, it will be more necessary than ever to address the resilience of roads, transport and road-

related functions." The following sets this out in more detail: Developing a disaster-resistant road network (tunnels, bridges, embankments, etc.), securing road infrastructure in times of crisis, maintaining inspection and diagnosis of roads with appropriate measurement and monitoring procedures and technologies, sharing information dynamically (the significant expansion of data base, data analytics and processing capability, including via social media offers a major source of information which can be exploited), and sharing experiences to create policies, procedures and best practices and to prepare combined disaster scenarios in terms of business continuity operations.

The topic of resilience has been covered throughout the PIARC COVID-19 webinars in the context of:

- Continuity of construction and maintenance work;
- Actions to address pandemic from a resilience perspective focused on transport corridors, transport restrictions & closed municipalities, plus actions in Freight Transport, Public Transport, Toll Highways, National/

Federal Road Network, Intercity Passenger Transport and continuity of Telecommunication and broadcasting services;

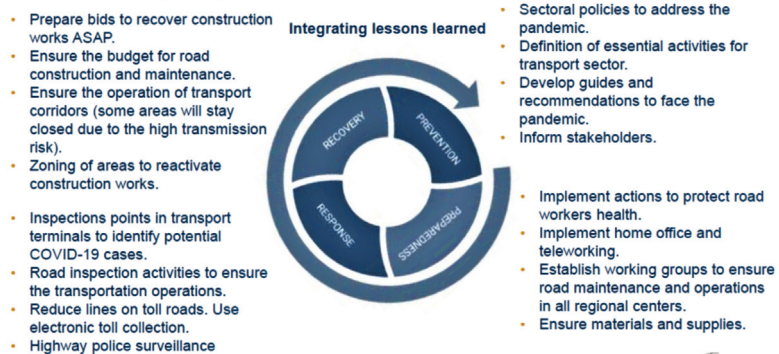
- General impacts and approaches, road network operations, freight and logistics, construction works and economic impacts and future resilience planning;
- Longer-term implications beyond the immediate crisis under behavioural change, business resilience plan.

Additionally, in July 2020, members of PIARC TC 1.4 "Climate Change and Resilience of Road Networks" and the PIARC CRT published an article with The Resilience Shift titled "A pivotal moment for the transport sector – and lessons for resilience".

As illustrated in the Figure below, there is a need to integrate lessons learned from a resilience perspective. Future pandemics and any other new and unconceivable threat will (and must) find road and transport administrations better prepared, building up flexibility and ability to recognize and choose the most sustainable measures.

Figure 4. A resilience perspective

A resilience perspective



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Source: Figure from Roberto Aguerrebere and Juan Fernando Mendoza Sánchez (Mexico) presentation at PIARC webinar 13 May 2020

The practices shared are very relevant since we are still obliged to adapt to the new circumstances as long as the current destabilising reality that is affecting the personal, social, working and economic lives of workers, individuals, communities, companies, administrations and countries continues.

Road and transport organisations have demonstrated their speed of reaction and adaptability to safely maintain daily activity in offices, road inspection, road maintenance (by their own means, contracted or concession), continue to manage road actions and mitigate as far as possible impacts on the supply chain and productivity, all while collaborating with many other agencies and stakeholders.

Road sector employees have continued their duties under conditions of acute professional and personal disruption and accompanied, in the private sector, by considerable stress, employee furlough and lay-offs. The impacts on the personal and professional lives of many working in the sector have been unprecedented: it is requiring to set up new roles, to find workarounds to problems and innovate in how to continue to get the job done. Road workers deserve public recognition and appreciation, and there are lessons to be drawn from this flexibility.

Key Conclusions and Recommendations Areas

For roads and road transport, COVID-19 has presented specific challenges: How should roads and road transport help to overcome the pandemics? How can roads and road transport help to fight the economic crisis and move towards a "new normal?"

How should longer term policies and initiative in roads and road transportation be adapted to cope with the new realities and the challenges presented by COVID-19?"

(Oscar de Buen, Past President of PIARC, 29th July 2020 Seminar)

PIARC's detailed Report is based on the extensive programme of webinars. It presents conclusions and recommendations for all road operators and administrations; most of them are applicable for all countries.

Declaration of Emergency

- Mandate authorities with appropriate emergency powers
- Be prepared to issue interpretative orders and instructions to ensure the provision of critical or essential services for the protection of people, property and places, and maintain activity in key (essential) economic sectors

Economic Measures to Support Businesses

- Establish recommendations for contracts, especially for PPPs
- Plan to maintain road-related activity and business continuity
- Mitigate the economic and financial consequences of reduction in traffic

Road Works

- Be alert and agile
- In certain cases, accelerate some maintenance works to take advantage of low traffic volumes, with operations adjusted according to the traffic decrease
- Secure access to adequate resources to ensure that work can be continued
- Investigate the feasibility of strategic

stockpiles of material that could become in short supply in the event of global disruption of supply chains

Data

- Think about data as something of great value for road transport organizations
- Recognise that real time information is needed to meet the needs of users and operators
- Evaluate the power of partnership for data collection and management to drive innovation through road transport

Security

- Recognise that physical security and cyber-security are essential for the application of the concepts related to resilience: prepare, prevent, protect, respond, recover
- Increase the security of I.T. systems

Disaster Management and Resilience

- Address the resilience of roads, transport, road-related functions, connections with other modes and connections with other stakeholders as a whole
- Develop a disaster-resilient road network, securing road infrastructure in times of crisis
- Apply the Preparedness, Response, Recovery, Prevention/Adaptation model
- Be prepared to face additional disasters while facing a pandemic

Passenger and Public Transport

- Restore citizen's confidence in collective (mass) public transport
- Analyze how the urban landscape shifts

- Look into how we can build flexibility in the infrastructure that we build to allow for the changing and uncertain mobility dynamics and expectations that our customer base is facing.
- Analyse how ITS can help public transit provide more reliable service

Freight and Logistics

- Establish guidelines/agreements on national/international level to keep freight moving during pandemics - keep key road networks and facilities open and operational
- Prepare and implement amendments to the law/regulations to have more flexibility regarding exemptions during pandemics or other disruptions.
- Support the digital transition for ITS solutions in logistics and freight transport to reduce physical handling and control processes and to minimize obstructions on traffic flows
- Prioritize investments for key freight corridors for economic recovery and good framework conditions for long distance road freight transport

Intelligent Transport Systems

- Focus on integration and management of the road network with an end-to-end and user-centered approach
- Consider low-cost ITS solutions as a valid option for road network operations, for all countries and for large and small jurisdictions. ITS does not have to be expensive to be effective.
- Even in ITS: Do not reinvent the wheel, and instead aim to benefit from others' experiences and knowledge

Road Safety

- Recognize the risk situations created by the crisis
- Identify local or network-wide meas-

ures for potential road safety improvements

- Educate and inform

Winter Service

- Implement heightened precautionary measures to protect workers
- Learn from each other and employ techniques used by Southern Hemisphere agencies during the first wave of the pandemic

Workforce

- Celebrate road workers
- Apply health and safety protocols like all businesses
- Design work-from-home processes with care
- Apply success factors that enable women to continue to thrive at work
- Use technology wisely

A series of implementation actions are also presented for the road community:

Monitor the New Transport Normal

- What is demand for transport going to look like from now on, including the work from home?
- How can we build some uncertainty into our models and processes?
- Pay even more attention to the needs of the users to be more "customer – centric"
- Do not lose focus of society's pre-COVID expectations regarding GHG emissions, cost-efficiency, resilience, and service levels... They are still relevant

Contribute to Economic Recovery

- Recognise that roads are key for economies and societies (they stayed

open during the crisis; road freight worked)

- Include investments in road infrastructure or road transport in national COVID-related economic recovery plans

Fill Gaps in Evidence / Evaluate

- Evaluate all measures that have been implemented in a hurry during the crisis
- Identify actual user needs and policy demands; i.e., what is the "new normal"

Share Knowledge

- Promote the use of all available knowledge
- Engage with LMICs in particular
- Continue providing a networking tool for people to connect
- Analyze the PIARC survey, renew it when appropriate

Final Remarks

The pandemic is still ongoing; therefore impacts are not yet complete across the full cycle and public policy objectives continue to evolve in containing the virus and fostering recovery whilst in the roads and transport sector a wide range of responses have been adopted with varying degrees of application and success but there has not been already determined what constitutes best practice and under what circumstances.

In many parts of the world, relaunching the economy is now a high priority on the political agenda. Roads and road construction are ideally placed to play a leading role in investment plans, not only because the sector is vital to the social and economic fabric of society, but also because road construction is a purveyor of jobs that can help address the unemployment juggernaut.

Figure 5. Mobility Patterns as a Result of COVID-19



Source: Figure from Dennis Ganendra presentation (Malaysia) at PIARC webinar 13 May2020; and presented by Caroline Evans (Australia) presentation at PIARC webinar29 July 2020

Looking forward, there is an opportunity to re-imagine the post-COVID world. This includes accelerating key trends, such as digitisation, online services, and automation, as well as renewed commitment to tackling pressing pre-pandemic challenges, such as congestion, pollution, and climate change, with new resolve. This means reconfiguring road and transport systems and services to drive a better, greener recovery which supports more sustainable, resilient, and happier communities. As we head into 2021, we should look beyond today's trials and tribulations, and focus on preparing well to build the economy and society of tomorrow.

These issues, and how they are handled across the globe, was the topic of the first PIARC webinar of the new sea-

son, which took place on 30 September, in Spanish. Following its initial activities, PIARC is now continuing to organize further webinars, bringing in new countries, organizations and focus areas. It is also intended that PIARC's more than twenty Technical Committee and Task Forces will pick up on COVID-19 issues relevant to their topics and lines of enquiry as relevant and appropriate.

Proof of the importance that PIARC attaches to resilience and to reflect the megatrends that are impacting the road sector, is decided to broaden the themes of next winter service congress, to be held in Calgary (Canada), to include resilience so it will be the XVIth World Winter Service and Road Resilience Congress.

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Perspectives from Road Transport on the Opportunities and Challenges of the Pandemic

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As the world road transport organisation, IRU (World Road Transport Organisation) represents more than 3.5 million road transport operators around the globe. As the lifeblood of global trade, road transport is the critical link to unlocking international prosperity. With this in mind, we use data from our dedicated market intelligence team to inform our advocacy work, making the voice of the industry heard so it can play its vital role in global supply chains.

Trade facilitation is at the core of our work. Under a United Nations mandate, IRU manages TIR, the only global transit system and an important trade facilitation tool. Governed by the TIR Convention and operational in 60 countries, TIR provides customs guarantees, enabling goods to flow easily, securely and reliably across borders. The digital version of the system, eTIR, is entirely paperless, making it even more streamlined and secure.

COVID-19 and the Road Transport Sector

IRU has a global network of members in the road transport sector, with whom we have been in close contact throughout the pandemic to build a picture of its financial and operational impact. We can confirm that the global economic slowdown caused by the pandemic has greatly affected the road transport industry. In addition, the transport restrictions put in place by governments to control the spread of the virus have disrupted mobility networks and supply chains. According to IRU research,

global goods transport losses are expected to exceed USD 679 billion in 2020, a turnover loss of 18% in comparison to 2019.¹

Commercial road transport operators have maintained services where possible, despite an often higher cost base due to transport, routing and delivery restrictions. Many road transport businesses have managed to survive up to now, but anecdotal evidence from IRU members and research from our market intelligence team indicates that they will not survive much longer without financial assistance. Following this concerning discovery, IRU assessed two key sets of financial indicators that provide an early warning on the risk of business default and insolvency. Both point to an approaching wave of bankruptcies in the road transport sector over the coming year,² which would have a devastating effect on global supply chains and trade networks. Road transport operators in all regions, including the Western Mediterranean, are facing a high or very high risk of defaulting on loans. This would lead to a deterioration in their creditworthiness, which in turn would increase their cost of borrowing, particularly for vehicles.

In spite of a bleak outlook for road transport companies, governments have failed to act. While many administrations have implemented support measures for businesses, IRU analysis of government measures in 79 countries, including France, Italy, Malta, Morocco, Portugal, Spain and Tunisia, revealed that very few transport operators benefited. This lack of action shows the extent to which the importance of the road

¹ IRU: COVID-19 Impact on the Road Transport Industry - Update November 2020.

² Ibid.

transport sector is underestimated. However, without it we would not have the essential goods and services we need to survive. Over 80% of commercial land transport of mobility and logistics services (in tonne-kilometres and passenger-kilometres) are provided by the road transport industry.

During the pandemic, the road transport industry played a key role, delivering medical and other essential supplies throughout the Western Mediterranean and around the world. Drivers put themselves at risk to keep goods moving and serve their communities under increasingly challenging conditions. Restrictions and reduced demand have led to a serious liquidity crisis in road transport. Operators desperately need targeted financial and non-financial support measures from governments if they are to survive. Such measures include direct cash grants, reductions in taxes and charges, extensions on loan repayments, support for unemployed workers and greater flexibility on the interpretation of driving rules and restrictions. It is vital that governments implement these measures to prevent mass bankruptcies and job losses.

Global economic and social recovery from the pandemic is dependent on a well-functioning road transport sector, which in turn depends on millions of road transport operators staying in business and continuing to run services for their clients. It is urgent that governments act accordingly. If no support is provided to the road transport sector, mass insolvency of road transport companies is inevitable. As a result, the global recession will be more devastating and longer than currently predicted,

people and essential goods will not be transported to where and when they are needed and economic development and recovery will come to a standstill.

Opportunities for a more digital sector

While the overall impact of COVID-19 is undeniably negative, the response to the pandemic presents governments and the transport industry in the Western Mediterranean with an excellent opportunity to improve transport networks and strengthen logistics chains. The crisis revealed the shortcomings in regional supply networks and highlighted the necessity of effective risk management. Flexibility, adaptability and the use of digital tools will be key to survive and remain competitive in a post-pandemic trading environment. Fundamental changes to business processes are encouraging digital innovation, as a value chain based on digital solutions is more reliable and able to mitigate all types of risk. It is therefore the ideal moment for governments to implement paperless and simplified procedures for road transport operations.

IRU's eTIR system and e-CMR digital consignment note are two tools that have received widespread recognition for their potential to support economies through recovery from the COVID-19 crisis. In April, the United Nations Secretary-General said that, "innovative tools such as UN eTIR/e-CMR systems and other tools that allow to exchange electronic information without physical contact and facilitate the flow of goods across borders should be used".³ A few months later, the heads of eight United Nations specialised agencies, including

³ United Nations: Shared Responsibility, Global Solidarity: Responding to the socio-economic impacts of COVID-19. March 2020.

the United Nations Economic Commission for Europe (UNECE) and the United Nations Conference on Trade and Development (UNCTAD), released a joint statement in which they affirmed that “a safe and efficient intermodal transport system is facilitated by the use of United Nations instruments, such as the United Nations TIR Convention and its eTIR system [...]. These instruments allow for moving cargo across borders without requiring physical checks and for reducing contact between people”.⁴

Paperless systems have obvious short-term public health benefits in terms of reducing human contact and preventing the spread of the virus, but digitalisation also carries economic benefits and a range of related opportunities to facilitate intermodal transit and trade. Logistics operators are suffering financially and streamlining customs procedures with tools such as eTIR will reduce transport times, cutting costs and helping them to manage the business impact of the pandemic. eTIR can be used for intermodal transport operations between Europe and North Africa, as long as at least one leg of the itinerary is carried out by road. This flexibility makes it an extremely useful trade facilitation tool and ideal for use in the Western Mediterranean region.

Another digital tool to be leveraged to boost trade during and following the pandemic is the e-CMR digital consignment note. Rules for transporting goods internationally are covered by the United Nations Convention for the carriage of goods, known as the CMR. This Convention has been ratified by most European states, as well as several other countries, including Morocco and Tun-

sia. Goods companies, drivers and those receiving shipments use a CMR consignment note, which presents information about the shipped goods and the transporting and receiving parties. Until recently, CMR notes were only in paper form, but an electronic format has been in development since 2008. Western Mediterranean countries have spearheaded the use of e-CMR electronic consignment notes, with the first shipment using e-CMR taking place in January 2017 between Spain and France. In its paper-based format, the CMR consignment note brings many benefits: it harmonises contractual conditions for goods transported by road and helps facilitate goods transport overall. A wider implementation of the e-CMR solution would modernise the system, retaining its benefits while removing paperwork and the related costs. It would also allow for faster invoicing and a reduction in delivery and reception discrepancies, as information is available to all parties in real time. Its digital nature means that e-CMR can be easily integrated with other services used by transport companies, such as customs declaration or transport and fleet management services. By moving to an electronic format, the three parties involved in each shipment benefit from better overall logistics efficiency, resulting in increased economic competitiveness.

Transport digitalisation has been high on agendas for some time, and even before the pandemic it was progressing steadily. In February 2008, a protocol was added to the CMR Convention introducing the electronic management of CMR through e-CMR. This protocol entered into force on 5 June 2011, and to date 17 countries have acceded. In Feb-

⁴ Joint statement on the contribution of international trade and supply chains to a sustainable socio-economic recovery in COVID-19 times.

ruary of this year, a landmark was reached when signatories of the TIR Convention unanimously adopted the new legal framework that will power the future of TIR and its fully digital eTIR system. eTIR will replace the paper TIR carnet, which serves as a customs guarantee and accompanies a shipment throughout its itinerary. With eTIR, customs officials receive cargo information electronically before the shipment arrives, making procedures more efficient and secure. The adoption of the legal framework for eTIR demonstrated the backing by governments and industry leaders of TIR as the only global transit system and a valuable and competitive tool to facilitate trade worldwide. It also represented a positive step towards trade facilitation and increased transit security. With the international legal frameworks in place, these tools are ready to be implemented in the Western Mediterranean, which would bring significant benefits to transport operators and other stakeholders in the supply chain.

For transport operators, the financial guarantees provided by TIR help to reduce the financial commitments and risks related to customs tax and duties. Digitalisation and the shift to eTIR will further reduce these risks, as it provides a robust and secure communication platform for all parties involved in TIR transport. The full life cycle of a TIR guarantee, from its issuance by IRU to its termination, can be controlled in real-time with the use of TIR IT tools. According to Olga Algayerova, the Executive Secretary of UNECE, "The digitalisation of the TIR system will enhance the speed, efficiency and transparency of

the TIR customs transit procedure. UNECE, IRU, the TIR Contracting Parties and the private sector all recognise this potential."⁵ TIR is proven to reduce journey times by up to 72%⁶ and eTIR is set to reduce them further, cutting costs for operators. Shorter transit times and lower costs will facilitate trade, helping to restart the global economy following the pandemic and supporting long-term economic growth.

In the Western Mediterranean, the intermodal functions of TIR make it the perfect trade facilitation tool for operations between Europe and North Africa. Algeria, France, Italy, Malta, Morocco, Portugal, Spain and Tunisia are already TIR operational. Tunisia has joined an upcoming UNECE eTIR pilot project, showing dedication to modernising its transport systems and an interest in trade digitalisation. TIR is already in use for routes from France and Italy to Turkey, eliminating the need for physical cargo inspections along the route.

Multilateral cooperation for more resilient supply chains

Another opportunity to be grasped during the pandemic relates to greater global and cross-border coordination. The chaos caused by travel restrictions at the start of the pandemic, and the continuing issues during the second wave, revealed a genuine and pressing need for greater coordination between governments. For transport operators, it is currently complicated to comply with the wide variety of restrictions put in place by different countries. This slows down the delivery of essential goods, leading to shortages for communities and finan-

⁵ IRU: The future of TIR is digital.

⁶ IRU: TIR cuts transport times between Saudi Arabia and Oman by 72%.

cial difficulties for operators, who are unable to work at their usual rate.

IRU recommends Western Mediterranean governments to coordinate the establishment of green lanes for trucks at all borders, backed by policies and procedures that prevent additional and systematic stopping of trucks. Governments should take joint steps to allow for maximum flexibility on the interpretation of driving rules and restrictions. Measures to prolong the validity of expired control documents, including visas, certificates and licences could also be coordinated between countries. Establishing such multilateral cooperation now would have lasting economic benefits and make supply chains more resilient to future crises.

As transport digitalisation progresses, cooperation between governments will also be important to manage effectively the huge amount of data produced. There is currently no international or European legal framework specifically for regulating the use of business-to-business data. Transport operators have no visibility regarding where their data is stored, how it used and by whom. Their consequent hesitancy to share data will slow down digitalisation, preventing us from reaping its benefits. To establish trust and data fairness, a multilateral legal framework is needed that explicitly includes the principles of the voluntary sharing of data and reciprocity in data access. The obligations and responsibilities of data aggregators must be clearly defined, along with the rights of data generators. Transport operators

must be able to ask for and receive remuneration for the data they provide. Without coordination between governments, operators and data aggregators will have to work with a patchwork of national regulations, complicating their work with a detrimental effect on digitalisation efforts.

Looking to the future

The digitalisation of trade and transit networks in the Western Mediterranean cannot be successful without a high level of cooperation between countries. As supply chains are digitalised and paperless transactions become the norm, political engagement and mutual trust will be essential. Governments should take a policy approach, implementing short and long-term measures to support the development of the transport sector and protect the supply chains upon which economies rely.

We can expect to see the benefits of digitalisation for economies and societies. Processes throughout the value chain will be more efficient, saving both time and money. This will mean goods arriving where and when they are needed. IRU has been supporting digitalisation around the globe, with several ongoing projects on different continents. We stand ready to help countries in the Western Mediterranean to implement the eTIR system to facilitate trade during and following the pandemic. However, if governments do not provide the necessary support now, the road transport industry will crumble, removing vital links in supply chains.

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Importance of Regulatory Convergence in Promoting Cross-Border Transport and International Haulage and Upgrading Road Transport Performance in South Mediterranean Region, Efforts, and Achievements

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Introduction

Transport is essential to life and of vital importance for society, ensuring everyday mobility of populations and allowing them to perform their economic and social activities. Transport is also pivotal for growth and competitiveness of economies enabling economic activities, the production and distribution of goods as well as trade. International transport is of strategic importance playing a vital role to international trade, which has a major impact on the economic development. On the other hand, transport negatively affects people's safety and health as well as the environment. For these reasons, *transport is a strategic responsibility of Governments, which can play a major role in promoting its efficiency, through the development of transport networks and a regulatory framework within which transport services can develop efficiently and under the best possible conditions of safety and environmental protection.*

This article, dedicated to road transport, draws on the experiences from the ongoing work under the European Union (EU) funded EuroMed TSP (2017-2022) and previously the EuroMed Road, Rail and Urban Transport (RRU) Project (2012-2016) (hereafter called EuroMed Projects), highlights the importance of the regulatory convergence in the EuroMed region, being one of the two major components of the Regional Transport Action Plan (RTAP) for the Mediterranean (2014-2020), along with the establishment of the future Trans-Mediterranean Transport Network (TMN-T). It also presents the selected regulatory frameworks developed under the United Nations (UN) and European Union (EU) auspices that were promoted in the region and describes the EuroMed partner country efforts and achievements.

Importance of Regulatory Convergence in Promoting Cross-Border Transport and International Haulage and Upgrading road Transport Performance in South Mediterranean Region

Roads are by far the most common transport mode for both passenger and inland freight transport, being extremely cost-efficient. However, in order for the cross-border transport by road to perform efficiently, there is a need for internationally harmonized standards and regulations. Heterogeneous transport regulations that vary from one country to another are real barriers to international transport and trade.

For more than six decades, UNECE provides a platform for intergovernmental cooperation to facilitate and develop international transport, while improving its safety and environmental performance. The results are reflected in 58 international legal instruments. These instruments, supplemented by EU legislation, represent the best European and international practices. By applying them, EuroMed partners may only benefit, since they are effective tools not only for the facilitation and development of international transport, but also for upgrading the performance of their national inland transport systems.

At its Action 8 (Efficient Land Transport Systems) and 9 (International Land Transport Haulage), the RTAP 2014-2020, *inter alia*, advocates for a regulatory convergence promoting cross-border transport and international haulage in the region and encourages EuroMed coun-

tries to accede and effectively implement the main UN road transport agreements and conventions. Moreover, RTAP Action 8 calls partner countries to pursue efforts for improving the efficiency of the road transport sector, and addressing the professionalism of drivers, of operators, the technical state of the vehicle fleet and road safety. RTAP Action 9 also makes particular reference to the AETR, ADR, ATP, TIR Convention, Harmonization Convention, the 1958 and 1997 Agreements and describes the benefits of Mediterranean partners by becoming contracting parties to them, while RTAP Action 10 (Road Safety) encourages countries addressing the technical inspections of certain types of vehicles and the minimum standards towards which the vehicles are to be tested.

Main UN and EU Road transport relevant Regulatory Frameworks Selected for Promotion in the EuroMed Region, Expected Benefits

Main UN road transport agreements selected

Nine (9) road transport legal instruments were selected by the concerned countries and the EuroMed Projects to focus their efforts, representing the basic regulatory framework facilitating cross-border road transport and international haulage, increasing road safety, and upgrading road transport performance using them as models for national regulations. Here follows a short instruction of them.

Road transport and road safety agreements

The Convention on Road Traffic, of 1968, aims at facilitating international road traffic and trade as well as tourism and increasing road safety through the adoption of uniform road traffic rules on all factors influencing international road traffic and its safety, including the driver (uniform licences, training and testing, etc.) and the vehicle. Acceding to this Convention help countries harmonise their road traffic regulatory framework with that of other 84 countries worldwide, Contracting Parties to it.

The Convention on Road Signs and Signals, of 1968, establishes a set of commonly agreed road signs and signals classified in three categories (danger warning, regulatory and informative), and provides for each of them definitions and physical appearance (dimensions, shapes, and colours, etc). Acceding to this Convention help countries harmonise their respective legislation and facilitate international road traffic.

The European Agreement concerning the Work of Crews of Vehicles engaged in International Road Transport (AETR), of 1970, aims at preventing drivers and crews of commercial vehicles of more than 3.5 tonnes, or transporting more than 9 people, engaged in international road transport, from driving excessive hours and defines the control devices (tachographs) that are used to control those periods. AETR Agreement creates a level playing field in the road haulage industry, helps prevent road accidents and introduces better conditions for professional drivers.

Border crossing facilitation

The Customs Convention on the International Transport of Goods under

Cover of TIR Carnets (TIR Convention), of 1975, sets up the international Customs Transit procedure that permits the seamless international transport of goods by road through as many signing countries without undergoing customs procedures or the need to make a financial deposit at each border. The agreement provides a cross-border guarantee system to cover duties and taxes for each transport operation. eTIR launched as a project in 2003 to fully secure electronic data exchange among customs administrations, is being developed. The TIR Convention results to a considerable reduction of international transport costs and facilitates international transport of goods.

The International Convention on the Harmonization of Frontier Controls of Goods (Harmonization Convention), of 1982, is a framework Convention that facilitates international border crossing for transported goods through harmonization and reduction of administrative formalities, and of the number and duration of border controls. Thanks to this one-stop-shop principle for border controls, international freight operators save time and money.

Transport of dangerous goods and perishable foodstuffs

The Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), of 1957, aims at ensuring the highest possible level of safety for dangerous goods transport at an acceptable cost. It defines which dangerous substances are eligible for international transport and which are not and establishes the conditions under which they can be carried and provides requirements for transport operations, driver training as well as vehicle construction and approval.

The Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for such Carriage (ATP), of 1970, establishes uniform prescriptions for the preservation of the quality of perishable foodstuffs for international transport and defines uniform norms and standards for the special transport equipment required. It also sets up uniform distinguishing marks to be affixed to the specially equipped vehicles. The conformity of the equipment is displayed through an international certificate and an ATP plate affixed to the vehicle facilitating transport by avoiding repetitive controls.

Vehicle regulations

The Agreement concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment and Parts which can be fitted and/or be used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals granted on the basis of these Prescriptions, of 1958, (1958 Agreement), provides the legal framework for the development of the safety and emission regulations for all types of motor vehicles manufactured in Europe and in many other parts of the world. The legal document comprises 131 UN Regulations and has contributed considerably to technical progress, increased vehicle safety, and drastically reduced vehicle emissions.

The Agreement concerning the Adoption of Uniform Conditions for Periodical Technical Inspections of Wheeled Vehicles and the Reciprocal Recognition of such Inspections, of 1997, (1997 Agreement), provides the legal framework for the technical inspections of vehicles and is especially useful for setting up national period-

ical technical inspection systems and minimum standards towards which the vehicles are to be tested. Accession to and implementation of this agreement help countries ensure that safer and less polluting vehicles are circulating on their roads, while the reciprocal recognition of the tests introduced by it facilitate the cross border circulation of vehicles.

Selected EU regulatory frameworks

In addition to the above, that also make part of the EU road transport regulations, the following four (4) EU legal frameworks addressing the professionalism of drivers and operators as well as the technical inspections of vehicles, were selected for promotion amongst EuroMed partners.

Regulation (EC) No 1071/2009 of the European Parliament and the Council of 21 Oct. 2009 establishing common rules concerning the conditions to be complied with to pursue the occupation of road transport operator and laying down minimum conditions governing admission to the occupation of road transport operator. The Regulation obliges undertakings to have (a) an effective and stable establishment; (b) be of good repute; (c) have appropriate financial standing; and (d) have the requisite professional competence. Such provisions have as a result the improvement of the profession of road transport operators.

Training of Professional Drivers

Directive 2003/59/EC of the European Parliament and of the Council of 15 July 2003 on the initial qualification and peri-

odic training of drivers of certain road vehicles for the carriage of goods or passengers, ensuring that the driver is of a standard to have access to and carry out the activity of driving. The Regulation obliges drivers, in addition to a driving permit, to hold an initial qualification and to undergo periodic training (every 5 years) intended to improve road safety and the safety of the driver. In order to establish that the driver complies with the obligations, the driver must possess a certificate of professional competence, referred as 'CPC'. Such provisions have as a result the improvement of the professionalism of professional drivers.

Technical condition of vehicles and inspection

Directives 2014/45/EU of 3 April 2014 and 2014/47/EU of 3 April 2014 of the European Parliament and of the Council on periodic roadworthiness tests and on technical roadside inspection of commercial vehicles, respectively, ensuring that vehicles are kept in a safe and environmentally acceptable condition during their use, following the technical standards and requirements applicable in the Union in accordance with the set UN Agreements and Regulations and the EU legislation.

EuroMed Partner Country Efforts and Achievements with EuroMed TSP and RRU Support

Harmonization of national legislation in the region along the said legal frameworks, is rigorously promoted through regional and national work-

shops, seminars and technical assistance missions organized by EuroMed Projects in all partner countries. Study tours were held under EuroMed Projects, in Geneva, Switzerland and Haute Savoie, France and in Padua-Vicenza-Venice area, Italy. Roadmaps on accession and implementation of AETR, ATP and 1958 and 1997 Agreements were elaborated and published in cooperation with UNECE. High-level participation of EuroMed officials in the work of selected UNECE intergovernmental bodies in Geneva, were encouraged and facilitated. National strategies were elaborated and or reviewed with EuroMed Projects support, aimed at promoting accession to and effective implementation of UN Agreements along with studies, analytical work, economic impact assessments, and pilot actions.

These efforts raised awareness amongst EuroMed partners on the vital importance of the UN Agreements and respective EU legislation and helped them familiarize with the relevant work of UNECE and EU. National legislations have been modified in almost all EuroMed partners, inspired by those UN Agreements and EU best practices, while accession and implementation to these agreements is ongoing. The accession of Palestine to the TIR Convention, in 2017 and to the Road Traffic Convention, in 2019 as well as that of Tunisia to the 1997 Agreement, in 2020, are among the concrete achievements, while Egypt's accession to the TIR Convention is forthcoming. Moreover, EuroMed partner efforts led to the opening of AETR to Algeria, Jordan, Lebanon, Morocco, and Tunisia, while soon AETR will be opened also to Egypt.

Concerted efforts are also pursued in the region for enhancing professionalism of drivers and operators as well as technical state of vehicle fleet. Mandatory training for professional drivers of certain road vehicles categories inspired by Directive 2003/59/EC is pursued already by some EuroMed partners and their drivers safety performance is being improved by respecting driving and rest times rules following the AETR Agreement. Rules for the access to the profession of transport operator inspired by Regulation 1071/2009/EC are applied in several EuroMed countries and same is valid the transport of dangerous goods. The technical state of the vehicle circulating in the region has been drastically improved through the application of some of the Regulations annexed to the UN 1958 and 1997 Agreements and EU best practice, including elements of Directives 2014/45/EU and 2014/47/EU.

EuroMed Projects have been instrumental in assisting partner countries, harmonize their transport regulations and enhance the performance of transport operations in the region in support of the implementation of the regulatory aspects of the RTAP 2014 – 2020. However, in spite the efforts, as seen in the following table, accession to the selected UN road transport legal instruments is still not well advanced. Lack of Human resources at the concerned Ministries and lack or limited cross-border road freight transport operations reducing the urgency of the need for harmonisation, are among the problems facing EuroMed countries with regard to their accession to these legal instruments. The COVID-19 pandemic has also negatively affected this process.

Figure 1. EuroMed Partners' Accession to the selected UN road transport legal instruments, October 2020

No	UNECE International Conventions and Agreements (EuroMed Project beneficiary countries)	Algeria	Egypt	Israel	Jordan	Lebanon	Lybia	Morocco	Palestine	Syria	Tunisia
1	Convention on Road Traffic, of 1968			✓				✓	✓		✓
2	Convention on Road Signs and Signals, of 1968							✓			✓
3	European Agreement concerning the Work of Crews of Vehicles engaged in International Road Traffic (AETR), of 1970										
4	The Customs Convention on the International Transport of Goods under Cover of TIR Carnets, of 1975 (TIR Convention)	✓		✓	✓	✓		✓	✓	✓	✓
5	International Convention on the Harmonization of Frontier Controls of Goods, Geneva, of 1982 (Harmonization Convention)				✓			✓			✓
6	European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), of 1957							✓			✓
7	Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for such Carriage (ATP), of 1970							✓			✓
8	Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions, of 1958		✓								✓
9	Agreement concerning the adoption of uniform conditions for periodical technical inspections of wheeled vehicles and the reciprocal recognition of such inspections, of 1997										✓

Source: EuroMed Transport Support Project

Conclusions and Recommendations

The high importance of the regulatory convergence in promoting cross-border transport and international haulage and upgrading road transport performance in South Mediterranean region, has become apparent to EuroMed partner countries. However, while the focus of the efforts was towards road haulage, which holds the largest share of the overall freight land transport movements, the cross-border road freight transport in the South Mediterranean region remains rather limited, due to subregional conflicts and security concerns.

While EuroMed partners have made substantive progress in the past years, a lot of efforts are still required. Regulatory reform and convergence of transport legislation, development of harmonized transport rules and standards, higher professionalism for

drivers and operators and improved technical state of the vehicle fleets, should remain the highest priority in the region, since they are considered prerequisites for the development of efficient land transport systems for the promotion of cross-border transport and international haulage. Accompanied with National Strategies, including on Road Safety, Intelligent Transport Systems (ITS) and Digitalization of Transport, will lead to enhanced operations and management of transport systems, reduced congestion and GHG emissions and improved network efficiency.

Moreover, existing national inland transport strategies should be reviewed and whenever not in place elaborated. Such strategies should define national regulatory approaches for improving the road transport system, facilitating cross-border transport and international haulage, and

improving road safety, for which accession and full implementation of the said UN legal instruments is essential. Strategies should also address climate change with all its adverse effects, being the biggest social and environmental challenges before the global economy, taking note that transport is responsible for 27% of total EU-28 Greenhouse Gas emissions, 72% of which come from road transport (EEA, 2017).

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Road Transport in Morocco: What is the Best Route Out of the COVID-19 Crisis?

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Introduction

Like many other countries across the world, Morocco was affected by an unprecedented economic and social crisis in 2020 as a result of the COVID-19 pandemic.

During this crisis, road transport companies across all sectors played a critical role in moving goods, supporting the operation of supply chains, repatriating citizens and transporting people to their workplace, all while increasing the risk to their employees' health and well-being.

However, the effects of the crisis were quickly felt and impacted several sectors, including transport and logistics, which experienced significant challenges.

Road passenger transport has been particularly hard hit by the virus, especially when one considers the lockdown measures, restrictions on movement, protective measures, the fact that transport seems to be a major factor in transmission of the virus and the speed with which the virus spreads. In fact, the measures taken by the Moroccan authorities, particularly the health authorities, to contain the spread of the virus since the first cases of COVID-19 appeared in March 2020 have had dramatic repercussions on the profitability of public and private passenger transport companies, especially as a result of the complete shutdown of public passenger and tourist transport.

Nevertheless, freight transport companies were affected to a lesser extent, in part due to the collective efforts of the authorities and professionals in the sector to ensure the

continuity of freight operations. However, the crisis has not affected all freight transport companies to the same degree. Suppliers in certain sectors under particular strain (food, refrigeration, essential products, courier, etc.) were highly productive, while others came to a virtual standstill. This situation was the result of the transport sector's high dependence on its client industries (shippers and contractors), which experienced a slowdown or partial or total suspension of operations, and the increase in demand for essential products, which gave rise to situations that were sometimes difficult to manage (flow imbalances, non-guaranteed loading rates, empty returns, adjustment of transport plans, etc.).

Admittedly, the COVID-19 crisis has had a huge, unprecedented impact on mobility operations and transport systems, but it has also exposed the weaknesses and structural failings in the Moroccan sector.

Although it is somewhat premature to draw definitive conclusions and lessons for the transport sector, one thing is certain: this health crisis marks a "before" and an "after" for the sector. It will give rise to a new context in which the transport sector will be forced to consider new ways of adapting and evolving to meet future challenges and be better prepared to strengthen its resilience and face a future marked by uncertainty.

Decarbonization of Transport: Towards Greater Awareness?

Although the COVID-19 crisis has had a severe impact on economic and so-

cial aspects of Morocco's transport sector, it has also brought positive effects, thanks in large part to the unprecedented lockdown and restrictions on movement and travel. These benefits include a reduction in environmental externalities, especially a cut in CO₂ emissions, better air quality and improved road safety indicators due to the drop in the number of road fatalities and injuries.

Raising awareness regarding these positive aspects may well have a lasting effect on future mobility behaviour and could encourage the country's political decision-makers to set up a national strategy for sustainable mobility, to consider more low-carbon solutions and to support a transition towards safer, more efficient, more accessible, more inclusive and more resilient transport systems.

Management of the pandemic and its economic and social consequences must not overlook measures to combat climate change in transport. On the contrary, post-COVID-19 public policies and economic recovery plans must allow for further progress towards green, sustainable solutions for the transport sector.

Physical Distancing: A Catalyst for Digitization in Transport

The handling of the COVID-19 pandemic has served to reinforce arguments in favour of digitizing services and the trend towards "zero paper" in several sectors, especially transport and related services.

The context created by the spread of the virus, lockdown measures, social distancing and restrictions on move-

ment has further highlighted the need for digitization. The lack of a digital solution was widely revealed by the suspension and termination of services and the exceptional extension of validity periods for certain documents issued to users.

Paperless administrative procedures and the use of electronic documentation are therefore becoming essential to ensure the continuity of services. They also provide a real opportunity to speed up digital transformation and ultimately boost economic growth and development.

Through cross-sectoral interactions between Morocco's various strategies, the transport sector is playing a central role in this dynamic and has been forced to follow this trend, above all to support its development. Digitization is therefore no longer an option for transport stakeholders and professionals, but rather an absolute necessity to adapt to the development and constant changes in the market.

In this context, the Ministry has launched several projects, in particular the digitization of transport procedures and documents, including those issued to freight transport professionals, promotion of virtual freight exchanges, deployment of teleservices and the widespread application of online appointments for public services such as driving licences, registration documents, periodic technical inspections and the individual approval of vehicles.

The Ministry is also focusing on completing and upgrading its legal and regulatory tools governing the sector with a view to monitoring the developments and changes that it has undergone during the pandemic and even to anticipate such changes in the future.

With respect to human capital, new occupations will inevitably emerge in this context, which is overflowing with new technologies. To that end, the government will focus on preparing and deploying adequate training plans aimed at capacity-building in areas related to digitization and information systems (TMS, WMS, etc.).

Improving Transport Services in Rural Areas: The Path to Social Equity?

The current crisis has also highlighted the inequalities in the provision of transport solutions and revealed the need for governments to implement mobility rights for all citizens, regardless of whether they live in urban, peri-urban or rural areas. In this regard, it should be noted that the challenges facing transport policymakers when it comes to establishing and guaranteeing the foundations of a fair, equitable and sustainable transport system are complex and highly diverse.

According to the projections of the Moroccan general population and housing census (RGPH) established by the High Commission for Planning (HCP), nearly 32.2% of the Moroccan population will live in rural areas by 2030. Therefore, improving means of access and mobility will be key to achieving objectives for growth and the reduction of social and territorial disparities. To achieve this, however, it is crucial to adopt and implement public policies concerning transport in rural areas, including road infrastructure, modes of transport and transport services.

Nevertheless, despite the substantial investments made by the Moroccan public authorities since the mid-1990s in the development and rehabilitation of road

infrastructure in rural areas through several programmes, most notably the National Rural Roads Programme (PNRR-1 and PNRR-2), the Territorial Upgrading Programme (PMAT) and the Programme for the Reduction of Territorial and Social Disparities (PRDTS), these interventions have not fully delivered on the population's growing expectations in terms of accessibility, nor have they improved the social conditions of rural areas or adequately responded to the need to boost economic activities.

Thus, if these investments are to provide the rural population with significant economic and social benefits, a more comprehensive approach should be adopted by the public authorities and the various stakeholders to improve transport planning and implement additional measures to address both infrastructure development and the provision of quality transport services that meet the specific mobility needs of rural areas and are compatible with the rural population's purchasing power.

Conclusion

Plans and solutions to overcome the crisis and mitigate its impact must be addressed by all economic sectors, including transport. The silo mentality of sectoral public policies must become a thing of the past. Now is the time for all stakeholders to pool their knowledge and come up with ideas to provide concrete, innovative and sustainable responses to the immediate challenges posed by this crisis, and also to long-term challenges that could arise unexpectedly. Of course, in the world of the "new normal", the transport sector must make great efforts to adapt and sometimes even transform itself if it is going to play its full part in recovery.

Chapter 4

RAIL TRANSPORT

Before the appearance of COVID-19, the rail transport sector was already working on a series of trends aimed to contribute to its reinforcement, by increasing its weight in the overall flow of freight and passengers. These include the resilience of the sector, its impact on the sustainability of the transport system, its interest in consolidating itself as the backbone of a multimodal system and digitalisation processes.

The evolution of these trends is directly linked to new demand patterns, as the health crisis has led to a change in habits among some sectors of the population (teleworking, e-commerce, etc.). Potential new supply patterns must also be taken into account, such as the availability of new services and better integration between modes of transport within urban and metropolitan areas. And finally, innovation and research processes that may affect stations, rolling stock, signalling and control, are aspects where harmonisation plays a key role.

Rail Transport: Towards a New Normal

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Introduction

In February 2020, UIC set up a task force to work with its members, experts and global rail transport associations with a view to sharing and providing information on the crisis caused by the coronavirus (COVID-19) and its consequences for the rail transport sector. Shortly afterwards, specific needs led the working group to produce several operational documents in multiple languages (www.uic.org/covid-19/):

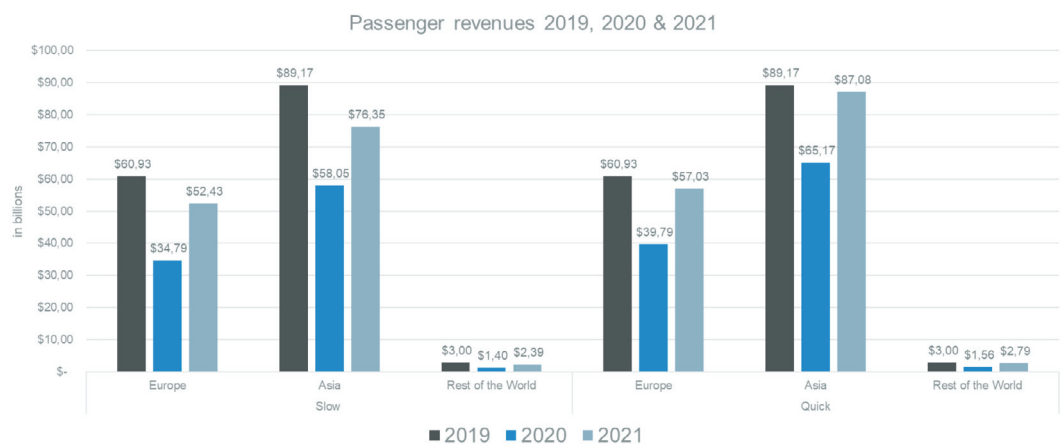
- “Management of COVID-19: Guidance for Railway Stakeholders”, which outlines potential measures to support railway stakeholders and provide reliable information on specific challenges facing the industry.
- “Potential Measures to Restore Confidence in Rail Travel Following the COVID-19 Pandemic”, which lists the various measures that could be taken by railway stakeholders to increase a sense of safety among passengers.
- “RAILsilence: How the Rail Sector Fought COVID-19 During Lockdowns”, which describes the situ-

ation during the lockdown and the measures implemented by the rail sector during the fight against the epidemic.

- “RAILsilence: Back on Track”, which presents the measures taken by members to resume rail traffic.
- Other documents issued include: “Masks, Ventilation and Social Distancing”, “Thermographic Cameras”, “First Estimation of the Global Economic Impact of COVID-19 on Rail Transport” and “Contamination Rates on Trains”.

A Global Economic Assessment

In our assessment of the economic impact on the rail industry carried out in mid-2020, at the end of the first wave, we concluded that demand for travel will mostly be delayed until 2021. Passenger demand in 2020 was expected to decline on average by around 30% compared to 2019, while the freight sector was expected to decline on average by up to 10%. Unfortunately, passenger confidence was expected to remain low.

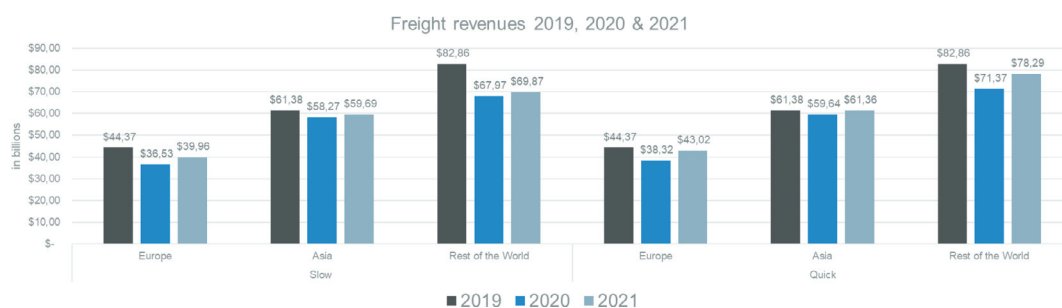


It is clear that this scenario will result in heavy losses in 2020 with respect to passenger operations, which will remain significantly elevated in the medium term.

The impact on the freight sector cannot be compared to the passenger sector because the activities differ and the lockdown during the COVID-19 crisis frequently gave rise to a shift from road to rail transport. In addition, while many borders were closed to

passenger traffic, the borders remained open for freight. That said, manufacturing output has fallen in some countries, which has led to a decline in freight transport.

Losses in freight operations in the first half of 2020 were lower than those in the second half of 2020. Most countries, particularly China, but also European countries, experienced a shift from road to rail transport during the lockdown.



Economic Support Measures

An initial estimate, carried out in mid-2020, of the global economic impact on the rail industry was around 125 billion dollars for 2020.

In mid-2020, UIC asked its members which of the following short- or medium-term support measures they would like:

- Direct financial assistance.
- Reduction in infrastructure access charges.
- Reduction in / elimination of VAT and other taxes.
- Secured loans.
- A level playing field for all modes of transport.

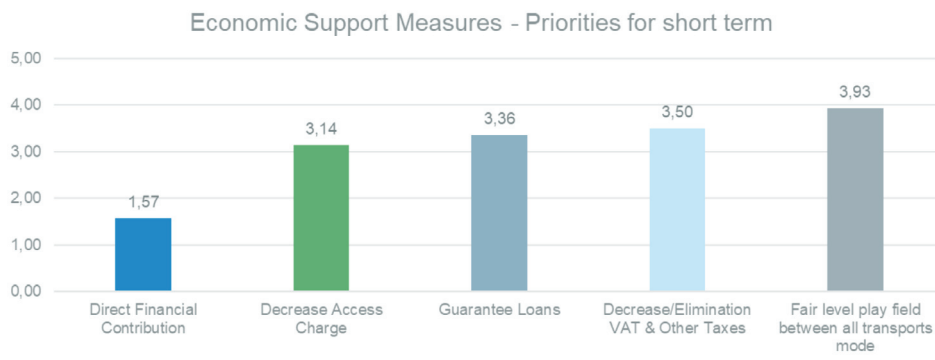
UIC members also mentioned measures such as short- to medium-term wage compensation during COVID-19 crises and long-term debt reduction.

Respondents were asked to rank the proposals from 1 to 6, where 1 was the economic measure they considered most important and 6 was the least important. Therefore, a value close to one indicated that the economic measure was highly desired by the respondents.

In the short and medium term, it is clear that the top priority involves the immediate recovery of economic losses.

All the other economic measures proposed received similar scores.

Priorities for short- or medium-term economic support measures.

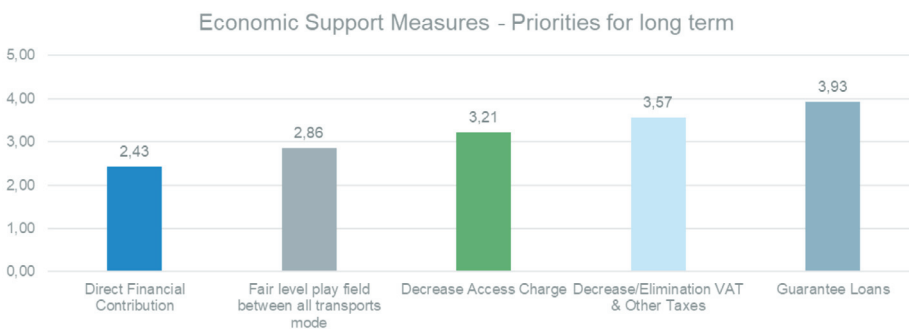


Note: A value close to one indicates that the economic measure is highly desired by the respondent.

Long-term analysis revealed entirely different priorities compared to short-term analysis. While the most important measure remained direct financial assistance, the second priority

changed. In the long term, a level playing field for all modes of transport replaced a reduction in infrastructure access charges, which fell to third place.

Priorities for long-term economic support measures.



Note: A value close to one indicates that the economic measure is highly desired by the respondent.

While financial measures have been implemented in other transport sectors in many parts of the world, similar measures are expected for the rail sector, which has clearly been severely affected by the crisis.

the scope of application is limited to infrastructure management or to train operations and rolling stock maintenance, or encompasses both.

The priorities of different railway sector organizations may differ between world regions, depending on whether

It is worth noting that, in this post-lockdown phase, most members are facing serious cash flow issues and have expressed a preference for direct financial assistance over tax cuts and a level

playing field between all modes of transport, which nevertheless remain long-term issues.

The rail sector is undergoing an unprecedented crisis that calls for economic measures from the government. Members expressed their preference for direct financial assistance, although several other options could be considered, such as lower infrastructure charges, a reduction in or elimination of VAT and other taxes, secured loans and a level playing field between all modes of transport.

The New Normal

What is the new normal? It refers to the stable situation that will be reached once the pandemic and its direct after-effects have been overcome. It is clear that, in countries where the crisis has lasted a long time, the after-effects will be felt for many months, or even years, in the form of an economic downturn. The new normal will therefore take place after this period, along with all the long-term consequences. Indeed, trends that should have occurred over the long term have taken place earlier than expected because of the crisis. Depending on the country, this new normal will begin sometime between 2021 and 2025.

In some countries, the new normal will resemble predictions made before the crisis, given the short duration and low impact of the crisis. This applies particularly to China, where more or less normal activities were resumed very quickly before the summer of 2020, and which therefore did not have time to make lasting changes in behaviour.

In other countries, especially in Europe and the Americas, the crisis has lasted

longer and habits have changed, particularly with regard to the way of people work and travel.

The pre-crisis trends in Europe were:

- Moderate economic growth.
- Development of tourism.
- Liberalization in the world of rail transport.
- Balanced multimodal competition.
- Major technological progress.
- Important developments in ticket distribution activities promoted by UIC.
- Developments in intermodality.
- Increased environmental awareness.

The COVID-19 crisis curtailed some of these activities, in particular through:

- Widespread teleworking for positions in which this was an option.
- A certain amount of counterurbanization, with many people leaving cities to telework in quieter, less expensive locations such as towns and rural areas.
- Economic collapse in some sectors.
- Significant restrictions on tourism.
- A halt on new infrastructure construction work.
- A need for extensive financial resources.
- Development of "virtual mobility" through remote meetings.
- Less priority given to environmental issues.
- An impression that public transport modes are less safe than individual transport in terms of health.

The post-COVID-19 environment will affect rail mobility in the following ways:

- Most pre-COVID-19 trends will be expedited.
- The balance between physical mobil-

ity and virtual mobility will shift in favour of the latter. Many companies have found that remote meetings are at least as effective as face-to-face meetings. This has been particularly true at UIC with respect to international meetings, in which the number of countries involved has grown significantly during the crisis. This has made it unnecessary for participants to travel, thus saving both time and money. On the other hand, meetings have to be scheduled in accordance with each country's time zone, and there is no substitution for meeting in person when it comes to getting to know people, making technical visits and taking decisions. Moreover, some cultures (especially in Asia) prefer face-to-face meetings to online meetings.

- Public funds will shrink because of the soaring debts of countries during the crisis.
- It will take some time for passengers to return to train travel.
- Environmental awareness will increase, which favours rail travel with respect to air travel over medium distances. In particular, before the crisis, on three-hour rail journeys, as many people travelled by train as by air. The total travel time is actually four hours or more. This makes a strong case for bringing back night trains, which could replace overnight hotel stays if the quality is good enough. Some countries will reinforce this trend by not allowing air carriers to operate on routes in direct competition with high-speed trains.

Evolution of Mobility Demand

The factors described above will cause the demand for mobility to change

quite substantially in the countries around the Mediterranean.

Business trips will decrease and be replaced by online meetings, a situation that will continue for some time.

Some countries will adopt laws to facilitate teleworking, which will have two opposing consequences:

- A reduction in the volume of suburban and regional daily trips.
- An increase in certain long-distance trips due to the relocation of people who have left their homes in cities to live in towns or rural areas. They might prefer to book hotel rooms once or twice a week so they can go to the office.

For companies, this rise in teleworking could lead to substantial savings in office rental, since companies could set up shared offices or hot desks for coworking.

Teleworking will also be the norm in university studies, remote exams, remote medical consultations, etc. Furthermore, growth of the circular economy will have an impact on passenger and freight transport.

In cities, traditional modes of transport will be partially replaced by so-called "soft" mobility, which will require different investments in infrastructure and new travel regulations.

Tourism will continue to increase, but more environmentally friendly modes of transport will be more common. Stigmatization of air travel (flight shaming, plane bashing and the Greta Effect) will continue to increase among all social classes.

It is precisely the right moment for governments to promote ambitious policies to develop more environmentally friendly modes of transport, in particular those that favour rail transport.

The COVID-19 crisis may present an opportunity for the rail sector, given that countries and supra-state organizations will provide vast funding to restart the economy.

This could involve new investments for high-speed lines, which are highly successful in Western Europe, and in Asia (China, Japan, South Korea), and represent a key factor in economic development. There are still vast areas not accessible by high-speed rail around the Mediterranean Basin. These investments could be earmarked for new high-speed lines (above 250 km/h) or for upgrading existing lines for speeds above 200 km/h.

Environmental Awareness

Most of the world's rail companies have pledged to reach carbon neutrality by 2050 by signing a pact proposed by UIC, which means that measures in this direction will be taken in the sector with vital support from national and regional authorities.

This also requires support for intermodality to promote the use of several modes of transport, in line with the specific features of each mode: ticketing, amenities in stations, redesign of the urban environment around "soft" transport.

Other Factors

Competition between rail companies following liberalization may have a positive impact on both transport prices and the quality of services offered to customers.

This was particularly evident in Italy with the competition between NTV-Italo and FS-Trenitalia, which led to highly significant developments in the volume of high-speed train traffic that benefited both railway operators. The rail / air modal split between Milan and Rome thus increased from 36% in 2008 to 80% in 2018, while, at the same time, the share of air traffic decreased from 50% to 14%.

This recent crisis strongly affected new railway operators, as the volume of the global market did not allow several operators to compete for the same routes. They therefore reduced their development plans for the near future.

The expected reduction in mobility associated with new working habits will also force infrastructure managers to reduce the cost of accessing infrastructure. The role of the public authorities will therefore be to establish a new balance between subsidies and the infrastructure charges paid by railway operators.

Conclusion

Governments must provide the rail sector with strong support while promoting the safest, most sustainable mode of transport, which plays a major role in the future mobility system of most countries.

This is especially true for rail freight, which can play a crucial role in supporting a sustainable logistics value chain, but also applies to passenger operations, at a time when travel conditions and expectations are changing dramatically.

This support could be provided through investments in new infrastructure, but could also take the form of government policies that support and give rail transport a real social and economic advantage.

Synergies between the Mediterranean Corridor and the Trans-Maghreb Multimodal Corridor

Josep Vicent Boira

Government Commissioner for the
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Government of Spain

Introduction

In this contribution the authors explore the potential synergies between the Mediterranean Corridor, developed within the Transeuropean Transport Network and Trans-Maghreb Multimodal Corridor (TMC) in the post COVID19 Era. Firstly, both Corridors are presented, stressing on the importance of railway as an efficient and sustainable transport mode for freight and passengers. The importance of Morocco and Spain for both Corridors will also be highlighted. Secondly, the potential synergies between Mediterranean Corridor and TMC will be proposed according to three complementary geographical scales: the Alboran Sea as an emerging geo-economics maritime space, the Spanish-Moroccan Cooperation and, finally the EU-Maghreb role in connecting transcontinental flows.

The Mediterranean Corridor: Towards a Resilient Transport Network

The Mediterranean Corridor is one of the 9 main corridors designed by the European Union within the Trans-European Transport Network (TEN-T). It is conceived as a multimodal corridor that crosses 6 countries (Spain-France-Italy-Slovenia-Croatia and Hungary) along 3,500 km. It will provide multimodal links from the ports and terminals of the Western Mediterranean to Central and Eastern Europe. The Med Corridor is interconnected with other 7 corridors and it provides an efficient, sustainable, and fast link between the main European markets and the Spanish Mediterranean economic

system (Figure 1 and 2). TEN-T network is therefore a strategic scheme to ensure and enhance the mobility of both people and goods, as declared in the Schengen Treaty.

The regulatory framework is defined in Regulation 1315/2013 (EC, 2013), which establishes the guidelines for the development of a Trans-European Transport Network, determining the projects of common interest and specifying the requirements that must be met. To achieve those goals, the Commission introduced the Connecting European Facility Fund (CEF) through the Regulation 1316/2013. Furthermore, other EU funding programmes support TEN-T development like the European Fund for Strategic Investment (EFSI), Horizon 2020 (for research and development projects), Cohesion Fund (CF) and the European Regional Development Fund (ERDF).

The European Corridors seeks to achieve two basic pillars, interoperability and intermodality through the coordinated execution of works and projects. Indeed, the appropriate planning of the Trans-European Transport Network is crucial to enable efficient and long-distance transport operations. Regarding the railway system, the main goal is to achieve the full connection between the main nodes (*Core Network*) of each Corridor by 2030 in accordance with the following requirements:

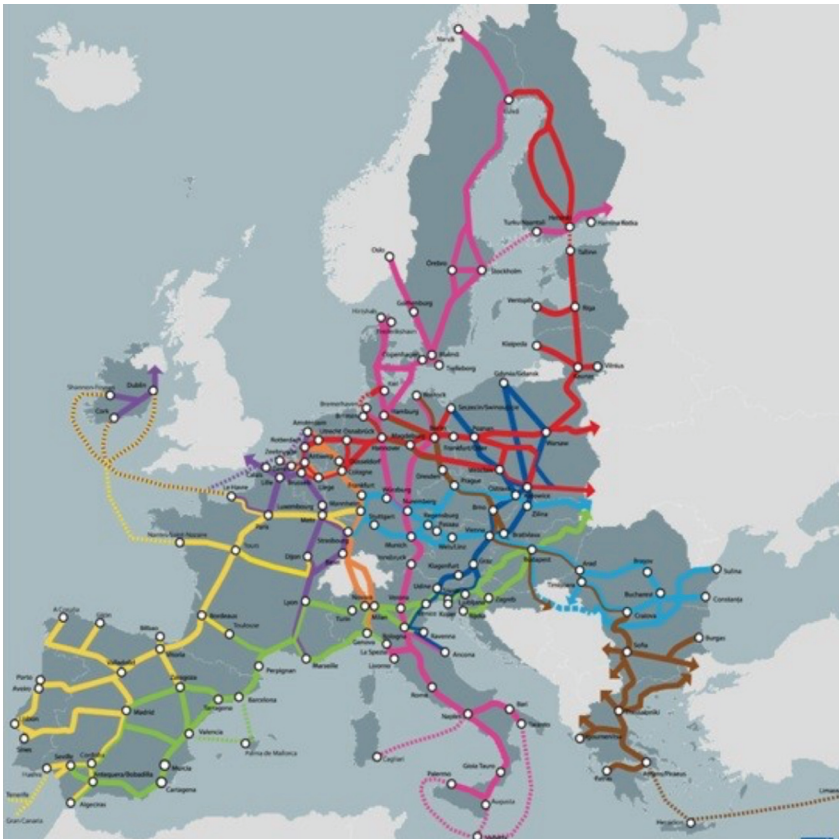
- Implementation of Standard track gauge (1435mm)
- Train length > 740 m
- Electrification 25Kv
- ERTMS Communication System
- Axle loads \geq 22.5 tons
- Improve rail connections with ports and terminals.

The Mediterranean Corridor is much more than a railway infrastructure. It is a large multimodal transport project which also includes roads, ports and airports in a more sustainable and competitive way. Beyond the infrastructural improvement, it is important to promote operations and services for passengers and freights. In this sense, the new sections should be complementary for both uses. Another important challenge is the development of a wide logistics strategy linking ports, airports, Rail-Road Terminals, and industries together. Not surprisingly, the Mediterranean Corridor will develop its full potential when its different modes of transport are connected. That is why we need to redefine

logistics to boost the growth of inter-modal terminals and port connections.

Finally, it is necessary to better integrate the infrastructure in urban nodes. For example, in Spain between Barcelona and Almeria there are more than 11 cities with more than 100,000 inhabitants, which requires specific attention to how the corridor crosses densely populated areas. But all these efforts will not be enough without the accurate planning of passenger and freight services, which aims at providing fast and effective transport. To achieve this goal, it is fundamental that infrastructure development is based on reliable and truthful analysis.

Figure 1. Transeuropean Transport Network (TEN-T)



Source: European Commission

Figure 2. The Mediterranean Corridor in Spain



Source: own elaboration

The Transmaghreb Multimodal Corridor: Multi-Scale Territorial Project

The Transmaghreb Multimodal Corridor (TMC) is the most ambitious project of multimodal corridor of the Southern Mediterranean Shore, from Mauritania to Libya, passing through Morocco, Algeria, and Tunisia, that is, the countries that make up the Maghreb. This East-West link is one of the most important in Africa (African Development Bank Group, 2015), like the TEN-T network, aims to connect the main cities and the strategic nodes for freight transport of the involved countries through the modernization of road and rail infrastructures. Among the most important there are the ports of Nouadhibou and Nouakchott (Mauritania), Tangier Med, Nador, Casablanca and Agadir (Morocco), Oran, Arzew, Annaba, Alger, Djen-Djen and Skikda (Algeria), Tunis-Radés (Tunisia). Regarding the rail cor-

ridor, the total length would reach 6,700km for freight traffic and 5,400 for passengers, 4,000km would be shared between both modes (CETMO, 2019). However, significant works for the modernization and extension of the infrastructure are needed to become an efficient, safe, interoperable and intermodal transport system. Investment for the rail mode of more than 50,000 million Euros was estimated in 2018 (more than 4,000 million €/year).

Beyond the Mediterranean scale, TMC represents an opportunity to connect Sahel countries with the core of Europe in a more efficient, sustainable, and safe way. Like all commercial and transport interconnection projects at the international level, it is expected that the TMC will promote a certain political stabilization and improvement of international relations in both the Maghreb and the Sahel. Influential exponents of the business sector have already expressed their support to such an ambitious initiative (Figure 3).

Figure 3. Position of Issad Rebrab, President of the Algerian industrial group Cevital, in favour of the development of a transcontinental rail corridor in Africa.



Source: Twitter, Issad Rebrab (@IssadRebrab) March 21, 2017

On the global stage, this project is strategic for the Belt and Road Initiative (BRI), promoted by the Chinese government, whose industrial and transport investments will improve logistics and multimodal freight transport (especially railways) in the countries of the TMC (Zulfikar Rakhmat, 2014). Some of the most interesting initiatives are:

- A 1.000ha new logistics zone in the port of Zarzis, (Tunisia).
 - The new railway line Zarzis-Gabès (Tunisia);
 - The new Tunisian car factory of SAIC– the Chinese state automobile manufacturing company (Ecofin Agency, 2018).
- Morocco as key player for TMC*
- Within this project, the country with the most advanced railway infrastructure is surely Morocco. 60% of its rail network is electrified and freight transport is comparable, in terms of total tons, to Spain and other European countries (Table 1). 70% of the traffic goes to sea ports and passes through the dry ports of Casablanca, Fez and Marrakech. The destination is especially the port of Tanger Med, the largest in the Afro-Mediterranean area and the 35th in the world by volume of traffic. In January 2021, the third terminal was inaugurated, increasing Moroccan leadership in maritime traffic.
- The Construction of the Cité Tanger Tech Mohammed VI (Morocco), a new industrial, logistics and technological centre (2000ha) which is expected to generate more than 100,000 jobs (CGNT Africa, 2020). The new port will have a capacity of 9 million containers.
 - New car factories and car components industries in Morocco (Eliason, 2019).
 - The construction of the port of el-Hamdania (Algeria), which will be the second largest in the Mediterranean after Tanger-Med (CGNT Africa, 2019).

Within rail freight transport, a strategic activity is car transport. In 2017, 334,000 cars were transported by rail (ONCF, 2018), that is, half of the total cars transported throughout Spain in the same period. These flows are explained by the recent establishment of European automotive factories (Renault, PSA, Fiat) and China (BYD) and it is expected a substantial increase in the future, as 90% of this production is exported (Oxford Business Group, 2021). Within the framework of the Belt and Road Initiative, the Memorandum of Understanding (MOU) signed between Morocco and China has already generated important results: two factories for aluminium car

components have been recently built and they are the first of their kind in Africa. As a result, the logistics sector will be a priority for the Moroccan economy and the railway will play an important role in a multimodal perspective. Substantial advances have also been made for passenger transport with the Tangier-Kentira High-Speed Line in 2018, the first section of the Moroccan High-Speed Line (HSL) 'Al Boraq', aimed at connecting Casablanca with Tangier (338km) in 1.30h (estimated by 2022 or 2023). Furthermore, Morocco planned to connect its main cities with the HSL by 2035. It is the first high speed line in Africa.

Table 1. Comparison between rail infrastructure and rail freight transport between Spain and Morocco

	<i>Spain</i>	<i>Morocco</i>
<i>Total length</i>	15.904 ⁵	2.295
<i>Of which electrified</i>	63,7% ⁶	64%
<i>Main Track Gauge</i>	1.668 mm	1.435 mm
<i>Electrification</i>	3kv	3kv
<i>Transported goods (thousand. tonnes)</i>	28.251 ¹	27.000
<i>Cars Transported</i>	757.000 ²	334.000
<i>Wagons</i>	11 292 ³	5.498
<i>Rail-maritime traffic</i>	7% ⁴	70%

Sources: Morocco ONCF (2017); Spain: 1, 3, 5, 6 EU Statistical Pocketbook 2019 (2017 data), 2 Anfac (2019), 4 OTLE, 2019 (2018 data)

Synergies Between Mediterranean Corridor & Trans-Maghreb Corridor

Synergies and Complementarities between the Mediterranean Corridor and the Trans-Maghreb Multimodal Corridor can be explained at three different scales: regional (Alboran Sea),

bilateral (Spain-Morocco) and Euro-Mediterranean (EU-Maghreb). The common denominator among all these all these scales is the railway, conceived as intermodal transport network, interoperable, competitive, and environmentally sustainable.

Regional Scale: complementarity in the Alboran Sea

The Alboran Sea represents a shared maritime space between Morocco, Al-

geria, and Spain in the westernmost of the Mediterranean Sea. The main maritime flows are concentrated between Tanger-Med and Algeciras for obvious geographical reasons: the Port of Algeciras is a true economic engine for Spain and for the Mediterranean basin, being one on the busiest port of Europe and in the world. Nonetheless, according to a regional perspective there are other important ports for the exchange of freight and passengers, such as Almería, Motril, Cartagena, Málaga, Melilla, Nador and Oran. Some of them are part of the TEN-T Network and they will be a competitive option for multimodal transport (Almería and Motril). Those on the southern shore of the Mediterranean are already included in the TMC.

The Alboran Sea is truly emerging geoeconomic space, where the complementarity and optimization of the existing infrastructures should be enhanced. Alboran ports act both as attractors of global maritime flows and as poles of regional redistribution and mutual exchange (Figure 4). Among them, RoRo traffic is of primary importance. In this sense, it is not difficult to imagine a scenario in which those ports will exchange rail-port flows in a competitive way, thanks to the interoperability of both railway infrastructure and the interconnection with other ports and urban nodes in Spain and in Maghreb. A study on the enhancement of logistics and multimodality in the Alboran Sea would be very useful to foresee future synergies and to boost the development of both corridors.

Figure 4. Main ports of the Alboran Sea and railway connections



Source: own elaboration

Strengthening Spain-Morocco Cooperation in railway development

The Trans-Maghreb Multimodal Corridor is as strategic for Morocco as the

Mediterranean Corridor is for Spain. Both countries need to promote their rail freight transport for domestic and international markets. Their railway networks are the links between the Sahel and Europe. Moroccan rail freight transport is above many European

countries and at the same level of Spain (in terms of total annual tons). We believe that it is necessary to strengthen mutual trade relations, specifically multi-modal services, through a co-competition approach: cooperate bilaterally to compete globally. It will be interesting to focus on potential Spanish Moroccan railway operation, sea-short shipping (Table 2) and on the removal of technical and administrative obstacles. The study of bilateral trade relations prepared by

CETMO (tab.2) constitutes a good starting point. At a financial level, attention should be paid to European Multiannual Framework 2021-27: the reactivation of the Spain-Morocco cross-border cooperation program could be a good opportunity to finance pilot projects. Interesting initiatives have been funded by the EU Program POCTEFA – Cross-Border Cooperation Program between France, Spain and Andorra, like the TRAILS Project (Batlle, 2020).

Table 2. Main maritime relation between Med Corridor ports and Maghreb (import)

Port	Origin (MAIN flows)
<i>Algeciras</i>	<i>Morocco, Mauritania, Argelia</i>
<i>Valencia</i>	<i>Argelia, Morocco, Tunisia</i>
<i>Barcelona</i>	<i>Argelia, Morocco, Tunisia</i>

Source: CETMO (2019)

MEDC and TMC: intercontinental connection between Africa and Europe in Post-COVID era

CETMO, as well as other institutions and research centers, have demonstrated how Euro-African freight flows have been growing constantly in the last ten years (before the outbreak of the pandemic crisis). Many African countries supply European markets and its industries with raw materials such as energy products and raw minerals. Conversely, Europe provides semi-finished products and basic agricultural or industrial products to African countries. Many of these products are compatible with rail transport. In this sense, the two corridors play a fundamental role in capturing and distributing such goods. The Mediterranean Corridor represents the fastest, most efficient, and environmentally sustain-

able way to reach the economic heart of Europe (Prytherch, & Boira, 2011; Li-bourel, 2017; Loyer 2020). The ports of Andalusia, Murcia, Valencia, and Catalonia will be connected in the medium term with the standard gauge, so that a part of these flows could be routed by freight trains to France, Germany and the other countries without interruptions or train changes. The Mediterranean Corridor already counts with the only Spanish port that is fully interoperable and already connected to Europe, that is the Port of Barcelona.

In the Post-COVID-19 Era, Governance is a crucial dimension for the achievement of the objectives of both Corridors. The pandemic has unveiled the fragilities of the pre-COVID transport sector, namely the lack of digitalization, of infrastructural interoperability, and of synergies between all modes. Transport and logistics need to be more resilient. In this sense, we think it is

strategic to align the Trans-Maghreb Multimodal Corridor to the TEN-T scheme as established in Regulations 1315/2013 and 1316/2013: similar objectives, requirements, deadlines, financing opportunities and governance approaches could be also implemented in the southern shore of the Mediterranean Sea. In this sense, the MEDA TEN-T project developed by CETMO is a good starting point. Thematic Working groups could be also set up to strengthen cooperation networks, to tackle common challenges and to exchange good practice on specific topics such as last mile connection, bottlenecks removal (Medeiros et

al, 2021) and cross-border cooperation and urban nodes. A TMC Coordinator could also be defined as well as National Coordination Offices for each state involved and a general Workplan could also be developed. Last but not the least, the pedagogical aspect of TMC should be promoted to the citizenship, being the infrastructural backbone of the Maghreb, a true Euro-African gate. A Geographic Information System (GIS) could be a suitable instrument for this task. Based on our experience, an open GIS with up-to-date information on both infrastructure and services is highly demanded for civil society, media, and industries.

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Chapter 5

MARITIME TRANSPORT

Maritime transport, and in particular container transport, has become an essential link in global supply chains over the last decades. The direct impact of the COVID-19 crisis during the first months of 2020 implied an adaptation to the conditions imposed by the health emergency. However, the adaptation to a "new normality" raises questions about the future organisation of maritime transport and the functioning of ports. In addition, there are other aspects prior to the outbreak of the health crisis to consider, such as the effects of adaptation to climate change, the processes of vertical and horizontal integration of the maritime industry in recent years or, the process of digitalisation.

In the Western Mediterranean, facing these uncertainties takes on special importance due to its position in global container flows and their interrelation with trans-Mediterranean flows, the existence and planning of large port infrastructures and the special impact expected from the effects of climate change in the Mediterranean area. Consequently, the restoration of normality will imply important challenges for the maritime transport sector in the Western Mediterranean.

Shipping in the Mediterranean

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Port and shipping services handle more than 80% of global trade volumes, and this share is even higher for most developing countries. Despite the growing eCommerce – in fact invigorated by it – the physical movement of goods across oceans remains at the core of trade driven development. To participate in global value chains, Mediterranean countries depend on well-connected ports and cost-effective shipping services.

Beyond being users of port and shipping services, Mediterranean countries also generate some income by providing services and hosting maritime businesses themselves. Some countries of the region are important players in ship owning, registration, and transshipment services.

In recent years, the issue of climate change has emerged as major challenge to those who use and provide maritime transport services. Mediterranean countries need to adapt to the impacts of climate change, including rising sea levels and more frequent extreme weather events that affect ports. As the industry moves towards decarbonization, Mediterranean countries also need to assess and mitigate the potential effects that decarbonization measures may have on transport costs and connectivity.

In order to help countries, assess options for their maritime policies, this article looks at the maritime profiles, port performance, and shipping connectivity of 12 countries in Southern Europe and Northern Africa.

Maritime Connectivity

In terms of their maritime transport connectivity, the twelve countries

covered in the present article can be arranged into three groups.

- First, in Europe (from West to East), Portugal, Spain, France, Italy and Greece have national markets and hinterland connections. The maritime services through which they are connected to overseas suppliers and markets tend to serve a combination of domestic demand, a wider hinterland, as well as transshipment services in the case of Spain, Italy and Greece.
- Second, Morocco, Malta and Egypt have some national cargo volumes, but above all benefit from their geographic position, providing transshipment services in the global liner shipping network. Morocco and Egypt are the two African countries with the highest liner shipping connectivity. The third highest liner shipping connectivity for African countries is recorded in South Africa, i.e. the three best connected countries are those in the geographical corners of the continent.
- Third, Mauritania, Algeria, Tunisia and Libya connect mostly through RoRo and passenger services to European countries. Algeria and Libya are also important exporters of oil and thus receive a large number of tankers.

UNCTAD publishes a quarterly Liner Shipping Connectivity Index (LSCI) on the country- and port-levels. The index is generated in collaboration and with data from MDS Transmodal on the deployment of container ships. The underlying six components include hard data on the number of ships, their container carrying capacity in TEU (Twenty foot Equivalent

Table 1. Bilateral connectivity index, 2019

	Algeria	Egypt	France	Greece	Italy	Libya	Malta	Morocco	Spain	Tunisia
Algeria		0.18	0.19	0.17	0.19	0.16	0.18	0.17	0.21	0.16
Egypt	0.18		0.32	0.42	0.47	0.20	0.27	0.36	0.46	0.13
France	0.19	0.32		0.38	0.51	0.20	0.45	0.46	0.51	0.15
Greece	0.17	0.42	0.38		0.40	0.18	0.26	0.28	0.38	0.13
Italy	0.19	0.47	0.51	0.40		0.21	0.38	0.39	0.57	0.16
Libya	0.16	0.20	0.20	0.18	0.21		0.19	0.17	0.21	0.16
Malta	0.18	0.27	0.45	0.26	0.38	0.19		0.29	0.38	0.15
Morocco	0.17	0.36	0.46	0.28	0.39	0.17	0.29		0.57	0.16
Spain	0.21	0.46	0.51	0.38	0.57	0.21	0.38	0.57		0.16
Tunisia	0.16	0.13	0.15	0.13	0.16	0.16	0.15	0.16	0.16	

Source: UNCTAD, based on data provided by MDS Transmodal.

Data for all countries is available under <http://stats.unctad.org/maritime>.

Port Performance

Thanks to Automatic Identification System (AIS) data, provided by MarineTraffic, we have detailed information about how many ships and what type of ships call in each country's ports. Annual and semi-annual reports about port calls and the time spent in port are available on UNCTAD-stat. The same data set also allows us to see the median time ships spent in port, as well as their average age and the average and maximum cargo carrying capacity. Table 2 provides two illustrative examples.

The highest total number of ships calls in 2019 among the 12 countries covered in this article were recorded in Italy, with 233 081 arrivals, followed by Greece (159 583) and Spain (142 773). Most of the ship calls in these three countries were passenger ships, including ferries and cruise ships.

The lowest number of vessel calls were recorded in Mauritania (806), Libya (2 772), Tunisia (4 068) and Algeria (6 188). In these Northern African countries, a high share of the vessel calls are general cargo dry break bulk carriers. These ships are

used for all types of cargo; they are used more often when cargo volumes are low and there is less incentive to deploy more specialized ships. Liquid bulk carriers are the most important vessel type only in Libya.

The fastest turnaround times for container ships in 2019 are recorded in Spain (0.65 days per ship in port), followed by Portugal (0.69), France (0.75) and Morocco (0.78). Container ships spent longest in the ports of Algeria (3.22 days per ship in port), Tunisia (3.12), Libya (2.32) and Mauritania (1.97) (Table 2).

Everything else equal, it should actually be expected that time in port would be longer in those countries with more container traffic, given that each ship has to load and unload more containers. However, there is also a causality going in the opposite direction: More efficient ports are more attractive for shippers and carriers and, thus, shorter time in port is a positive indicator of a port's efficiency and trade competitiveness.

With limited gateway cargo, there are fewer outside trucks causing congestion in the yards, and with cargo arriv-

ing and departing in large batches, potentially planned days ahead, transshipment ports have some fundamental advantages. Last and not least, most are operated by global terminal operators, and many are set-up as cost centres or joint ventures with the ship operators.

On average, 75-85 per cent of port call time of container ships is con-

sumed by container operations, i.e. the time between the first and last container lifts, while the remaining time may be due to pilotage, mooring, possibly Customs formalities and other operational or procedural requirements. There exists a huge spread in average port times, and this should be seen as an opportunity for improvement.

Table 2. Vessel arrivals and time spent in port, 2019. Examples of Algeria and Spain

Algeria							
	Number of arrivals	Median time in port (days)	Avg age of vessels	Avg size (GT) of vessels	Avg cargo carrying capacity (DWT) per vessel	Avg container carrying capacity (TEU) per container ship	Maximum size (GT) of vessels
All ships	6 188	2.44	16	17 942	26 545	1 115	156 919
Liquid bulk carriers	1 041	1.59	13	25 743	44 673	..	156 919
Liquefied petroleum gas carriers	459	1.50	11	18 661	20 960	..	48 963
Liquefied natural gas carriers	196	1.07	12	77 133	61 085	..	137 000
Dry bulk carriers	777	7.06	11	24 740	41 174	..	70 933
Dry breakbulk carriers	1 763	2.48	17	6 702	8 942	..	38 910
Roll-on/ roll-off ships	167	..	29	11 600	6 123	..	66 802
Container ships	1 119	3.22	16	11 817	..	1 115	26 061
Passenger ships	666	..	28	21 537	47 842

Spain							
	Number of arrivals	Median time in port (days)	Avg age of vessels	Avg size (GT) of vessels	Avg cargo carrying capacity (DWT) per vessel	Avg container carrying capacity (TEU) per container ship	Maximum size (GT) of vessels
All ships	142 773	0.88	17	16 226	13 971	3 235	232 618
Liquid bulk carriers	16 042	0.90	11	11 074	18 168	..	160 457
Liquefied petroleum gas carriers	1 486	0.96	11	7 631	8 761	..	48 963
Liquefied natural gas carriers	362	1.04	10	92 790	73 120	..	163 922
Dry bulk carriers	3 279	1.90	16	22 414	38 830	..	151 915
Dry breakbulk carriers	13 374	1.17	15	5 127	7 197	..	71 543
Roll-on/ roll-off ships	11 529	..	17	22 418	7 733	..	77 000
Container ships	15 137	0.65	14	35 592	..	3 235	232 618
Passenger ships	81 564	..	19	14 158	225 282

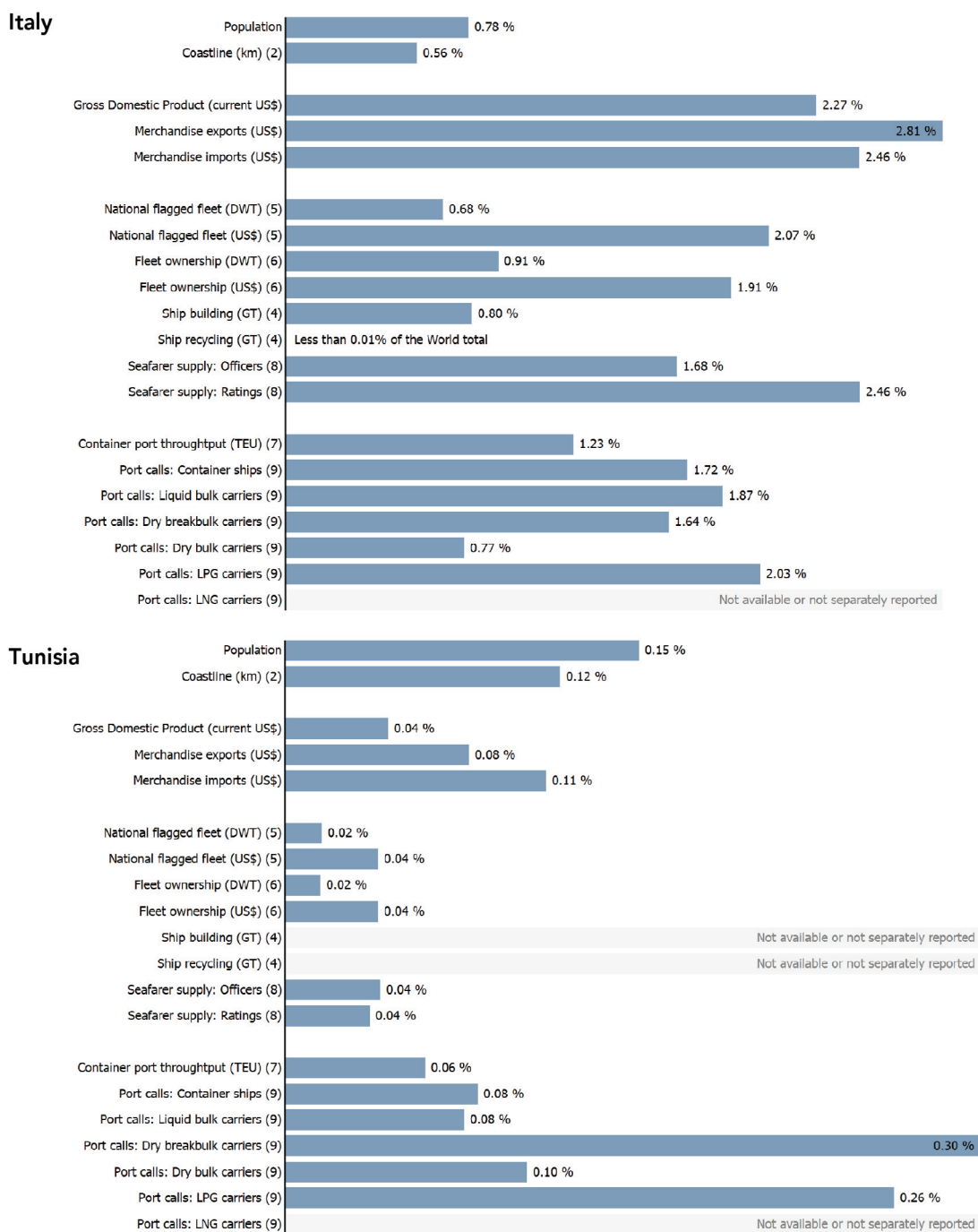
Source: UNCTAD, based on data provided by MarineTraffic.
Data for all countries is available under <http://stats.unctad.org/maritime>.

Maritime Profiles

The UNCTAD Maritime Country Profiles show each country's participation in maritime businesses. Figure 2 provides the example of Morocco. It is interesting to see how some countries

are important providers of some shipping segments, notably ship owning (Greece) and ship registration (Malta). However, most countries of the region are predominantly users of maritime transport services (reflected in their share of vessel calls) than providers.

Figure 2. Market shares from maritime country profiles, 2019. Examples of Italy and Tunisia



Source: UNCTAD, <https://unctadstat.unctad.org/CountryProfile/MaritimeProfile/en-GB/380/index.html>

The Impact of COVID-19

In all countries, during the first semester of 2020, port calls in most vessel types declined significantly. Globally, in 2020, port calls of container ships were 2.8% lower than in 2019; this sector saw the earliest recovery. Port calls by general

cargo ships went down by 7.8%, while calls by dry bulkers and tankers declined by 4.1% and 4.9%, respectively. The highest declines were recorded for Ro/Ro vessels (minus 12.8%) and Passenger ships (minus 18.3%) (Table 3). Thus, cargo carrying ships fared better than ships that carry people.

Table 3. Port calls in 2020, and change over 2019

Country	All ships		Break bulk		Container		Dry bulk		LNG carriers	
	2020 total	Change 2020/19	2020 total	Change 2020/19	2020 total	Change 2020/19	2020 total	Change 2020/19	2020 total	Change 2020/19
Algeria	5 703	-5.2%	1 050	-13.2%	1 190	2.8%	905	0.9%	341	24.9%
Egypt	27 328	-7.3%	2 322	-13.5%	8 091	-8.4%	7 081	2.8%	673	-11.8%
France	36 456	-22.1%	1 991	-6.4%	3 755	-15.5%	1 485	-13.0%	290	-10.2%
Greece	46 364	-16.1%	892	-22.7%	3 933	-1.0%	1 798	-0.7%	140	15.7%
Italy	68 924	-20.8%	3 041	-18.0%	7 906	-3.7%	1 841	-10.5%	212	-12.0%
Libya	2 669	-7.6%	415	21.0%	936	18.0%	208	-1.9%	80	-27.9%
Malta	7 527	-15.2%	587	-2.3%	1 619	-9.9%	1 028	-5.6%	0	n/a
Mauritania	1 215	3.2%	270	-12.3%	315	3.6%	294	5.4%	0	n/a
Morocco	15 098	-26.5%	1 004	-7.3%	4 608	5.8%	1 552	2.6%	0	n/a
Portugal	7 340	-17.0%	1 255	-6.8%	3 392	-4.0%	344	-21.8%	74	-2.6%
Spain	80 347	-24.8%	4 914	-13.1%	14 565	-5.0%	4 784	-8.4%	492	-5.7%
Tunisia	2 734	-15.8%	450	-18.8%	380	7.3%	294	-2.6%	0	n/a
World	2 247 806	-9.6%	162 592	-7.8%	471 282	-2.8%	346 065	-4.1%	17 080	-0.2%

Country	All ships		LPG carriers		Passenger ships		Ro/Ro		Tanker	
	2020 total	Change 2020/19	2020 total	Change 2020/19	2020 total	Change 2020/19	2020 total	Change 2020/19	2020 total	Change 2020/19
Algeria	5 703	-5.2%	787	24.1%	150	-77.4%	111	-36.9%	1 169	16.8%
Egypt	27 328	-7.3%	837	0.7%	686	-35.4%	1 288	-26.1%	6 350	-5.1%
France	36 456	-22.1%	680	-11.1%	21 975	-27.5%	1 566	-22.3%	4 714	-7.5%
Greece	46 364	-16.1%	560	9.2%	32 687	-22.3%	2 937	14.2%	3 417	13.2%
Italy	68 924	-20.8%	729	-14.5%	40 018	-27.8%	8 835	-7.0%	6 342	-10.0%
Libya	2 669	-7.6%	201	12.9%	1	n/a	327	11.6%	581	-45.8%
Malta	7 527	-15.2%	299	-25.3%	575	-42.2%	452	8.4%	2 887	-16.7%
Mauritania	1 215	3.2%	25	-7.4%	0	n/a	13	-35.0%	298	24.7%
Morocco	15 098	-26.5%	436	11.2%	5 178	-49.3%	1 295	-32.7%	1 025	-4.2%
Portugal	7 340	-17.0%	205	-22.3%	177	-79.4%	884	-22.5%	1 009	-14.6%
Spain	80 347	-24.8%	875	-14.0%	37 132	-34.8%	7 885	-33.6%	9 700	-5.4%
Tunisia	2 734	-15.8%	151	-6.2%	386	-35.0%	731	-18.0%	342	-12.5%
World	2 247 806	-9.6%	36 705	-3.1%	698 681	-18.3%	150 087	-12.8%	365 314	-4.8%

Source: UNCTAD, based on data provided by MarineTraffic.

Note: In this table, only ships of 5000 GT and above are considered.

Additional data is available under <http://stats.unctad.org/maritime>

Among the 12 countries covered in this chapter, Morocco (-26.5%), Spain (-24.8%), France (-22.1%) and Italy (-20.8%) saw the largest decline in port calls throughout the pandemic. These countries also have a high share of passenger and Ro/Ro traffic, which

are the two markets most heavily affected by the pandemic. Mauritania is the only country that recorded an increase in port calls in 2020, albeit starting from the lowest base, and benefitting from growing arrivals of tankers.

Conclusions and Policy Implications

The countries in the sub-region are above all users of maritime transport services. They are not ship building countries (most ship building takes place in China, Japan, and Korea), nor – with the exception of Greece – ship owning countries. Only Portugal and Malta have significant ship registries, i.e. foreign-owned ships fly the flag of these countries.

The main interest of the Mediterranean region countries lies in port calls and traffic. And here there are large differences in the performance, as measured for example in the liner shipping connectivity index and the time ships spend in port.

Building on the UNCTAD Review of Maritime Transport 2020, there are six priority areas for policy action to be taken in response to the COVID-19 pandemic and the persistent challenges facing the maritime transport and trade.

- First, Mediterranean countries need to continue their support to trade so it can effectively sustain growth and development. Protectionism or export restrictions, particularly for essential goods in times of crisis, bring economic and social costs.
- Second, carefully analyse the options to improve the resilience of supply chains. For example, a shortening of supply chains through re-shoring or near shoring may reduce transport costs and fuel consumption, but it does not necessarily future-proof supply chains against disruptions that could take place, regardless of the

location. Diversification may be more important and multi-sourcing approaches may guarantee greater resilience than approaches that concentrate production in a single location, whether at home or abroad. Especially for smaller economies, including most of those covered in this article, would benefit more from stronger regional integration rather than aiming at reducing foreign trade.

- Third, harness data for monitoring and policy responses. The use of fast-evolving data capabilities can support efforts to forecast growth and monitor recovery trends. New sources of data and enhanced possibilities emanating from digitalization provide ample opportunities to analyse and improve policies. The pandemic has highlighted the potential for real-time data on ship movement and port traffic, as well as information on shipping schedules to generate early warning systems for economic growth and seaborne trade.
- Fourth, enable agile and resilient maritime transport systems. There is a need to invest in risk management and emergency response preparedness beyond pandemics. Future-proofing the maritime supply chain and managing risks requires greater visibility of door-to-door transport operations.
- Fifth, maintain the momentum on sustainability, climate-change adaptation and resilience-building. The International Maritime Organization (IMO) has embarked on a programme aimed at the decarbonization of shipping. According to the fourth Green-House-Gas Study of the IMO, the share of shipping emissions in global anthropogenic emissions has

increased from 2.76% in 2012 to 2.89% in 2018. The goal of the IMO is, however, to reduce the emissions, and eventually to achieve zero-carbon shipping. The resulting energy transition in shipping is the most important challenge for maritime transport in many decades, comparable to the shift from wind to steam ships, or from steam ships to oil-fuelled ships. The transition will impact the ships and port operations, as well as the cargo carried, as currently about 40% of seaborne trade consists of energy products (oil, coal, gas). Especially some of the Northern African countries could become important future providers of alternative fuels for the future world fleet.

- Sixth, the COVID-19 pandemic has led to a further push towards trade facilitation, especially solutions that require digitalization. In their responses to the crisis, governments and port authorities are pushing for reforms that aim at keeping trade flowing while still protecting populations, transport workers, and officers working at the ports. It would be wrong to think that there is a kind of trade-off between trade facilitation and controls, or that governments would have to strike a balance. The contrary is true: Practically all trade facilitation measures that are included, for example, in the Trade Facilitation Agreement of the World Trade Organization help achieve both: faster and more trans-

parent trade procedures, and at the same time better protection of public interests. For example: By dematerializing processes, data can be transmitted faster and physical “social” contact can be reduced. Accepting digital copies instead of paper originals, pre-arrival processing, electronic payments, Customs automation, applying risk-management techniques, and the cooperation among agencies (within the same country, and with trading partners), all help speed up the processes of international trade. At the same time, all these measures also help agencies such as Customs, ministry of health, bureau of standards or the border police do an even better job at detecting unwanted activities. Our Policy Brief with a 10-point action plan puts it as follows: “Facilitating trade and the transport of goods has become more important than ever, to avoid logistics obstacles that lead to shortages of necessary supplies. The concrete measures proposed in this policy brief help to facilitate transport and trade and to protect the population from COVID-19.” As governments and regional organizations have enhanced international cooperation and invested in further trade facilitation reforms and digitalization during the COVID-19 crisis, the progress achieved should also help revive international trade. It will be important to assess what worked and what didn’t, so that we can lock-in the progress made during lockdown.

References

The statistical information included in the article is largely drawn from the UNCTAD on-line statistics, available under <http://stats.unctad.org/maritime>. The statistics are regularly updated as new information becomes available. The underlying raw data comes from a wide range of national and international sources, including Clarksons Research (<https://sin.clarksons.net>) for the fleet data, MarineTraffic (<https://www.marinetraffic.com>) for the port calls and time in port statistics, and MDS Transmodal (<https://www.mdst.co.uk>) for the container ship fleet deployment liner shipping connectivity indices.

The maritime profiles for 230 economies are available on-line <https://unctad-stat.unctad.org/CountryProfile/MaritimeProfile/en-GB/012/index.html>. They are updated annually.

For further discussion of the performance indicators, country profiles, and the impact of the covid-19 pandemic, see UNCTAD, Review of Maritime Transport 2020, Geneva: <http://unctad.org/RMT>.

Some Observations on the Impact of COVID-19 on Shipping

Malta Maritime Forum

The problems created by the Covid pandemic to the carriage and distribution of goods caught everyone including the major container carriers unaware and necessitated the introduction of short term measures in order to safeguard both the coherence of the logistical cycle as well as the financial sustainability of the carriers. The situation that evolved between March and June saw a plummeting of cargo volumes and an unprecedented situation of port closures (mainly in China) which left the carriers grappling at situations never experienced before and which needed immediate solutions.

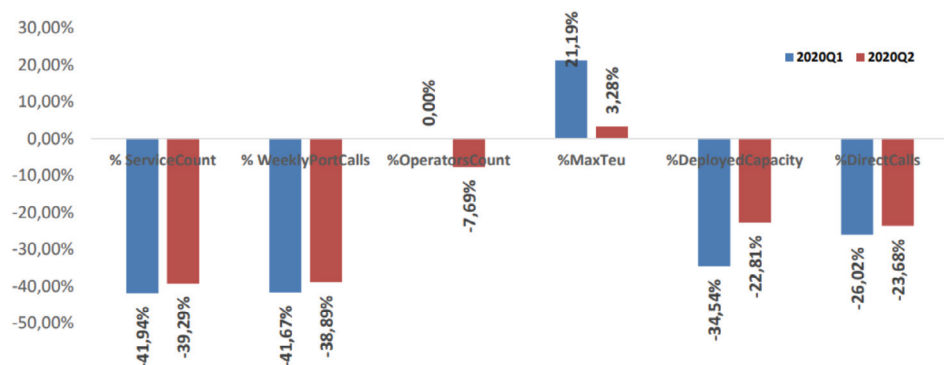
The economic downturn in China as a result of the curtailment in manufacturing and exportation had an immediate effect on the amount of cargo available for export from Far East to the rest of the world. As early as March, the UN had already published a study wherein it estimated that China's reduced exports cost other countries and their industries over USD 50 billion. The regions most effected in order of priority were the European Union, the United States, Japan, South Korea, Taiwan and Vietnam.

The recovery in Chinese exports during the summer months was immediately counterbalanced by the drop in demand particularly in Europe as a result of lockdown measures introduced in the various European countries. Hence the problem shifted from supply to demand but the net result was the same – less seaborne cargo to be carried.

The effect of this situation, particularly in the Mediterranean, reflected itself in a drop of the volume of cargo handled, estimated in the region of 35% to 40% which was mainly caused by the measures taken by the main line carriers to cut down on the number of voyages with the aim of reducing operating costs.

The effect of the blank sailings on container shipping was very well highlighted in the study commissioned by UNCTAD under the heading "Covid 19 and Maritime Transport Impact and Responses". The below graph reproduced from this study shows the impact of blank sailings on the port of Marsaxlokk (Freeport) Malta, where the weekly port calls in the first and second quarters of 2020 dropped by 42% and 39% respectively.

Liner Shipping Connectivity of the port of Marsaxlokk (Percentage change Q1 & Q2 2020 - Q1 & Q2 2019)



The issue of the blank voyage as an economic tool to stem losses gave the desired results to the carriers who in the meantime started reporting positive results but caused tremendous financial damage to terminals, hauliers and other service providers within the logistical chain. The application of blank sailings reduced the supply of slots available at a time when exports from the Far East started increasing again and this pushed up freight rates because of the limited space available. According to a report carried in the Lloyd's List of 5th October, the Asia-Europe freight rates reached a new high which was not experienced in pre-Covid times. It is definitely to be expected that the container carriers, having learnt to their satisfaction the outcome of a disciplined approach, will do their utmost in future to maintain this mechanism which is the epitome of the economic forces of supply and demand.

The other development which evolved throughout the first half of this year and which is influencing logistics to a substantial degree is the purchasing online on a mass level. Lockdown conditions, fear of contagion and other measures adopted by governments to reduce social contact, generated a demand for home delivery service and this was extended from the food industry to every imaginable consumer good that was facilitated by ordering online. This movement of goods created a paradigm shift in the logistics of cargo transport whereby the online service provider in combination with courier services replaced to a certain degree the freight forwarder and the line agent whose task it was to source and book cargoes. The online service

providers found themselves in control of so much volume of cargo that they attracted the attention of the container carriers who had already been viewing them as potential clients. This development has immense ramifications for the future of logistics not only for the Mediterranean but worldwide because once the consumer gets to grips with the convenience of ordering and paying online with guaranteed delivery within a short period of time, it will be difficult to dissuade the consumer from such a system and revert to systems which entailed employment of more time to source and secure delivery of goods.

Particularly within the Mediterranean these developments can translate themselves into more shortsea intra-European services. This development brought even more to the fore the concept of intermodalism as a logistical pipeline to channel cargo between producer and consumer. One is to expect cargo to move on fast means of transport such as trains which link to ports that in turn facilitate services for shortsea fast ferry vessels. The transport by sea throughout the whole journey, especially on a regional level, will be seriously challenged by intermodal solutions whereby the sea plays a part and not the whole logistics cycle. Such a scenario however will bring back to the European discussion table the existing bottlenecks that hinder or obstacle the fast movement of cargoes especially through ports. The lack of the single window and an effective customs union that can do away with customs barriers, will hinder the development of this intermodal solution because the logistics process gets bogged down with bureaucracy and inefficiencies. Were

this development to take its natural course, intra-European traffic will flourish because of:

1. The just-in-time buying.
2. The need to diversify sources of supply to avoid the situations created by Covid in China.

These developments necessitate a functioning infrastructure which involves ports, terminals, vessels, crew,

forwarders, customs and receiver. These represent links in the supply chain and it goes without saying that the malfunction of one link jeopardises the strength and coherence of the whole chain. Post Covid has to ensure that appropriate protocols are in place to facilitate the proper functioning of each link. It is only through such an approach that we can look back at this period and feel that lessons have been learnt to sustain impacts of epidemics in future.

The COVID-19 Crisis: A Catalyst to Speed Up the Digital Transformation of Ports

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Moroccan ports have played a major role in managing the COVID-19 health crisis. In fact, the port sector has demonstrated strong resilience and great agility by adapting its various operational processes to the new context, which requires that health measures be taken into account to deal with the pandemic threat. Moroccan ports have thus continued to fulfil their role as platforms serving the country's foreign trade, thereby ensuring supply chain continuity with respect to strategic products and keeping the channels open for national exports to foreign markets¹.

It is important to note that Moroccan ports represented the only border point that remained in operation after the airports and land borders were closed during the lockdown.

As part of the national port sector's efforts to manage this crisis, digitizing port processes and making them paperless has represented a crucial move that has enabled the sector to meet the challenge of service continuity.

With the health crisis, the use of paperless trade to reduce physical interactions has proved essential and has become a key element of the business continuity plan implemented by the National Ports Agency.

The context of the COVID-19 pandemic has thus revealed the importance of the National Ports Agency's strategic choice to digitize port processes in 2008 through the implementation, together with all stakeholders in the port ecosystem, of a port com-

munity system known as PORTNET, which has become the single-window system for foreign trade procedures. Since this community information system was implemented, around 50,000 customers have used PORTNET's services and more than 40 port, customs and foreign trade processes have been digitized through this platform; these include vessel arrival notifications, requests for allocation of posts, the hazardous goods list, import documents, manifest declarations, gate passes, inspections, and the entry and exit of goods.

The direct and indirect effects of the COVID-19 health crisis have made the port community more aware of the added value for port users of speeding up the digitization of new processes to ensure greater fluidity of port traffic and improve the competitiveness of ports.

For the National Ports Agency, which has already been involved in an extensive programme to enhance the digital transformation of Moroccan ports for several years now, the health crisis has served to speed up the implementation of its SMART PORT programme, whose goal is to achieve "zero paper" ports.

The objective of the SMART PORT programme is to strengthen the competitiveness of national ports by exploiting the opportunities offered by digital technology and new technologies in general.

During the COVID-19 crisis, this programme was adapted to the context and several new services were set up

¹ The ports managed by the National Ports Agency (ANP) moved 92.5 million tonnes of goods in 2020, 5.1% more than in 2019.

via the PORTNET single-window system, including:

- The procedure for inspecting ships' stopover documents, which has been extended to the services of the General Directorate for National Security (DGSN) and the Ministry of Health;
- Issuing of customs release forms, which was implemented on the community platform on 4 May 2020;
- Orders for related activities (ship chandling, surveillance, etc.);
- Automatic notification of the arrival of goods at the port, plus traceability and tracking;
- Digitization of the procedure for requesting port access passes, etc.
- Electronic payment for all types of port and goods inspection services.

The Digital Transformation of Ports: A Driving Force for Competitiveness

The COVID-19 health crisis has served as a catalyst for a trend that was already well under way and will help speed up the digital transformation to spark a real digital revolution geared towards the digitization of port processes.

Digitalization currently represents a crucial challenge for ports across the world and will pave the way for a genuine breakthrough in the port and maritime industry, which has seen few innovations since the container was introduced back in the 1950s.

Indeed, according to the latest report published by the World Bank and the

International Association of Ports and Harbors (IAPH), digitalization is essential if ports are to recover successfully from the COVID-19 crisis and effectively prepare for future crises.² According to this report, we are now definitively entering a new era in which digitalization will be a port's key factor for success.

Thus, the year 2020 constitutes a historic turning point, since it allowed the maritime and port digitalization process to gather speed.

In addition to digitalization of information flows between the various stakeholders in the port ecosystem, a flood of new innovations is being implemented in several ports, which are seeking to take advantage of the latest technologies, such as the Internet of Things (IoT), blockchain and 5G, to devise new, "disruptive" ways of carrying out procedures.

Several initiatives of this kind have been launched, including the creation of a blockchain platform (Maersk), implementation of a smart bollard (Port of Rotterdam) and testing of autonomous vessels.

At national level, and in the same spirit, in December 2020, the National Ports Agency announced the first Smart Port Challenge in Morocco and Africa in the form of an entirely online hackathon designed to encourage companies, start-ups and universities in Morocco and abroad to offer innovative solutions to address several port issues in areas such as electronic payment, energy efficiency, port infra-

² "Accelerating Digitalization: Critical Actions to Strengthen the Resilience of the Maritime Supply Chain", World Bank Group, IAPH and WPSP, December 2020.

structure management, port security and environmental protection.

This event, which finished at the end of January 2021, benefited from the participation of more than 500 researchers, experts, start-ups and professionals from more than 10 countries and resulted in the submission of more than 70 projects.

Through this new innovation-based community approach, the National Ports Agency intends to boost the performance and competitiveness of national ports by coordinating the actions of the various stakeholders with a view to providing innovative solutions to major port challenges.

The Digital Transformation of Ports: Facilitating Regional Trade

Advances such as the digital transformation of ports and making port processes paperless are now paving the way for greater regional collaboration aimed at facilitating trade.

Indeed, optimization of the global logistics chain requires that port ecosystems are connected at regional level through the implementation of a data exchange system between the different port community systems to increase the efficiency of port transit by providing real-time information to all foreign trade stakeholders.

Emerging new technologies (blockchain, IoT, etc.) will simply serve to strengthen this concept of sharing key trade information at regional level, in particular by facilitating the acquisition and exchange of data throughout the global supply chain.

Chapter 6

AIR TRANSPORT

Air transport has been one of the sectors most affected by the COVID-19 crisis, especially in terms of passenger transport. Airlines and airports represent the first line of those affected, followed by all services and businesses linked to tourist activity, among others. In addition to the direct impact of the reduction in the number of flights, there is the loss of passenger confidence, which does not augur well for a rapid recovery of the sector. All of this is forcing airport managers and operators to reflect on the adoption of new measures to achieve user safety and comfort.

But what far-reaching measures would facilitate the recovery of air transport? Would the opening up of markets and the liberalisation of bilateral air transport agreements be a measure to be taken into account for possible recovery? In this respect, the Mediterranean region has several fronts open to it. On the one hand, there are the possible Euro-Mediterranean air services agreements. On the other, the Single African Air Transport Market (SAATM). These processes must be based on the harmonisation of air transport regulations, in order to achieve efficient implementation.

Air Transport in the Post-COVID Era

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The COVID-19 pandemic could be the greatest challenge the global aviation industry will ever face. The effects are being felt throughout the ecosystem, including airlines, airports and air navigation bodies.

Recent estimates by the International Civil Aviation Organization indicate that the 2020-21 air traffic recession will take one of the following shapes:

- V-shaped: the normal shape for a recession; a brief period of sharp economic decline followed by a quick/smooth recovery.
- U-shaped: prolonged contraction and muted recovery to trend line growth.
- L-shaped (depression): long-term downturn in economic activity; a steep drop followed by a flat line with the possibility of not returning to trend line growth.
- W-shaped: a double-dip recession consisting of a “down-up-down-up” pattern before full recovery.
- Nike-swoosh-shaped: a sharp rebound that quickly flattens.

With the overall severity and duration of the COVID-19 pandemic still uncertain, four different recovery paths under two indicative scenarios have been developed:

- Baseline: counterfactual scenario in which the COVID-19 pandemic never happened, i.e. as originally planned or business as usual.
- Scenario 1: two different paths (similar to Nike-swoosh- and W-shaped).
 - International
 - Path 1: Smooth capacity recovery through rebound of pent-up demand, but at a diminishing rate of growth.

- Path 1a: Smooth capacity recovery at first, followed by a downturn due to over-capacity.

- Domestic

- Path 1: Swift capacity rebound pushed by pent-up demand but at a diminishing rate of growth.

- Path 1a: Smooth capacity recovery at first, followed by a downturn due to over-capacity.

- Scenario 2: two different paths (similar to U- and L-shaped).

- International

- Path 2: Return to trend growth accelerates after slow progress of capacity recovery.

- Path 2a: Capacity recovery at a decreasing speed due to respite and continuous demand slump.

- Domestic

- Path 2: Gradual capacity recovery followed by accelerated growth.

- Path 2a: Capacity recovery at a decreasing speed due to sluggish demand growth.

On this basis, the International Civil Aviation Organization published the provisional results for 2020 compared to 2019, which show a 49.5% reduction in seating capacity and a reduction of 2.69 billion passengers worldwide (i.e. a 60% reduction). Moreover, air carriers recorded losses of 369.7 billion USD.

According to the organization, this downward trend is set to continue throughout the first half of 2021, compared to 2019 levels, with at least a 42.1% reduction in seats offered by airlines, 1.1 billion fewer passengers (i.e. a 50% reduction) and revenue losses of up to 156 billion USD for airlines.

Tunisia has not been spared the effects of this situation; air traffic to and from Tunisian airports has been hit hard, with a substantial drop in 2020 (compared to the same period in 2019) of 75.5% for passenger traffic, 64.8% for aircraft movement and 14.4% for cargo tonnage.

This decline is a natural consequence of the suspension of commercial passenger traffic to and from Tunisian airports from mid-March until 27 June 2020. During this period, traffic was limited to repatriations, medical and humanitarian operations and cargo.

Commercial traffic in Tunisia resumed on 27 June 2020. The process was carried out cautiously, gradually and, most importantly, in accordance with a health protocol that was developed by the Ministry of Transport and Logistics, in coordination with the Ministry of Health, and that took account of guidelines issued by the International Civil Aviation Organization (ICAO) and the World Health Organization (WHO) and the recommendations of the European Union Aviation Safety Agency (EASA), the International Air Transport Association (IATA) and Airports Council International (ACI).

This protocol outlines a series of requirements and recommendations for airport operators, aircraft operators and other relevant stakeholders and stipulates that they must coordinate their actions with the health authorities and local airport facilitation committees with a view to achieving effective risk mitigation and ensuring compliance with national public health requirements.

Currently, people who want to visit Tunisia by plane must be in pos-

session of a certificate that shows a negative RT-PCR test result and then undergo a 14-day quarantine period, although there are some exceptions. Nevertheless, even with this health protocol and all the precautionary measures required of passengers, airlines and airports, demand for air transport cannot increase and keep growing unless passenger confidence is restored.

It is therefore essential to reassure passengers who are worried about catching the virus during air travel and convince them that the risk of being infected at the airport or on board the plane is minimal.

In fact, airports are actually clean, safe places; all passengers must wear a mask at check-in, while boarding, during the flight and when disembarking. Physical distancing of at least 1 metre at check-in desks and while boarding is mandatory. Temperature screening is also mandatory before entering the terminal, and body temperature is checked again prior to boarding. Disinfection and cleaning are carried out continuously and hydroalcoholic gel dispensers are available everywhere.

Moreover, planes are very safe places with respect to COVID-19 transmission, given that mask wearing is compulsory, the cabin air is renewed every two to three minutes and the cabin is equipped with HEPA particle filters, which absorb 99.9% of particles and are identical to those used in operating theatres. This renewal ensures that the air on board is healthy.

Insurance and precautionary measures could be considered once a vaccine is available. These could include making it compulsory for passengers to have the

COVID-19 vaccine before boarding and setting up a health passport (international vaccination record).

Several international organizations are currently working on this. The International Civil Aviation Organization published the second edition of its "Take-off" guidelines on 17 November 2020: Guidance for Air Travel Through the COVID-19 Public Health Crisis (CART II), which includes additional recommendations and guidance in light of new developments relating to the COVID-19 crisis and supplements the recommendations included in CART I, published in June 2020.

All countries now face a new challenge and must implement a post-Covid air transport recovery plan based on innovation, digitization and the use of technologies such as digital credentials and artificial intelligence, which must play a key role in the restart and recovery of air transport after the crisis and steer it onto the most sustainable path possible.

Countries must also share information, expertise and good practices based

primarily on innovative procedures and technologies to restore passenger confidence in air transport.

The liberalization of air services, whether within Africa (SAATM) or with the European Union, must make allowances for the difficulties experienced by airlines following the COVID-19 crisis and should be based on fair competition to preserve the economic sustainability of airlines and avoid further eroding their results, which have already been negatively affected by the COVID-19 crisis.

In conclusion, the COVID-19 pandemic is not only a health crisis, but also an economic, social and humanitarian crisis. Given the dramatic global economic and social impact it has caused, the aviation system now stands on the verge of rapid transformation.

Admittedly, the light at the end of the tunnel is not yet visible, but this pandemic will one day come to an end and the world of air transport will put the most serious crisis in its history behind it.

Air Transport Development, the Tool to Achieve Good Harvest Seasons: How Aviation Can Play a Key Role in the Prosperity of a Post-COVID-19 Mediterranean

Ignacio Biosca

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Marketing and Airlines Assistance, AENA

It is hard to write an article on travel and tourism these days. We are only a few weeks from finishing 2020, the year in which travel stopped. In the midst of COVID-19, airlines and airports struggle to survive in the hardest crisis that the air transport industry has seen in its entire history. Yet, there is consensus that, once the pandemic is controlled, travel and tourism will resume, and we will again be able to enjoy such an important aspect of our lives, and of course, of our economies.

If we go back to 2019, we can get an idea of the dimension of air transport between countries in the Mediterranean area. The seats put on sale by airlines that flew internationally between two points of the region was around 130 million in 2019. This is certainly not a small figure.

How was this figure achieved? We can be certain that the liberalization process that allows for open markets, in which airlines make decisions on where to fly based on the profitability of the routes they operate, has played a key role. In this sense, the policy promoted by the European Union to sign open skies agreements with its neighbouring countries, has proved to be extremely fruitful.

The Common Aviation Area, designed to allow a gradual opening of the market between the EU and its neighbours, has offered opportunities for airlines and a wider choice for passengers. At the same time, it has allowed a regulatory convergence on safety, security, environmental and other areas of the industry.

A good example of the efficiency of this policy is the agreement signed

between the EU and Morocco in 2006. The number of passengers that flew between Spain and Morocco, as a reference, grew more than 50% in only one year, and in 2019, it was 4 times higher than that of 2006. Other agreements have been signed since then with Jordan and Israel, and negotiations are on-going with Lebanon and Tunisia. If the Common Aviation Area reached its goals, it could encompass up to 50-55 states and a total population of 1 billion inhabitants. The opportunity this brings for the Mediterranean area has to be properly valued by the air transport and tourism stakeholders and by policy makers.

This opportunity may seem just an illusion in 2020, when the entire world has nearly stopped, and travel and tourism are far from being a priority. Health authorities are focused in controlling the pandemic and restrictions in mobility are an essential part of the strategy to fight against it. In fact, in the Mediterranean area, the 130 million seats mentioned before, were reduced by more than 60% in 2020, and given the extremely low load factors experienced this year, we can estimate that passengers are only around 20% of those in 2019. However, it is not an illusion.

Air transport is a key element for the development of the regions it serves. For every million passengers, the study carried out by Intervistas for ACI Europe estimates that around 950 direct jobs are created¹, and if we count the indirect and induced ones, this figure can easily be 3 times higher. The analysis also found that

¹ At airports between 1 and 10 million Air Traffic Units. For more complete information at airports with different traffic levels, see Intervistas: "Economic Impact of European Airports".

every 10% increase in connectivity was associated with an increase in GDP per capita of 0.5%. Air transport is a clear catalyst for economic growth. But, although being extremely important, not only the economy counts. Air transport also ties cultural bonds and brings understanding between regions and societies, which is the foundation of a peaceful and sustainable development, with the direct effect this has in the lives of their citizens. Only with a proper and balanced policy that gradually opens the market, we will seed the plants that eventually will allow us to harvest the fruit of a developed and peaceful Mediterranean area.

But, what are those seeds? Where can we get them? What are the drivers for growth and prosperity in our region in a post COVID-19 era? Being from the Mediterranean, I am sure that we all feel familiar with the basic ingredients of our ancient agricultural tradition. Wheat, grapevine, olives. Allow me to use this metaphor to describe how we can use the air transport sector to develop our land.

First, we need a fertile land. In our sector, a fertile land means an attractive destination. No one doubts that the Mediterranean, from Greece or Turkey to Spain, from Croatia or Albania to Morocco or Egypt, and including all the rest of the countries in the region, is a privileged one. Mild weather, amazing cultural sites that show the birth of human civilization, and a rich gastronomy, are the essential elements of a highly attractive destination. We do not only have an extremely fertile land, but also the right seeds ready to be planted. However, we have work to do. We cannot just sit and wait that this fertile

land gives us the fruit it can develop. We have to plough the land. Investment in infrastructure, good and price-competitive hotels, and high safety and security standards, are essential to build a destination to which passengers and tourists are willing to travel. And, efficient airports, from the operational and economic points of view for the airlines. All these infrastructure and conditions combined allow for the next step: to prepare the soil with mineral and nutrients.

Once we have the land in the right conditions, it is necessary to provide the adequate nutrients and to water the soil. In the air transport sector, the combination of nutrients and water comes in the form of an open market. Open skies agreements allow airlines to properly develop their activity in a healthy and sustainable manner. As mentioned before, the policy the European Union fosters in its Common Aviation Area, allows for market opening and regulatory convergence, which gives confidence to airlines to explore and develop new routes. New routes that allow passengers to fly and discover destinations, with the correspondent benefit for the regions they visit.

With our fertile land, the seeds properly planted, and the nutrients and water of an open market, we will be ready to collect the results of the harvest and to take them to the marketplace.

As in any marketplace, in the air transport sector, you have to sell your product. Airports and destinations play a key role in "*selling the destination*" to airlines and tour operators. The best way to do it is by joining efforts and coordinating messages. Air-

port operators and tourism authorities, both, have the right pieces of information to convince an airline, or a tour operator, that if they fly to their region, the result from the economic point of view will be positive. And not only positive, but also more profitable than alternative options. A way to work together is by creating the so-called "*Route Development Committees*" (RDC). In these Committees, tourism authorities, city councils, chambers of commerce and airports, each one in the area of their competence, offer market information, promotion, offer market information, promotion and incentives in a joint package that facilitates the decision-making process by the airlines. The RDC created in Barcelona is a good example and a reference of this kind of approach.

Aviation events like *Routes*, or Tourism ones like the World Travel Market or *Fitur*, are the right ones for these RDCs to meet with airlines and offer the products of their harvest. They do not differentiate too much from the ancient markets in which bread, wine or olive oil were sold in the different cities of the Mediterranean shore. Market intelligence with personalized and detailed business cases, incentives and promotion proposals are explained in detailed and exchanged with the network developers of the airlines, to finally be able to celebrate the opening of a new route. Patience and consistency are also essential elements of this marketplace, as the decision-making process in the air transport sector can take long periods. Not too different from the wise strategy of the farmers in our countries.

Nevertheless, the plan, as explained before, is easy to draft, but difficult to

achieve. We have extremely relevant challenges to overcome. The economy in the Mediterranean area, as in the rest of the world, will be seriously damaged by COVID-19. To what extent the evolution of the pandemic will improve with the vaccines that have become available from early 2021, and the recovery pace of the economy, remains to be seen. Health experts agree that in 2021 the combination of the vaccination process, the development of new and more accurate tests, the discovery of an early treatment and the natural evolution of the virus will result in a significant decrease of the pandemic. On the other hand, we have seen that when mobility restrictions are lifted, demand for travel recovers extraordinarily fast. It is human nature. We all want to be close to our beloved ones, and to enjoy a few days under the sun and close to the sea. And we all want to know more of our ancient culture, the pyramids, the amphitheatres, the music, the architecture, the gastronomy... We have plenty of this in the Mediterranean. Therefore, travel and tourism will recover; there is no doubt about it.

In any case, it is true that COVID-19 will change the world, even once the pandemic is controlled. We have to be aware of the challenges and learn the lessons that it has brought. Sustainability is already, but it will be even more in the future, the backbone of any strategy in the air transport industry. This is especially true in the Mediterranean, a sea that is suffering the consequences of climate change and CO2 emissions, with its coral and *posidonia* disappearing, or the invading tropical species colonizing our coasts. Therefore, the use of Sustainable Aviation Fuels and

hydrogen, and a more efficient air navigation design are key elements to achieve the commitment towards net zero CO₂ emissions in European aviation in 2050. Aviation, in the future, will be sustainable or it will not be.

Another relevant challenge in the roadmap to develop the region is the digitalization process. Certainly, the world is already digital. Our smartphones can every day do more and more things, and the decision to buy a plane ticket or to make a hotel reservation after having searched for the things to do, or the quality of the beaches at a particular destination, is not an exception. Hotels, natural parks, historic sites, scuba diving resorts, museums, they all form part of the potential experience of a tourist. To make this potential experience in a real one, paradoxically, they have to be digital.

On the other hand, in the marketplace that the aviation industry is, it is essential to prepare the business cases with the most accurate and personalized information possible, to allow the airlines make the right decisions. Internet travel searching tools, credit cards utilization, mobile phones roaming are only a few examples of the kind of information the airlines need to finally be in a position to decide the opening of a new route. Another example of how important it is to count with state-of-the-art digital tools.

Finally, safety and security are aspects without which travel and tourism simply do not exist. Unfortunately, we are experiencing it these days. The travel industry has already very demanding safety and security standards in place and is continuously

adapting them to new challenges. Safety, with all its different perspectives, and now especially the health related one, is a prerequisite for any trip. The same happens with security. We are aware of how fragile demand to a destination can be if security is not guaranteed. Therefore, to allocate the adequate resources to safety and security is an investment that cannot be underestimated to achieve the expected return by means of travel demand. And after COVID-19 health protection related measures during flights and at airports, or later in hotel, resorts, theatres or museums, have become a priority to ensure a safe travel experience. It is not difficult to foresee that they will continue to be in the future.

Let me finish these lines by saying that long haul traffic will be more challenging in the years to come. Passengers will be looking for shorter trips to places in which it may be easier to get back home if there was the need to. In this environment, the Mediterranean area has an opportunity to offer within the region, and in the whole of Europe, all its potential.

The Common Aviation Area the EU promotes, with its common skies agreements, and its regulatory harmonization that brings certainty for passengers and airlines, can be the path towards a sustainable development of the Mediterranean, and one of the tools to strengthen the links between the countries that share such a privileged region. Following this path, I am convinced that sooner than later, we will see those 130 Million seats offered again for travellers to visit their beloved ones, or to enrich themselves by discovering a different culture. Moreover, I am

convinced that this figure can grow significantly with the positive results it means for the jobs and economies, and therefore for the people, of the whole Mediterranean area.

There is nothing more common and closer to us in the Mediterranean than bread, wine and olive oil. Let us work together as if we were farmers to be able to collect the harvest our land offers.

COVID-19, An Opportunity for African Airports to Embrace Technology and Innovation

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The Need to Redefine the Passenger Journey Experience

It cannot be over-emphasised enough that the air travel industry is facing one of the most challenging times of its existence. In addition to the catastrophic financial consequences of the COVID-19 pandemic on the industry, the confidence enjoyed by travellers before the crisis has eroded substantially since airports and airlines have been regarded as one of the vectors of transmission of the virus across borders.

Since the outbreak of the pandemic and in a bid to maintaining the continuity of air services during border closures in order to carry out vital humanitarian, evacuation and cargo operations, airports all over the world, including in Africa, have had no choice but to rapidly rethink their normal processes to keep passengers, crew and staff safe, and this included the continuous disinfection of all touchpoints, wearing of suitable face coverings, physical distancing, COVID-19 testing and the reinforcement of touchless technologies where available. These new protocols introduced gradually have slowly been reshaping the normality we were all used to in the air travel industry. Indeed, in addition to safety and security, a healthy air travel experience has now become a top priority for passengers. Whether they are travelling for business or leisure, domestically or internationally, passengers now prefer to choose airports that prioritize their well-being over other travel considerations.

In August/September 2020, Airports Council International (ACI) conducted a study among 4,100 travellers in 30

countries worldwide with the main objectives to evaluate the speed at which travellers are likely to return to airports, to identify the main factors influencing the speed of recovery, to assess the evolution of their habits as well as to specify passengers' perceptions and expectations towards the passenger journey (ACI, 2020). The good news is that 97% of respondents, who travelled in 2019, intend to travel again in the future, with 61% of respondents from the Africa region confirming, at the time of the survey, their willingness to travel by the end of this year itself (ACI, 2020). However, the study also revealed that 20% of respondents were not confident that airports and airlines were providing a safe environment, and those that were planning to travel were expecting specific measures to be implemented by airports (ACI, 2020). The most expected measure was the mandatory use of masks for all passengers and airport staff, as confirmed by 48% of all respondents, followed by a 28% of respondents for COVID-19 test prior to their journey, hand sanitizing stations (28% of respondents), and interestingly, 27% of respondents looking forward for a contactless experience (ACI, 2020).

Therefore, notwithstanding the recent encouraging news of the implementation of a number of potentially successful vaccines against the COVID-19 virus, the latter has unfortunately left an indelible print in the minds and habits of most passengers, and to such an extent, that their normal travel expectations may have been permanently redefined.

As the airport industry now begins to plan for a sustainable recovery after a gradual restart over the past few

months, it will be even more important for airports to listen, understand, and respond to the changing needs and expectations of the travelling public. Indeed, passengers will naturally expect to be able to clear airport formalities such as security, customs and immigration swiftly, avoiding crowds and long queues, and to have more choices about how they will interact with airlines, airports and border control authorities. This new travel mindset was already an expectation of the current generation of travellers, but it is likely that this change will be accelerated now with the COVID-19 pandemic. Addressing and tracking the new drivers of satisfaction in the redesign or new design of the passenger journey through airports will be the key to confidently reassuring passengers about the safety of air travel.

Technology and Innovation to Play a Centre Stage in Boosting Passenger Confidence

The impact of the COVID-19 pandemic on air travel certainly presents airports with a lot of challenges and complexities but also with a unique opportunity to think strategically and adopt a systematic approach to understanding, evaluating and adapting to the changing expectations of passengers for a safe, secure and hygienic air travel experience.

Technology and automation is bound to play a crucial role and artificial intelligence will offer an ideal platform to automate tasks and increase efficiency while improving safety and security and ensuring lower margin of errors, if implemented correctly.

The need for systems and processes at airports to cope with the new challenges posed by the COVID-19 crisis in the facilitation of passengers and handling of cargo and baggage is evident. Based on the lessons learnt from this crisis and in a bid to improving its business continuity resilience at all levels, the industry is determined to take the lead in many areas aimed at addressing public health-related issues, managing queues and crowds, and optimizing use of resources by adopting automation and advanced technologies, facilitating data exchange and embracing digital solutions such as biometric recognition technology.

There are numbers of areas where significant opportunities exist within the control of national authorities to foster the introduction of technology and innovation, such as enabling faster clearance of passengers by border control agencies, promoting adoption of automated and electronic processing by customs, and simplifying inspection points throughout the passenger journey at airports. In a nutshell, this crisis must actually be regarded as the catalyst for change to swiftly embrace technology and innovation in passenger processing in the airport industry, and review and adapt all the national regulatory frameworks needed to support the change.

Growing Appeal for Touchless and Remote Processes

The current crisis has highlighted the need for greater use of mobile and automated solutions, including touchless self-service and biometrics, and

the greater use of data, including health information, to enable seamless and safe air travel.

Digital transformation will play a more prominent role in ensuring that efficiency, safety and customer experience are all addressed at passenger touchpoints such as: check-in, self-service bag drops, security check-point, border control and boarding gates, and retail and duty-free outlets, amongst others. Touchless processes will undoubtedly be an integral part of the future of air travel. Whilst this is not a new concept, having been around for some years now and forming the backbone of ACI's vision for the future of travel, this pandemic has certainly accelerated its adoption. Many airports and airlines have already turned to touchless kiosks or virtual/mobile processing to replace traditional check-in and bag drop functions.

The accelerated use of digital identity, and potentially coupled with some health information, to provide clearance for passengers to travel, is likely to gain much momentum. In the short term, this may be proof of COVID-19 test results, and in the longer term evidence of vaccination against COVID-19.

Some passenger processes will also take place off-airport before the start of the journey so that less face-to-face contact is required. For instance, check-in and bag drop processes may move largely off-airport, to hotels and conference centres, and services will more commonly include bag pick-up and delivery. A greater and smarter integration with other transit systems is also expected in order to enable a more seamless and touchless journey.

These approaches will eliminate or greatly reduce the need for physical exchange of travel documents between staff and passengers. It may also speed the overall passenger process, with the benefit of enhanced health protection, and resulting in reduced queuing and other process efficiencies which is much needed at a time when revenues are severely impacted.

The Situation at African Airports

Africa, the second-largest and second-most populous continent, is unfortunately still lagging behind when it comes to the introduction and use of technology in delivering new and innovative passenger processing and improved customer experience at airports.

This current state is mainly due to barriers posed by the current complexity of introducing digitalisation in airport processes, data ownership issues, lack of stakeholders' collaboration, regulatory obstacles to enable fully online or mobile processes and funding priorities not necessarily geared towards technology and innovation. For instance, most African countries currently do not have biometric passports or national identification cards which enable the chips in those documents to store the biometric data passengers, which is the first main requirement to positively identifying a passenger in the travel process and thus allow for contactless experience. Data ownership is also a huge challenge in Africa with governments claiming the sole ownership and not allowing third parties to access, verify or use biometric data.

Nevertheless, over the last years, a few countries in Africa, such as South Africa, Morocco and Ghana, have started to introduce technology to improve the overall passenger experience, mainly with self-service and automated processes. Lanseria International Airport in South Africa is so far the only airport on the continent with self-bag drop facilities. The room for self-service and automation growth is huge on the continent, and with the COVID-19 pandemic, there is an opportunity for all African airports, irrespective of size, to embrace this technology as it will gradually and confidently help to embark on the contactless passenger journey experience. Addis Ababa Bole International Airport of Ethiopia has clearly understood this vision and is currently integrating this technology at its new airport.

Financial Implications Versus Long Term Investment

It is important that in the process of introducing a contactless experience at airports, the entire journey must be redesigned to identify all the touch-points that can be made contactless and this can be achieved through a journey mapping exercise taking into consideration the different passenger profiles, setting clear objectives and goals, and matching the technology that will fit each and every process. It is important to bear in mind that there is no "one size fits all". There is always a solution that fits every budget and every process.

Finance will indeed be an issue in the current testing times for the airport industry, but solutions implemented

now will bring significant return on investment in the long term. Innovation does not have to mean expensive technology as better use of data for efficient operations, and a move to cloud-based computing may be low-hanging fruit to save costs in the short and long term. For instance, during the COVID-19 pandemic, the cargo industry has demonstrated this flexible approach and resilience when substantial capacity constraints resulted from the imposed passenger travel restrictions. A harmonized approach to modify processes, e.g. loading cargo on aircraft and moving to paperless operations, overcame some significant challenges in exceedingly short time scales. The same approach should now be used in other areas of airport operations.

The Future of Air Travel as Envisioned by the NEXTT Initiative

New Experience Travel Technologies (NEXTT) is a joint initiative of Airports Council International (ACI) and International Air Transport Association (IATA). NEXTT encapsulates the shared vision of both associations for the future of travel encompassing the complete journey from home to end destination by focusing on three concepts for passengers, baggage, cargo and aircraft operations, namely: (i) off-airport activities, (ii) advanced processing technology such as robotics and biometrics, and (iii) interactive decision-making (NEXTT, 2020).

The NEXTT vision used to remain a long-term focus on the future of travel for many airports, with its implementation considered in a phased manner. However, with the COVID-19

pandemic, the scenario is altogether different and the adoption of these concepts has become extremely relevant today and will certainly constitute the most relevant framework for airports willing to instil efficiency in their processes whilst at the same time complying with the needs of passengers for a safe, secure and healthy air travel experience.

Pre-COVID-19, NEXTT's vision of off-airport activities was that passengers would have full control of their journey in the comfort of their home prior to reaching the airport by providing them with a number of options regarding online or mobile check-in procedures, off-airport baggage or cargo drop-off, travel authorisations and customs procedures to be managed digitally, and online shopping and booking of ancillary airport services, amongst others.

These off-airport options, as envisaged by NEXTT, are extremely relevant now during this ongoing crisis to reduce contact and crowding at airports, to help physical distancing and to alleviate on-site capacity airport constraints, and will certainly become even more relevant in the post-pandemic world. In addition, with health declaration being part and parcel of the mandatory border control formalities, the concept of a passenger's digital wallet, that will include all health-related information including COVID-19 test and vaccination, is bound to form an integral part of the off-airport passenger processing process in the future.

Pre-COVID-19, NEXTT's vision of advanced processing related to the use of technology for identification purposes, automation and robotics to

create a seamless, secure and harmonised process for passengers and baggage handling at various automated touchpoints at airports, viz. document check at entry, check-in, self-service bag drops, access to security checkpoints, border control and boarding.

In the post-pandemic world, the need for contactless processing will become an even stronger recommendation, if not a norm in the long term, as evidenced by the ICAO Council Aviation Recovery Taskforce (CART) Report and Recovery Guidelines released during the crisis, which now recommends the increased use of technology to facilitate contactless processing of passengers at various stages of their journey (ICAO, 2020). Thus, the passenger experience at the airport will involve the biometric verification of identity and health status at walking pace for a completely uninterrupted and touchless journey. Passenger touchpoints, such as kiosks and other process points, will be touchless, activated by biometric recognition, including voice or motion, and will offer the possibility to seamlessly interact with mobile technologies.

Similarly, electronic bag tags will provide luggage with a digital identity and will help in reducing passenger and staff touchpoints to tag luggage, which is in line with the contactless journey experience envisaged during and post-COVID-19 crisis.

The third concept of NEXTT, i.e. interactive decision-making, is quite forward looking in terms of control and personalisation of the travel experience of passengers through a better communication and coordination of

data sources. Airports would experience enhanced understanding of the needs of their passengers because of the collaboration offered with open Application Programming Interface (API) platforms. On the other hand, tracking technologies and situational awareness would increase the reactivity of passengers to changes made during their travel journey.

During the current crisis and in a post-COVID-19 world, the need for accurate, relevant and up-to-date information on travel requirements and authorizations, especially with respect to health protocols, has all its pertinence for passengers. For airports, advanced information on passengers and on their specific needs will also become key in anticipating potential issues and adjusting the processes and resources allocation to enable a pleasant and seamless passenger journey experience through the airport. Solutions, such as mobile apps and exchange of data through APIs, will be critical to enable passengers to navigate through their journeys.

The Way Forward

Although short-term growth projections have dramatically changed, the need to provide immediate solutions required to mitigate COVID-19 risks when travelling, and to improve effi-

ciency for airports and airlines remain key drivers of innovation and technology.

Around the world, technology, through contactless solutions, self-service and automated processes, and biometrics, is gradually taking the centre stage in helping both airports and airlines overcome the challenges of the new reality of air travel. While the global crisis has placed air transport industry growth ambitions on hold, it has also presented an opportunity for meaningful innovation and transformation to be accelerated, a sure investment for the future.

In the current context, where the COVID-19 pandemic has impacted heavily on air travel, passenger trust and airport operations, the concepts, on which NEXTT rest, are certainly the way forward to achieving the paradigm shift in the passenger journey experience.

For African airports, the time is opportune to confidently embrace technology and innovation so as to improve, once for all, on the efficiency of processes at all levels whilst guaranteeing passengers with a safe, secure, healthy and harmonised air travel experience within and out of Africa.

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A Broad Harmonisation of Regulations is the Indispensable Corollary of a Sustainable Liberalisation of Air Transport

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If we want to guarantee sustainable recovery and the development of air transport in the Western Mediterranean, the mere liberalization of traffic rights is not sufficient: to benefit all air transport stakeholders and users, the creation of a single aviation market in the Western Mediterranean must be underpinned by harmonization of the regulations applicable to air transport.

Liberalization is not an end in itself, but rather serves as a tool to support connectivity and the economy and develop closer ties between nations. The official launch of the Single African Air Transport Market (SAATM) by the African Union (AU) in January 2018 was not merely a step to revive the African air transport liberalization process initiated in 1999 with the Yamoussoukro Decision; it represented a key tool to deliver on Agenda 2063, along with the other Agenda 2063 flagship projects, especially the African Continental Free Trade Area (which was signed by 44 African countries in March 2018), the African Union Passport or the free movement of people (the Protocol to the Treaty Establishing the African Economic Community Relating to Free Movement of Persons, Right of Residence and Right of Establishment was adopted in January 2018).

However, to ensure that the benefits of air transport liberalization are optimal and sustainable, liberalization must form part of a gradual, comprehensive approach; the opening of aviation markets between countries in the Western Mediterranean should be carried out in stages and be supported in parallel by the harmonization of the rules applicable to air transport. The latter ensures uniform travel conditions for passengers and shippers (freight transport) and guarantees high levels of aviation safety

and security; moreover, it provides operators with a level playing field, in terms of competition, and cost-effective services such as those relating to air navigation.

This gradual, comprehensive approach was adopted by the European Union in the 1990s and, more recently, by the Association of Southeast Asian Nations (ASEAN), whose single aviation market made its first appearance some 15 years ago. The creation of some form of single air transport market for the Western Mediterranean could be the outcome of a similar integrative approach involving the 10 countries concerned. However, the immediate challenge is to support an air transport sector that has been devastated by the health crisis.

The Devastating Effects of the COVID-19 Pandemic on the Air Transport Sector

The air transport sector, which has undergone constant growth for years and had an untroubled outlook over the coming decades according to forecasters, is facing an unprecedented shock as a result of the COVID-19 pandemic and is not expected to return to the 2019 level of activity until 2024 at the very earliest.

At its 76th General Meeting held on 24 November 2020, the International Air Transport Association (IATA), which represented 290 airlines, updated its forecasts regarding the impact of the crisis. The figures for 2020 are staggering: passengers numbers are down by 66% compared to 2019, airlines are estimated to generate just 328 billion US

dollars, down by 60.9% compared to the previous year (838 billion), airline losses are now estimated at 118.5 billion US dollars, downgraded from June's estimate of a "mere" 84.3 billion, airline debts have increased from 430 billion US dollars in 2019 to 651 billion in 2020, and so on.

The outlook for airports is equally grim. According to the Airports Council International Europe (ACI Europe), which represents nearly 500 airports in 46 European countries, traffic on 15 November was already down by 1.5 billion passengers compared to 2019 levels. Under these conditions, ACI Europe estimates that more than 190 airports run the risk of insolvency. In terms of recovery arrangements, it is exercising extreme caution out of fear of lasting changes in travel habits.

Despite the fact that the prospect of an effective vaccine has revived airline stock prices, IATA is predicting a difficult 2021, with losses estimated at 38.7 billion US dollars. It does not expect air traffic to return to 2019 levels until 2024 and, even then, only if certain conditions are fulfilled, especially with respect to the vaccine's effectiveness.

Against this backdrop, the opening up of markets between the countries of the Western Mediterranean could represent a facilitator for relaunching air transport for passengers and goods in this region. In the longer term, the creation of a single aviation market should involve an additional dimension: regulatory convergence is the only way to guarantee the harmonious, sustainable, and safe development of air transport. This requires a gradual, comprehensive approach, similar to that used to construct the single European

air transport market and implement common air spaces with the neighbouring countries of the European Union created through specific European air agreements.

A Gradual, Comprehensive Approach: The Example of the Construction of the Single European Air Transport Market

The internal market of the European Union, which comprises the 27 member states and also fully extends to Iceland, Liechtenstein and Norway through the Agreement on the Economic European Area (EEA), allows airlines with an air carrier licence issued by one of these 30 states to freely operate services between all the airports in this region, including in cabotage, without any restrictions in terms of routes, frequency and capacity, and with complete freedom to set fares.

The construction of this single aviation market, which concluded in 1997 with respect to liberalization when cabotage was included, has been accompanied by full harmonization of the rules applicable to air transport in terms of safety, security, air traffic management, slot allocation, insurance, competition, the environment, consumer protection, flight crew working hours, etc. All stakeholders in the air transport chain must therefore apply the same rules; these benefits not only passengers and shippers, who are guaranteed high-quality air transport through some of the strictest standards around, but also airlines and airports, which are able to operate in an environment where the

competition is fair, the rules are the same for everyone, and the services are ever more efficient.

The liberalization of air transport within the European Union has resulted in increased connectivity, diversification of supply, lower fares and, therefore, increased traffic. There are now four times more routes (or pairs of cities served) than in 1992, when the liberalization process began, and eight times more routes on which at least three carriers compete, all for the benefit of air transport users (source: European Commission).

The European Union's single aviation market has been extended to the six countries of the Western Balkans (Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Montenegro and Serbia) through an agreement to create a European Common Aviation Area (ECAA) that was signed in 2006. As well as the 27 EU member states and the six Western Balkan states, this area also encompasses Iceland and Norway. These 35 states will eventually share the same air transport rules in a space where airlines holding a carrier licence issued by one of the states can operate freely. However, integration of the Western Balkans into the single airspace is a gradual and conditional process; the agreement provides for two meetings to transpose its provisions into national law and ensure that the countries of the Balkans implement a predefined list of European standards, as set out in the agreement. At each stage, new rights are granted to air carriers. The number of routes between the European Union and the countries of the Western Balkans trebled between 2006 and 2018 (source: European Commission).

However, regulatory harmonization between the European and Maghreb

countries of the Western Mediterranean need not go this far, since the ECAA agreement forms part of the process to gradually integrate the countries of the Western Balkans into the European Union and reflects their commitment to fully embrace the European acquis.

Drawing on this Gradual, Comprehensive Approach to Build the "Single Aviation Market for the Western Mediterranean"

The creation of a single aviation market for the Western Mediterranean should be based on these same principles: a gradual opening up of markets linked to a certain degree of harmonization of the rules applicable to air transport. This construction could be considered a gradual process, the first step of which would involve the execution of Euro-Mediterranean-style agreements relating to air services between each of the Maghreb countries and the European Union; at the same time, the Maghreb countries could work together to open up their markets in the spirit of the Yamoussoukro Decision (1999) and within the more general framework of the creation of the Single African Air Transport Market.

With respect to north-south relations

The European Union has already embarked on the journey to open up its aviation market to some Maghreb countries as part of its external air transport policy dedicated to neighbouring countries. This policy concerns Algeria, Libya, Morocco and Tunisia.

Thus, the 2006 "Euro-Mediterranean aviation agreement between the Euro-

pean Community and its Member States, of the one part and the Kingdom of Morocco of the other part” sets out the conditions for the operation of commercial air services between the Kingdom of Morocco and the 27 countries of the European Union. Air services are already largely open, and Moroccan and European air carriers are permitted to operate unlimited services between any airport in the Kingdom and any airport in the European Union. This opening up of markets is accompanied by a process of regulatory harmonization in several areas of air transport, albeit not to the extent provided for by the ECAA agreement. Ultimately, when the joint committee, the body responsible for managing the agreement, confirms Morocco’s implementation of all air transport regulations provided for by the treaty, air carriers will benefit from additional opportunities (i.e. certain fifth-freedom rights, especially within the European Union for Moroccan carriers).

Since this agreement with Morocco was implemented in late 2006, the number of city pairs served has doubled (there were 198 different connections between Morocco and the European Union in 2018), the average fare has fallen by more than 60% and the number of passengers has doubled (15 million in 2018) (source: European Commission).

A similar agreement between Tunisia and the European Union, the text of which was initialled in November 2017, should finally be implemented in 2021 after a delay caused by legal problems within the European Union. The philosophy of this agreement is in keeping with

that of the agreement with Morocco, namely an opening up of markets based on a certain degree of harmonization of the rules applicable to air transport. Arrangements have been made to ensure a smooth transition between the current situation and the full opening up of the market between Tunisia and the European Union with a view to supporting the efforts of Tunisian air carriers to adapt to this new situation.

Since 2008, the European Commission has also had a negotiation mandate for Algeria; in other words, an authorization issued by the Council of the European Union and EU member states to open negotiations with Algeria on a European air transport agreement. It is therefore possible that negotiations between Algeria and the European Union will be launched on the basis of an agreement that sets forth the same principles as the two preceding agreements once the two parties are ready to do so.

With respect to the other two Maghreb countries, i.e. Libya, which has observer status within the Union for the Mediterranean and is involved in the European Union’s neighbourhood policy, and Mauritania, which is not included in this policy, relations with the European Union in the field of air transport remain to be defined, especially since the intensity of traffic between these two states and EU member states remains marginal.

The figures below provide more insight into the priorities and effects of the European Union’s aviation policy towards its neighbours in the Eastern Mediterranean (sources: Eurostat):

	2014	2015	2016	2017	2018	2019
Algeria	4,767,772	5,036,314	5,337,257	5,538,734	5,394,335	5,213,326z
Morocco	7,902,589	7,800,398	7,864,422	8,825,896	9,779,788	11,048,632
Tunisia	3,652,440	2,938,734	2,907,029	3,341,045	3,827,976	4,152,709

The economies of Morocco and Tunisia are highly dependent on tourism, and the rise in passenger numbers between the former and the five European countries within the Western Mediterranean is being fuelled by the benefits of the European agreement, which allows all Moroccan and European carriers, especially low-cost airlines, to operate all possible routes between the airports of Morocco and those of the European Union. It is important to note the repercussions of the events of 2015 on tourist traffic in the two countries. With regard to Tunisia more specifically, the flow of passengers is rising less drastically than

for Morocco, given that existing bilateral agreements generally do not allow European low-cost carriers to operate from a member state other than the one that issued them with a carrier licence. The forthcoming signing of the air agreement between Tunisia and the European Union will make it possible to observe the effects of liberalization on passenger flows. Finally, in the case of Algeria, certain bilateral agreements retain limitations and restrictive conditions on the level of access to the market, which is likely playing a role in the stagnation of traffic and the maintenance of fares deemed excessively high.

Passengers 2019	Algeria	Libya	Mauritania	Morocco	Tunisia
Spain	693,796	:	1,242	2,355,411	119,807
France	4,352,669	:	38,883	6,706,645	3,444,762
Italy	149,009	:	:	1,412,533	504,398
Malta	:	4,180	:	18,788	36,322
Portugal	17,852	:	61	555,255	47,420
Total:	5,213,326	4,180	40,186	11,048,632	4,152,709

Given current air traffic levels between Libya and Mauritania and the European Union, the relationship between them in the field of air transport has yet to be defined.

With respect to relations between the Maghreb countries

The Yamoussoukro Decision of November 1999 begins with these words:

"We, African Ministers in charge of civil aviation meeting in Yamoussoukro, Côte d'Ivoire on 13 and 14 November 1999, (...) hereby adopt this decision (...):

This Decision establishes the arrangement among State Parties for the grad-

ual liberalization of scheduled and non-scheduled intra-Africa air transport services. This Decision has precedence over any multilateral or bilateral agreements on air services between State Parties which are incompatible with this Decision."

Besides the gradual liberalization of services (the first five freedoms of the air), without limitation in terms of capacity or frequency, the key features of a single market, the Decision also includes a notable addition, i.e. the possibility of states to designate an airline from another state party to the Yamoussoukro Decision.

In 2018, two essential annexes were added: Annex 5 on Regulations on Competition in Air Transport Services

within Africa and Annex 6 on Regulations on the Protection of Consumers of Air Transport Services. This is surely proof that a single market cannot be viewed from a liberalization viewpoint alone, and that the convergence or, better still, harmonization, of certain rules is essential to guarantee that it functions properly.

The official launch of the Single African Air Transport Market in January 2018 placed the Yamoussoukro Decision in the context of Agenda 2063 and revived a liberalization process that was initiated 20 years earlier. Thirty-four African states, including Morocco, have already made "solemn commitments" to the SAATM, and 18 states have already signed the Implementation Protocol aimed at ensuring coherence between the Yamoussoukro Decision and their bilateral air service agreements (source: website of the African Civil Aviation Commission).

In the foreword to the 2018 edition of the Yamoussoukro Decision (Single African Air Transport Market - Towards a Single African Sky), Moussa Faki Mahamat, Chairperson of the African Union Commission, said that air transport liberalization in Africa would lead to greater connectivity, a "massive reduction in air ticket prices" and growth in intra-African traffic in terms of passengers and freight, which would improve the profitability of African airlines. These remarks are supported in particular by a study by InterVista titled "Transforming Intra-African Air Connectivity: The Economic Benefits of Implementing the Yamoussoukro Decision".

The effective implementation of liberalization is likely to reveal a broader need for regulatory harmonization. This need should quickly become evident in the

field of aviation safety and security, especially when states avail themselves of the option to designate air carriers whose regulatory oversight in these fields is guaranteed by another state.

In addition, the increased flow involves the risk of saturating the airspace and air traffic control bodies. The search for greater efficiency in this area, especially in terms of the economy and environment (e.g. reduction of greenhouse gas emissions), should result in ever stronger cooperation, one of the advanced stages of which could be the establishment of so-called functional airspace blocks (FABs), based on the European Union's model. These functional airspace blocks are designed to address the fragmentation of airspace and organize airspace according to flows rather than national borders. Such cooperation levels between countries, or between air traffic control services, can be conceived only on the basis of highly or even fully harmonized regulations.

It should be noted that cooperation in the field of air navigation already extends across the Mediterranean, as reflected in the partnerships established between the BLUE MED FAB (the Mediterranean functional airspace blocks that links Cyprus, Greece, Italy and Malta) and the air navigation service providers of Egypt and Tunisia, which participate as "associated partners", as well as the Hashemite Kingdom of Jordan, which enjoys observer status.

The first building blocks of air transport liberalization between the countries of the Western Mediterranean have been laid; the next steps should take shape as the SAATM progresses.

All of these building blocks (European agreements with certain Maghreb coun-

tries, North-South cooperation, the gradual implementation of the Single African Air Transport Market) are paving the way for the orderly opening of the air transport market between the countries of the Western Mediterranean. The next steps could potentially relate to new agreements between the European Union and the Maghreb countries but, more importantly, real progress in the implementation of the SAATM would mark a decisive turning point in the process to liberalize air transport services.

A symbolic step was taken on 13 November, when the Assembly of Heads of State and Government of the African Union designated 14 November as the anniversary of the Yamoussoukro Decision and named it Yamoussoukro Decision Day. Beyond its symbolic sig-

nificance, this move also underlined the commitment of African states to forge ahead with the initiative.

Moreover, the health crisis has reinforced this need to open up the African market, as stressed at the Assembly by Ali Tounsi, the Secretary General of Airports Council International Africa. He made a passionate plea in favour of the Single African Air Transport Market, the African Continental Free Trade Area and the Free Movement of Persons Protocol (FMPP), elements he considers essential to ensure the recovery of the air transport industry in the post-Covid era but, even more importantly, for the future of the African continent (*Institutional Message delivered by the Secretary General of ACI Africa on the occasion of Yamoussoukro Decision Day 2020*).

Chapter 7

URBAN TRANSPORT

The lockdown measures applied to reduce the spread of COVID-19 had a clear impact on urban mobility, in some cases leading to a reduction of an estimated 90% of journeys. On the one hand, the experience of how it could be to live in cities with low pollutant emissions was presented. However, on the other, there was a drop in confidence in the use of public transport, one of the primary means of achieving the medium and long-term low-emission target scenario.

The post-lockdown period is an opportunity to plan and test a series of measures that should contribute to a city model (and its transport system) committed to the UN Sustainable Development Goals (SDGs) and the Paris Climate Agreement. There is talk of tactical urban planning, smart and sustainable mobility, public transport as the backbone of urban mobility and digitalisation as a tool to facilitate transport, among other ideas.

Urban Transport in the Post-COVID Era: The Same Solutions for the Same Problems

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Freedom from the Car As the Ultimate Goal of Urban Transport

We are all familiar with the history of urbanization in the last two centuries, mainly in Europe and North America, spreading in the last 50 years to the rest of the world. Of course, each city has its own history, but it is fairly easy to identify long term continental and worldwide trends.

The overarching trend in urban transport since the 1950's has, undoubtedly, been motorization. From America, to Europe, to Asia and Africa, some sooner some later, all large metropolises cope with congestion, scarcity of parking and pollution caused by car traffic. Even cities with old, large and developed public transport networks, the increase in motorization coincided with a long pause in the expansion of transit networks, at the same time new express ways were being built.

More recently, the dominating trend in the discourse has been around the concept of "smart and sustainable mobility", exemplified by the recently published European Commission Sustainable and Smart Mobility Strategy [EC 2020]. It is often completed with other adjectives such as connected, shared and digital.

The exact meaning of smart and sustainable mobility is not entirely clear, and it does not necessarily help when other adjectives are added, like "connected", "shared" or "digital". It is also likely that different stakeholders interpret them differently. This becomes clear when almost all transport solutions assign themselves several or all these adjectives.

One of the meanings of "smart and sustainable mobility" translates into the concept of Mobility as a Service (MasS). Like so many corporate buzzwords, its meaning is also not entirely clear. Most often, it is used in connection with ride-sharing, car-pooling, e-bike or e-scooter-sharing mobile applications. Also like many corporate buzzwords, all players in the sector suddenly feel like they need to adopt it if they are to remain at the forefront of innovation. The truth is that most solutions that adopt the MaaS label are individual mobility solutions, even if, at the end of the day, ridesharing and car-pooling are simply glorified taxi services.

There are, of course, positive examples and true useful innovation. Bike-sharing services are a good example, as they help overcome an important barrier to initial adoption of the bicycle as a mode of transport. These services help to bring more people to cycling.

The "sustainable" part usually refers to electrification or, more generally, energy transition in transport. Combustion engines in cars and buses are gradually being exchanged for batteries and electric motors. It is still not clear if hydrogen can overcome its technical limitations and become widespread.

However, we must bear in mind that electric cars are not environmentally neutral. In fact, there are no environmentally neutral solutions, there are only better and worse solutions, from an environmental point of view. An electric car still needs energy, and needs batteries to store that energy, that needs to be produced somewhere. A railway takes up space, needs earthworks, tunnels and viaducts, it needs large quantities of concrete and steel.

The overall point is that simply shifting from combustion to electric engines will only help solve the problems with pollution and greenhouse gas emissions. Shifting from privately owned cars to shared cars, whatever their power source, will only partially reduce the demand for parking, while its effects on congestion may even be negative.

Generally speaking, individual motorized transport is almost always worse than either collective or individual active mobility. There will always be exceptions, but this is true for the vast majority of cases, most certainly in cities.

The Need to Regain Trust

The COVID-19 pandemic, the lockdowns and the need for social distancing had a devastating impact on all collective transport systems. In a matter of days, streets became empty, while buses and trains became emptier, but not completely empty.

Even if urban transport systems always have a significant portion of direct public funding, ticketing revenue is still an indispensable part of their operating budgets. The situation combined a sudden fall in ridership with the need to keep most services in operation to transport essential workers, while attempting to keep social distancing. This led us to realize that there are large amounts of workers that cannot work remotely, especially, among what we now know as “essential workers”, as trains and buses were still transporting too many people to allow for the recommended social distancing. On the other hand, we intuitively perceive that some people became afraid of using collective transport and returned to their cars for their commute.

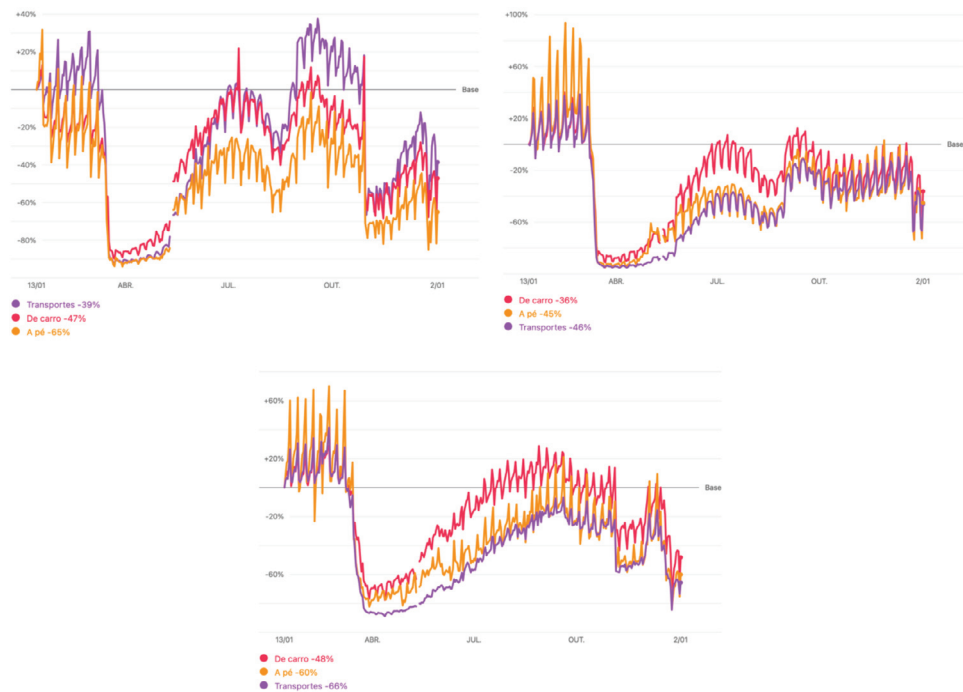
As restrictions have been eased and reintroduced, people seem to gradually revert to their previous commute habits. Of course, we must also account for the impact of the drastic reduction in tourism that is likely to last for several years. The combined effects of regular and occasional passengers have been asymmetric in different cities.

The data collected by both Apple and Google from their respective mobile mapping platforms has been made available in mobility reports that yield some interesting results [Apple 2020, Google 2020]. Although these datasets have limitations, they provide us, at least, a proxy for the tendencies in transport usage throughout the year 2020. The data provided by Apple actually allows us to compare the requests for itineraries by car, on foot and public transport and compare their evolutions.

Taking, for example, the data from three European capitals, Paris, London and Madrid, we can see that, while in Paris public transport usage recovered faster than car usage, in London and Madrid it was the other way around. A good explanation for this difference would require a detailed study of the different factors, like the importance of tourism, policies during the lockdown or the extent and duration of the lockdowns themselves.

The immediate take from these results, shown in Figure 1, is that we should not take the loss in public transport as definite. Once the restrictions are eased, people tend to come back to their normal lives quite quickly. Even when restrictions remain in place, fatigue leads to a slow reversion to the mean.

Figure 1. Mobility trends from Apple Maps application usage in Paris (top left), Madrid (top right) and London (bottom). Red lines are for car, orange for on foot and blue for public transport.



However, being an important milestone in people's lives, and indeed causing unexpected changes like unemployment or new employment for significant numbers of people, there is an opportunity to lead people to change their habits and adopt public transport as their transport of choice. While it is not possible to build new transit lines in a matter of months, it is possible, for example, to reduce fares. As has been shown in Portugal in 2019, a fare reduction has the ability to immediately cause a measurable shift in public transport usage.

It is still unclear how long it will take for people to fully regain trust in collective transport, but all indications lead to a fairly quick return to a previous normal, despite all the talk about a new normal. It may take longer in some places than

others, but we will most likely arrive in a few months or a couple of years with more or less the same problems demanding the same solutions.

Ephemeral and Lasting Effects

Many cities have used the empty streets during the lockdown as an opportunity to redistribute public space, in what has become known as tactical urbanism. For the most part, this has materialised in the establishment of pop-up bike lanes and other means for reserving public space for future deeper interventions.

Some of these initiatives have faced the usual resistance when new bike lanes taking up space that was previously de-

voted to car circulation or parking face. Others have already been removed, such as the one in High Street Kensington, London. The dispute for public space is ongoing and has not paused during the lockdowns.

On the other hand, the sudden closure of most businesses caused a sudden shift to remote work. This is another aspect that has been lauded as part of a new normal. Indeed, this is not a new trend, but it is limited to some specific kinds of jobs, mostly, qualified office jobs. A vast portion of workers, now called essential, that cannot work from home. These workers also have a high correlation with lower incomes.

It is very tempting to assume long-lasting trends from short-term effects, but it can be misleading. If it seems that tactical urbanism will be successful in cities that can take swift action to make the changes permanent, it remains to be seen how much remote work will remain.

Technology Is Not the Key

There are two main ways in which technology comes into the debate about transport.

The first and most common one is the talk about digitalization. Digitalization will not bring about any major change by itself, but it may help the transition. One example is the already mentioned bike-sharing services. In collective transport, digital technologies enable integrated ticketing and journey planning. However, no digital platform can move thousands of people without adequate infrastructure and rolling stock.

The second way that technology is brought into the debate about transport is when entirely new solutions are promoted to tackle the challenges of mobility. These technologies come in different stages of maturity but almost always with soaring promises to revolutionize mobility. Examples of such are HyperLoop, autonomous cars, flying cars or autonomous flying cars, the latter being dubbed as drones.

Arguably, this kind of proposals can mislead for policy makers, by shifting their attention from readily available solution in favour of a promise of a much better "revolutionary" concept, usually promised for only a few years in the future. The problem is that the promises, often, don't survive a detailed scrutiny and, when they are feasible, might be decades in the future, like HyperLoop or only affordable for elites, like flying cars.

Of course, technology is far from irrelevant, but the solution must fit the problem and not the other way around. As mentioned above, the key challenge of urban mobility today is modal shift away from individual motorized transport. The key transport technologies needed for this are, essentially, the ones that have been available for over a century: trains, trams, buses and bicycles. Of course, being old, they all have had over a century of incremental improvement, leading to new approaches to those same technologies like tram-train or Bus Rapid Transit (BRT).

The layer of digital technologies and applications allows to make these systems and networks easier to operate and to use, and that is their key goal, but they do not replace the investment in infrastructure and equipment.

City Design Is the Key

One key difference between urban transport planning nowadays and the first half of the twentieth century is the central role that urban planning and public space architecture have taken in the planning of the transport networks themselves.

In the late nineteenth and early twentieth centuries, major cities embarked on the construction of transit networks that tried to move people while trying to avoid the congestion on the surface. This was the golden age of underground and elevated urban rail networks. Although some fast-growing cities in China have built huge underground networks in the last few decades, the trend across the world has been to move towards the coexistence of transit networks on the surface, making them more effective and efficient.

The vast majority of non-built-up areas in any major city is devoted to the automobile, either for circulation or parking. Some cities in North America took this car dominance of the public space to extremes, with vast parking lots and wide avenues and expressways cutting through the centres of major cities.

Public space is a scarce resource in cities. For that reason, it is a matter of social equity, before all, to ensure its adequate distribution. It is inevitable that space for cars needs to be reduced in order to provide more space for walking, cycling, for public transit or even just to stay. Despite frequent resistance from residents and local businesses, it has been shown time and again that this kind of intervention in city streets leads to positive results for all concerned: public space becomes more pleasant, public transport works better, becoming

a more attractive option, and local commerce increase their movement. In the end, a dull and dangerous avenue can be turned into a lively neighbourhood plaza.

The role of the neighbourhood should also be highlighted here. The concept of a “15-minute neighbourhood”, where all essential services are within reach for every resident without the use of a car, has seen widespread adoption in academic and planning communities. There are good examples of entirely new neighbourhoods built under this principle, but it is more difficult and certainly slower to transform an existing part of a city into such a neighbourhood. Many cities already went through a decades long process of urban sprawl with vast residential areas built around the car. These situations present a great challenge. Still, the redistribution of public space is an indispensable part of it, and often one of the first steps.

This is why the shift towards a transit-oriented development is the only change that can bring about a truly decisive modal shift in urban transport. A city made up of multiple neighbourhoods, crossed by public transport lines that connect to other neighbourhoods.

Railway Stations As Central Hubs

The transit neighbourhood principle explored in the previous section can be adapted to a larger scale when we are talking about larger cities that have large and very dense centres. Also, when considering a territory with multiple cities of different sizes, the urban transit system of each one of them needs to connect to the intercity transport network. The

sustainable mode of transport for intercity travel is, unquestionably, the railways.

This is why, in many cities across the world, great railway stations are reasserting their role as central hubs, not only of mobility, but of public life.

In New York City, the demolition of Penn Station in the 1960's has been regarded as one of the largest acts of public vandalism in history. An effort to make it right is underway, along with the expansion of the station itself, making it ready to handle 900 000 passengers every day. On the first day of 2021, a new Train Hall has been opened, partially recovering the past grandeur of this historic station [MTH 2020].

In Paris, Gare du Nord, the busiest rail station in Europe is also going through a major renovation and expansion, along with the public space surrounding it [StatioNord 2021].

These two projects serve just as examples to illustrate their common aspects. In their function as transport hubs, they concentrate all modes and scales of transport, from intercity trains to local trains, to urban mass transit, to bike parking and sharing. In their other function as hubs of public life, they offer large and beautiful in-door and out-spaces, including shops, restaurants and gardens.

The overarching theme of this article has been to show how we already have the key problems identified and the required solutions. In the world, and indeed in the Western Mediterranean region, countries and cities advance at different paces, but there should be no shame in copying the good examples next-door and learning from others' mistakes. It is impossible to know if, a few decades from now, we will be able to look at the years 2020 and 2021 as a turning point in urban transport. Let us, at the very least, not reverse the positive trends that are already underway.

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The Key Role of Sustainable Urban Mobility to Build Back Better in Mediterranean Cities

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Introduction

The crisis generated by COVID-19 has had a major impact on public transport systems across many Mediterranean countries. Public and private sector stakeholders have adopted all the necessary measures to guarantee service continuity, ensuring the mobility of essential front-line workers.

Existing services have been kept running or new ones put in place so that people who cannot stay home and must travel have an adequate mobility alternative. Supply has been adapted to the newly required distancing measures, face masks have been mandated across most cities, and station and vehicle cleaning has been scaled up with no regard to the extra costs. All this has been done while protecting workers and customers.

However, the health situation has powered a widespread and unsustainable fall in public transport ridership and associated fare box revenues of close to 90% in some cities, despite supply far outstripping demand since the crisis began. With a progressive resumption of activities after lockdown, it is imperative to step in with exceptional measures or the system will collapse.

We are facing a global pandemic that is profoundly deepening inequalities and undoing progress on the Sustainable Development Goals (SDGs). At the same time, we continue to face many global challenges with irreversible impacts for people. In the responses to these interconnected crises, we cannot afford to tackle just one or the other. Indeed, climate, health, social inclusion, road safety and the economy are all under attack and public transport, driven by innovation and service quality, is a vital part of the solution.

The Undisputed Benefits of Public Transport to Our Societies

In the response, repair and recovery phases of this crisis, citizens and policy-makers have reacted differently across regions. This time, we need to build back better. A key part of doing so will entail shoring up the role of public transport, the backbone of urban mobility, as an enabler to other economic, social and environmental city objectives.

The economic benefits of public transport are five times higher than the money invested in it. Public transport unlocks positive effects in the wider economy by connecting people to their jobs, studies and leisure occupations, allowing for clustering of activities and business development, improving quality of life, supporting tourism, reducing traffic congestion, stabilizing property values and helping to regenerate cities or deprived areas through transport connections. Studies report a significant increase in the value of property developments close to transport projects designed with a transit-oriented approach, reflected by nearby retail stores, quality pedestrian areas and open spaces.

Worldwide, over 13 million local jobs are linked to public transport services. For every direct job in public transport, 2.5 additional jobs exist in the supply chain and the local economy. A recent study carried by United Nations and the International Labour Organization (ILO) suggests that employment opportunities would indeed be opened up by the promotion of green and healthy transport. Stimulating the use of public transport by doubling investment could create at least 2.5 million additional jobs in the transport sector worldwide. This in-

creases to at least 5 million jobs if the wider impact on other sectors of the economy is considered.

Public transport brings people together and equal opportunities to all citizens, as the accessible and affordable option to ensure access to public services. It plays a crucial role in local development, offering mobility to all and maintaining territorial and social cohesion, leaving no one and no place behind after the crisis.

According to the World Health Organization (WHO), seven million premature deaths are due to air pollution. It accounts for one-third of deaths from the leading non-communicable diseases (stroke, lung cancer, heart attacks and chronic obstructive pulmonary disease). Over 90% of the world's population live in areas where air pollution exceeds safe levels. There must therefore be no 'back to normal' where it is dangerous just to breathe.

According to the European Environment Agency, public transport is four times more efficient per pax-km than private cars. Every kilometer travelled on public transport saves 95 grams of GHG emissions and 19 grams of NO_x compared to motorized private transport.

Investing in health prevention by reducing air pollution would bring down the cost of treating non-communicable diseases in the 21st century. A significant part of the health solution would involve equipping cities and their inhabitants with integrated public transport, reducing risks from traffic injuries, obesity, air pollution and noise. Those would benefit all and reduce the social inequalities in front of these hazards.

Decreased traffic resulting from the lockdown in many cities shows that nitrogen

dioxide (NO₂) concentrations can rapidly be reduced by up to a third. While in the current crisis, several cities have decided to suspend existing car use and parking restriction policies or delay new ones to help healthcare workers and essential deliveries, it is vital that these instruments for cleaner air be fully reactivated as soon as possible. The main risk for catching COVID-19 is undoubtedly contact with an infected person, and healthcare quality is vital in determining outcomes. However, studies show that air pollution could matter in several ways. For example, higher death rates due to lungs and hearts weakened by dirty air. Pollutants also inflame the lungs, making inhabitants more susceptible to the virus. This raises concerns about rising pollution levels after lockdowns.

If we are to limit the rise in global temperature to 1.5°C as per the Paris Agreement, we must cut global emissions by 7.6% every year for the next decade. As outlined in the UITP Declaration on Climate Leadership, this requires more ambitious national commitments and tougher targets to reach carbon neutrality by 2050. Non-state actors like the public transport sector have shown increased determination and commitment to achieving a low-emissions future and harnessing related opportunities. The fastest and most cost-efficient way to decarbonize people's daily mobility and reduce the footprint of their mobility choices is to promote public transport, walking, and cycling.

Road traffic injuries are the 10th leading cause of death globally, responsible for more than 1.2 million deaths per year. 90% of these casualties happen in developing countries. Around 50 million people are also injured on the world's roads every year, costing governments up to 3% of GDP. The number of road

traffic deaths continues to climb steadily and the rate of death relative to the size of the world's population has remained constant, meaning we are way off delivering on the goal set by SDG 3.6 to halve the number of global deaths and injuries from road traffic accidents. Public transport has a critical role to play as access to a safe and sustainable urban transport system for all, which includes expanding public transport, is a recognized solution to achieve this objective.

Cities Need Better Mobility

Throughout history, the urban landscape of the Mediterranean cities has evolved in response to social, economic and environmental changes. Today, with more people moving to urban areas, cities are responsible for 75% of energy consumption and 70% of global carbon dioxide emissions. The way we plan and build our cities defines our quality of life. Urban planners and decision-makers are being pushed to rethink how mobility is organized.

Cities across our Region have understood that with this crisis now is the time to move forward on sustainable urban mobility and many have already begun to remodel their urban space and review the allocation of road space disproportionately allocated to private cars during the last decades. The complementarity and integration of active, shared and collective modes of transport is key.

The digital revolution has brought radical changes to our economies, including freight and passenger mobility, and has encouraged new actors to enter the mobility market. If the new services affect city mobility management and impacts the urban streetscape, as part of a wider

city strategy they also represent new opportunities to enrich the mobility options and facilitate a car free lifestyle. Cooperation, partnerships and dialogue are key to enable a redefined public transport system, integrating these new complementary services with mass public transport in an efficient and sustainable way. In the context of Mobility as a Service (MaaS), no shared or collective mode of transport should be left out of this dialogue.

This crisis represents a vital opportunity to definitively change things for the better, handing cities back to the people. The decisions taken in the coming weeks and months will define how healthy, resilient, and livable our cities will be going forward. But we can only do this by stepping up collaboration among stakeholders to support public transport. Public transit institutional frameworks and market regulations differ in line with local specificities, but the starting point to any city's strategic development plan should be to craft a common vision (both vertically and horizontally) in which urban mobility is posited to deliver on the city's strategic objectives and secure wider socioeconomic benefits. Twinning long-term strategies with tactical measures fosters a stream of consistency in the decision-making process, not subject to political terms. Current short term initiatives enabling walking and cycling should evolve in long term solutions associating public transport stakeholders.

Health is not only an indicator for monitoring progress, but an essential element to ensure sustainable development. Placing health and wellbeing at the center of the planning process can foster good livelihoods, build resilient and vibrant communities, and give voice to vulnerable groups, while

enabling progress to reduce inequalities in urban areas.

Some regulators might view the crisis as an inflection point to accelerate the transition toward sustainable mobility, while others could loosen regulatory mandates. By framing how our urban ecosystems operate, regulations can have a major impact on the success or failure of an urban mobility strategy. Indeed, a flexible and conducive regulatory approach, adapted to an increasingly complex and competitive environment, supporting innovation and innovative itself, enables cities to thrive and reach their full potential.

Innovation, including the development of new technology solutions, has a major role to play to build a more resilient urban mobility system, with actors able to show greater agility and offering more flexibility in the provision of services than they have been able to do until now.

Some of the trends that appeared during the COVID-19 crisis might only be temporary but some shifts will be permanent. The more pervasive use of digital technologies, including the increase of virtual interactions (teleworking, etc.), is likely to impact the structure of the demand and the shape of cities. To ensure the continued relevance of public transport and its associated benefits in this future environment, the sector should adapt and embrace goal driven innovation and digitalization to build and deliver better quality, upgrading the level of personalized services and standards for public transport customers.

Public transport is a lucrative investment and important driver of wealth. Ensuring long-term funding stability,

enabling CAPEX and OPEX planning in the context of rigorous SUMP, is critical to supporting city strategies and achieving targeted mobility results. Dedicated legislation and funding should be ring-fenced. The governance model has to be enhanced to better include the various beneficiaries of public transport infrastructures and services, including businesses.

The coronavirus crisis is also hitting public transport finances and urgent extraordinary measures in the form of clear conditions for using recovery funds in favor of a modal shift are needed. This timing might be perfect to implement alternative funding schemes, such as congestion charging or road pricing, leading to a virtuous cycle in which private cars fund public transport.

Policy Recommendations

Mediterranean cities and countries should invest in recovery and resilience for a systemic socioeconomic transformation, where public transport and active mobility play a key role to build back better. For that purpose:

1. Strengthening public transport should be a priority for decision-makers in all countries across the Region. Governments, currently deciding how to allocate some of the biggest public funds in history, should include the sector in the financial recovery measures and maintain and even step up planned investments in public transport infrastructures and services, due to their various positive multiplier factors.
2. The public sector must step in to guarantee a certain level of stability through dedicated mobility funds, acting as a driver. The EU Recovery

Plan and the next Multiannual Financial Framework will be key in some countries of the Mediterranean ecosystem. We need to move forward with concrete figures allocated to public transport on the next long-term budget and Next Generation EU by the end of the year. Alternative funding schemes, such as congestion charging or road pricing, should be considered. Clear rules and a coherent approach at regional/global level by competent authorities are key, while providing agile regulatory frameworks and financial incentives to build and deliver urban transport systems that have the levels of capacity and increased quality of environment people desire.

3. The current crisis is setting the scene for doing what so many cities wanted but lacked the opportunity to do. Through transport-oriented development, the need for motorized travel and the trip length can be reduced. Residential, work and leisure districts must become more closely connected and intermixed. Cities must prioritise accessible, safe, breathable, and walkable streets through urban planning, putting people at the heart, by implementing the careful coordination of land use and long term mobility planning with the engagement of all stakeholders from project start. There is now a golden opportunity for policy-makers to integrate and strengthen these policies.

4. Public transport should be the backbone of urban mobility across all exit strategies that aim to shift individual motorized transport in cities towards more sustainable modes as part of an integrated public transport system (administrative, modal, fare...) that combines mobility services, provides

door-to-door seamless journeys and eliminates the need for the private car.

5. Travel demand management plays a key role to decongest the peak. Public authorities and private actors should collaborate to monitor and realign strategies affecting the short and, especially, long term impacts of the current crisis on the dynamics of cities and mobility. Supported by technological solutions and flexibility, efficient responses to optimize and adapt the network will influence smart travel.

6. Grounded in data and the science, positive communication measures are key to restoring people's trust in the public transport sector. All the tools are already in place, be a combination of policy decisions, active measures and reassurance of clients. Public transport authorities and operators must strengthen their interaction with the media to explain the important sector pillars (customer focus, cleaning and sanitary measures and efficiency) and to accelerate levers (innovation, digital transformation and strategic partnerships).

Conclusion

Cities and countries have been responding to short term emergencies, but now we must move beyond, ensure the survival of the public transport and seize a historical unique opportunity to start over and shape the future of our cities.

Our urban mobility sector is strongly inter-linked with many other challenges (climate, health, social inclusion, road safety, etc.) that will not be met without a clear priority given to public transport as a vital pillar for economic, social

and environmental recovery, both in the short and long-term.

Public transport stakeholders have demonstrated that although they didn't have the experience to deal with such sanitary crisis, they have reacted extremely rapidly to the situation and demonstrated their great sense of responsibility towards their staff and the communities they serve.

Numerous scientific studies and empirical analysis show that public transport is

much less risk than other public places or private gatherings. Unfortunately, it has been too often stigmatized without any solid arguments. Based on scientific findings and practical experience available today, public transport is taking the appropriate measures to reduce those risks to a level that is manageable and acceptable by users.

Nevertheless, additional efforts should be made to strongly communicate public transport benefits to society and restore citizens' trust.

Chapter 8

LOGISTICS AND MULTIMODALITY

The existence of efficient logistics is one of the requirements for the good development of economic activity. This efficiency resides, in part, in the existence of alternatives for the routing of goods, allowing users to choose between them according to their priorities (costs, quickness, response capacity, etc.). In this sense, the availability of good connections between the different modes of transport is a key element. Logistics platforms, ports and land terminals play an important role in multimodality. Furthermore, transport corridors represent the prioritisation exercise in moving towards an orderly and planned implementation of multimodality within the transport system.

COVID-19 impacted logistics chains by affecting the distribution of goods in certain sectors of activity. In Europe, despite the closure of borders, the importance of transport corridors as a priority route for the supply of essential products was demonstrated. In this context, and in order to improve the current multimodal logistics system, there was talk of increasing the robustness of supply chains, accelerating digitalisation processes, and committing to more sustainable logistics chains, among other issues.

Logistic Platforms Post-COVID: Prospects and Opportunities

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European Logistics Platforms Association)

There are many speculations about the impact of the Coronavirus crisis on economic activity, but in the transport and logistics sector it is increasingly obvious that its effect will go far beyond changes in processes and operations.

Uncertainty prevails and it is difficult to homogenize the varying situations in each country since the measures taken by the respective governments have a major impact on both the mobility of people and goods and the economic situation.

From Europlatforms, a federation of national associations of European-wide logistic platforms across Europe, providing services for over 25 years, we are convinced that the configuration of supply chains cannot be conceived nowadays without logistic platforms, which already play a key role once these logistic chains have evolved into intermodal logistic chains.

Our function is to raise the profile and significance of logistic centers across European institutions to be seen as a primary hub of activities related to transport and logistics. It is a no-brainer: no supply chain, no economic development. Yes, it is that simple. Logistic platforms add value and offer services; they are also spread throughout the European corridors. The European Commission is always talking about European cohesion and Logistic Centers are a good example of this.

With regard to the European Transport Network (TEN-T), logistic platforms are configured as freight generators for European freight corridors, freight integrators across Europe and a point of joining the different European freight corridors.

As it stands, both existing centers and new centers that can be developed have the capacity to respond to the evolving needs of the logistic sector that demands excellent connectivity measures in a quality and reliable infrastructure.

Challenges of the Future...That Are Already at Our Door

Vendor diversification

- Local industry development: The crisis has highlighted the dependence of European industries on Asian markets. As a result, various professionals in the sector have taken a shift in logistic flows for granted, to reduce dependence on third countries - especially on the Asian continent - and on a return to local manufacturing, with a knock-on effect on the local economy, employment, and changes in modes of transport.
- Alternative sourcing, localized production systems based on 3D printing are emerging, which may lead to a drop in dependence on Asian suppliers.
- A review of the role of stocks that could lead to re-evaluating Just in time policies.
- It still appears to be a little early to identify the countries benefiting from this diversification in the supply chain, but what we can say is that those already investing in new infrastructure and offering greater facilities to the installation of the industry

could receive most of the relocations. The recovery of increased industrial activity in Europe is obviously what companies want.

- This hypothetical scenario of de-globalization could have two effects: a change in business strategy and less efficiency with a knock-on effect of higher costs. The cost would inevitably be directed at the final consumer. But it is something that we will have to accept, and which cannot be allowed to spread into global supply chains. Companies may move away from just in time models to adopt safer models. Higher stock levels imply a greater need for ships to store and serve more efficiently.
- These circumstances, together with the increased environmental awareness of consumption habits and the impact of transport on air quality, also appear to have an impact on the enhancement of local trade, diminishing purchasing from third countries.

Sustainable mobility

We should take the guidelines set out in the "Green Deal" into account, that brings us to the concept of Green Logistics, i.e. all efforts to measure and minimize the environmental impact of logistic activity, particularly carbon footprint control. The Green Deal was formalized in December 2019 by the EU and the road map is being considered for the coming years. More specifically the transport sector is being translated into legislative proposals and changes that will accelerate the transition to sustainable and intelligent mobility: the overriding objective is to reduce emissions by 90% by 2050.

These policies also reflect an interest in transferring the volume of road freight transport to rail and inland waterways.

The movement of goods to rail must continue if we are to meet the emission reduction target and export to the European continent under the same conditions as our competitors from the East, who rely on the Chinese railway line, the Silk Route. But to do so, every single player in the rail sector, particularly administrations and public entities with competence in the field, have to change their mindset on one hand, to seek to change the focus from "traction to transport", and on the other hand, to develop a loyal partnership with the road transport companies, the ones that currently move most of the goods in Europe, imports and exports.

In addition, nowadays logistic platforms are already developing active policies for the development of sustainable environmentally friendly mobility by optimizing the transport short haul operations, enhancing the intermodal long-distance rail traffic and integrating urban structure and public passenger transport.

The concept, cooperation between different modes of transport is fundamental to logistic platforms enabling sustainable development for all transport and logistic operators.

Logistic platforms are key within a sustainable transport system because they facilitate the development and cooperation of different modes of transport (rail, road, plane and ship) to reduce transit times, lower cost and increase the volume of goods transported effectively increasing the overall efficiency of transport by promoting large freight traffic corridors.

Urban distribution of goods

The rise of e-commerce and the incorporation of shopping online by new, significant segments of the population has advanced development by up to 5 years. And this is here to stay.

Consumption in urban centres is rising. Logistic operators will have to find the right balance to be efficient in so-called "last mile" to satisfy customers with competitive delivery costs. Reverse logistics, intelligent and robotized warehouses, and segregation of proximity and half-rotation warehouses tied to large, hyperconnected logistic hubs are all coming back.

This growth of e-commerce will boost the demand for new logistic spaces, in two ways: on the one hand, the need for large logistic spaces and storage platforms in locations far from major cities will increase, and on the other, there will be an increased need for high-rotation cross docking last mile vessels located 5, 10, or 15 kilometres away from major cities.

This type of shipping is essential for the development of urban distribution due to its operativity, agility and contribution to the management of cities. In the same vein, we cannot forget the needs arising from reverse logistics. The management of returns is also a challenge arising from the growth of e-commerce and will also require an expansion of logistic surfaces.

The development of urban platforms for distribution, perceived as a network of e-systems to manage the delivery of goods on these urban distribution platforms in city centres, seems unstoppable.

And this will totally transform the scenario of the three types of logistic areas

in big-city environments and the typologies of logistic ships and all types of warehouses: low-rotation, regional, high-rotation, capillary, and urban distribution.

That is why the logistic parks linked to traditional consumption, those linked to e-commerce and now also those linked to this new urban distribution in big cities, will have to change. Warehouses will tend to be multi-valent for low rotation and high rotation, avoiding intermediate processes that increase costs and times by producing a flow between department stores away from city centres because of their low costs, their greater accessibility, etc., and over large surfaces, with urban distribution platforms in the centre of cities.

The introduction of new measures to improve the urban distribution of goods is complex, mainly because of the multiplicity of agents and sectors involved beyond e-commerce. As a result, private public collaboration is revealed as key to develop potential solutions.

Transport and logistic centres, public or private, play an important role in defining this new ecosystem, and we must collaborate to implement these new distribution and transport models. Public administrations should establish new regulations to ensure mobility and sustainability, and promoters of logistics centres should provide the necessary infrastructure. For best results, the work must be done from an integrative perspective.

Logistic centres play a dual role in this context: they are incorporated into urban-metropolitan territorial planning plans and programs because of the

positive externalities generated by the following: by facilitating centralized distribution, reducing the number of vehicles on fleets, and shortening the vehicle route, which eases congestion on urban road networks, and thus mitigates the emission of pollutants and greenhouse gases and also incorporates the real estate industry.

Digital transformation of logistics (BIG DATA)

Digitization involves data exchange between different players in the transport sector to adjust supply and demand in real time, leading to a more efficient use of resources. Digitization can help create a truly multimodal transport system that combines all modes of transport into one well-functioning mobility service.

A prerequisite of BIG DATA is further training that incorporates new skills such as the automation of storage, technique to optimize stock, etc. Training will be the key and across both logistics and transport in the coming years, positions linked to customer satisfaction and customization will be in demand.

Digital transformation will create the need to further professionalize human resources working in logistic business processes, where today there are still a large number of professionals who will have to adapt to this digital environment.

Any company will require professionals with a mixture of skills and knowledge not so easy to find in today's workforce. Logistics and technology are certainly sectors that generate employment, and we must also be prepared for that.

The logistics professional should be characterized as:

- **Multidisciplinary:** Logistics has been divided into compact, highly specialized areas of knowledge with very specific technology, but the future will be marked by a more multi-purpose professional with a knowledge of all areas of the supply chain, able to adapt to different situations that may arise and make the right decisions in complicated times by having a more global view of all the processes.
- **Digital:** He must be able to use different tools, especially management software and process simulators to anticipate various situations that markets bring to the table. Another interesting aspect of the logistic professional will be to discern whether a technology offered to the company is necessary for the organization operationally and also be economically profitable.
- **Flexible:** Able to adapt quickly to the radical changes that supply chains can undergo, and with a strong capacity to make real-time decisions to adjust working procedures in different operating processes under his command.

This Highlights the Need for More Efficient Platforms

Therefore, today more than ever, the developers of these infrastructures must be able to develop platforms that respond to these new demands, to keep ahead of the game.

The infrastructure determines mobility. No fundamental change in transport will be possible if it is not supported by an adequate network, more efficient

and intelligent. Globally, investments in transport infrastructure have a positive impact on economic growth, create wealth and jobs, and increase trade, geographical accessibility, and mobility.

The change must be planned in a way that maximizes the positive impact on economic growth and minimizes the negative impact on the environment. If there is one positive thing we can highlight about this pandemic, it is the visibility given to the transport sector and the awareness of what this sector means for the economy.

Which is why I do not wish to end without expressing my appreciation and thanks to all the professionals in the logistic and transport sectors, who have secured the supply of

goods in general and of medical products and foodstuffs in particular, who have guaranteed supply during this terrible situation caused by the pandemic.

This is a crisis that for sure has both an expiry date and a solution and will undoubtedly not leave us without valuable personal and professional life lessons. I would like to highlight one of those: the perspective of collaborative work.

Logistic platforms are a proactive element of the transport system, working to enable companies to increase their competitiveness.

Logistic platforms are set up and ready to make the most of all evolution and change in the sector on a global level.

Sustainable Supply Chains in Mediterranean: a Concrete Roadmap for the Post-COVID-19 Era

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Introduction

Recent studies on Maritime Space Planning and Blue Economy reveal the importance of shipping to the region's economy, society and environment. These studies, carried out integrating technical, socio-economic and environmental aspects, reveal that maritime transport is the second most important factor of change in the Mediterranean, after coastal and maritime tourism.

The Mediterranean is today considered the iconic place of sustainable mobility in the region, where concrete transport and logistics projects are developed with the aim of connecting Trans-Mediterranean and Trans-European Transport Networks. The latest trends in this maritime framework show the movement towards a model in which the shipping services in the Mediterranean assume a decisive role in the Ro-Ro, Ro-Pax services connecting the Mediterranean maritime terminals, in the service of social and economic structure of the countries.

However, Mediterranean Sea is currently affected by different pressures. Due to its geographic position, wedged between the temperate climate of central Europe and the arid climate of northern Africa, the Mediterranean area seems to be one of the most susceptible to global climate change. Moreover, the increased rates of introduction and spread of marine alien species, due to the Suez Canal sheer magnitude of shipping traffic, represent a supplementary stress factor to Mediterranean marine native biota already challenged by climatic abnormalities. We also highlight a lack of a joint or regional environmental impact assessment process to evaluate the potential effects of ports,

port infrastructure and port components on the delicate balances of the marine environment.

So, it is time to implement an innovative model of sustainable mobility for Mediterranean, aimed at harmonizing, on the one hand, the establishment of effective, high-quality maritime connections, and so reducing the socio-economic imbalances between the Southern and Northern Countries bordering the Sea, which are among some of the causes of migration movements, and, on the other hand, at limiting pollution damages to the sea, taking action on climate change and enhancing cultural exchanges.

To do that, we think that the concept of sustainability should be applied in a more comprehensive, holistic perspective, protecting life below water, navigating to zero emissions, promoting sustainable development of ports in line with the United Nations Sustainability Agenda. Because ports are critical points of connection where cargo is passed between ships, railroads and trucks, improving their sustainability will trickle down to every element of the global supply chain. Likewise, by assessing port sustainability, we can identify which parts of the chain need fixing.

The World Ports Sustainability Program (WPSP), launched in Antwerp on 22nd and 23rd March 2018 by the International Association of Ports and Harbours (IAPH) in partnership with some of the world's major port industry-related organizations, aims to contribute to the sustainable development of world ports in line with the United Nations (UN) Sustainability Agenda and its 17 Sustainable Development Goals (SDGs). The WPSP Portfolio counts 120

projects from 71 ports, covering 38 countries and five continents. The World Ports Sustainability Program has developed a practical framework on how ports can implement each of the 17 UN SDGs in practice. Resilient Infrastructure, Climate and Energy, Community Outreach and Port City Dialogue, Safety and Security and, finally, Governance and Ethics are the main addressed domains. So far, few projects have been delivered from Mediterranean Ports.

In this article we would like to highlight some of the current project to which the Mediterranean Ports should involve themselves to make more efficient the supply chains and contribute to the sustainable growth of the Mediterranean Region, whilst maintaining and rebuilding ecosystems.

Resilient Infrastructure

Resilience is the capacity to anticipate and plan for disruptions, resist loss in operations and/or absorb the impact of disturbances, rapidly recover afterwards, and adapt to short- and long-term stressors, changing conditions and constraints. To successfully operate, the maritime transport system must be resilient. Stressors that affecting it include environmental, human-induced, energy-related, and others. Planning for mitigation to minimize disruptions from these and other potential stressors will serve to streamline operation of the maritime transport. In this regard, we highlight the importance of digital solutions and an integrated approach to enhance its resilience.

Digitalisation is one of the recent main factors driving the traditional port in-

dustry to fully reshape its business and make the industry more efficient and sustainable. The International Port Community System Association (PCS) promotes adoption of a Single Windows to manage port and logistic processes through a single submission of data and to connect transport and supply chains. The digital platforms provide also an intelligent exchange of information between public and private stakeholders, fostering PPP initiatives, co-developing innovation and cutting operational costs.

The Building Information Modelling (BIM), a process for creating and digitally managing information on a construction project across the project lifecycle, also gives the opportunity to leverage business capability regarding lifecycle management of port and infrastructural assets in all phases - from project development, planning, building, operation and maintenance until the fading out of these objects. With the application of BIM since the feasibility studies, ports can allocate its resources more efficiently in the planning and building phases both on construction materials and personnel. Moreover, BIM models help with project control, especially for cost and time dimension. This information can be visualised via the digital twin and/or by mean of immersive experience through virtual and augmented reality, in order to help in the communication process with stakeholders. Once the objects are finished and ready for operational phase, the sensors built into these infrastructures are connected as IoT applications with artificial intelligence resulting in capability on predictive maintenance for better cost-efficiency in operation of infrastructural assets.

As regards Climate Change, a multi-stakeholder coalition so called "Navi-

gate Climate Change" (NaCC) supports the sector encouraging operators and users of maritime infrastructure to face climate change reducing Greenhouse Gases (GHG) and improving preparedness to adapt to the changing climate. To this aim, the World Association for Waterborne Transport Infrastructure appointed in 2015 a Working Group of 20 experts, which provides methodological guidance to support climate change adaptation decision-making in the ports and navigation sector. It is a four-stage methodological framework based on: understanding the context of reference, understanding climate-related impacts, identifying vulnerability and risks, and identifying and implementing measures. The proposed methodology covers a range of day-to-day activities such as the management, operation and maintenance of infrastructure, conservancy, dredging, pilotage and engineering. It is also considering possible climate change implications for the design and construction of new development projects and it reflects on interdependencies such as hinterland connections. The foreseen outcome is a useful, well-structured and practical guidance designed. Templates are available to help in identifying relevant stakeholders, preparing an inventory of climate-vulnerable infrastructure assets and operations, and determining monitoring needs.

Climate and Energy

The reduction of CO₂ and Greenhouse Gases (GHG) from ships is the highest priority in the maritime domain. The initial strategy adopted in 2018 by IMO's Marine Environment Protection Committee (MEPC), envisages a reduction in GHG emissions from international shipping by at least 50% by 2050 compared to 2008. To do that, different initiatives

of IAPH are ongoing, as well as Onshore Power Supply (OPS), port calls optimization, port incentives for energy-efficient vessels and Clean Marine Fuels (CMF).

Onshore Power Supply consists of connecting the ships to the port grid and turn-off ships engines. The solution appears effective to reduce air pollution in ports and GHG emissions from vessels, and it is giving momentum with an increasing number of ports that are adapting the infrastructure to this aim. The port calls optimization implements the Just-In-Time arrival of ships helping the reduction of GHG. A practical guide on this solution was developed by the IMO's Global Industry Alliance. Port incentives award cleaner vessels on the basis of an Environmental Shipping Index (ESI), calculated taking into account the amount of NO_x and SO_x emitted, and also based on the use of onshore power that reduces CO₂ and PM emissions. The Clean Marine Fuels (CMF) Working Group aims to tackle climate change and improve air quality by focusing on safe bunker operations for new fuels as well as Liquefied Gas Natural (LNG).

It is worth to highlight also the Global Maritime Energy Efficiency Partnership (GloMEEP), a joint initiative of IMO-GEF-UNDP, which delivered toolkits for ships and ports to understand the nature of emission and analyze strategies to reduce them. Trainings have been held in ports to instruct participants on how conducting emissions inventories and develop actions in port areas.

Port-Rail Integration

Connectivity to the hinterland is becoming ever more important for ports, which are upgrading their rail connec-

tions to turn them into a competitive differentiator. Port-rail connectivity is a strategic element of port development, both in economic and competitive terms and to reduce negative externalities on people and the environment. Rail connectivity expands the port hinterland, increasing the capture of new value-added freight and services for the port and also promotes growth in capacity, without affecting the port-city relationship, by linking "spatially" fragmented processes without congesting the urban environment surrounding the port.

The European Regulation (EU) No. 913/2010, concerning a European rail network for competitive freight, required Member States to establish international market-oriented Rail Freight Corridors (RFCs) in order to strengthen co-operation between Rail Infrastructure Managers on key aspects such as the allocation of paths, deployment of interoperable systems and infrastructure development, and to promote intermodality between rail and other transport modes by integrating terminals and ports into the corridor management process.

To this aim, a common European web portal was designed to provide a platform for service facility operators such as freight terminals, ports, marshalling yards, etc. to publish information about their facilities complying with the relevant EU regulations and to promote their facilities and services. At the same time, it is meant for shippers, rail undertakings, container terminal operators and other logistics service providers using rail to be a single source of information allowing them to identify relevant facilities for the planning of their services and the optimization of their transport and supply chains.

The above-mentioned freight Regulation provides also for the establishment of two Advisory Groups, namely Terminals and Ports Advisory Group and Railway Undertakings and MTOs Advisory Group. They are meant to act as a sounding board giving the Management Board of the Rail Freight Corridor advice on what actions to take to improve the offer to the customers. Terminal Integrated Capacity Offer is a concrete example of an innovative commercial service that was enabled thanks to a co-operation between Ports and RFCs. It consists in offering a pre-arranged international path including the internal time-slot in the Terminal or Port Terminal, so that the applicant can book a service from ramp to ramp similarly to what is done in road transport. European and Mediterranean Ports joined the product, which is available in RFCs capacity catalogue.

Sustainability KPIs

When we have multiple indicators that collectively represent sustainability, we can see how well ports do with regards to each sustainability goal. Then we can statistically combine these results into a composite index to rank their sustainability holistically. This way, we can use data to accurately compare ports for many different, but concrete, sustainability targets. However, we cannot accurately define, defend, and evaluate sustainability goals without the help of data, and we cannot progress toward goals without making that data public. With a balance between data, metrics, and stakeholders in mind, the path toward sustainability for ports and for other areas becomes a lot clearer.

Among the current tools to evaluate the project sustainability, the Envision

rating system, developed by the Institute for Sustainable Infrastructure (ISI) and the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design, proves to be the most appropriate guidance tool to make informed decisions and provide sustainability metrics that can be applied to all types of infrastructure. The framework provides a flexible system of criteria and performance objectives to aid stakeholders and decision makers and help project teams identify sustainable approaches during planning, design and construction that will continue throughout the project's operations and maintenance and end-of-life phases.

Envision includes 64 sustainability and resilience indicators organized around five categories: Quality of Life, Leadership, Resource Allocation, Natural World, Climate and Resilience. Envision verification is available to all types and sizes of physical infrastructure including airports, bridges, dams, landfills, levees, parks, power generating stations, pipelines, railways, streetcars, stormwater management systems, wastewater treatment plants and other components that make up civil works. The majority of projects that have been verified under Envision have been transportation or water focused, and this specificity encourages to adopt the tool in supply chains assessment, also to provide a common language for collaboration and clear communication between the several involved actors. The interdependency between the credits allows the project team to maximize project benefits and evaluate competing ideas on how to achieve those goals. It also forces the issues of a holistic approach to maximize project sustainability. A qualified, ISI-trained verification team is assigned by ISI to

review project documentation provided by the project team, and confirm it meets the Envision sustainability criteria. In this regard, credibility of a third-party rating system as Envision will increase public confidence and involvement in decision-making.

Projects that complete the verification process and achieve sufficient points earn an Envision award. Award levels are based on the number of applicable Envision points achieved: Verified, Silver, Gold, Platinum. To qualify for an award, a project must achieve a minimum of the total applicable Envision points.

A new Supply Chains Mediterranean Model

The implementation of a new initiative to implement the Mediterranean supply chains could be based on the following concrete actions:

- Carry out an in deep analysis of the Mediterranean context, assessing the conditions conducive to increase intermodal connectivity of the Mediterranean region, introducing a "Inter-Mediterranean" network, in which the supply chains play a relevant role in articulating relations between the different ports and countries.
- Create an innovative maritime service model with a clear definition of the characteristics and quality of the services to be provided, in order to increase the connectivity between the Mediterranean rims not as the sum of individual port connections, but through a system of coherent and synergic maritime services. The choice of the characteristics of the new maritime services and the selec-

tion of the ports could be made with the active role of the MEDport Association, launched in 2016.

- Update the Trans-Mediterranean Network map and focus on the objective of its validation, extending the policies, the financial instruments, the best practices and the operational models applied at European and international level. The validated map should take into account the plans to connect TMN-T with the African Transport Network, Arabian Peninsula and Asia, in order to achieve the vision of an enlarged and harmonized network.
- Analyse the key performance indicators needed to establish a sustainable, efficient, well-organized and frequent maritime service, including the environmental and social dimensions (socio-economic and environmental aspects), the energy issues, transport issues (ship equipment, road and rail intermodality, operations, efficiency of services and port facilities), economy (cost-benefit analysis, demand forecasts), the regional integration and the institutional framework. Sustainable indicators and outcomes of the rating system adopted for the project assessment will allow to select the projects "highly sustainable".

The selected projects could be endorsed by the Union for the Mediterranean for labeling, directly proposed to

the IFIs for a further assessment, or submitted to the European funding mechanisms to move to the next steps of the project lifecycle (feasibility, detailed design, implementation, monitoring).

Conclusions

The analysis carried out highlights the existence of initiatives and working groups at international level, which are studying and developing concrete solutions aimed at introducing the concept of sustainability in maritime transport and at extending innovative processes and techniques to the entire transport supply chains. The Mediterranean institutions responsible for promoting concrete transport projects in the Mediterranean can benefit enormously from the projects already started, triggering a virtuous circle by stimulating potential stakeholders, starting the project concept and monitoring the subsequent stages of project maturation and implementation. Finally, it is essential to find resources at all stages of the project life cycle. To this aim, their active role in promoting projects included in a "system vision" that highlights their interdependence and overall, the long-term framework of the transport networks, can be carried out through the activation of technical workshops with the main International Financial Institutions.

Digitizing Supply Chains: The Gateway for Post-COVID-19 Era

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Introduction

The Chinese government announced the first case of COVID-19 until the epidemic swept through the world in a short period not exceeding days, and most of the countries of the world have successively announced the discovery of cases among its citizens (WTO, 2020b). The majority of countries in the world initially adopted prudential policies at international airports arriving from China. However, precautionary measures at these airports became applied not only to all air travelers but also by all the means of transport to apply a mandatory thermal detection procedure for travelers (World Economic Forum, 2020). Hence prevailed Intra-world movements are a kind of reservation regarding the European Union countries, which also closed their borders Geography among them.

COVID-19 differs from the rest of the epidemics and diseases that have stricken the world throughout history, which are confined spread in a limited geographical range around the world or a specific country, such as the SARS epidemic in China, and the Ebola epidemic in West Africa, Spanish flu, and swine flu, where these diseases and epidemics did not leave the same effect (World Bank, 2020a). Which was caused by the COVID-19 in a short period. China's response came with the authorities imposing a state of high alert to control the epidemic by quarantining the infected and isolate them healthily away from populated areas, and imposed a curfew in Chinese cities and the city Ohan is the source of the epidemic, with a population of about 11 million people. With the gradual spread of the virus, The World Health Organiza-

tion has declared COVID-19 a global pandemic, and countries must confront it strictly by means of: Take measures to limit its spread and take caution (World Bank, 2020b).

Therefore, this article aims at determining two main approaches: First, to highlight the impact of COVID-19 on global supply chains by revealing the circumstances on the global economic growth and the international trade of goods and services. Second, to focus on how digital supply chains can be the most adaptive tool for dealing with several disruptions. Finally, the article concludes with several recommendations and actions to be taken for better risks and disruption mitigation.

The Impact of COVID-19 on Global Supply Chain Spectrum

Global economic growth

Although the Chinese economy has faced a decline by 2% growth rate during the previous two years but it is still playing a pivotal role in the global economy, as the second largest economy after the US economy, and as the largest exporter economy for manufacturing goods and a major trading partner for world countries (World Bank, 2020b). The growth of the global economy witnessed a slowdown even before the emergence of the COVID-19 pandemic due to the challenges it faces and represented in trade tensions between China and the United States of America, and political and political risks, as well about the fluctuating conditions in

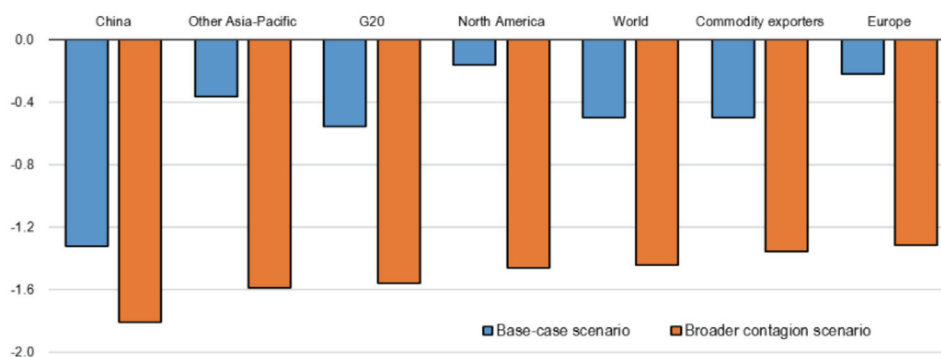
some countries of the world (UN, 2020). Multinational companies had lowered their forecasts on global economic growth before the outbreak of the COVID-19 epidemic. For instance, the International Monetary Fund revised its forecast from 3.3 % to 3.2 % in 2020 following the emergence of Virus (IMF, 2020), while it is currently moving to amend these expectations after the spread of the COVID-19, taking into account its impact on the negative side of global supply and demand, especially after the slowdown in the determinants of global demand represented by the slowdown global consumption and investment (OECD, 2020).

In addition to the movement of international trade that has been paralyzed after countries close their borders, and restrict the movement of goods and individuals. The global economy is in a deeper recession than it witnessed during the global financial crisis in 2008 (WTO, 2020b). In the same context, the World Bank predicted that the global economy will grow by about 2.4 % in 2020, except for the indicated that the uncertainty surrounding the global economy still exists (IMF, 2020). The World Bank (2020a) indicates that these expectations can be modified in line with current conditions and potential threats it is caused by the outbreak of the epidemic, despite international efforts and stimulus packages launched by multinational companies, international organizations and governments and the global central banks. On the other hand, the United Nations (2020) indicated that the global economy in light of the COVID-19 outbreak, it is expected to grow by less than 2 % in 2020 compared to its expectations before the emergence.

The virus, which reached 2.5 % with the possibility that the organization will make further adjustments in light of current uncertainty. Note that companies pointed to some of the existing challenges that could be an obstacle to achieving rates the growth it referred to, including trade and geopolitical conflicts and financial turmoil (ICMA, 2020). In addition, the repercussions of the COVID-19 on the global economy is facing a state of uncertainty, and the lack of access until now to discover vaccines to treat it, so international and regional organizations have tended to review expectations economic growth for 2020, and recently adopting more realistic scenarios to assess the threat of the outbreak of the epidemic on the global economy. Consequently, lowered its global growth forecast to 2.4 % (WTO, 2020a). Figure 1 illustrates coronavirus scenarios highlight the adverse impact on growth. The change in GDP growth in 2020 relative to baseline, percentage points.

Simulated impact of weaker domestic demand, lower commodity and equity prices and higher uncertainty. Base-case scenario with the virus outbreak centered in China; broader contagion scenario with the outbreak spreading significantly in other parts of the Asia-Pacific region, Europe and North America.

According to World Economic Forum (2020) their estimates a decline in global economic growth is attributed to the modification of the US economic growth in 2020 as a result of the outbreak of the virus from 2.3% to 1.9% due to the decline in public and private consumption, And uncertainty about asset prices. In the EU area, a

Figure 1. Coronavirus scenarios highlight the adverse impact on growth

growth rate of 0.8 % is expected instead of 1.2 %, due to lower exports and slowing consumption. The growth rates have also been adjusted the Japanese economy went from negative 0.7 % to -0.2 % in 2020. Growth rates have also been adjusted the Chinese economy went from 6.1% to 4.9%, and there are still other negative risks to the global economy in view of the uncertainty prevailing in the world in this period (World Bank, 2020a).

International Trade of Goods and Services

International trade was paralyzed during the short period of the outbreak of the COVID-19, which in turn affected all from exports and imports, as the World Trade Organization expected a slowdown in the movement of merchandise trade around the world in the short term, as a result of the disruptions caused by the virus's repercussions of conditions of uncertainty and border closures between countries, including countries of the EU. The World Bank (2020) indicates that the global services trade is witnessing a significant slowdown since 2019, as the rate de-

creased its growth from 4.7 % in the first quarter of 2019 to about 2.8 % in the third quarter of 2019. The decline is expected to continue, especially as the outbreak of the COVID-19 has had a negative impact in the short term on a number of important services that represent the basis for the balance of payments of countries such as air transport, and tourism services, which are the main sectors most affected by the outbreak of the virus (WTO, 2020a). For example, a trade scale was recorded passenger air transport services and the merchandise transport services trade scale are 93.5 and 94.3 points, respectively (IMF, 2020).

Where Which recorded losses in EU countries, where the majority of hotel reservations were canceled after the announcement of the virus outbreak the tourism sector in EU incurred heavy losses. The tourist sector is not expected to recover during the remainder of 2020, as the impact may extend until the end of 2021, it may begin to recover, but not at the level it was before the crisis even in If the virus recedes, due to the negative impression about the disease that dominated international tourists (European Central Bank, 2020). In this regard, it

is expected that the ranking of the world's countries will change in the travel and tourism competitiveness index (UNWTO, 2020). China, which ranks No. 13, is estimated at 26.7 points in the index to decline in 2020, as is the case for countries that witness high rates of HIV infection. Especially the countries of the EU and the US as a result of the controls and restrictions, they imposed. Countries that prohibit entry and exit as well as to closing tourist and entertainment areas until notice else (World Economic Forum, 2020). According to the measure of trade in services issued by the WTO (2020b), it is expected the growth rate of global services trade due to the virus continues to be weak, as it is likely to decline further in the coming months.

The Impact of COVID-19 on Digital Supply Chains Deployment

Even in the middle of a pandemic, the good news is that a push to accelerate digital transformation will be rewarded by newfound agility (KPMG, 2020). COVID-19 allowed the rare opportunity for resetting global supply chains. Now is the time to put a relentless focus on the customer centric, data enabled, digital technology that many companies had good intentions to implement prior to COVID-19, but deferred due to fragmented efforts, legacy systems, or other factors (Flynn, 2020). Furthermore, manufacturers have experienced competitive challenges in local markets due to relatively higher labor costs. That has been partly mitigated by investment in automation, digital enablers and advanced technologies.

Additionally, COVID-19 has brought back an emphasis on boosting local manufacturing for critical industries, compounded by growing unemployment and consumer desire to support local business (Carnevale & Hatak, 2020). The pandemic disruption to trade caught many off-guard, causing disruption in the supply chain. Global lockdowns brought fragile domestic, regional, and global supply chains to a grinding halt. The initial outbreak underscored how much of the global economy relies on China. Along with increased international trade and interconnected supply chains came hyper-efficient, just-in-time supply models. As COVID-19 hit, few companies had redundancy in their supply chains to weather a disruption of more than a few weeks (KPMG, 2020). There are trade-offs with any business strategy such as: there are embedded costs to carry extra inventory, to invest in back-up supply chains, or to manufacture closer to the customer base.

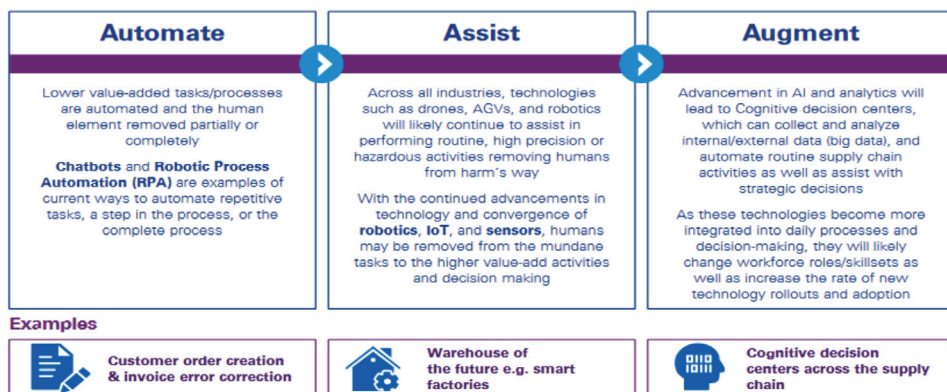
Many supply chain strategies have been changed from efficiency and low-cost country sourcing, to focus more on supply chain resilience and visibility that can reduce complexity and uncertainty across the supply chain network. The supply chain resilience against unpredictable, dramatic events require strong business models enabled by a robust digital backbone and processes that can pivot rapidly (Flynn, 2020). Thus, it is mandatory now to highlight the broad steps that can help businesses enhance their supply chains, regardless of their digital maturity and transformation journey.

Consumers expect a personalized experience such as product recommendations and communications are

willing. Global companies are moving away from traditional sales reps going door-to-door and using digital sales-force automation (Flynn, 2020). A survey by Carnevale & Hatak (2020) found that almost 40% of respondents in EU increased online shopping in early April, higher than during the worst days of the crisis, and three-quarters of them said they planned to keep up the habit in the future. This aligns all functional areas within the supply chain to be integrated. This in-

tegration allows real-time visibility to make better decisions and can reduce operational cost. The broad emergence of stay-at-home orders further pushed the digital trend as millions suddenly found themselves working remotely, using digital systems to collaborate and support their work, while millions of others were home-schooled using online learning technologies. Figure 2 presents how digital transformation in Supply chain can be implemented.

Figure 2. Implementation of Digital transformation in Supply chain

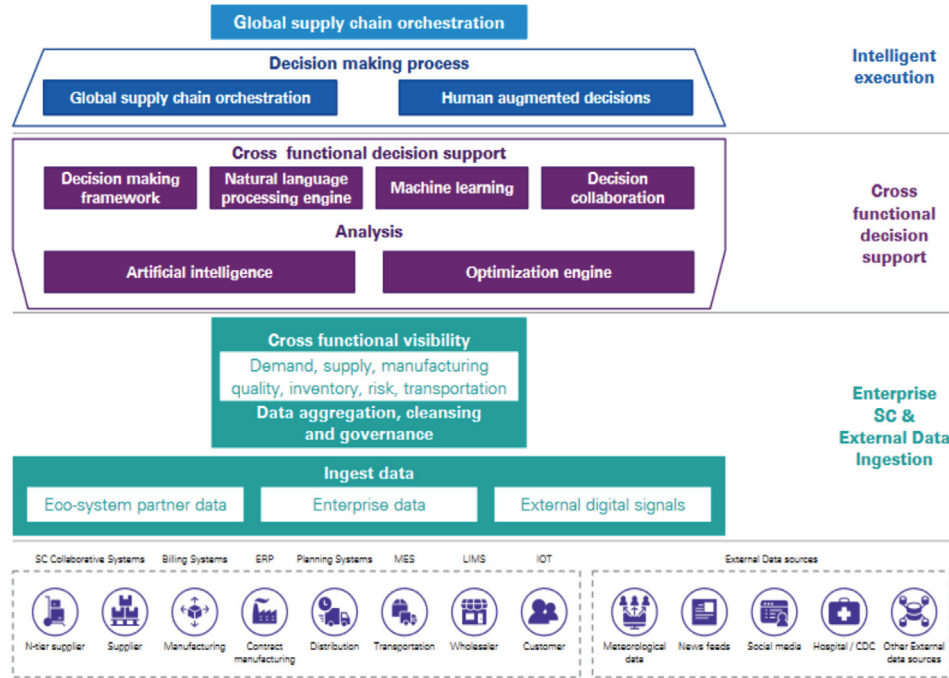


Conclusions

Every company is at a different stage in its digital evolution. Some are successfully executing pilots or launching new business models and an equal or greater number perplexed as to where to even begin. The digital transformation journey objective is: to improve performance, create value, and enhance the customer experience. Therefore, some supply chains of many companies the EU had transformation efforts toward the new normal sets in and businesses turn their attention to the mid-and long-term priorities to drive sustained growth and prepare for future challenges. Figure 3 presents the recommended

model for how digital supply chain in Post-COVID-19 Era. Thus, companies should focus on value. They have to use a variety of tools and methodologies to target and realize benefits and opportunities for ROI that can offset the costs incurred in transforming supply chains. Companies can create a transformation roadmap by mapping critical activities and determining potential areas for failure /disruption, and conduct scenario analysis to develop future contingency plans that build resilience. Many companies have developed a sophisticated, purpose-built digital analytics platform that can leverage to pinpoint opportunities and cost-drivers faster and more effectively than before.

Figure 3. Digital Supply chain Model in Post COVID-19 Era



COVID-19 has forced us to accelerate and re-assess our digital transformation plans. By leverage new technologies and the power of the Cloud to ensure our systems are agile, secure, robust and scalable. Therefore, the are six stages are recommended to be applies for effective digital supply chains as stated by KPMG (2020):

1. Understand the cost of complexity versus the value of variety. While there is value in meeting growing customer demand for choice, offering too wide a range of the wrong products and services is often not profitable.
2. Leverage data to improve core competencies. The business intelligence is served by dozens of different data streams, but are you able to leverage the data in a meaningful way to improve existing capabilities?
3. Lead with performance, not technology. Forget the hype surrounding the latest technological trends and focus on their present capabilities and the needs of the customers they serve.
4. Upskill the workforce. Whatever the technological maturity of the business, the success of the future supply chain strategy depends on the people.
5. Embrace new partnerships. In the future, no single organization is likely to have the full suite of digital capabilities under one roof.
6. Without the specific focus of these steps, the supply chain digital roadmap risks becoming just a collation of good ideas – a bottom-up brainstorm churned into a project plan with little thought given to overall return on investment.

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Key Features and Challenges for the Mediterranean Corridor

Iveta Radicova

Coordinator of the Mediterranean
Corridor, one of the nine TEN-T core
network corridors

This article is the result of an interview conducted by CETMO with Ms. Iveta Radicova in early December 2020. Ms. Radicova is the Coordinator of the Mediterranean Corridor, one of the nine core network corridors that make up the Trans-European Transport Network (TEN-T). The objective is to know the role of transport corridors, and more specifically the Mediterranean Corridor, during disruptions such as that experienced during COVID-19, the key elements for their effective operation and the challenges they will face in the medium and long term.

The Mediterranean Corridor: Main Figures and Coordination Tasks

First of all, Ms Radicova describes the Mediterranean Corridor and its importance for the territory.

“The Mediterranean Corridor is the main east-west axis in the TEN-T network south of the Alps. In political terms, it constitutes a basis for an interoperable transport link between countries of Western Europe and countries of Central Europe. It also equips the Iberian Peninsula with a better transport connectivity in the wider Mediterranean basin.

The Corridor runs between the most south-west regions of Spain, following the Mediterranean coastlines of Spain and France, crossing the Alps towards the east through Italy, Slovenia and Croatia, continuing through Hungary up to its eastern border with Ukraine. With 18% of the EU’s population, the Mediterranean Corridor regions generate around 17% of the EU’s GDP. It is a tremendous contribution.

It is one of the most interconnected Corridors in Europe, crossed by 7 other Core Network Corridors. It features in total 70 core nodes, including 12 highly competitive and global sea ports, situated along the Mediterranean coastline.

In pre-Covid times, it was a Corridor characterized by strong cross-border exchange flows, especially between Spain and France (48 million tons) and France and Italy (44 million tons) with the average annual projection of further growth at levels above 2%.

The ports of the Mediterranean Core Network Corridor (CNC) handled 490 million tonnes of cargo in 2018 (around 12% of all cargo transiting through EU ports), of which roughly 80 million tonnes are transshipment traffic. Hence, around 80%, or 400 million tonnes of cargo are actually moving between the ports and the corridor, making it the third-most important CNC in terms of maritime traffic.

Port traffic is dynamic, especially for containers. The growth observed between 2010 and 2017 in the ports of the Mediterranean Corridor is higher than the average growth in the North Sea ports over the same period.

It is also a Corridor with significant potential for further boosting of international passenger traffic. It carried 81 million passengers on international rail routes crossing six countries of the Corridor in 2015 with the main flows between major urban nodes of Spain and France and France and Italy.

Finally, large parts of the Corridor traverse environmentally sensitive areas (the Alps) and touristic zones (the coastline). This Corridor has a high po-

tential to shift from road/air to rail both for freight and passengers, utilizing better the high-speed network between dynamic urban zones and conventional/regional rail lines for the transport of goods and passengers.”

The Mediterranean Corridor and the rest of the TEN-T corridors were established in 2014. That year, the EU transport policies also underwent an important adaptation, as explained by the Mediterranean Corridor Coordinator hereafter.

“The EU transport infrastructure policy has evolved in the last several years. At the beginning of 2000, the whole of EU transport investment was limited to cross-border issues in the context of bilateral cooperation between Member States.

Transport infrastructure policy had a very limited link with horizontal issues of sustainability, decarbonisation, innovation, congestion or modal shift. It merely focused on a group of selected projects.

2014 marked the beginning of a new era in European infrastructure policy. Nine Core Network Corridors were established, a robust governance system headed by European Coordinators was created and a solid financial scheme for investments in infrastructure was set up thanks to Connecting Europe Facility (CEF).

Since that moment, the adoption of the new Regulation on the trans-European transport network, combining individual cross-border projects into real multimodal corridors, with horizontal topics of sustainability, modal shift, intelligent transport systems, and a clear EU investment planning through CEF

and the other instruments that the EU disposes off, we can think of a truly European infrastructure policy.”

Ms. Radicova is proud to be appointed as Coordinator of the Mediterranean Corridor. In the exercise of this position, she performs a double political and analytical function.

“I was very pleased when the European Commission proposed me to become one of the European Coordinators for the TEN-T network. This was an opportunity to join a team of distinguished personalities, who commit themselves to help enhancing Europe’s transport system.” “Given my past political experience, I exchange with Ministers, regional governments, infrastructural managers and European citizens on the common planning of transport infrastructure. Infrastructure that is interoperable, that invests in removing bottlenecks, that focuses on cross-border dimension and addresses adequate attention to the most environmentally modes of transport such as railways, Motorways of the Sea and inland waterways. In my interaction with involved stakeholders, I constantly appeal for stable and logic programming of actions that lead to a full completion of the Corridor.

On the analytical side, I prepare Corridor Work plans. They consist of a detailed overview of the state of compliance of the Corridor infrastructure with the TEN-T requirements. The ambition is to show good examples of progress achieved, to inform about the state of modernisation with regard to key standards agreed by the TEN-T Regulation, to point out to challenges and weak points that still have to be addressed, if we want to achieve full compliance of the network along the MED Corridor by 2030.

My team also analyses the socio-economic situation of the Corridor and its transport flows through a dedicated transport market study. I make sure that there is a clear plan of the investment needed on the Corridor for all modes to reach the EU targets of 2030."

The COVID-19 and Transport Corridors

COVID-19 has had a high impact on the transport sector, but it has also allowed to draw lessons on the TEN-T as the backbone of transport. This is the vision expressed by the coordinator of the Mediterranean corridor.

"We know only part of the pandemic's dramatic effects on people and economies so far. The transport sector continued to be heavily impacted by the containment measures in Europe and worldwide.

The European Commission reacted quickly to the evolving pandemic situation. The concept of "Green Lanes" was established in the first weeks of the crisis in order to implement uniform border management measures to ensure the availability of goods and essential services.

What is important from my point of view is that the common practice set up at all the relevant internal-crossing points used the trans-European transport network (TEN-T) as a reference.

The Covid crisis proved the utility and resilience of the transport corridors in Europe built around the TEN-T concept. At the same time, it demonstrated further, a need and added-value for investing in truly inter-

operable and borderless transport infrastructure based on common transport standards and formalities.

The current crisis corroborated a crucial role TEN-T corridors can play for the effectiveness and functionality of the overall transport infrastructure in Europe. It is obvious that we need to further invest in cross-border solutions, remove bottlenecks that remain in national sections of transport grid, we need to further invest in digital solutions and intelligent transport systems and measure that decarbonise transport."

Advancing in Multi-Modality and Interoperability of the Mediterranean Corridor

The improvement of cross-border connections was already a priority before COVID-19, especially with regard to multimodality and interoperability, basic characteristics of the TEN-T core network corridors. For this reason, Ms. Radicova wanted to emphasize some actions that will be carried out in cross-border sections to improve connectivity between modes, contributing to the efficient operation of the corridor in the medium and long term.

"The Mediterranean Corridor is about 3000 km long. We must prioritize investments and make sure that they are not fragmented. Continuity and multi-modal logic of highest standards are the key words applying to the Corridor. We need to resolve major bottlenecks that exist among various modes of transport. The most important is the completion of key missing links, notably the cross-border sections. The

three sections come to mind – Lyon Turin Base Tunnel, high-speed line linking Barcelona with Montpellier, connections between Trieste-Ljubljana-Zagreb-Budapest up to the border with Ukraine.

The Lyon Turin project is the key section on which the optimal functioning of the whole Corridor hinges. This is the major link connecting the Iberian Mediterranean coast with Italy and South-East Europe. Without the modern base tunnel and high capacity access routes, the traffic flow across the Alpine border remains confined to road transport affecting this environmentally sensitive area. They will also be deviated to other routes (such as Ventimiglia) causing unnecessary congestion and creating additional costs.

The upgrade of Trieste/Aurisina and Divača requires an upgrade to meet TEN-T standards. I hope for a conclusion of this section on the Italian side by 2026. The same applies to cross-border section between Slovenia and Croatia.”

In addition to cross-border sections, surroundings of large cities can also pose a problem to be solved, due to the concentration of flows.

“The Corridor features dynamic urban nodes – they suffer from lack of capacity and have congested ring roads. For example, regional rail passenger traffic has grown by 23% in Lyon between 2012 and 2017. High growth of such traffic is also observed around Barcelona, Milan, Budapest and other main cities. This particular phenomenon creates an increasing pressure on infrastructure in urban nodes, creating conflicts between freight, passenger long-distance and regional trains.”

The introduction of interoperable railway standards represents the main element to be solved in the Mediterranean corridor to improve the connection of both sides of the Pyrenees.

“If I look specifically at the Iberian Peninsula most ongoing and planned investments aim at upgrade to UIC gauge by either modernising the existing lines or constructing parallel new platforms in the most congested sections.

The usage level of cross-border tunnel Le Perthus has not reached expected levels yet mainly due to the lack of connectivity in UIC gauge to traffic generators and lack of interoperability (different voltage and signalling systems, limited number of adapted locomotives). Both the extension of the UIC gauge to the south to Algeciras, currently ongoing investment along the coastline of various sections, and the construction of the missing link between Montpellier and the end of the Le Perthus section are very important to realise the potential of the tunnel.

In this context notable progress can be observed in sections between Barcelona-Valencia-Alicante.

- The second platform between Castellón and Valencia is under planning to increase the line capacity. The two future UIC tracks, currently under informative studies, will cover high-speed services, releasing additional capacity for freight traffic on the existing tracks.
- The Vandellos rail bypass, which solved the bottleneck caused by the single-track section between Vandellos and Tarragona, is in operation since the beginning of 2020. It re-

duced the travel time between two major urban nodes of Valencia and Barcelona.

- Between Tarragona and Barcelona the works are ongoing with regard to installation of a third rail in the existing conventional tracks.
- The line between Granada and Almería will be electrified and upgraded to UIC gauge by 2025.
- Regarding the Antequera-Algeciras line, preparatory works started with the drafting of the engineering project for the construction of the two electric supply substations required for the electrification of the line.
- Finally, the new infrastructure is almost finished for the connection of Murcia with the high-speed network."

Different actions planned in the Mediterranean Corridor and supported by CEF aim at having competitive travel options available to users.

"The Mediterranean Corridor has been successful in securing CEF funds, especially if we take into consideration quite significant oversubscription rate.

Between 2014 and 2018, 147 actions were co-financed by the Connecting Europe Facility (CEF), which translates to €2.9 billion in CEF funding for a total investment of €6.3 billion. The largest share of funding remains allocated to rail (54 Actions, €2.4 billion, i.e. 83%) followed by projects aiming at making road transport cleaner and safer (49 Actions, €163 million) and maritime projects (33 Actions, 248 million).

By implementing the TEN-T policy, our aim is to create a viable and competi-

tive transport infrastructure, offering competitive solutions across selected modes of transport. Only then, it is a decision of market players what offer to take, what preferred option for travel to take."

Next Challenges of the Mediterranean Corridor

Beyond final impacts of COVID-19 on transport sector, there are some challenges that transport policies cannot ignore to guarantee the resilience of the sector in future scenarios, with climate neutrality being the most important of them, as pointed out by the coordinator of the Mediterranean Corridor.

"A serious commitment to EU's climate neutrality means achieving 90% reduction in transport emissions by 2050. I strongly believe that the TEN-T policy is a beneficial instrument allowing for a gradual achievement of the climate goal.

The European Green Deal and resulting from it and soon to be adopted the EU strategy for sustainable and smart mobility (9 December 2020) pave the way for future orientations of EU transport investment policy. Greater focus on transport decarbonisation, digitalisation, innovation, multimodality and the necessary shift from roads to other more environmentally modes of transport is emphasised.

Unavoidably, the Corridor Work Plan will follow the strategic objectives of the European Commission. They are numerous:

- *We need to decarbonise transport.*
- *We have to increase rail's share in transporting people and goods.*

- *We need to invest in transport solutions that are innovative, energy efficient and safe.*

Ms. Radicova also indicated other challenges that should be faced in the near future, such as the confluence of traffic in urban areas and administrative and operational barriers.

"In addition, it became quite apparent that the rail in main urban areas faces serious bottlenecks, which hampers development and efficient co-existence of local, regional and international traffic. Particular attention needs to be paid to urban nodes which form the crossing points with other core network Corridors, in order to allow a seamless flow of high-speed passengers and freight flows. This concerns first the major nodes like Valencia, Madrid, Barcelona Lyon, Milan, Verona, Venice and Budapest.

A separate issue is the existence of the operational and administrative barriers that can have a negative impact on the profitability of the investment and on the efficiency of the whole Corridor. The existing limitations to train length, the limited loading gauge, various speed standards, ERTMS deployment, standardised length of the tracks in rail-road terminals are the most press-

ing issues that should be addressed in the future."

Finally, Ms. Radicova reflected on the importance of incorporating technological advances into the operation of the corridor, as shown by some projects already funded by CEF.

"Beyond the realisation of the geographical components of the Mediterranean Corridor by 2030, I believe that we must also make sure that we "go with the time" and leverage the technical and technological advances that are within reach today. Alternative fuels, intelligent transport systems, single windows, better multimodal connections should become a trademark of the Mediterranean Corridor. Many projects going into these directions are already being financed by the Connecting Europe Facility, a EU transport budget dedicated to a full implementation of core and comprehensive transport network.

CEF features many projects that deploy alternative fuels' infrastructure, implement digital solutions across four modes of transport, and innovate on ITS in urban nodes. We can be sure this focus will not be lost in the next EU financial perspective."

CONCLUSIONS

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry, no matter how small, should be recorded to ensure the integrity of the financial data. This includes not only sales and purchases but also expenses, transfers, and adjustments. The document provides a detailed list of items that should be tracked, such as inventory levels, accounts payable, and accounts receivable. It also outlines the proper procedures for recording these transactions, including the use of double-entry bookkeeping and the importance of regular reconciliations.

The second part of the document focuses on the analysis of the recorded data. It explains how to calculate key financial ratios and metrics, such as the gross profit margin, net profit margin, and current ratio. These calculations are essential for understanding the company's financial performance and identifying areas for improvement. The document also discusses the importance of comparing the company's performance to industry benchmarks and providing a clear explanation of any significant variances.

The final part of the document provides a summary of the findings and offers recommendations for future actions. It stresses the need for ongoing monitoring and reporting to ensure that the company remains financially sound and compliant with all applicable regulations. The document concludes by reiterating the importance of transparency and accuracy in financial reporting and encourages the company to continue to strive for excellence in all aspects of its operations.

CONCLUSIONS.

The COVID-19, a Follow-On in the Evolution of Transport and Logistics

Centre for Transportation Studies for the
Western Mediterranean (CETMO)

Background

The World Health Organisation (WHO) declared the COVID-19 a pandemic on 11 March 2020. Its impact on economic and social activity was evident from the beginning. The COVID-19 caused a global contraction of 3.5% of real GDP by 2020 according to World Bank data. The drop of real GDP in the Middle East and North Africa (MENA) and the European Union (EU) regions was estimated at 3.9% and 6.6% respectively, marked by the decline in the second quarter of 2020, with 6.6% and 14.6% respectively.

Affected by mobility restrictions, the transport and logistics sector has been deeply hit by the impact of the health crisis. Despite the contribution of different modes of transport to ensure the distribution of essential goods, such as food and medical supplies, the decline in activity was a fact. More specifically, the International Road Transport Union (IRU) estimates that, compared to 2019, 2020 has witnessed a 18% drop (USD 679 billion) in the global road freight transport. Regarding rail transport, the UIC estimated passenger volumes decreased approximately 80% for all national rail services and almost 100% for international rail passenger services during lockdowns. However, for freight operations, the volumes were hit with an average estimated loss of between 10 -15% for most operators. With regard to maritime transport, UNCTAD estimated global merchandise trade to drop of 20% in 2020, influenced by the contraction of 27% in the second quarter. Finally, referring to global air transport, ICA and ICAO estimated that international passenger traffic fell by 74% (a reduction of 1,376 million passengers) in 2020 compared to 2019, equivalent

to \$250 billion loss of gross operating revenues of airlines. Domestic passenger traffic, dropped by 50% (a reduction of 1,323 million passengers) in 2020, representing a \$120 billion loss of gross operating revenues of airlines.

Although the quantification of the impact of the pandemic is clearly reflected by statistics, home confinements of population, closure of borders, interruption of value chains, definition of priority freight corridors for essential goods and cancellation of flights and cruises showed the magnitude of the impact during the early stages of the COVID-19 crisis. With this perspective, CETMO and IEMed decided to contact experts on transport and logistics to open a reflection through short articles on how the pandemic could affect the future of the sector. It resulted in the present initiative **“Mediterranean transport and logistics in a post-COVID 19 era: prospects and opportunities”**.

Articles drafted by experts from different parts of the Mediterranean and international institutions have served to exchange views on sector trends and the future of different modes of transport in the region, achieving a **socialisation of knowledge and challenges focused on the Mediterranean reality**.

COVID-19, a trend accelerator

The COVID-19 has accelerated the development of regional and global trends that were already manifesting before the onset of the pandemic, allowing us to frame the conclusions of the initiative. It mainly concerns the increase in reshoring and nearshoring processes, the fourth industrial revolution and increasing resilience in value chains.

The first trend is the **increase in reshoring and nearshoring processes**. The trend of relocation of some companies from developed countries in search of cheap workforce, occurring since the 1980s, has been losing support in recent times as a result of trade wars between countries, the growing awareness of value chains' high dependence on countries such as China, the financial crisis that began in 2008, and the emergence of regional or global disruptions jeopardizing the proper functioning of global value chains. Under these premises, the processes of reshoring (relocation of production to the country of origin) and nearshoring (outsourcing production to countries close to the origin) have been increasing in recent years, facilitating control of production, reducing transportation costs, and gaining agility in the face of disruptions on value chains. The COVID-19 crisis has been an example of disruption, interrupting and unbalancing the functioning of global value chains, which has led to look for closer alternatives, theoretically less fragile.

These nearshoring processes are of special interest in the Mediterranean region, as they strengthen trade relations between territories of the region and encourage the improvement of connectivity between both shores, promoting regional integration. In addition, there is also the impact on the country hosting relocated companies, contributing to its development. But in a long-term view, a good business environment and efficient logistics should be provided in order to attract and retain potential companies.

Secondly, **the fourth industrial revolution**. Although popularly referred to as digitalisation, the fourth industrial revolution is based on the integration

and mutual leverage of existing technologies to gain in productivity and transparency, as well as to improve products with digital capabilities and asset management, among others. It is based on key enabling technologies, which can be adopted and improved progressively, given their scalability. The transport and logistics sector can take advantage of the experience of other sectors to selectively adopt these new technologies and achieve substantial benefits, without the risks that past technological changes transmitted. The need to resume work and economic activity after the first wave of the pandemic, guaranteeing the safety of the population, helped to visualize the high potential for the application and development of these technologies in the different sectors of activity.

The technologies of the fourth industrial revolution with a potential impact on transport and logistics notably include artificial intelligence leveraging Big Data Analysis, robotics and automation, the Internet of Things (IoT), autonomous vehicles and drones, augmented and virtual reality, industrial 3D printing, digital platforms and blockchain, among others. For example, an increased connectivity and visibility of value chain can be achieved through a combination of IoT, cloud computing and artificial intelligence.

The latest trend is to **increase the resilience of value chains**. The COVID-19 has had a high impact on global value chains. The temporary closure of production centres and the interruption of sea, land and air transport services not associated with basic necessities disrupted the operation of value chains. Different speeds of recovery around the world and changes in consumption patterns related to e-

commerce and inventory-building in anticipation of new waves of the pandemic contributed to increase trade flows. But this unexpected growth has also involved changes in the operation of value chains with respect to the pre-pandemic period such as the increase of container freight prices. This disruption due to the COVID-19 and subsequent alterations have made the concept of resilience gain prominence.

This resilience is linked to **sustainability**. Climate change and its effects will have a major impact on the resilience of value chains. Sustainability was the main challenge for transport and logistics sector before the health crisis, in line with the Sustainable Development Goals and the Paris Climate Agreement. The COVID-19 crisis is a wake-up call to redouble institutions' efforts and commitment. In this sense, the European Commission, in the framework of the European Green Deal and in accordance with the EU Climate Law of 14 July 2021, aims to reduce its net emissions of greenhouse gases by at least by 55% compared to 1990 levels. Transport plays a relevant role in this reduction.

Commitment to an optimised transport connectivity

The above trends offer a framework that, crossed with the reflections of the different experts participating in this initiative, allows us to visualize some key ideas for the transport and logistics sector in a medium and long term scenario.

It's about taking advantage of the *momentum* and betting on the region. The impact of the COVID-19 has led to envisage a scenario of change and accel-

eration of trends such as the fourth industrial revolution and sustainability. It is necessary to believe in its potential and, first and foremost, **invest in its transport infrastructure** to eliminate bottlenecks, especially on the southern shore, which hinder Mediterranean connectivity, and to foster the development of Africa-Europe value chains. It will be of great help in consolidating nearshoring processes and increasing the resilience of value chains. Following the example of the Trans-European Transport Network (TEN-T) of the European Union and its priority corridors, the exercise of planning and identification of infrastructures on the southern shore is already done, either by the GTMO 5+5 Multimodal Network of Transport Infrastructure (approved and focused on the Maghreb countries) with its trans-Maghreb corridor at the forefront or by the Trans-Mediterranean Transport Network (TMN-T) (pending approval and focused on the southern shore of the Mediterranean). What remains to be done is a firm commitment to its implementation and funding.

A second conclusion is the visualisation of **ports as key elements of this regional network**. They are the main gateway for goods in and out of the region, but they are also the main mode of connection between the territories of the region. Therefore, it is necessary to encourage the development of efficient intraregional maritime connections that contribute to strengthening intraregional trade flows, fostering motorways of the sea. But in addition, it is necessary to look inland and ensure good connection with their port community, promoting multimodality. They are key points to encourage nearshoring. Ports are the meeting point of land transport and maritime transport.

In addition to the physical connectivity, **digital connectivity and tools** related to the fourth industrial revolution have gained prominence. They have come to stay. The health crisis and the corresponding protection measures adopted have highlighted how the application of certain technologies can contribute to the safety, reliability, robustness, transparency and sustainability of value chains and transport networks. So, their resilience will also improve. This includes the use of technologies such as IoT or AI, the dematerialisation of transport documents, cooperation, and trust between actors, among others. Applicable to different modes of transport, the adoption of interoperable technological solutions throughout the territory is an added value for the integration and efficient operation of transport networks.

The **harmonisation** of regulations also applies to all modes of transport, both for the transport of passengers and goods. It is the main tool for facilitating transport, guaranteeing a smooth operation of the transport network and benefiting resilience of value chains, but also a tool for upgrading transport systems. Harmonization has been a recurring theme since the beginning of regional transport cooperation, led by UNECE and subsequently reinforced with technical assistance projects launched by the EC. The adoption of international conventions in the field of transport represents the first step towards a homogeneous operation based on the use of specific standards. Without harmonisation, one could not speak of liberalisation of air transport or efficient road cross-border transport.

The last of the conclusions to highlight is the role of **decarbonisation of transport** to achieve a sustainable transport

network. Despite the negative impact of COVID-19, the pandemic offered the opportunity to visualise what it would be like to live in a more peaceful environment, with fewer GHG emissions and less noise pollution. This image represents an additional motivation for the sector's commitment to the future of the planet. In this sense, sustainability is one of the requirements in the post-COVID-19 economic recovery and in the case of transport, it translates into the commitment to less polluting means of transport such as rail, support for multimodality to optimise transport routes and encourage collaboration between modes, the promotion of urban transport as the backbone of a more sustainable urban mobility... But sustainability in transport should also be associated with the transition to more sustainable and low-carbon energy systems, working to obtain a green energy network that supports the transport network.

Concluding thoughts

In short, the vision of the transport and logistics sector in the Western Mediterranean in a post-COVID-19 era refers to an **optimised transport connectivity**, with ports as the backbone of the multimodal transport network, thanks to its contribution to the economic development. A network that reinforces links between different modes of transport and connectivity among territories of the region, especially between the two shores of the Mediterranean. In addition, thanks to this connectivity and the processes of harmonisation, it favours regional integration. Finally, the use of digital tools and technologies contributes to optimisation and sustainability of the network and to the coordination and cooperation between their actors.

The initiative “Mediterranean transport and logistics in a post-COVID-19 era: prospects and opportunities” aimed to **build region** developing a collective knowledge from contributions of international institutions and experts from the region.

This process of research, reflection and socialisation has highlighted the situation of transformation that is experiencing the transport and logistics sector, accelerated by the COVID-19.

This transformation is still alive and that will need to be followed closely to take advantage of the opportunities that may arise to build a **more sustainable, safe, accessible and connected transport system.**

In the meantime, we must take the opportunity to continue working together, generating and sharing knowledge, establishing dialogues on the priorities of the region and identifying common visions and strategies.

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