

# The Trans-Maghreb Multimodal Corridor From Transport Corridor to Trade Corridor





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## The Trans-Maghreb Multimodal Corridor. From Transport Corridor to Trade Corridor

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Edited by CETMO

Second Edition: November 2025

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# 1. FOREWORD

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The development of multimodal corridors has emerged as a cornerstone strategy for promoting regional economic integration, enhancing trade facilitation, and fostering sustainable economic growth across the globe. This is particularly relevant for regions with significant unrealized potential for intra-regional trade and economic cooperation, such as the Maghreb. The Trans-Maghreb Multimodal Corridor (TMC), connecting Mauritania, Morocco, Algeria, Tunisia, and Libya, represents an infrastructure initiative of strategic importance that holds transformative potential for North Africa's economic landscape and its connections with neighboring regions.

## 1.1. The Strategic Importance of Multimodal Transport Corridors

Multimodal corridors serve as the backbone of modern economic development strategies, facilitating the efficient movement of goods and people across borders while creating opportunities for value chain integration and industrial development along their routes. According to the World Bank's Transport Global Practice research, well-functioning transport corridors can reduce trade costs by up to 15% and increase trade volumes in developing regions, creating substantial economic benefits through improved market access, enhanced regional integration, and job creation in transportation and logistics sectors.

The African Development Bank's Infrastructure Development Index highlights transport infrastructure as a critical component of regional competitiveness, noting that African countries with better transport connectivity demonstrate stronger economic performance. Their analysis emphasizes transport corridors' role in addressing the infrastructure deficit that has historically limited Africa's competitiveness (AfDB, 2020).

The International Transport Forum's Transport Outlook 2023 reinforces this perspective, noting that "multimodal corridors represent not merely transportation infrastructure but comprehensive development axes that can transform economic geography and create new patterns of production, trade, and urban development" (ITF, 2023).

The United Nations Economic Commission for Africa has emphasized through its Regional Integration Assessment framework that transport corridors represent a particularly valuable approach for land-linked (rather than landlocked) countries in Africa, enabling the continent to overcome limited and outdated infrastructure that primarily connects resource extraction points to ports rather than facilitating intra-regional connectivity. Their analysis indicates how multimodal corridors help convert geographical constraints into development opportunities by creating economic density and agglomeration effects along their routes (UNECA, 2020).

## 1.2. The Trans-Maghreb Multimodal Corridor (TMC) in Context

Against this backdrop of analysis on the economic significance of transport corridors, the Trans-Maghreb Multimodal Corridor assumes particular importance. The Maghreb region, despite its geographical proximity to European markets, historical and cultural ties, and complementary economic structures, has remained one of the least economically integrated regions in the world. Intra-Maghreb trade accounts for less than 5% of the region's total trade volume, a figure significantly below the potential suggested by economic complementarity analyses.

The African Development Bank's infrastructure assessments identify this integration deficit as a major obstacle to the region's development, estimating that enhanced regional integration could increase GDP growth across Maghreb countries up to 1-2% annually (AfDB, 2020).

This limitation is in good part generated by the low level of economic complementarity between Maghreb economies, as detailed in Chapter 7 of this study. The Trade Complementarity Index (TCI) analysis reveals that while there are specific bilateral relationships with moderate complementarity (such as between Morocco and Tunisia), overall intra-Maghreb trade potential is constrained by similarities in export profiles, particularly the dominance of hydrocarbon exports in Algeria and Libya. This structural challenge suggests that the TMC's impact on intra-regional trade may be limited without concurrent efforts to diversify national economies and develop new areas of complementarity.

Additionally, the ongoing political tensions between Algeria and Morocco results in a discontinuity of the TMC. The mistrust between Algeria and Morocco goes back nearly six decades, and the failure to open borders has shaved according to the geopolitical think tank CIDOB at least 2 percentage points of growth across the region, as curtails a potential connection of the TMC as a whole with a future Trans Saharan corridor.

Morocco has been particularly able to develop its portion of the TMC infrastructure, and Algeria is catching up. Morocco has recognized the importance of its section of the TMC to vertebrate its national economy, better linking it to the EU, and the potential advantage of positioning itself as a gateway between Europe and Africa.

The development of the Tanger Med port complex represents a cornerstone of this vision, transforming it into the largest container port in Africa and the Mediterranean, with a capacity of 9 million TEUs (twenty-foot equivalent units) as of 2022 (Tanger Med Port Authority, 2023). This has been complemented by significant investments in connecting infrastructure, creating an integrated transport system that has successfully attracted major manufacturers. The success of Morocco's nearshoring strategy is evident in the industrial zones surrounding Tanger Med, which now host over 1,000 companies generating significant export value. This demonstrates the potential economic impact of well-planned corridor development when supported by appropriate industrial and trade policies.

Beside the low Trade Complementarity Index (TCI) among Maghreb countries, the full potential of the TMC remains constrained by political tensions between Algeria and Morocco, which have severely limited cross-border mobility and trade. The land border between these two largest economies of the Maghreb has been closed since 1994, with periodic crises further complicating prospects for regional integration. This impasse has effectively segmented the TMC, preventing it from functioning as a truly integrated corridor.

### 1.3. The Trans-Maghreb Corridor and ECOWAS-Maghreb's Ports-EU Connection

The broader continental context adds another dimension to the TMC's strategic significance. The progress of North-South Trans-African corridors, which could potentially connect the Sub-Saharan Africa to Maghreb's Mediterranean ports and the EU, has been notably limited. The Trans-Saharan Highway, designated to connect Algeria to Nigeria via Niger, remains incomplete with significant missing links in the Sahel region (IsDB) (2022). Similarly, other planned Trans-African Highway corridors identified by the African Union's Programme for Infrastructure Development in Africa (PIDA) have seen limited progress beyond feasibility studies and preliminary planning documents, with implementation hampered by financing constraints, security challenges, and coordination difficulties across multiple countries (African Union, 2022).

Positioned at the crossroads of Europe, Sub-Saharan Africa, and the Middle East, the TMC has the potential to serve as a vital link in global supply chains, particularly in the context of the growing economic relationships between Europe and Africa. The World Bank's Global Value Chain Development Report 2023 highlights the emergence of "near-shoring" and "regionalization" trends in global production networks, with European firms increasingly looking to North Africa as a viable production and logistics hub (World Bank, 2023).

Furthermore, in the context of the African Continental Free Trade Area (AfCFTA), which came into effect in January 2021, the TMC represents a critical infrastructure asset for unlocking the potential of expanded continental trade. The United Nations Economic Commission for Africa's regional integration assessment projects that the AfCFTA could significantly increase intra-African trade, with transport infrastructure identified as a key enabler for achieving this growth (UNECA, 2020). By enhancing connectivity between the Maghreb and neighboring regions, particularly ECOWAS countries, the TMC can play a pivotal role in this continental integration process.

This situation presents an opportunity for the TMC, as the limited development of North-South African corridors creates an opportunity for the corridor to position itself as part of an alternative route connecting ECOWAS (Economic Community of West African States) countries to European markets via Maghreb's ports.

The ECOWAS Regional Infrastructure Development Program and Annual Reports have identified the improvement of connectivity to global markets as a strategic priority, with a particular focus on the Dakar-Lagos Coastal Corridor and its potential extensions (ECOWAS, 2022), with recent progress on this corridor, including the completion of highway sections in Côte d'Ivoire and Ghana and the modernization of border crossing points. However, the efficiency of transport connections to European markets remains a significant challenge, with maritime shipping routes often requiring transshipment through congested Mediterranean or Northern European ports, increasing costs and transit times.

The cost/efficiency component and feasibility of the long rail and road connections between ECOWAS countries and Maghreb ports is based on the limitations of most ECOWAS ports, which have structural constraints that limit their efficiency and capacity. Unlike the deep-water ports of the Maghreb, particularly Tanger Med (with depths of 16-18 meters), major ECOWAS ports typically have maximum depths that prevent them from accommodating larger, more efficient vessels (UNCTAD, 2023). This limitation forces ECOWAS exports to rely on smaller feeder vessels or multiple transshipments, significantly increasing freight costs.

Comparative analyses conducted in UNCTAD's Review of Maritime Transport 2023 provide arguments for the economic viability of the road and rail ECOWAS-Maghreb connection. For containerized cargo from inland production centers in northern Nigeria, Mali, or Burkina Faso destined for European markets, the combined road/rail transport to Maghreb ports plus direct shipping to Europe can be more cost-effective than routing through ECOWAS ports (UNCTAD, 2023).

Although the infrastructure investment requirements are very large, analyses indicate that the long-term economic benefits justify these costs, particularly when considering the enhanced trade facilitation and economic development along the corridor routes.

This context creates a compelling opportunity for the TMC to serve as a key segment of an ECOWAS-EU logistics axis. For the Maghreb countries, serving as a logistics interface between ECOWAS and Europe

could generate significant economic benefits in terms of logistics services across the region and stimulate additional value-added manufacturing activities related to partial processing and redistribution of goods.

This represents a transformative opportunity for good part of the Maghreb to capitalize on its strategic geographical position, even in the context of limited intra-regional integration. It also provides special relevance to the Mauritania-Morocco segment of the TMC that emerges as the key segment of a potential ECOWAS-Mauritania-Morocco-EU axis.

#### 1.4. From Transport Corridor to Trade Corridor: A Comprehensive Approach

The development of the Trans-Maghreb Corridor has evolved from its initial conception as a transport infrastructure project to a broader vision of a trade and economic corridor. This evolution reflects an enhanced understanding of how infrastructure development relates to economic growth and regional integration.

Recent World Bank research has highlighted the importance of this transition from transport to trade corridors. Their Trade and Transport Corridor Management Toolkit notes that corridor success depends not only on physical infrastructure but also on the integration of "hard" and "soft" components that together facilitate trade flows (World Bank, 2020). This study identifies several key dimensions for this transformation: infrastructure quality, border management, logistics services, regulatory frameworks, institutional coordination, and private sector participation.

The distinction between "hard" and "soft" components is central to understanding the transformative process from transport corridor to trade corridor. Hard components encompass the physical infrastructure elements—roads, railways, ports, airports, border crossing facilities, and multimodal terminals—that provide the structural backbone of the corridor. Soft components, by contrast, include the regulatory frameworks, institutional arrangements, operational procedures, and trade facilitation measures that determine how efficiently goods can move along this physical infrastructure (World Bank, 2020).

Multimodality represents a particularly important hard infrastructure component in this transformation. The ITF Transport Outlook 2023 notes that multimodal connectivity—the integration of different transport modes—can significantly reduce logistics costs compared to single-mode corridors, while improving reliability and environmental performance (ITF, 2023). ITF's analysis identifies multimodal terminals as important nodes that can support value-added activities and industrial development along corridor routes.

UNCTAD's Handbook on Special Economic Zones in Africa has noted the importance of multimodality in its framework for trade corridor development in African countries. In its 2021 study, UNCTAD identifies intermodal facilities as a priority for trade facilitation, observing that countries with developed multimodal systems experience higher trade volumes compared to those relying primarily on single-mode transport (UNCTAD, 2021). The study emphasizes the value of developing rail-road intermodal facilities and improving connections between ports and inland locations.

Border infrastructure represents another important hard component. Research by UNECA in its Regional Integration Assessment shows that modernized border crossings with appropriate facilities can significantly reduce crossing times and associated costs (UNECA, 2020). Their analysis indicates that

border delays have a measurable impact on trade volumes, highlighting the importance of border infrastructure in corridor performance.

The UNECA's regional integration assessment specifically addresses the challenges and opportunities of corridor development in the African context, noting that "successful corridors evolve beyond transport infrastructure to become development axes that catalyze industrial clustering, strengthen value chains, and generate employment" (UNECA, 2020). Their analysis of emerging corridors across the continent identifies regulatory harmonization and coordinated border management as critical success factors that can substantially amplify the economic impact of infrastructure investments.

## 1.5. A Foundation for Collaborative Action

The realization of the Trans-Maghreb Multimodal Corridor's full potential with its completion and optimization as Transport Corridor and its full evolution to Trade Corridor will require sustained political commitment, coordinated investments, and harmonized policies. The analysis and recommendations presented in this document aim to provide a framework for such collaborative action, identifying priority projects and interventions that can generate significant economic returns while advancing regional integration goals.

The partnership between the Group of Transport Ministers of the Western Mediterranean (GTMO 5+5), of which CETMO is the Technical Secretariat, the Islamic Development Bank (IsDB), and the Islamic Centre for Development of Trade (ICDT) in supporting this assessment is, in our opinion, a small example of the type of institutional collaboration required to facilitate the infrastructural development and to foster socio-economic development in the region.

As we present this integrated assessment of the Trans-Maghreb Multimodal Corridor, we acknowledge the valuable contributions of the transport ministries of the Maghreb countries, whose commitment to this vision and provision of information have been instrumental in developing this comprehensive analysis. We also recognize the importance of continued engagement with a broad range of stakeholders, including the private sector, civil society organizations, and local communities, in ensuring that corridor development generates inclusive and sustainable benefits.

The path from vision to implementation will undoubtedly present challenges, but the potential rewards—in terms of economic growth, social development, job creation, regional integration, and enhanced connectivity with global markets—justify the concerted efforts required.

## 2. OBJECTIVES AND STRUCTURE OF THE STUDY

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### 2.1. Objectives of the Study

The first objective of this study is to assess the state of TMC as a Transport Corridor and to provide a prioritized list of required projects to ensure its continuity and efficiency. This requires to develop first a comprehensive and updated inventory of road, rail, port and logistics facilities components, second to conduct an infrastructural assessment to identify network discontinuities, capacity bottlenecks and lack of new nodal logistic infrastructures (Missing Links) that limit the continuity and efficiency of the TMC as trade corridor, and finally to identify, characterize and prioritize the required infrastructural projects.

The second major objective is to also assess the infrastructural state of the TMC as potential Trade Corridor, and also provide prioritized lists of hard projects to facilitate its evolution and optimize its performance.

This Trade Corridor assessment and project identification, characterization and prioritization requires to cover three critical dimensions. First, multimodality enhancement focuses on assessing the current state of multimodal infrastructure and services, identifying gaps in modal integration, and prioritizing projects that facilitate efficient transfers between different transport modes. Second, capillarity expansion involves analyzing the current connectivity between the TMC and surrounding economic zones, evaluating the potential economic impact of improved connections, and prioritizing infrastructure projects that would effectively extend the corridor's benefits to areas not directly on its route. Third, regional connectivity enhancement examines trade patterns and complementarities between the Maghreb and neighboring regions (particularly the European Union, ECOWAS, and other neighboring African countries), assesses the current state of cross-border infrastructure, and identifies key connection points for strengthening the TMC's role in facilitating intercontinental trade.

The study also aims to develop prioritization frameworks for infrastructure investments across all dimensions of the TMC's development, applying multi-criteria analysis techniques that balance project maturity, financing status, strategic alignment, and economic and social impacts to identify high-priority interventions with the greatest potential benefits relative to implementation challenges.

Finally, this work seeks to help providing a strategic roadmap for collaborative action among the Maghreb countries, development partners, and regional organizations, outlining a coordinated approach to the TMC's development that integrates both hard infrastructure investments and complementary soft measures for trade facilitation.

Through these integrated objectives, this study seeks to contribute to the realization of the TMC's full potential as a catalyst for regional economic integration, a facilitator of international trade, and a driver of sustainable development across the Maghreb region and beyond.

### 2.2. Structure of the Document

This document is organized into eight chapters that address the various dimensions of the TMC's development, providing a framework for understanding its current state and future potential.

The foreword establishes the strategic importance of multimodal corridors in general and the TMC in particular, contextualizing the study within broader regional development and international best practices, highlighting the transformative potential of the TMC for the Maghreb region's economic landscape and its connections with neighboring regions

Chapter 2, the current chapter, presents the specific objectives of this study and provides a navigational guide to the document's organization, and Chapter 3, the Methodology chapter, details the analytical approaches, data sources, and evaluation frameworks employed throughout the study. It explains the specific methodologies used for assessing the TMC's transport infrastructure state and identifying missing links, evaluating multimodality capabilities and requirements, analyzing capillarity and connectivity with surrounding zones, examining trade patterns and cross-border connections with neighboring regions, and applying multi-criteria analysis for project prioritization. This chapter provides the technical foundation for the analyses presented in subsequent chapters, ensuring transparency and reproducibility of the assessment.

Chapter 4 presents a comprehensive assessment of the TMC's as Transport Corridor, with its current infrastructure components, identifying gaps in the physical connectivity across the corridor. It includes detailed mapping and analysis of existing road, rail, port, airport, and logistics infrastructure; identification of missing links, and characterization and prioritization of **106 infrastructure projects** required to establish the TMC as a fully functional transport corridor; and country-specific analyses for Algeria, Morocco, Mauritania, and Tunisia.

Chapter 5 examines the TMC from a multimodality perspective, analyzing the integration between different transport modes and the efficiency of modal transfers. It covers assessment of existing inland platforms and maritime terminals, analysis of multimodal railway services and flows, diagnosis of multimodal infrastructure gaps, identification and prioritization of **64 multimodality projects** to enhance multimodal capabilities, and strategic framework for developing the multimodal dimension of the TMC.

Chapter 6 focuses on the extension of the TMC's benefits to economic zones not yet directly served, through improved connectivity. It includes identification and characterization of Relevant Economic Zones (REZs), assessment of current connectivity between REZs and the corridor, accessibility analysis based on economic relevance and distance, and identification and prioritization of **36 projects to enhance capillarity**.

Chapter 7 analyzes the TMC's potential role in facilitating trade between the Maghreb and neighboring regions. It covers analysis of trade patterns and complementarities with the European Union, ECOWAS, and other neighboring African countries and it also assesses the current transport routing and modal distribution in interregional trade. It also identifies the corridors able to connect to the TMC with neighboring regions, and includes detailed analysis of critical border crossings and cross-border infrastructure. Finally, it identifies key connections and its present state. The concluding chapter synthesizes the key findings from all dimensions of the analysis, presenting an integrated perspective on the TMC's state and potential development.

This study contains 133 figures, maps and tables. For the sake of documents integrity, the maps included in the body of this study are of small size, therefore the Annex I provides the same maps at a much larger size for easier readability. Annex II provides detailed forms with description, characteristics and cartographic representation of the top 31 identified Missing Link projects. The Annex III includes the characterization of the 64 TMC's multimodality infrastructure projects identified, and finally Annex IV brings additional graphs related to the Trade Complementarity Index (TCI).

## 3. METHODOLOGY

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This chapter presents the methodology developed in the different analyses carried out in the framework of the completion of the Trans-Maghreb Multimodal Corridor (TMC) as the main transport corridor in the Maghreb, as well as in the framework of the evolution of the TMC as a transport corridor.

In this regard, four distinct processes can be distinguished:

- The Trans Maghreb Multimodal Corridor as Transport Infrastructure
- The Multimodality Upgrade of Trans Maghreb Multimodal Corridor
- The Trans Maghreb Multimodal Corridor Connectivity with Surrounding Zones
- The Trans Maghreb Multimodal Corridor Connectivity with Neighbouring Regions

The four processes together offer a long-term strategic vision for the development of the TMC as a tool at the service of the region, contributing on the one hand to its integration by strengthening ties and connections between the countries of the region, and on the other hand to its expansion, taking advantage of its potential as a link between Africa, Asia and Europe.

### 3.1. Updated Transport Infrastructural State and Missing Links Projects

In order to achieve the proposed objectives, a series of tasks have been structured consecutively. Firstly, to exhaustively compile updated information on the layout, location, functionality and capacity of TMC's infrastructural components in order to obtain an updated status of the TMC.

Secondly, an assessment of the TMC as a system, evaluating the continuity and capacity of the infrastructures that make up the corridor, and thirdly, the identification of missing links and the characterization and definition of the projects necessary to optimize the TMC as a transport corridor.

Finally, the identified projects have been evaluated and prioritized through the use of a specifically designed multi-criteria analysis tool. The application of this tool has allowed the ranking and prioritization of the projects based on common criteria. These phases are explained in the following sections. In order to undertake the tasks described above, two set of necessary tools have been developed ad-hoc:

In order to undertake the tasks described above, two set of necessary tools have been developed ad-hoc:

- Georeferenced database for the analysis and geographical representation of existing and planned transport infrastructures and the main socio-economic variables, using GIS software.
- Layout and components representation and its insertion in the Maghreb context

The completion of the tasks has resulted in four outputs:

- The representation of the layout and components of the TMC and its insertion in the Maghreb context.
- The comparative evaluation (ranking) of the projects based on the application of the MCA.
- Projects prioritization by country.
- Fact sheets of the priority infrastructure projects on the missing links of the TMC.

The detailed content and conclusions of these results are presented in Chapter 4.

#### 3.1.1. Georeferenced Database

From the point of view of transport infrastructure, the TMC integrates five types of infrastructure. Two of them are linear infrastructures, roads and railroads, plus three, ports, airports and logistics platforms.

The information on these infrastructures is structured on the basis of the georeferenced database of the GTMO 5+5 Technical Secretariat's Geographic Information System. This cartographic database compiles the layout and location of the multimodal transport network of the GTMO 5+5 countries, as well as the technical information of the sections and nodes that compose it.

Based on this database, the following work has been carried out:

- Definition of variables and compilation of information needed for detailed planning of the TMC. This information is related to existing, transport infrastructures and regional/national transport planning. This information has been mainly provided by the Ministries of the Maghreb countries to the Technical Secretariat of the GTMO 5+5.
- Additionally, the definition of variables and compilation of information related to economic activity and socio-economic characteristics of relevance for the development of TMC. This information includes main economic and social variables of regions and urban areas served by the TMC. The data source are the official national statistical services.

As shown in figure 1, the geo-referenced database organizes the information, either linear, in the case of roads and railroads, or point or nodal, in the case of ports, airports and logistics platforms. A dataset is associated to each graphic element.

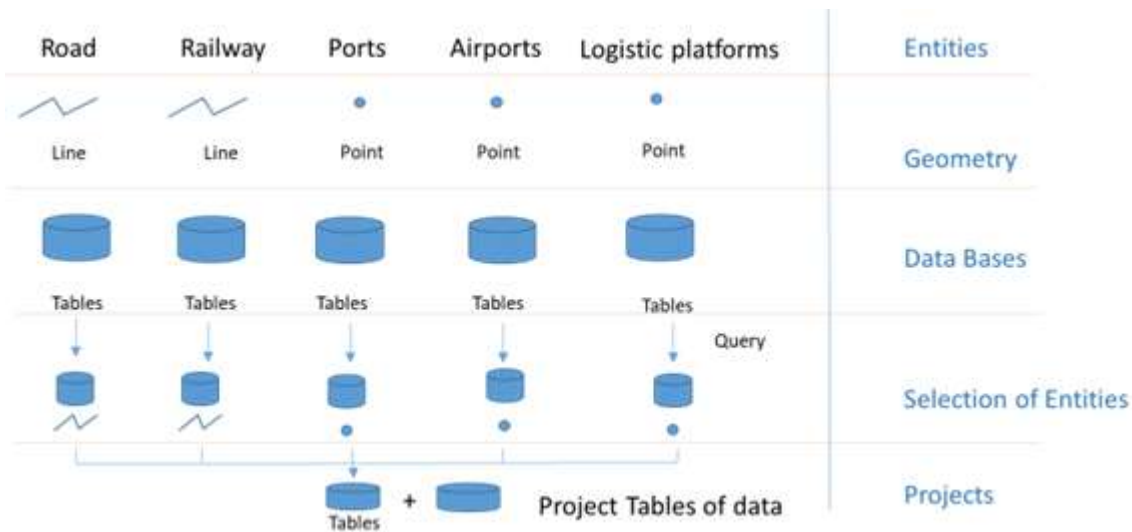


Figure 1. Database structure. Source CETMO.

This georeferenced database has allowed the creation of geographic representations of the TMC components, their characteristics and infrastructure projects, as well as the main regional context variables. An example of this is shown in figure 2, (maps, figures and tables are all labeled as figures).

### 3.1.2. Infrastructural Missing Links

The transport corridor function of a set of infrastructures requires the physical continuity of these infrastructures and the adequacy of their characteristics for the establishment of continuous transport flows.

Identifying and overcoming missing links, i.e., sections or nodes that break the continuity of the infrastructure or hinder flows, is one of the main objectives in the planning, implementation and management of transport corridors.



Figure 2. Example of cartographic representation of the data base components. Source CETMO.

From a strict point of view, missing links refers to the lack of continuity of physical infrastructure to complete the uninterrupted routing of a transport network route - a broader consideration may include the sections of a transport corridor which are not part of the transport network.

In the case of this evaluation of the TMC as a transportation corridor, three types of projects are considered as contributing to the solution of missing links:

- Projects that solve infrastructure discontinuity are the most obvious case of missing link as it creates a new infrastructure where it does not exist, which guarantees the continuation of a route and therefore of the corridor. These are linear infrastructures such as roads and railroad lines.
- Also projects to increase or improve the technical capabilities of existing infrastructure, whether linear or nodal. Their function is to solve bottlenecks that hinder the fluidity of travel.
- Finally, new nodal infrastructures contribute to the facilitation or improvement of transport conditions, especially in terms of multimodality. These are the cases of ports, airports or logistics platforms.

### 3.1.3. Data Sources and Project Identification

The identification and characterization of projects as missing links has involved the creation of a list of projects, the collection of detailed information and the definition of a set of relevant and homogeneous variables for their characterization. This characterization will later allow for their comparative evaluation. The identification of the projects intended to cover the missing links of existing infrastructure was initially carried out on the basis of the information available in the geographic information system of the GTMO 5+5 technical secretariat. This first list was sent to the various transport ministries of the Maghreb countries of the GTMO 5+5 for confirmation and, if necessary, extension.

This contact with the transport ministries was also used to obtain more detailed information on the projects. The purpose of obtaining this information was to obtain a set of homogeneous and standardized variables for all the projects, so that a database could be created and subsequently evaluated on the basis of homogeneous criteria.

### 3.1.4. Missing Links Infrastructural Projects Prioritization

#### *Multicriteria Analysis, Perspectives and Criteria*

Multicriteria analysis (MCA) is a method that allows the comparative evaluation of projects based on the categorization, quantification and weighting of a set of common criteria. In general terms, it involves the evaluation and comparison of projects or measures on the basis of a quantitative assessment. This assessment is obtained from the following steps:

- The definition of common criteria
- The assignment of quantitative values for the different parameters that each criterion can adopt
- The assignment of a weight or importance to each criterion
- The sum of the values obtained for each criterion and the ranking of the actions evaluated.

In this way, based on a quantitative value, actions or projects considered are evaluated and prioritized. At the same time, it allows to understand, for each project, the relative importance of each criterion in the final assessment of the project.

Two stages are particularly important. First, the definition of criteria and parameters, as well as the assignment of values. Secondly, the assignment of importance or weights to each of the selected criteria.

To define the criteria and parameters of the MCA tool to prioritize the identified infrastructure projects on the TMC, five exercises of infrastructure evaluation using a MCA have been studied, to understand the criteria and sub-criteria used to characterize the infrastructure projects assessed. Once identified the criteria and sub criteria, these have been adapted to the TMC projects characteristics and then final criteria:

- EUROMED transport Forum: Methodology to identify the list of Priority Projects (PP) of Mediterranean Partners (2012)
- Strategy of the Intergovernmental Commission TRACECA for development of the international transport corridor Europe-the Caucasus-Asia for 2016-2026 (2012)
- Methodology identifying the TEN-T priority projects: The UfM MCA Tool (2015)
- *Étude de Faisabilité de la réhabilitation et de la modernisation de certains tronçons de la Ligne de Chemin de Fer Trans-Maghrébine* from Arab Maghreb Union (AMU) (2019)
- The integrated Corridor Approach from PIDA PAP 2. (2020).

Criteria and sub criteria of the different exercises are classified into general categories and grouped in accordance to main groups of MCA system as shown in Table/Figure 3 and 4.

Finally, the selected criteria are:

- Political Alignment: alignment of the project with national, regional and international strategies. Governmental support.
- Project maturity: Existence of studies and / or definition level of the project. From the idea to procurement / works.
- Economic impact of the project: Measure the economic impact of the project expected.
- Social impact: Measure the social impacts (+) expected.
- Financing: existence (or not) of a robust financial plan.

With regard to the assignment of quantitative values for the different parameters of each criterion, the following parameters and values are considered:

- Alignment:
  - Strong: 5
  - Medium: 2.5
  - Weak: 0.5

| Criteria                 | Sub-criteria or parameter                                |        |         |     |     |      |
|--------------------------|--|--------|---------|-----|-----|------|
|                          |  | EURMED | TRACECA | URM | UMA | PIDA |
| Relevance                | Project solving a missing link                           | ✓      |         |     |     | ✓    |
|                          | Multimodality and interoperability                       | ✓      | ✓       | ✓   |     |      |
|                          | Typology of project in relation to specific criteria     | ✓      |         |     | ✓   | ✓    |
|                          | New Technologies   |        | ✓       |     | ✓   | ✓    |
|                          | Level of transport demand                                |        |         | ✓   |     |      |
|                          | Connectivity to origin/destination centers               |        |         | ✓   | ✓   | ✓    |
|                          | Capacity   |        |         |     | ✓   |      |
|                          | Women Participation                                      |        |         |     | ✓   | ✓    |
| Alignment of the project | Integration of the project in national regional networks | ✓      | ✓       | ✓   | ✓   | ✓    |
|                          | Alignment with political objectives                      |        | ✓       |     |     |      |
| Readiness of the project | Political support  |        | ✓       | ✓   |     |      |
|                          | Existing studies and definition level of the project     | ✓      |         | ✓   |     |      |
|                          | Land acquisition and compensation                        |        |         |     | ✓   |      |
| Financial plan           | Risk evaluation  |        |         | ✓   |     |      |
|                          | Private/institutional involvement                        | ✓      |         | ✓   |     |      |
|                          | Cost/Inversion   | ✓      | ✓       |     | ✓   |      |
|                          | Profitability  |        | ✓       |     |     |      |
| Project Impact           | Existing financial plan                                  |        |         | ✓   |     |      |
|                          | Regional development/spill over effects                  |        | ✓       | ✓   | ✓   | ✓    |
|                          | Modal shift to more sustainable modes                    |        | ✓       |     | ✓   |      |
|                          | Emissions  |        | ✓       |     | ✓   | ✓    |
|                          | Specific environmental mitigation measures               |        | ✓       |     | ✓   |      |

Figure 3. Comparison of the criteria and sub-criteria of the analyzed MCA exercises. Source: CETMO

| Criteria                 | Sub-criteria (CETMO)                                     | Parameter  | Parameter description  |
|--------------------------|--|--|--|
| Relevance                | Project solving a missing link                           | Layout of the project (if possible GIS data)   | Cartographic information   |
|                          | Multimodality and interoperability                       | Relation with other modes  | Multimodal component of the project. Relation with modes or specific technical multimodal/multoperability solutions adopted      |
|                          | Typology of project in relation to specific criteria     |  |  |
|                          | New Technologies   | Technological and energy innovation  | Technical innovations or alternative energy fuel supply/use  |
|                          | Level of transport demand                                | Current demand   | Existing demand to be served by project  |
|                          | Connectivity to origin/destination centers               | Layout of the project (if possible GIS data)   | Cartographic information   |
|                          | Capacity   | Expected capacity  | Expected design capacity   |
|                          | Women Participation                                      | Other social and gender measures   | Social and gender integration and participation measures considered  |
| Alignment of the project | Integration of the project in national regional networks | Layout of the project (if possible GIS data)   | Cartographic information. Description of relation with other infrastructure networks   |
|                          | Alignment with political objectives                      | Alignment of the project with national, Regional and International strategies and policies | Project enhancement/insertion of/Into nation and International policies and plans  |
|                          | Political support  | Governmental entities promoting the project  | Promotor of the project / Institutional arrangements for the project implementation (steering committee, Execution Agency, etc.) |
| Readiness of the project | Existing studies and definition level of the project     | Existing feasibility/design studies/ environmental evaluation                              | Availability and development of previous studies and procedures  |
|                          | Land acquisition and compensation                        | Existing plan for land acquisition and compensations                                       | Existing or ongoing plan for land acquisition. Definition of measures for people affected by the project                         |
|                          | Risk evaluation  | Existing risk evaluation   | Existing risk Evaluation Study and definition of mitigation measures   |
| Financial plan           | Private involvement                                      | Private involvement and level of participation   | Involvement of private investors. Level and type of involvement  |
|                          | Cost/Inversion   | Cost   | Monetary value of needed investment  |
|                          | Profitability  | Profitability  | Internal Return Rate   |
|                          | Existing financial plan                                  | Existing financial plan  | Existing financial plan  |
| Project impact           | Regional development/spill over effects                  |  | Existing Cost/Benefit Analysis. Main results in GDP and employment. Contribution to regional/local development                   |
|                          | Modal shift to more sustainable modes                    | Modal shift to more sustainable modes  | Quantification of expected modal shift to maritime and rail from road  |
|                          | Emissions  | Expected Emissions   | Yearly expected greenhouses gases emissions  |

Figure 4. Criteria and, parameters considered in the MCA Missing Links. Source: CETMO

- Project Maturity:
  - Open tender: 5
  - Detailed studies completed: 4
  - Detailed studies in progress: 3
  - Simplified studies completed: 2
  - Simplified studies in progress: 1
  - National planning – preliminary concept: 0.5

- Works ongoing or programmed: 5
- On service: 0
- Unknown: 0
- Economic impact:
  - Logistics improvement: 3
  - Increasing capacity: 5
  - Fulfilment of missing link: 2
  - Access to node or infrastructure: 4
  - New regional accessibility: 1
  - New High Speed Line: 1
- Social impact:
  - Logistics improvement: 2
  - Increasing capacity: 2
  - Fulfilment of missing link: 5
  - Access to node or infrastructure: 3
  - New regional accessibility: 3
  - New High Speed Line: 1
- Financing:
  - Committed financing: 5
  - Detailed financing plan: 5
  - Existing financial plan: 3
  - Budget approximatively: 2
  - Financial plan non identified: 1

For the weighting of the 5 selected criteria, a consultation process was carried out between the CETMO technical team and IsDB representatives. These consultations focused on the consideration of the impact of each project identified from two points of view, financial and socio-economic development impact.

To prioritize the projects from a financial perspective, a multi-criteria analysis that includes the criteria of project maturity, financing and economic impact was constructed, assigning the latter a weight of 30% of the total.

To prioritize the projects from a socio-economic development perspective, the multicriteria analysis also took into account the criteria of project maturity, financing and economic impacts, plus the criteria of social impact with a value equal to that assigned to the economic impact of the first scenario, 30%.

The results of the project prioritization from both financial and socio-economic development standpoints, yielded very similar results, with all same top 25 projects and just some minor differences in ranking in other less priority ones. As a result, a new and final set of criteria and weights was set that aimed to be a hybrid of both the financial and socio-economic standpoints as it is further described assigning the following weights to each criterion:

- Political Alignment: 20%
- Project maturity: 25%
- Economic Impact: 20%
- Social Impact: 15%
- Financing: 20% “

### *Infrastructural Projects Prioritization*

Once the criteria, values and weights had been defined in the multi-criteria analysis tool and the different project categories had been parameterized, a ranking of the projects was established, according to the score obtained in the MCA and the determination of the most relevant projects by country.

The result of this prioritization is presented in a set of graphs by country, in which the projects are presented in order according to the total score obtained in the CSF, showing at the same time the evaluation obtained in the different criteria.

Finally, for each priority project, a descriptive sheet has also been drawn up with a series of variables that allow its characterization, as shown in the figure 5.

The variables considered are:

- Typology of infrastructure: mode of transport.
- Type of action, Objective of the project: Main objective of the action.
- Description of the projects: Detailed description of the components of the projects.
- Impact: expected changes in transport flows and structure and in socioeconomic aspects.
- Capacity/expected demand: Expected volume of transport unit (passengers or merchandises) to be treated by infrastructure.
- Developer: Name of the main promotor/developer/manager of the new infrastructure.
- Planning document: Name of the national planning documents where the project is considered.
- Time horizon: Expected time of starting service of the infrastructure.
- Financial plan: Phase or state of financial plan.
- Phase: Studies already developed (feasibility, design, detailed design).
- Budget: Monetary budget.

Trans-Maghreb Multimodal Corridor Action plan  
Priority projects

### Autoroute Tunis - Jelma

Tunisia Scale: 1:5000

|                            |   |
|----------------------------|---|
| Typology of infrastructure | Road  |
| Action                     | New infrastructure  |
| Objective                  | New regional accessibility  |
| Description                | The project aims to link the capital Tunis with the interior governorates (Dghouen, Kairouan, Sidi Boucid, Kasserine and Gafsa) through the A2 central highway.<br>The project has a total length of 305 km and is divided into two sections.<br>Priority Section 1 (Tunis - Jelma) is 136 km long. |
| Impact of project          | New regional accessibility and connection of the inland governorates with the economic poles and logistic zones.  |
| Capacity/Expected demand   | Demand studies existing   |
| Developer                  | Ministère de l'Équipement et de l'Habitat/Direction Générale des Ports et Chaussées   |
| Planning document          | Included in national planning   |
| Time horizon               | Short term  |
| Financing plan             | Financing committed   |
| Phase                      | Ongoing/programmed works  |
| Budget                     | 1,700 M TND   |

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Trans-Maghreb Multimodal Corridor Action plan  
Priority projects

### Autoroute Tunis - Jelma

Tunisia

Location



Trans-Maghreb Multimodal Corridor Action Plan

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Figure 5. Example of Missing Link project characterization. Source: CETMO

## 3.2. Multimodality Assessment and Enhancing Projects

The tasks and methodological process to identify and prioritize the necessary projects to allow TMC's full evolution from transport to trade corridor, are similar to those also used to prioritize the infrastructural projects and missing links; first to define the current state of multimodal facilities by compiling updated information regarding the state and localization of existing, in construction and planned multimodal facilities, to secondly assess multimodality requirements, and potential deficiencies to finally identify, define, categorize and prioritize the multimodality facilitating projects.

The analyses carried out on both components have led to nine outputs:

- List of Existing Inland Platforms and Maritime Terminals.
- Set of Maps on Main Characteristics of Existing Inland Platforms and Maritime Terminals.
- List of Multimodal Railway Services and Flows.
- Map on Multimodal Railway Services.
- Quantification of the Typologies of Inland Platforms and Maritime Terminals and their Main Services
- Characterized List of Identified Interventions on Inland Platforms and Maritime Terminals.
- List of Multimodality Projects Ranked by MCA Score.
- List of Multimodality Projects by Country and MCA Score.
- Map on the Multimodal Interventions according to MCA Score.

A detailed explanation of the content and conclusions of these outputs is given in chapter 5.

### 3.2.1. State of TMC's Multimodality

The first step of the methodology provides a comprehensive description of the current state of the TMC from a multimodality perspective, following a four-step process:

#### *Maritime Terminals and Inland Platforms: Characterization and Grouping*

This step involves the creation of a georeferenced database containing common variables that inform about the main characteristics of existing multimodal platforms and terminals. This database enables geographical representation and comparative analysis of these infrastructures across the region.

The characterization process considers two types of platforms: inland platforms and maritime terminals, because they are the facilities where the transfer of goods between different transportation modes takes place. It should be noted that the lack of available and accessible information has prevented the creation of a comprehensive database, particularly for inland platforms. A limited number of descriptive variables are considered for each type of platform, with these variables synthesizing the main services provided that condition their multimodal performance.

For inland platforms, road-road or rail-road are considered and the main descriptive variables used include availability of freight consolidation areas, presence of customs facilities, modal connectivity, container handling capabilities, and specialized facilities for automobile logistics. These variables are described in the figure 6:

For maritime terminals, the main descriptive variables considered are specialized equipment for container handling, railway connection and exclusive or multipurpose use, specialized equipment for container handling, and automobile handling facilities. These variables are described in the figure 7.

This information is compiled in the database and presented through country-specific tables and regional maps, providing a visual and data-driven overview of existing multimodal infrastructure throughout the TMC.

| Inland platforms             |   |
|------------------------------|---|
| <b>Name</b>                  | Name of the platform.   |
| <b>Typology</b>              | Typology of the platform according to national definition and classification. The variability in definitions prevent a common set of categories. The original French is maintained. |
| <b>Surface</b>               | Surface of the platform in ha.  |
| <b>Freight Consolidation</b> | Existing of space and services that allow the unloading, storage, loading of goods, and the exchange of the charge between vehicles.  |
| <b>Customs services</b>      | Existing custom services allowing import/export procedures.   |
| <b>Modes of transport</b>    | Road or rail and road or road.  |
| <b>Storage TEU&amp;ITU</b>   | Existing space and equipment for handling and storage of containers (TEU) and ITU (trailers).   |
| <b>New Cars Storage</b>      | Existing space and equipment for handling and storage new cars.   |
| <b>Status</b>                | Development stage of the platform (developed or partially developed).   |

Figure 6. Variable considered for inland platforms characterization. Source: CETMO

| Maritime platforms     |  |
|------------------------|--|
| <b>Port</b>            | Name of the port where the platform is located.  |
| <b>Name</b>            | Name of the platform or terminal.  |
| <b>Surface</b>         | Surface of the platform in square meters.  |
| <b>Depth</b>           | Maximum depth of quay in metres.   |
| <b>Length quay</b>     | Length of quay in meters.  |
| <b>Portainer crane</b> | Existing of cranes exclusively for treatment of containers allowing the movement of containers between the vessel and the platform. (yes/non). |
| <b>Conexion rail</b>   | Existing connection of the terminal of containers to the railway network. (yes/non).   |
| <b>Uses</b>            | Exclusive use of the space platform for the handling of containers (exclusive) or it is shared with other type of cargo (multi-purpose use).   |
| <b>Status</b>          | Development stage of the platform (developed or partially developed).  |

Figure 7. Variable considered for maritime terminals characterization. Source: CETMO

### *Railway Role: Identification of Existing Multimodal Services and Flows*

Railway transport emerges as one of the main drivers of multimodality, as it enables efficient transport of multimodal units over long distances and connects inland production/distribution centers with multimodal terminals in ports. Therefore, this step focuses on identifying existing railway networks and multimodal services and flows.

Multimodal services refer to railway services that transport goods between ports and inland platforms, involving two modes of transport (sea and railway), while multimodal flows refer to the actual movements of goods by these multimodal railway services.

For the analysis of multimodal flows in the Maghreb countries, information has been compiled about the existing railway network, origins and destinations of multimodal services, types of multimodal units transported (primarily containers or new automobiles), descriptive information about the flows, and quantitative information where available.

It should be noted that homogeneous quantitative information about flows has not been accessible for all analyzed services, which prevents the development of common indicators and direct comparisons. The results of this analysis are presented in tables and maps, with additional charts created to analyze the share of multimodal flows in national transport of containers

### *Diagnosis of Multimodal Facilities*

This step provides a diagnosis of existing and planned multimodal infrastructure through a quantitative analysis by country, considering variables that describe the main functions of multimodal infrastructures.

For inland terminals, the analysis considers:

- Transport modes: rail/road or road/road connectivity,
- Customs facilities: existence of services allowing import/export procedures,
- Freight consolidation/deconsolidation capabilities: Existing of space and services that allow the unloading, storage, loading of goods, and the exchange of the charge between vehicles.
- TEU/ITU stockage: Existing space and equipment for handling and storage of containers (TEU) and ITU.
- New cars stockage: Existing space and equipment for handling and storage new cars.

For maritime terminals, the analysis includes both container and ro-ro terminals, examining factors such as:

- Uses: Exclusive use of the space platform for the handling of containers (exclusive) or it is shared with other type of cargo (multi-purpose use).
- Railway connection: Existing connection of the terminal of containers to the railway network.
- Port-Trainer cranes /new cars platform: Existing of cranes exclusively for treatment of containers / Existing space and equipment for handling and storage new cars.

The analysis results in country summary tables that provide an overview of existing services and infrastructure capabilities across the region.

### *Characterization of the Interventions Identified on the TMC Multimodality*

This final step characterizes the infrastructural interventions related to inland platforms and maritime terminals included in the planning documents of Maghreb countries. The characterization is based on a common and synthetic set of variables applied across all countries, allowing for standardized analysis despite the heterogeneous nature of available information.

The characterization uses the same variables as those used for existing platforms, plus additional variables that includes national planning documentation, trade improvement, project maturity, alignment, and financing status. These variables have been chosen to ensure consistency with the work carried out during the analysis of the TMC as a transport corridor.

CETMO has completed these variables based on the interpretation of available information from various sources. These additional variables are defined as follows:

- National planning: Name of the planning document or plan where the project is included
- Trade improvement: Easing of the flow of goods by enabling changes of modes or providing handling and logistics services
- Project Maturity: Existence of studies and / or definition level of the project. From the idea to procurement / works.
- Alignment: Alignment of the project with national, regional and international strategies. Governmental support.
- Financing: Existence (or not) or definition level of a robust financial plan. those services always exist.

It should be noted that a truly in-depth analysis of multimodal interventions would require a level of detail that is not accessible in the present project. Nevertheless, this process has resulted in the preparation of detailed country-specific tables characterizing the identified interventions for both inland and maritime terminals.

### 3.2.2. Multimodality Projects Prioritization

The second component of the methodology applies a Multi-Criteria Analysis (MCA) tool to prioritize the identified infrastructure interventions aimed at increasing TMC multimodality. This analysis leverages the homogeneous fields and variables in the database created in the previous component to enable comparison and evaluation based on common criteria.

The MCA tool used in this case is based on the MCA tool developed in the analysis of the TMC as a transport corridor, to ensure consistency of the results. But the criteria, parameters and weights have been adjusted to the purpose of the analysis to improve the multimodality of the TMC.

#### *Definition of Common Criteria for Assessing and Comparing Identified Projects*

Four common criteria have been defined for assessing and comparing the identified projects:

- Alignment: It refers to the alignment of the project with national, regional, and international strategies and the level of governmental support it receives. Projects with stronger alignment with existing strategies and higher governmental support receive higher ratings.
- Project maturity: It evaluates the existence and advancement of studies and the overall definition level of the project, ranging from preliminary concepts to ongoing works or projects that are already in service.
- Financing: It assesses the existence and robustness of the financial plan for the project, from unidentified financing sources to committed funding and detailed financial planning.
- Trade Improvement. It evaluates how the project facilitates the flow of goods by enabling changes of transport modes or providing handling and logistics services that enhance trade efficiency.

#### *Assignment of Quantitative Values for the Various Parameters*

Each criterion is evaluated through specific parameters that are assigned quantitative values:

- Alignment parameters. It is rate based on their consistency with strategic priorities:
  - Strong: 5

- Medium: 2.5
- Weak: 0.5
- Project Maturity. It is evaluated on a scale from preliminary concept (0.5 points) to open tender or ongoing works (5 points), with intermediary stages such as studies in progress or completed studies receiving proportional scores:
  - Open tender: 5
  - Detailed studies completed: 4
  - Detailed studies in progress: 3
  - Simplified studies completed: 2
  - Simplified studies in progress: 1
  - National planning – preliminary concept: 0.5
  - Works ongoing or programmed: 5
  - On service: 0
  - Unknown: 0
- Financing. It is assessed from non-identified financial plans (1 point) to committed financing or detailed financing plans (5 points), with intermediate stages based on the level of financial planning detail:
  - Committed financing: 5
  - Detailed financing plan: 5
  - Existing financial plan: 3
  - Budget approximatively: 2
  - Financial plan non identified: 1
- Trade improvement. It ranges from unimodal facilities without services (0.5 points) to full maritime multimodal terminals (5 points), with various combinations of multimodal capabilities and services receiving scores in between:
  - Maritime multimodal terminal: 5
  - Multimodal TEU&ITU stockage and customs services: 4
  - Multimodal TEU&ITU stockage: 3
  - Unimodal TEU&ITU stockage and customs services: 2
  - Unimodal TEU&ITU stockage: 1
  - Unimodal without services: 0,5

#### *Assignment of a Weight or Importance to each Criterion*

Each criterion is assigned a specific weight reflecting its relative importance in the overall evaluation. These weights are as follows:

- Alignment: 25%
- Project maturity: 25%
- Financing: 20%
- Trade improvement: 30%

#### *Ranking of infrastructure interventions.*

The final step involves calculating the weighted sum of values obtained for each criterion and ranking the infrastructure interventions accordingly. This process produces a prioritized list of projects that should help guiding investment decisions and implementation planning, focusing resources on interventions with the highest potential impact on TMC multimodality.

### 3.3. Capillarity Assessment and Expansion Projects

The methodology used for analyzing the TMC connectivity with the zones served consists of five components. The first three are related to the definition, identification and characterization of Relevant Economic Zones (REZs) in terms of connectivity to the TMC and accessibility, establishing the geographic scope of the analysis and assessing the current state of transport infrastructure connecting the identified REZs to the TMC, as well as their economic significance and current level of accessibility. The other two components are based on the identification of capillarity projects and their prioritization to increase connectivity with the zones already served or to increase the access to new zones.

The analyses carried out on the five components have led to ten outputs:

- Set of Maps Representing the REZ in the Surrounding of the TMC
- List of REZ in the TMC Surroundings
- Set of Maps Representing the Current Connectivity of REZ in the Surrounding of TMC.
- List of Connectivity Characteristics of the REZ in the TMC Surroundings.
- Map Representing the Regional Relevance Index (RRI) of the REZ in the Surrounding of TMC.
- List of RRI of the REZ in the TMC Surrounding
- List of Capillarity Projects Identified
- List of Capillarity Projects Ranked by MCA Score
- List of Capillarity Projects by Country and MCA Score
- Map on the Capillarity Interventions according to MCA Score

A detailed explanation of the content and conclusions of these outputs is given in chapter 6.

#### 3.3.1. Identification and Definition of Relevant Economic Zones (REZ)

This component establishes the geographic scope of the analysis by identifying and characterizing the relevant zones surrounding the TMC. It consists of three steps.

##### *Definition of Relevant Economic Zones (REZ)*

The Relevant Economic Zones in the TMC (and the Trans Sahara Road) surrounding are all those sub-national administrative divisions of each country not directly crossed by the TMC. These sub-national administrative divisions are identified for each involved country (Algeria, Morocco, Mauritania and Tunisia):

- Algeria: Wilaya
- Morocco: Province or Prefecture
- Mauritania: Wilaya
- Tunisia: Region

##### *Characterization of Regions*

The different sub-national divisions of the Maghreb are described based on common indicators related to economic activity. Through desk research carried out to identify available data on common indicators, population was identified as the only consistently available common indicator across all regions. Consequently, population is used as a proxy to economic development, ensuring coherence and comparability in the analysis of TMC surroundings. The case of Moroccan provinces is presented in figure 8 as an illustrative example of this proxy.

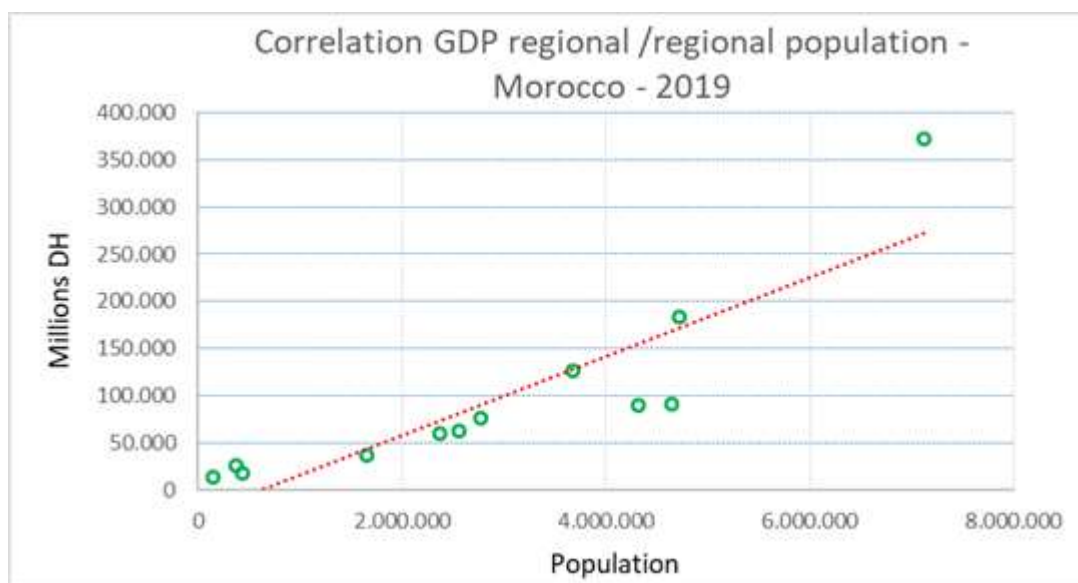


Figure 8. Population as proxy to economic development. Moroccan example. Source: CETMO

In addition, the Euclidean distance to the TMC has also been defined as a characterization element of the REZs.

#### *Representation of Relevant Economic Zones (REZ) in the TMC Surrounding*

Each REZ is represented in the Geographic Information System (GIS) by its main city or regional capital, serving as the centroid of the region. This point, its location, and its infrastructure accesses are used to determine the distance to the TMC through Euclidean distance measurement. Tables are elaborated for each involved country (Mauritania, Morocco, Algeria, Tunisia) presenting region, main city, population, and distance. The centroid of the REZ is also used in subsequent methodology components to determine existing connectivity and planned projects.

### **3.3.2. Characterization of the Connectivity of the REZ with the TMC**

This component assesses the current state of transport infrastructure connecting the identified REZs to the TMC. It consists of three steps.

#### *Identification of the REZs Connection to the TMC Road Network*

Desk research is conducted to identify the connection of each REZ centroid to the TMC road network and the typology of these road connections. To determine the existing road connection, the GTMO 5+5 multimodal network is considered as reference. The definition of the GTMO 5+5 multimodal network and its projects was based on unified criteria, and it becomes the base for common regional transport analysis and planning. Most of the projects identified are not classified as priority in the national planning of the countries. So, studies and information about these projects are not fully developed or accessible.

#### *Identification of the REZs Connection to the TMC Railway Network*

Similar to road connectivity, desk research is conducted to identify the connection of each REZ centroid to the TMC railway network and the characteristics of these railways. To determine the existing road connection, the GTMO 5+5 multimodal network is considered as reference. The definition of the GTMO 5+5 multimodal network and its projects was based on unified criteria, and it becomes the base for common regional transport analysis and planning. Most of the projects identified are not classified as priority in the national planning of the countries. So, studies and information about these projects are not fully developed or accessible.

### *Representation of the Connectivity Characteristics*

The information identified in previous steps has been represented by specific regional maps and grouped in national tables, providing a comprehensive overview of the current connectivity between each REZ and the TMC.

### **3.3.3. Accessibility Analysis**

This component evaluates the relative importance of connecting different REZs to the TMC, considering their economic significance and current level of accessibility. It consists of three steps.

#### *Conceptualization of Accessibility Analysis*

This step defines the Regional Relevance Index (RRI) as a representative index for the accessibility analysis of REZs to the TMC. The RRI weights the economic importance of zones, as directly related to population (as a proxy of economic production/importance) and inversely related to Euclidean distance (measured in km) to the national section of TMC. The result is the RRI expressed as an abstract value normalized over 1,000.

#### *Calculation of the RRI*

The RRI, defined in the previous step, is calculated for all REZs identified across the involved countries (Mauritania, Morocco, Algeria, Tunisia).

#### *Representation of the Accessibility Analysis*

The RRI values, previously obtained, have been represented by a specific regional map and by tables grouped by country, providing a visual and tabular overview of the relative accessibility of different regions to the TMC.

### **3.3.4. Capillarity Projects Prioritization**

This component consists of the identification of the planned projects of the road and rail networks connecting the REZ centroids with the TMC. These projects are interventions that increase the TMC connectivity. Projects identified are those defined in the GTMO 5+5 network. Road and railway projects connecting the REZ to TMC are listed in table grouped by country and transport mode.

This component applies a Multi-Criteria Analysis (MCA) tool for the prioritization of identified infrastructure interventions (projects) to increase connectivity with surrounding zones of the TMC.

As was the case with the MCA tool used on the analysis of multimodality upgrade of TMC, the MCA tool used in this case is based on the MCA tool developed in the analysis of the TMC as a transport corridor, to ensure consistency of the results. But the criteria, parameters and weights have been adjusted to the purpose of the analysis to improve the multimodality of the TMC.

These adjustments are detailed in the following 4 steps of the prioritization process.

#### *Definition of Common Criteria for Assessing and Comparing Identified Projects*

This MCA considers four criteria:

- Alignment: alignment of the project with national, regional and international strategies. Governmental support.
- Project maturity: Existence of studies and/or definition level of the project. From the idea to procurement/works.
- Socioeconomic impact: as RRI score.
- Financing: existence (or not) of a robust financial plan.

The proposed criteria for this MCA differ from those ones proposed in the MCA for the prioritization of projects regarding the Phase I of the Trans Maghreb Corridor (TMC) Action Plan.

#### *Assignment of Quantitative Values for the Various Parameters*

The parameters and quantitative values for each defined criterion are defined as follows:

- Alignment parameters:
  - Strong: 5
  - Medium: 2.5
  - Weak: 0.5
- Project Maturity:
  - Open tender: 5
  - Detailed studies completed: 4
  - Detailed studies in progress: 3
  - Simplified studies completed: 2
  - Simplified studies in progress: 1
  - National planning – preliminary concept: 0.5
  - Works ongoing or programmed: 5
  - On service: 0
  - Unknown: 0
- Socioeconomic impact (based on RRI score):
  - 375 RRI score: 5
  - 325 – 375 RRI score: 4
  - 130 – 325 RRI score: 3
  - 75 – 130 RRI score: 2
  - < 75 RRI score: 1

The determination of values of Socioeconomic impact aims to consider the results of the accessibility analysis into the evaluation of the projects.

- Financing:
  - Committed financing: 5
  - Detailed financing plan: 5
  - Existing financial plan: 3
  - Budget approximatively: 2
  - Financial plan non identified: 1

#### *Assignment of a Weight or Importance to each Criterion*

A specific weight has been assigned to each criterion. These weights are as follows:

- Alignment: 20%
- Project maturity: 25%
- Socioeconomic impact: 35%
- Financing: 20%

#### *Sum of the Values Obtained for each Criterion after the Weight Assignment*

Finally, the values obtained for each criterion after weight assignment (step 3) are summed, and the infrastructure interventions (projects) evaluated with the MCA are ranked accordingly. This process produces a prioritized list of projects and a map that help to understand the potential for increasing the number of territories served by the TMC.

### 3.4. Connectivity and Key Projects

It is important to emphasize that the connection of the TMC with EU's corridors is in general already set, with an extensive set of ports already in service and more planned in Morocco, Tunis and Algeria. The optimization of that connection is realized through port management and supported by multimodal facilities, as assessed in the section Multimodality Upgrade. Therefore, the focus of the analysis is the connectivity with a potential Trans-Sahara Corridor and with ECOWAS countries to help vertebrate a Nigeria-Gulf of Guinee-Maghreb-EU axis.

The methodology used for analyzing the potential relations of the TMC countries with other corridors and neighboring regions consists of two distinct processes explained in the next sections. The first one is used for the analysis of trade flows and composition of trade with neighboring regions and the second one for the analysis of situation of transport infrastructures and border crossings

The analyses carried out on both components have led to five outputs:

- External Trade Analysis of Maghreb Countries
- Trade Complementarity Index (TCI) Matrices and Figures
- Evolution of the Maritime Transport Share and Updated Modal Split.
- Maps on Neighboring Regions' Corridors.
- Technical Sheets on the Situation of Transport Infrastructures and Projects in the Areas of Interest.

A detailed explanation of the content and conclusions of these outputs is given in chapter 7.

#### 3.4.1. Trade Flows and Trade Composition Analysis

The analysis of trade flows and composition of trade focuses on examining current trade patterns, volumes, and structures to identify potential complementarities and opportunities for enhanced trade flows. The analysis was conducted through the following steps:

##### *Data Sources and Management*

Trade data was downloaded and processed from the United Nations Commodity Trade Statistics Database (UNComtrade) according to the Standard International Trade Classification (SITC). This data was used to analyze trade balances of the countries of the TMC (Algeria, Libya, Morocco, Mauritania, Tunisia) at global level and intra-Maghreb level, as well as with the following neighboring regions:

- ECOWAS (Economic Community of West African States): This regional group comprises 15 West African countries, including Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. The ECOWAS region would be involved in connecting the TMC to the south, following the Atlantic coast and facilitating access to the sea for some of its landlocked countries.
- The European Union (EU): With particular focus on the European GTMO 5+5 countries (France, Italy, Malta, Portugal, and Spain), the EU constitutes the primary trading partner for most Maghreb countries. The historical, cultural, and economic ties between these regions make this relationship particularly important for the TMC's trade development.
- Other Neighboring African Countries (ONAC): This grouping includes other African countries that border or are in proximity to the Maghreb region but are not part of ECOWAS. Its countries do not form a consolidated regional grouping of countries on their own. This includes countries like Egypt, Sudan, Chad, and Cameroon that represent important potential connections for the TMC, mainly to the east.

### Trade Complementarity Index (TCI) Matrix

Based on the Trade Complementarity Index (TCI) formula and previous UNComtrade data download and processed, TCI matrices were elaborated.

TCI estimates the degree to which the export pattern of one country is compatible with the import pattern of another country. TCI values can range from 0 to 100, with 0 meaning not at all complementary and 100 perfectly complementary. It is calculated using the following formula:

$$TCI_{ij} = 100 \times \left[ 1 - \sum_k |m_k^i - x_k^j| \div 2 \right]$$

$m_k^i$ : sector  $k$ 's share in country  $i$ 's total imports from the world;

$x_k^j$ : sector  $k$ 's share in country  $j$ 's total exports to the world.

These matrices show the TCI values between the countries in the regions being compared and classify the values into 4 levels of complementarity according to previously defined ranges of values.

The classification used is as follows:

- High:  $60 < TCI$
- Medium-high:  $40 < TCI < 60$
- Medium-low:  $20 < TCI < 40$
- Low:  $TCI < 20$

The country-country complementarity relationships analyzed are established on the basis of a comparison of the following regions:

- Intra-Maghreb
- Maghreb versus European GTMO 5+5
- Maghreb versus ECOWAS
- Maghreb versus ONAC
- European GTMO 5+5 versus ECOWAS
- European GTMO 5+5 versus ONAC

These matrices provide a quantitative basis for identifying the most promising trade relationships to develop based on the correspondence between the export profile of one country and the import profile of another country.

### Analysis of Maghreb External Trade Conditions and Routing

Based on available information on routing, on the main trade relations identified above and on the potential benefit for Maghreb logistics chains, the relationships used for the analysis of the routing of external trade are:

- Maghreb versus European Union: Trade with the EU accounts for about 50% of the total of the Maghreb trade, with the exception of Mauritania (30%). So, this can be a good example to understand the routing of goods in the region. In addition, the EU does provide data by mode of transport.
- European GTMO 5+5 versus ECOWAS: Given the potential for trade relations between the European GTMO 5+5 countries and the ECOWAS region that could benefit Maghreb logistics chains, it is also considered interesting to analyze the current routing of trade relations between these two regions

This step examines the current transport modes used for trade between regions and the historical importance of maritime transport in trade relations.

### 3.4.2. Analysis of the Situation of Transport Infrastructures and Border Crossings

The analysis of the situation of transport infrastructures and border crossings focuses on the physical infrastructure necessary to facilitate the trade relationships identified in the previous process. The analysis was conducted through the following steps:

#### *Identification of the Layouts of Trans-African Highways*

Official documentation and development plans, mainly from the African Development Bank (AfD) and from the Programme for Infrastructure Development in Africa (PIDA), were consulted for the identification process. The desk research for the identification of layouts concerned both existing infrastructures and planned projects.

#### *Identification of the Layouts of Other Regional Corridors in Western Africa*

The identification process was undertaken through the consultation of official documentation, development plans, and strategic documents from regional and international organizations, as the United Nations Economic Commission for Africa (UNECA), the African Union (AU), the African Development Bank (AfD) and the Programme for Infrastructure Development in Africa (PIDA). The identification process concerned both existing infrastructures and planned projects.

#### *Preliminary Classification of Transport Corridors*

The identified corridors in the previous steps were classified according to the mode of transport served (road or rail) and the function of these corridors. Three main functions were identified:

- Extension of the TMC: Corridors that would directly extend the reach of the TMC into neighboring regions
- Access element: Corridors that would connect landlocked areas or countries to the TMC network
- Complementary accesses: Corridors that provide alternative or supplementary connections to African corridors

#### *Identification of the Most Suitable Areas Connecting the Maghreb with Other African Regions*

Based on the classification carried out in the previous step and the importance it could have for the future development of the TMC as a trade corridor, connecting with landlocked territories and giving continuity to its infrastructures towards other corridors, the main areas of interest were identified for connecting the Maghreb with other regions of Africa by linking the TMC with corridors located in these regions.

#### *Detailed Analysis on the Most Suitable Areas Connecting the Maghreb with Other African Regions*

The final step involved a detailed characterization of the current infrastructures and border crossings connecting with the TMC or its potential area of influence, as well as the planned infrastructures, in the areas of interest identified above. This characterization was based, first of all, on official project reports and development plans, allowing a reliable and high-quality updated description of the project. Official press communications or media articles directly referring the projects are also used, but in these cases the information about the projects is limited.

## 4. TMC AS TRANSPORT CORRIDOR - UPDATED STATE AND REQUIRED MISSING LINK PROJECTS

### 4.1. Introduction

#### 4.1.1. Context

The Trans-Maghreb Multimodal Corridor (TMC) is configured as the transport infrastructure axis that will allow interconnection between the main areas of socioeconomic development of the Maghreb countries. This interconnection requires the existence of infrastructures that allow the continuity of transport flows under optimal conditions of fluidity and safety.

The importance of Trans-Maghreb Multimodal Corridor (TMC) as a major strategic corridor of the transport network for the five countries of the Maghreb has been recognized on various occasions by cooperation organizations. In 1990, the AMU (Arab Maghreb Union) defined the road component of the Trans-Maghreb Corridor for the Maghreb and qualified it as a project of paramount importance for the region.

In 2008, the conference of Ministers of the GTMO 5+5 adopted the Multimodal Transport Network of the GTMO 5+5, which includes the different modes of transports (Roads, railway, ports, airports), as a transposition of the criteria of the EU's Trans European Transport Network (TEN-T) to the countries of the Maghreb. In 2014, the updated TEN-T directives were also adopted.



Figure 9. GTMO 5+5 multimodal corridors

Due to the importance of the transport networks included in the corridor, the completion of the transport infrastructures and missing links of the TMC has been one of the main objectives of transport development policies in the countries of the Maghreb, being the efforts made by the three countries of

central Maghreb (Morocco, Algeria and Tunisia) to complete the motorway axis one of the most relevant examples.

Moreover, the completion and upgrading of the infrastructures, so continuity of networks and transport flows are guaranteed, has been recognised by cooperation organisations as the MoU between the AMU and the GTMO 5+5 in 2008. Also by the decisions adopted in several GTMO 5+5 ministerial conferences to intensify efforts to complete the missing links in this infrastructure, and additionally by the Union For the Mediterranean's support for completion of the central section of the trans-Maghreb motorway axis.

#### 4.1.2. Objectives

The first objective of this chapter is to provide a detailed and updated depiction of the present state of the core transport infrastructural components of the TMC's

The second objective is to assess their present state to then identify the Missing links, defined as network discontinuities, capacity bottlenecks and lack of new nodal logistic infrastructures that limit the continuity and efficiency of the TMC as trade corridor.

The final objective is to define, characterize and prioritize the required projects to address the identified Missing Links, thus resolving the corridor infrastructure discontinuities, increasing or improving the technical capacities of existing infrastructures or creating new nodal infrastructures that contribute to the facilitation or improvement of transport conditions

#### 4.1.3. Methodology Summary

In order to achieve the proposed objective, a set of tasks has been structured consecutively, briefly summarized below and as described in more detail in Chapter 3, Methodology.

First of all, the infrastructure components that make up the TMC have been determined, as well as the compilation of information on their characteristics, condition, layout and location. This has led to the creation and updating of the georeferenced database on the TMC infrastructure and socioeconomic elements that frame it.

The core TMC's infrastructure is assessed to identify the Missing Links leading to the third stage that involves the identification and characterization of projects that resolve the discontinuities of the infrastructure, interventions that increase or improve the technical capacities of existing infrastructures and that provide new required nodal infrastructures, all of which contribute to the facilitation or improvement of transport conditions, and the optimization of the TMC as Trade Corridor.

The third stage involved the Missing links, based largely on the provision of information by the respective ministries of transport of the Maghreb countries. This involves the creation of a list of projects, the collection of detailed information and the definition of a set of relevant and homogeneous variables for their characterization. This characterization will subsequently allow their comparative evaluation.

A Multi-Criteria Analysis (MCA) tool has been defined as a method that allows the comparative evaluation of projects based on the categorization, quantification and weighting of a set of common criteria. In general terms, it is the evaluation and comparison of projects or measures based on a quantitative assessment.

Finally, once the criteria, values and weights have been defined in the multi-criteria analysis tool and the different project categories have been parameterized, a ranking of the projects has been established, according to the score obtained in the MCA and the determination of the most relevant projects per country.

#### 4.1.4. Content Description

The study findings are organized into two groups firstly the infrastructure components of the TMC, the current state of the network and the insertion of the TMC in the geographical and socio-economic context of the Maghreb. Secondly, the selection, evaluation and prioritization of projects defined as missing links.

The main result obtained in this block has been the creation of a georeferenced database that has allowed not only the compilation of the information but also the cartographic representation by means of GIS tools. It is this tool, already explained in the methodology section, which allows to properly manage and cartographically represent the data of the infrastructure components of the TMC, the current state of the network and the insertion of the TMC in the geographical and socio-economic context of the Maghreb.

This and following sections include an array of cartographic representations, that are also included in a much larger format in the **Annex 1**.

The rest of this section includes three types of cartographic representations, first the layout and components of the TMC, where existing and planned roads, railways, ports, airports and logistics platforms are represented, providing in that way a geographical overview of the TMC, together with the Trans-Sahara Road.

Secondly the cartographic representation for each country of road networks and nodal infrastructure, where the different typologies of road infrastructure are represented. These typologies include motorways, toll motorways, double carriageways, roads, and tracks.

Thirdly, representation for each country's railway networks and nodal infrastructure, where the different typologies of rail infrastructure are represented. The typologies represented are classified according to gauge, electrification, type of track (double or single) and type of line (if High Speed Line exists).

Population is the most reliable, accessible and homogeneous socioeconomic information to be applied to sub-national regions of the countries of the Maghreb, as such has been selected as the most suitable variable to represent the socioeconomic context where the TMC is inserted. Demographic data is complemented with TMC's area of influence over of urban and activity/industrial spaces of the countries of the Maghreb, defined as a 50 Km. band on each side of TMC's infrastructure. Both population and territory influence have cartographically represented.

##### *TMC's as Transport Corridor Required Projects: Identification, Characterization, and Prioritization*

The output of this block of activities includes the identification, listing, characterization and cartographic representation of the missing links regarding road, rail, ports, airports and logistics platforms, complemented with an explanation of how these projects fit into national strategies and the completion and modernization of TMC infrastructure.

This information is later assessed and prioritized applying multicriteria analysis (MCA), and the results obtained are presented by country and in the form of a graph. This presentation also shows the scores obtained in the different criteria considered for each project.

Additionally the **Annex 2** provides the description and characteristics of all 106 projects identified.

## 4.2. Present State of Core Transport Infrastructure

The TMC starts at the Rosso border point between Mauritania and Senegal, links the capitals of the Maghreb countries, up to the Amsaad border between Libya and Egypt. Its layout which runs parallel to the coastline, and allows the connection not only between the capitals but also between the main cities of the countries it crosses such as Nouadhibou in Mauritania; Agadir, Marrakech, Casablanca, Tangier or Fez in Morocco; Oran, Chlef, Settif or Constantine in Algeria; Sousse, Sfax or Gabès in Tunisia; and finally Misrata, Sirte, Benghazi or Tobruk in Libya.

A set of branches allows connection with port hubs such as El Jadida, Safi or Nador in Morocco, Arzwe, Bejaia, Annaba or Skikda in Algeria, and Bizerte or Zarzis in Tunisia. The corridor is thus positioned as a set of infrastructures that guarantees the connection of ports with their hinterland. On the other hand, the connection between the major cities also guarantees access to the main airports in the region and therefore also constitutes the backbone of passenger flows.

As a multimodal corridor, the TMC includes five types of infrastructure, considering the mode of transport: roads, railroads, ports, airports and logistics platforms. Both existing and proposed infrastructures are considered.

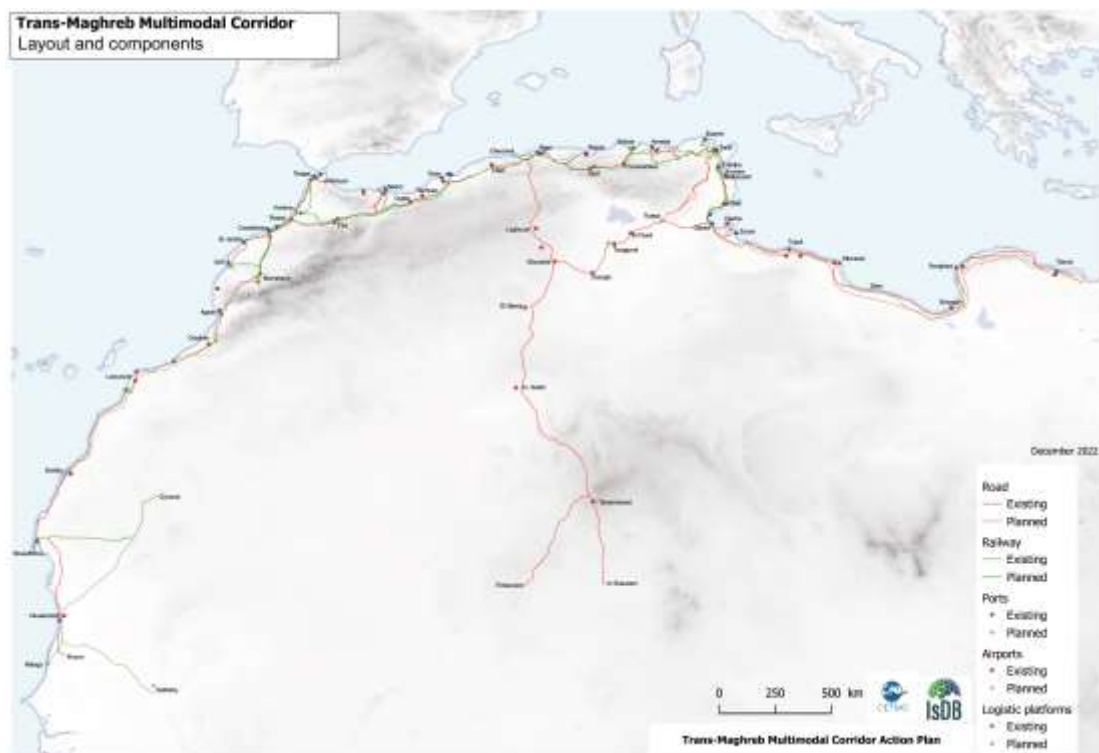


Figure 10. Layout and components of TMC and TSR Source: CETMO

Together with the TMC, the Trans-Sahara Road (TSR) axis is represented. This infrastructure is part of the attempt to create a corridor across the Sahara to link the Algerian and Tunisian coastline with the Sahelian and Gulf of Guinea countries.

#### 4.2.1. Core Transport Infrastructure State - Algeria

The road infrastructures of the TMC in Algeria include the East-West Highway that runs parallel to the coast between the borders with Morocco and Tunisia. A set of roads links this axis with the main coastal cities such as Oran, Cherchell, Bejaïa, Skikda and Annaba. On the other side the Trans-Saharan Highway axis coincides with National Highway 1 running north-south from Algiers to Tin Zaouatine and In-Guezzam. In the northern part, up to the city of Gardaiïa, a large part of the route corresponds to highways. From Ghardaïa, a branch road connects with the Tunisian border, part of the route also consisting of dual carriageways.

The rail component of the TMC in Algeria follows a layout very similar to that of the road component. For the most part, it is a single-track infrastructure, not electrified, although there are a significant number of double-track sections, some of which are electrified.

The layout of the linear infrastructure of the TMC connects the country's main ports, including the future port of Cherchell. The country's main airports and those connecting the country's most peripheral regions are located around this linear axis and along the Trans-Sahara route (TSR). To date, a limited number of logistics platforms are located around Algiers and in the vicinity of the port of Bejaïa, in Setif.

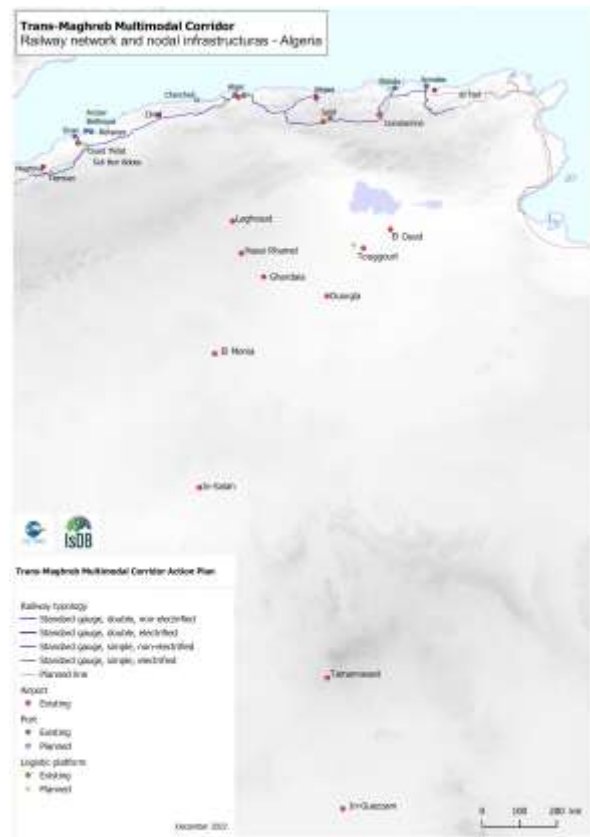


Figure 11. Layout and components of the TMC and TSR Roads and Nodal Infrastructure - Algeria

Figure 12. TMC and TSR layout and components Railway and Nodal Infrastructure - Algeria

#### 4.2.2. Core Transport Infrastructure State - - Mauritania

In Mauritania, the road section of the TMC includes the N-2 road running north-south parallel to the coast. This road links the city of Nouadhibou, in the north of the country, with the capital Nouakchott, and this capital with the city of Rosso, in the extreme south of the country on the border with Senegal. This route connects the country's three major ports, Nouadhibou, Nouakchott, also known as the port of friendship, and the recently built port of Ndiago.

In relation to the railway, the only existing line in the country has been considered, which links Zouerat with the mining port of Nouadhibou, with a perpendicular route to the coast and dedicated exclusively to the transport of iron ore.



Figure 13. Layout and components of the TMC. Roads and Nodal Infrastructures - Mauritania



Figure 14. Layout and components of the TMC. Rail and Nodal Infrastructures - Mauritania

### 4.2.3. Core Transport Infrastructure State - - Morocco

The northern part of the road component of the TMC in Morocco is almost entirely composed of the country's highway network: Highway A-1 between Rabat and Safi via Casablanca, Highway A-2 between Rabat and Oujda, Highway A-3 between Casablanca and Agadir and Highway A-5 between Rabat and Tangier. South of Agadir, the road component of the TMC corresponds to the RN 1, running parallel to the coast. Between the city of Agadir and Laayoune this road takes the form of a dual carriageway and from Laayoune it runs as a highway to the border with Mauritania.

As far as the rail network is concerned, almost the entire network is part of the TMC, including the high-speed line between Tangier and Kenitra. The sections between Casablanca and Marrakech on the one hand and Casablanca-Fès on the other are electrified and largely double track. From the existing axis between Marrakech and Fès, the network extends as non-electrified tracks to Oujda, Nador, Tangier, El Jadida and Safi.

The arrangement of these two networks allows the interconnection of the country's main ports and airports. There is also an incipient network of logistics platforms around the cities of Casablanca, Fès, Kenitra, Tangier and Marrakech.



Figure 15. Layout and components of the TMC. Roads and Nodal Infrastructures - Morocco



Figure 16. Layout and components of the TMC. Railroad and Nodal Infrastructures - Morocco

#### 4.2.4. Core Transport Infrastructure State - - Tunisia

The road component of the TMC in Tunisia is largely structured on the country's freeway network, which connects the capital with the vicinity of the Algerian border, the port city of Bizerte and the border crossing with Libya at Ras Ajdir. This last connection links the city of Tunis with Hammamet, Sfax, Gabès and Medenine through a north-south route running parallel to the coast. In addition, the TSR links Tozeur with the port of Gabes on one side and with the city and port of Tunis on the other.

As far as railroads are concerned, it should be noted that there are two different track gauges in the network, which makes it difficult to operate the network as a whole. On the one hand, the line between Tunis, Bizerte and the Algerian border has a metric gauge, while the rest of the network, from Tunis to the south as far as Gabès, is built in UIC standard gauge. Most of the two networks are non-electrified single track lines, with the extension of double track limited to the sections between Jedida and Tunis on the eastbound line and to M'Saken on the standard gauge line. Electrification is limited to the vicinity of the capital.



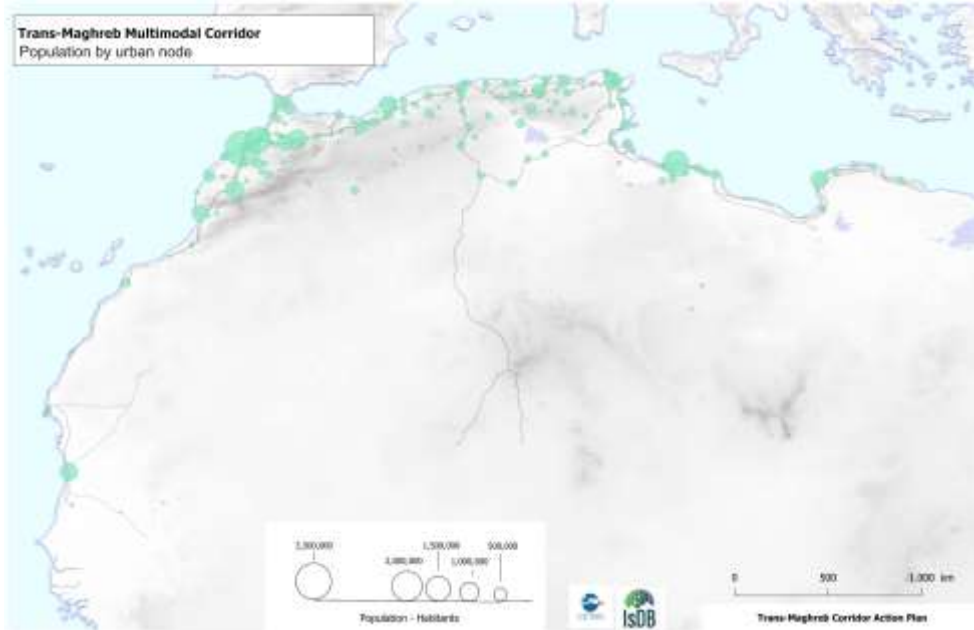
Figure 17. Layout and components of the TMC and TSR Roads and Nodal Infrastructure - Tunisia



Figure 18. TMC and TSR layout and components Railway and Nodal Infrastructure - Tunisia

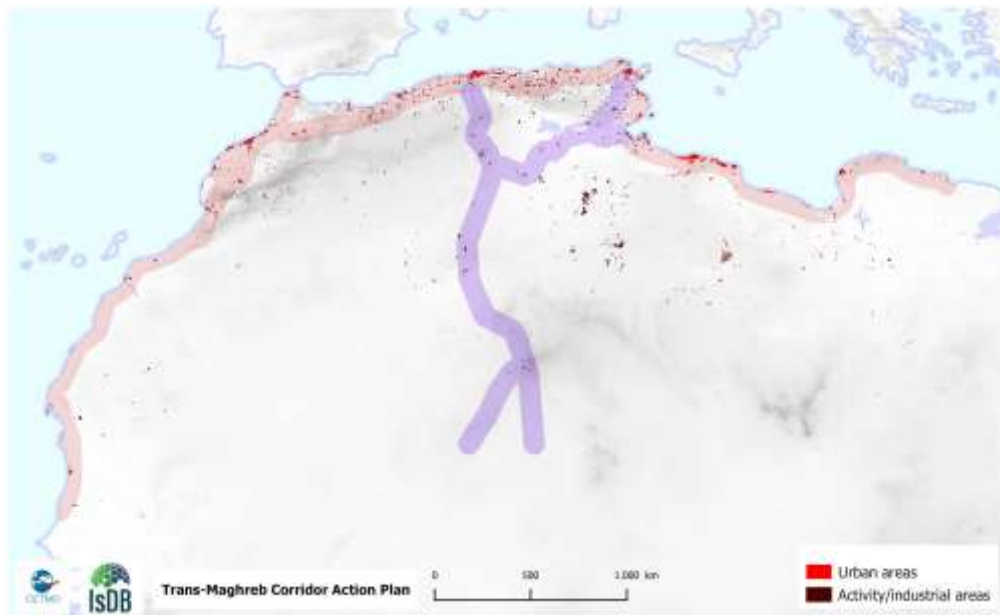
#### 4.2.5. Maghreb Region Socio-economic Elements

*Cartographic representation of population for sub-national regions of the countries of the Maghreb*



*Figure 19. Layout of TMC and population for sub-national regions of the countries of the Maghreb*

*Cartographic representation TMC area of influence over of urban and activity/industrial spaces*



*Figure 20. Layout of TMC and urban and Industrial/activity areas of the Maghreb*

The Trans-Maghreb Multimodal Corridor provide service and accessibility to regions that represent 66% of population, 70% of urban surface and 66% of activity/industrial surface of the Central Maghreb.

Improvement of this Corridor, through completion of missing infrastructures, upgrading performance and ameliorate multimodality, will reduce transport cost and then increase trade and integration in the region.

### 4.3. Assessment and Required Missing Link Projects

Based on information on the status of the GTMO 5+5 multimodal transport network, consultation of the countries' main infrastructure development plans and information provided specifically by the ministries in charge of transport in the Maghreb countries, **106 infrastructure projects** have been identified along the route of the TMC. These projects cover five types of projects: roads, railways, ports, airports and logistics platforms.

| Country      | Airport   | Logistics | Port     | Railway   | Road      | TOTAL      |
|--------------|-----------|-----------|----------|-----------|-----------|------------|
| Algeria      | 0         | 4         | 1        | 10        | 8         | 23         |
| Mauritania   | 1         | 0         | 0        | 3         | 3         | 7          |
| Morocco      | 9         | 11        | 5        | 21        | 12        | 58         |
| Tunisia      |           | 7         | 2        | 5         | 4         | 18         |
| <b>TOTAL</b> | <b>10</b> | <b>22</b> | <b>8</b> | <b>39</b> | <b>27</b> | <b>106</b> |

Figure 21. TMC Total Missing Link projects by country and mode of transport.

The number of projects, as well as the great length of the network route covered by each country - as will be explained in the following sections - serve as indicators of the importance given in the planning of the countries to the improvement of the infrastructures that make up the corridor. The development strategies of the countries' transport networks show the priority of modernization or construction of the infrastructures associated with the corridor, as a basic axis for the flow of goods and passengers.

Consideration of the number of projects by type of infrastructure provides a more detailed view of the infrastructure needs of the TMC as well as the infrastructure strategies and policies of the Maghreb countries. In the Maghreb as a whole, rail projects are the most represented, with 39 projects. Bearing in mind that road is currently the main mode of goods and passenger flows in the Maghreb, the large representation of rail projects over the total shows a strategic will on the part of transport managers to redistribute flows in favor of rail.

It is also necessary to consider that, thanks to the investments of the last two decades, a large part of the TMC's road layout now has the characteristics of high-capacity roads, either as freeways or dual carriageways, so that this mode does not currently require a renewed modernization effort. Even so, the road mode is the second most represented mode in the projects identified, reaching the figure of 27 projects.

On the other hand, the rail promotion policies of the Maghreb countries are in line with a global trend in favor of redistributing the modal split in favor of rail, as the most sustainable and efficient mode. Finally, in the case of the Maghreb countries, the railroad network, inherited from the colonial past, still presents discontinuities in its layout, and therefore the need to create new sections, as well as a state of maintenance of the infrastructure that makes necessary its improvement and modernization to new demands of both passenger and freight transport.

As will be shown in the following sections, the development plans for a high-speed network is the most expensive test of modernization in the passenger rail transport sector. In the case of freight, this modernization involves the adaptation of the network and its connection with ports and logistics areas.

Also noteworthy is the high representation of logistics infrastructures over the total number of projects. The number of projects of this type of infrastructure reaches 22, more than double the sum of the number of port and airport projects. The existence of this number of projects can be explained not only by the fact that they are simpler projects than those of other types of infrastructure, but also by the awareness of the new needs of freight transport, in which logistics services are seen as a fundamental element in its competitiveness. These needs are not only focused on better management of goods and their distribution, but are also considered as a basic infrastructure in the promotion of multimodal flows of goods.

### 4.3.1. Missing Links Projects - Algeria

| Code   | Name of project   | Typology  |
|--------|---|-----------|
| DZPo1  | Port de Cherchel - Tipaza   | Port      |
| DZRo2  | 3e Rocade Autoroutière d'Alger – Benimered – Nador                              | Road      |
| DZRo3  | Autoroute Penentantre de Skikda   | Road      |
| DZRo4  | Autoroute Est-Ouest : Bouteldja - Melloulal                                     | Road      |
| DZRo5  | Amélioration à voie express : Oulet Tlelat – Arzew-Béthioua                     | Road      |
| DZRo6  | Amélioration à voie express : Djelfa –Ain El Bell                               | Road      |
| DZRo7  | Amélioration à voie express : Ghardaïa- In Guezzam                              | Road      |
| DZRo8  | Amélioration route : Silet - Tin Zaouautine                                     | Road      |
| DZRo9  | Amélioration à voie express : Ighzer Amokrane – El Kaseur                       | Road      |
| DZRa10 | Nouvelle ligne ferroviaire : Oued Tlelat - Maghnia                              | Railway   |
| DZRa11 | Nouvelle ligne ferroviaire : Zéralda – Tipaza - Cherchell                       | Railway   |
| DZRa12 | Nouvelle ligne ferroviaire : Annaba –El Tarf – Frontière Tunisie                | Railway   |
| DZRa13 | Nouvelle ligne ferroviaire : El Khroub – Ramdane Djamel                         | Railway   |
| DZRa14 | Modernisation de la ligne ferroviaire : Maghnia – Akid Abbas                    | Railway   |
| DZRa15 | Modernisation de la ligne ferroviaire : Oued Tlelat- Alger                      | Railway   |
| DZRa16 | Modernisation de la ligne ferroviaire : Beni Mansour - Béjaïa                   | Railway   |
| DZRa17 | Modernisation de la ligne ferroviaire : Alger - Annaba                          | Railway   |
| DZRa18 | Modernisation de la ligne ferroviaire : Ramdane Djamel - Skikda                 | Railway   |
| DZRa19 | Modernisation de la ligne ferroviaire : Annaba – Souk Ahras – Frontière Tunisie | Railway   |
| DZLo20 | Zone logistique Oran – El Kerma   | Logistics |
| DZLo21 | Zone logistique Alger Blida   | Logistics |
| DZLo22 | Zone logistique Skikda  | Logistics |
| DZLo23 | Zone logistique Touggrouit  | Logistics |

Figure 22. List of Identified infrastructure projects on the TMC - Algeria

The projects identified for linear infrastructure in Algeria, i.e. railroads and roads, are clearly aimed at modernizing the existing network. In the case of roads, a large part of the TMC route already corresponds to high-capacity roads and the projects are aimed at completing a modernized network. This is the case of the DZRo4 project, which aims to complete the east-west freeway route to the Tunisian border.

Other projects identified are aimed at linking the trunk axis of the East-West highway with the main cities and port centers of the coast, such as the DZRo3 project of the Skikda penetrant. On the other hand, the aim is to complete the transformation of the RTS into a high-capacity road in those sections where the roadway has not yet been widened (DZRo6, DZRo7, DZRo8). Another set of projects aims to establish east-west freeway links to the main ports and coastal cities.

Among the railway projects, two major renovation projects of the main railway axis parallel to the coast (DZRa15 and DZRa17) linking the capital with the east and west of the country stand out. Other minor projects are oriented to the connection with ports and coastal cities (DZRa16 and DZRa18) and the extension/modernization of the network towards the borders of Morocco (DZRa14) and Tunisia (DZRa19).

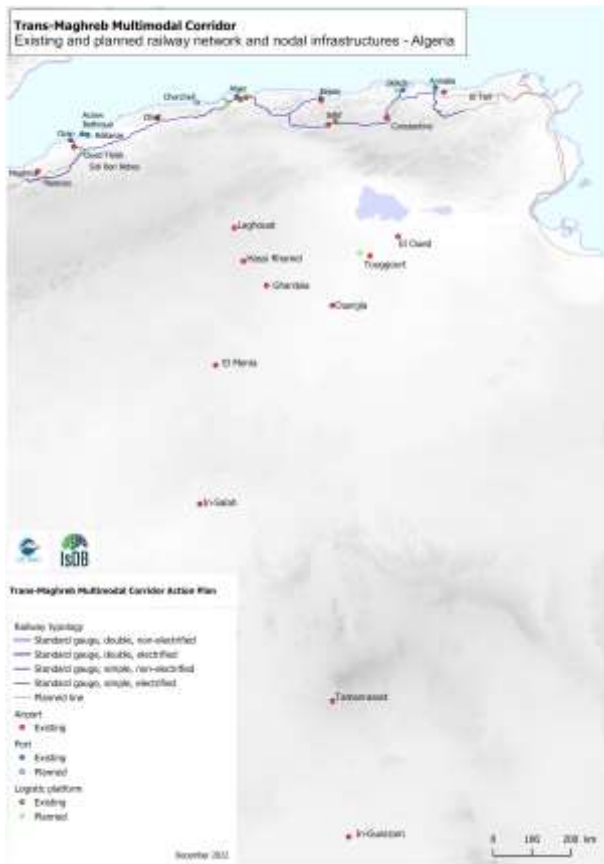


Figure 23. Maps of Identified infrastructure projects on the TMC – Algeria

### 4.3.2. Missing Links Projects - Mauritania

The only port project, the port of Cherchell, is of great importance, as it aims to provide the country with a modern port infrastructure that will contribute to the decongestion of the ports of Alger and Oran. In terms of logistics infrastructure, the projects are located near the ports and in the hinterland, thus forming the beginning of a network that will cover the entire country.

| Code  | Project   | Typology |
|-------|---|----------|
| MRAi2 | Aéroport Sélibaby                                   | Airport  |
| MRRa5 | Nouvelle ligne : Nouakchott – Choum                 | Railway  |
| MRRa6 | Nouvelle ligne : Tiguent – Port de Ndiago           | Railway  |
| MRRo4 | Nouvelle autoroute: Nouadhibou - Nouakchott - Rosso | Road     |
| MRRa7 | Nouvelle ligne : Nouakchott - Tiguent -Sélibaby     | Railway  |
| MRRo5 | Nouvelle autoroute : Nouakchott -Boutilimit         | Road     |
| MRRo3 | Amélioration de la route : Nouakchott -Nouadhibou   | Road     |

Figure 24. List of Identified infrastructure projects on the TMC - Mauritania

The projects identified in Mauritania focus on airports, railroads and roads. Road projects aim to strengthen the coastal axis linking Nouadhibou to the capital Nouakchott (MRRo3) and to the border with Senegal (MRRo4). The development of the Nouakchott-Boutilimit highway (MRRo4) is also intended to strengthen communication with the interior of the country. The orientation of the railroad projects also aims to improve communications from the capital to the hinterland (MRRa5, MRRa7) and to the port of Ndiago. Finally, in the airport sector, the Sélibaby airport is planned.

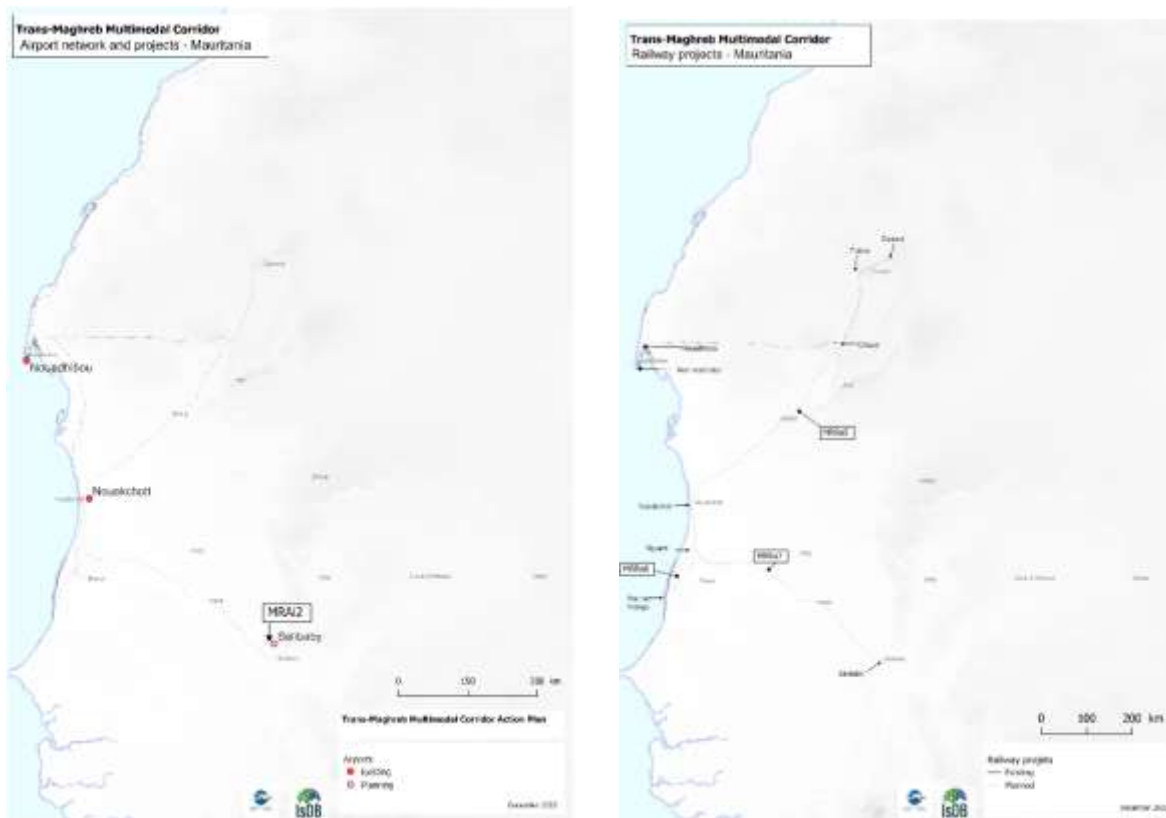




Figure 25. Maps of Infrastructure projects identified on the TMC - Mauritania

### 4.3.3. Missing Links Projects - Morocco

With regard to the projects identified in Morocco, the first thing that stands out is both their large number and the fact that they cover the five types of infrastructure considered: roads, railroads, ports, airports and logistics platforms. This is explained, first of all, by the facilities provided by the ministry in charge of transport and other agencies in the preparation of this study. But it is also explained by the effort of future planning of the various transport networks that has been carried out in this country.

From the point of view of railway projects, the extension of the network of high-speed lines stands out. This network is to be extended southward from Casablanca to Agadir via Marrakech (MARa32, MARa33) and eastward from Kenitra to Oujda via Fez (MARa28, MARa29). In addition to these major projects, there are smaller projects to guarantee or reinforce the connection with ports such as Tanger Med (MARa40), Safi (MARa45, MARa42) or Nador West Med (MARa34) among others, as well as a modernization and extension of the conventional network. Projects to extend this network include the extension of the network to the border with Mauritania (MARa36, MARa37).

| Code   | Name of project  | Typology |
|--------|--|----------|
| MAPo1  | Nador West Med   | Port     |
| MAPo2  | Chantier naval d'Agadir  | Port     |
| MAPo3  | Dakhla Atlantique  | Port     |
| MAPo4  | Port vraquier de Safi- Terminal phosphatier                            | Port     |
| MAPo5  | Kénitra Atlantique   | Port     |
| MAAi6  | Aéroport Casablanca - Construction d'une zone centrale                 | Airport  |
| MAAi7  | long terme   | Airport  |
| MAAi8  | Infrastructure aéronautique  | Airport  |
| MAAi9  | infrastructure aéronautique  | Airport  |
| MAAi10 | Aéroport de Rabat - Construction d'un nouveau terminal                 | Airport  |
| MAAi11 | Aéroport de Tétouan - Extension de la piste pour les gros porteurs     | Airport  |
| MAAi12 | Aéroport de Tétouan - Construction d'un nouveau terminal               | Airport  |
| MAAi13 | Infrastructure aéronautique  | Airport  |
| MAAi14 | Aéroport d'Al Hoceima - Extension de la piste d'envol                  | Airport  |
| MARo15 | Nouvelle Autoroute : Oujda(A2/RN6)-Frontière Algérie                   | Road     |
| MARo16 | Nouvelle Autoroute : Projet échangeur Guercif-Nador-WestMed-Nador      | Road     |
| MARo17 | Projet échangeur autoroute continental Casablanca                      | Road     |
| MARo18 | Nouvelle Autoroute : Tit Melill- Berrechid                             | Road     |
| MARo19 | Nouvelle voie express : Accès au port d'Agadir                         | Road     |
| MARo20 | Amélioration à voie express : Port Casablanca-Zenata                   | Road     |
| MARo21 | Amélioration à voie express : Échangeur Jorf Lasfar – Port Jorf Lasfar | Road     |
| MARo22 | Amélioration à voie express : Marsa-Port Dakhla                        | Road     |
| MARo23 | Amélioration route : Dakhla- Frontière Mauritanie                      | Road     |
| MARo24 | Élargissement autoroute à 2x3 voies : Tit Melill – Casablanca Lissarfa | Road     |
| MARo25 | Élargissement autoroute à 2x3 voies : Casablanca Ouest- Berrechid      | Road     |
| MARo26 | Amélioration à voie express : Guercif-RN2/RN15                         | Road     |

|        |  |           |
|--------|--|-----------|
| MARa28 | Ligne Grand Vitesse : Rabat – Fès                              | Railway   |
| MARa29 | Ligne Grande Vitesse : Fès– Oujda                              | Railway   |
| MARa30 | Ligne Grande Vitesse : Kenitra – Rabat                         | Railway   |
| MARa31 | Ligne Grande Vitesse : Rabat – Casablanca                      | Railway   |
| MARa32 | Ligne Grande Vitesse : Casablanca – Marrakech                  | Railway   |
| MARa33 | Ligne Grande Vitesse : Marrakech – Agadir                      | Railway   |
| MARa34 | Ligne conventionnelle : Antenne Nador West Med                 | Railway   |
| MARa35 | Ligne conventionnelle : Kenitra - Kenitra Atlantique           | Railway   |
| MARa36 | Ligne conventionnelle : Agadir - Laayoune – Dakhla             | Railway   |
| MARa37 | Ligne conventionnelle : Port Casablanca- Zenata                | Railway   |
| MARa38 | Ligne conventionnelle : Traversée de Casablanca                | Railway   |
| MARa39 | Ligne conventionnelle : Traversée de Rabat                     | Railway   |
| MARa40 | Doublement Tanger-Tanger Med                                   | Railway   |
| MARa41 | Doublement Sidi Yahia – Tanger                                 | Railway   |
| MARa42 | Doublement Ben guérir – Safi                                   | Railway   |
| MARa43 | Doublement/électrification Taourirt – Nador                    | Railway   |
| MARa44 | Doublement/électrification Fès-Oujda                           | Railway   |
| MARa45 | Ligne conventionnelle : Connexion port vraquier de Safi        | Railway   |
| MARa46 | Ligne Grande Vitesse Oujda Frontière Algérie                   | Railway   |
| MARa47 | Ligne conventionnelle : Connexion Dakhla- Frontière Mauritanie | Railway   |
| MARa48 | Doublement Antenne de l'aéroport de Casablanca                 | Railway   |
| MALo49 | Zone logistique de Dakhla West Africa                          | Logistics |
| MALo50 | Zone Logistique de Nador                                       | Logistics |
| MALo51 | Zone logistique d'Ait Melloul                                  | Logistics |
| MALo52 | Zone logistique de Ras El Ma                                   | Logistics |
| MALo53 | Zone logistique de Tamensourt                                  | Logistics |
| MALo54 | Zone logistique de Guelmin                                     | Logistics |
| MALo55 | Zone logistique de Beni-Mellal                                 | Logistics |
| MALo56 | Zone logistique de Laâyoune-El Marsa                           | Logistics |
| MALo57 | Zone logistique de Zenata II                                   | Logistics |
| MALo58 | Zone logistique de Oulad-Saleh                                 | Logistics |
| MALo59 | Zone logistique de Midelt-Zaida                                | Logistics |

Figure 26. List of Identified infrastructure projects on the TMC - Morocco

A major part of the road projects are concentrated in the vicinity of the urban agglomerations of Casablanca and Rabat (MARo17, MARo18, MARo20, MARo24, MARo25), interventions aimed at decongesting road traffic in this area. Other road interventions are focused on improving the connection with the ports, such as Agadir (MARo19), Jorf Lasfar (MARo21) or the new highway to Nador and its port (MARo16). Finally, the modernization of the Atlantic road axis to the border with Mauritania (MARo36, MARo47) is envisaged.

In relation to nodal infrastructures, the projects identified on the TMC are a reflection of existing strategies and plans for the extension and modernization of port, airport and logistics platform infrastructures. Port projects include three new ports, Dakhla Atlantique (MAPo3), Kenitra Atlantique (MAPo5) and Nador West Med (MAPo1), as well as the modernization of the port of Agadir (MAPo2) and Safi (MAPo4). Projects in the airport sector include the expansion or modernization of existing infrastructure at the airports of Agadir, Marrakech, Casablanca, Tangier, Tetouan and Al-Hoceima. Lastly, the proposed expansion of the network of logistics platforms reflects an ambitious program to develop Morocco's logistics competitiveness. Nine new logistics platforms are planned along the corridor, complementing the five existing ones.

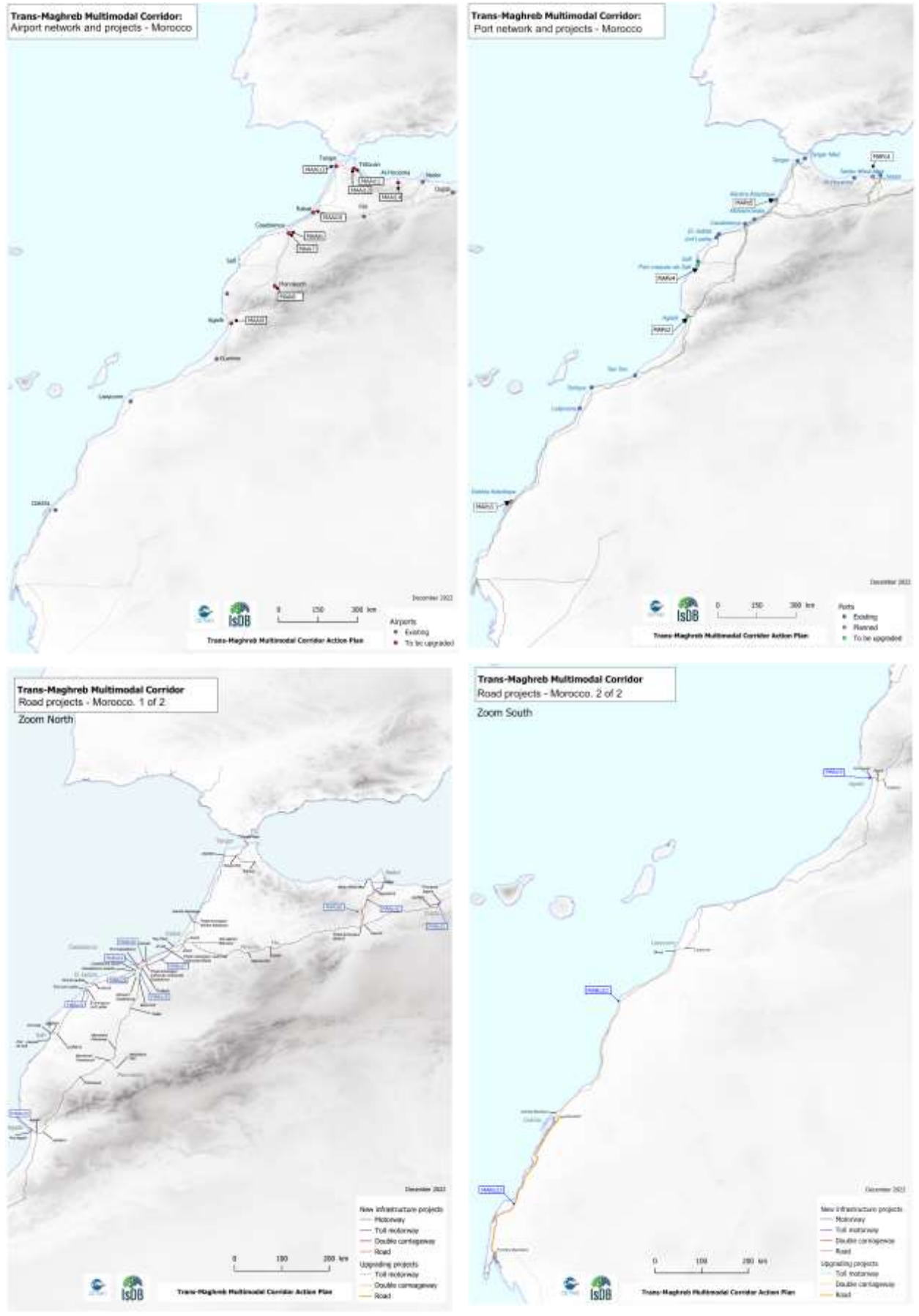


Figure 27. Maps of Infrastructure projects identified on the TMC - Morocco (I)



Figure 28. Maps of Identified infrastructure projects on the TMC - Morocco (II)

#### 4.3.4. Missing Links Projects - Tunisia

| Code   | Name of project   | Typology  |
|--------|---|-----------|
| TNPo1  | Port d'Enfidah  | Port      |
| TNRa4  | Nouvelle ligne grande vitesse : Tunis – Sfax – Gabès – Ras Ajdir    | Railway   |
| TNRa5  | Modernisation de la ligne (électrification) : Erriadh- Kalaa Sghira | Railway   |
| TNRa6  | Modernisation de la ligne : Jendouba- Ghardimaou (Frontière)        | Railway   |
| TNRo7  | Autoroute : Boussalem – Frontière Algérienne                        | Road      |
| TNRo8  | Autoroute : Gabès- Médenine   | Road      |
| TNRo9  | Autoroute Tunis - Jelma   | Road      |
| TNLo10 | Zone logistique Jendouba  | Logistics |
| TNLo11 | Zone logistique Radès   | Logistics |
| TNLo12 | Zone logistique Bir Mchergua  | Logistics |
| TNLo13 | Zone logistique Enfidha   | Logistics |
| TNLo14 | Zone logistique Sfax  | Logistics |
| TNLo15 | Zone logistique Gafsa   | Logistics |
| TNLo16 | Zone logistique Tozeur  | Logistics |
| TNPo2  | Nouveaux terminal à conteneurs au port de Radès                     | Port      |
| TNRa18 | Réhabilitation de la ligne 1 entre Jedeida et Bizerte               | Railway   |
| TNRa19 | Rétablissement et la rectification de la ligne 2 Mateur - Tabarka   | Railway   |
| TNRo20 | Autoroute : Jelma - Gafsa - Kasserine                               | Road      |

Figure 29 .List of Identified infrastructure projects on the TMC - Tunisia

Tunisia's railway projects include the creation of a network of high-speed lines coinciding with the route of the TMC, although there does not appear to be sufficient support for its implementation. Other railway projects are aimed at upgrading the existing conventional network, namely the upgrading of the rail connection with Algeria (TNRa5), the extension of electrification to a significant section of the network (TNRa6), as well as the rehabilitation of other lines (TNRa18, TNRa19).

The three existing road projects aim to complete the freeway network on the route of the TMC and the RTS. Specifically, they involve extending the highway network to the Algerian border (TNRo7), completing the section between Gabès and Medenine (TNRo8) and, finally, creating a new highway axis towards the interior of the country, coinciding with the route of the RTS (TNRo9).

The two port projects identified reflect Tunisia's strategy to overcome the current problems facing the country's ports. On the one hand, the modernization of the port of Radès in order to improve its efficiency and productivity (TNPo2). On the other hand, the need for a deep-water port to enable the Tunisian port system to integrate into global container flows (TNPo1).

Seven logistics platform projects have been identified. This shows the existence of a strategy that recognizes the importance of logistics services in the efficiency of goods flows.



Figure 30. Maps of Identified infrastructure projects on the TMC - Tunisia

## 4.4. Missing Link Projects Prioritization

This section covers the prioritization of the required projects to solve the existing TMC's network discontinuities, capacity bottlenecks and required new nodal logistic infrastructures (missing links) in order to ensure the continuity and efficiency of the TMC as trade corridor. As explained in detail in chapter 3 Methodology, this is done applying multicriteria analysis that considers the development and planning maturity of the projects, their financing stage, plus the alignment with the national administration planning and policies, and the social and economic impact.

### 4.4.1. Missing Link Projects Prioritization, Algeria

#### All Missing Link Projects

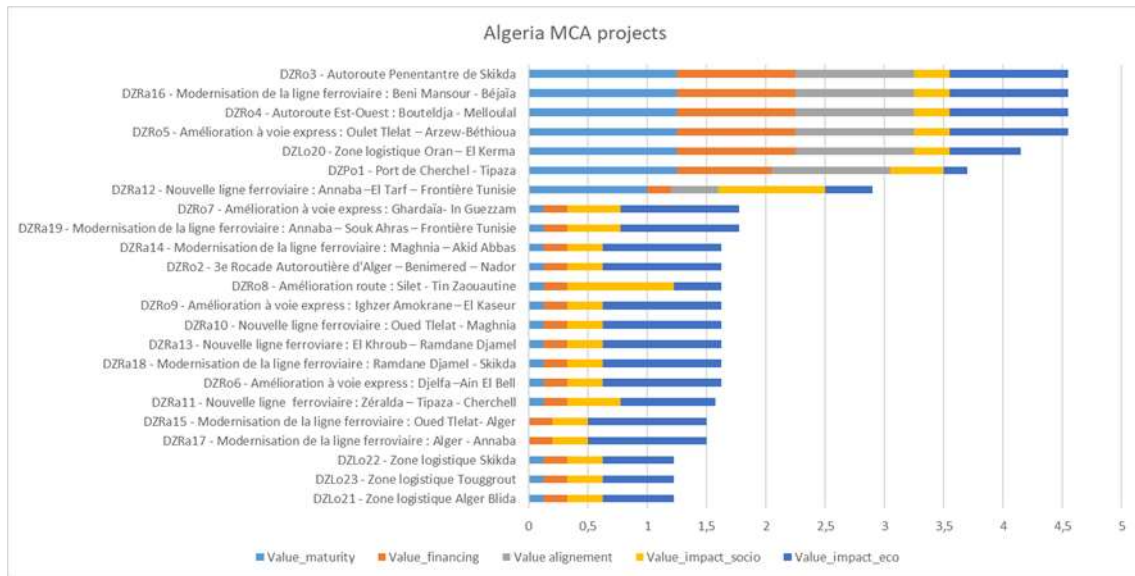


Figure 31. Benchmarking of infrastructure projects on the TMC – Algeria

#### High Priority Missing Link Projects

| Code   | Project   |
|--------|---|
| DZPo1  | Port de Cherchel - Tipaza                                     |
| DZLo20 | Zone logistique Oran – El Kerma                               |
| DZRo5  | Amélioration à voie express : Oulet Tlelat – Arzew-Béthioua   |
| DZRo4  | Autoroute Est-Ouest : Bouteldja - Melloulal                   |
| DZRa16 | Modernisation de la ligne ferroviaire : Beni Mansour - Béjaïa |
| DZRo3  | Autoroute Penentantre de Skikda                               |

Figure 32. Priority infrastructure projects on the TMC - Algeria

## 4.4.2. Missing Link Projects Ranking, Mauritania

### All Missing Link Projects

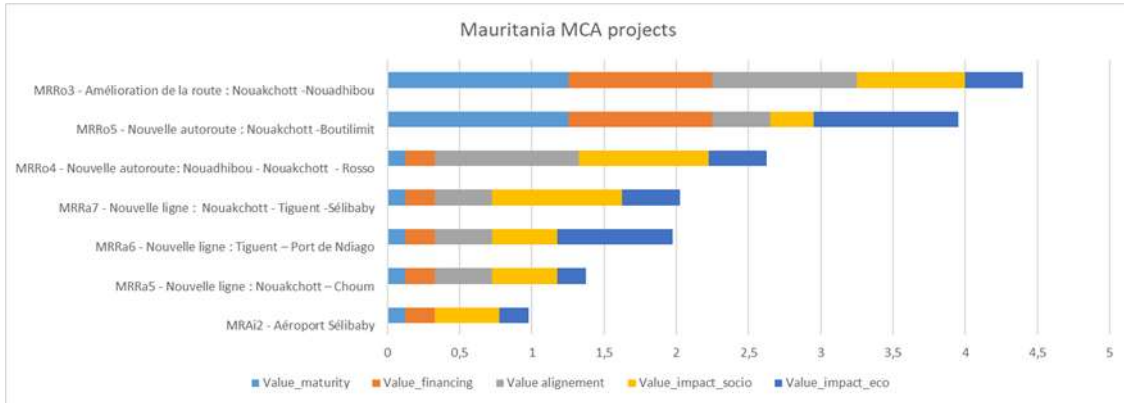


Figure 33. Benchmarking of infrastructure projects on the TMC - Mauritania

### High Priority Projects

| Code  | Project  |
|-------|--|
| MRRo5 | Nouvelle autoroute : Nouakchott - Boutilimit       |
| MRRo3 | Amélioration de la route : Nouakchott - Nouadhibou |

Figure 34. Priority infrastructure projects on TMC - Mauritania

### 4.4.3. Missing Link Projects Ranking, Morocco

#### All Missing Link Projects

Morocco is the country where the TMC is more extensive and therefore the one that requires more projects to optimize its TMC section as Transport Corridor. The following three figures 35, 36 and 37 list all missing link projects identified and prioritized, and 38 list the high priority ones.

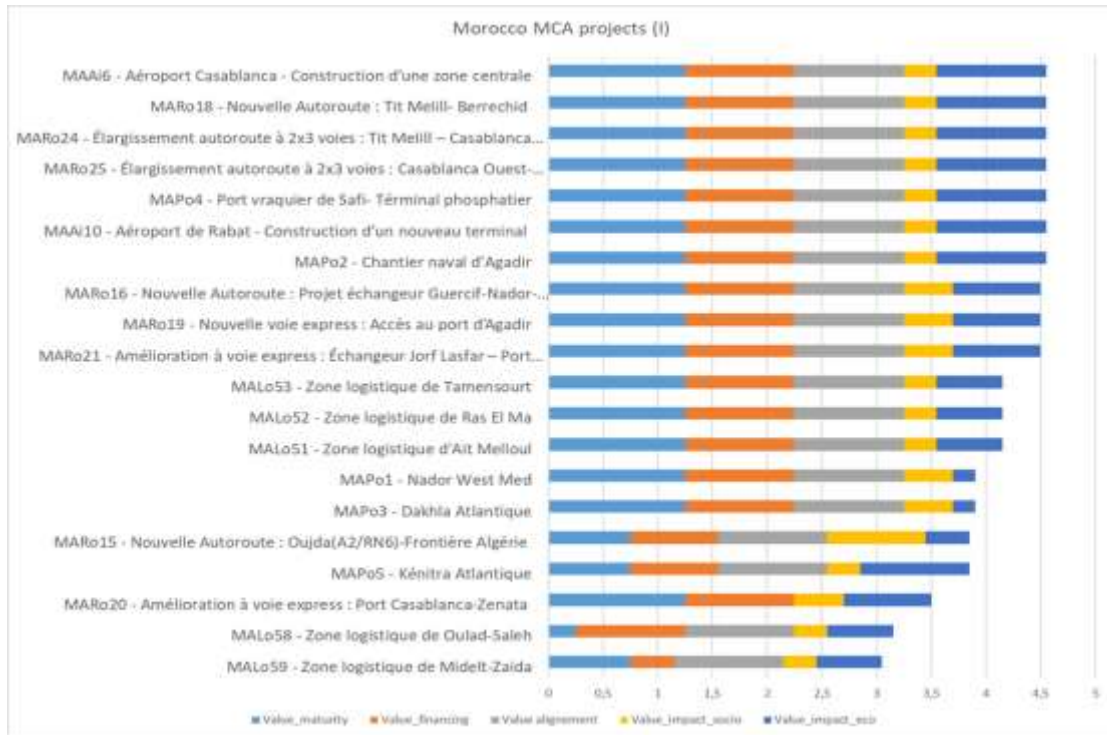


Figure 35. Benchmarking of infrastructure projects on the TMC- Morocco- I

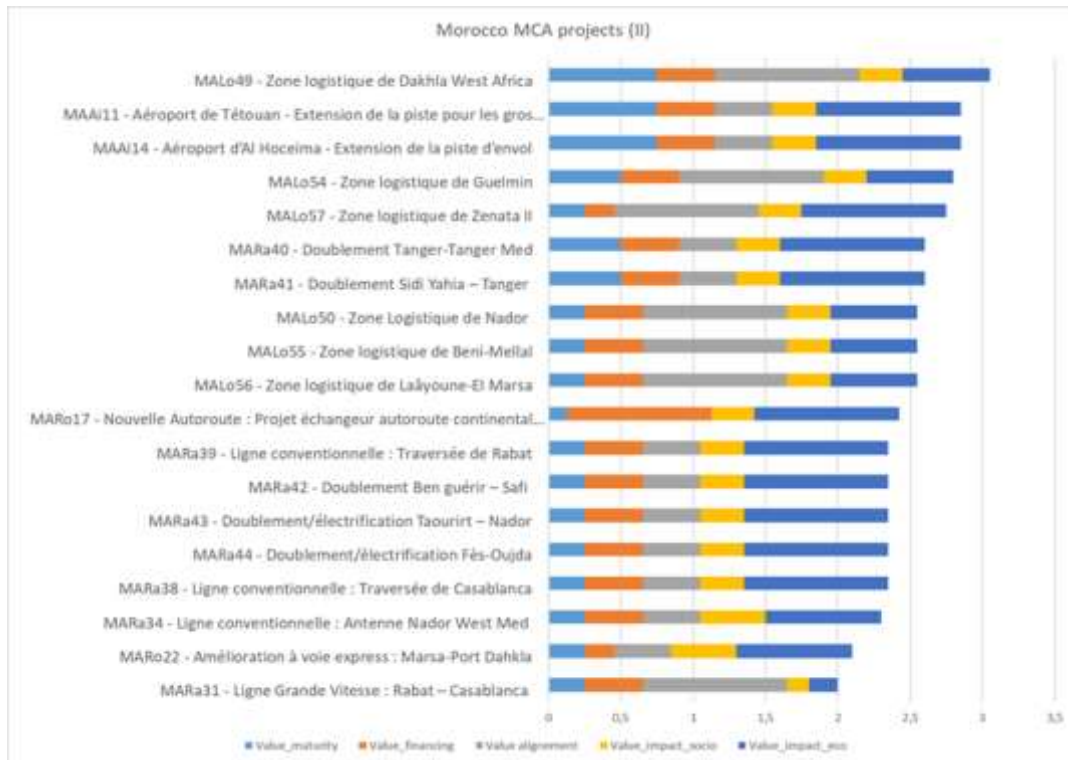


Figure 36. Benchmarking of infrastructure projects on the TMC - Morocco- II

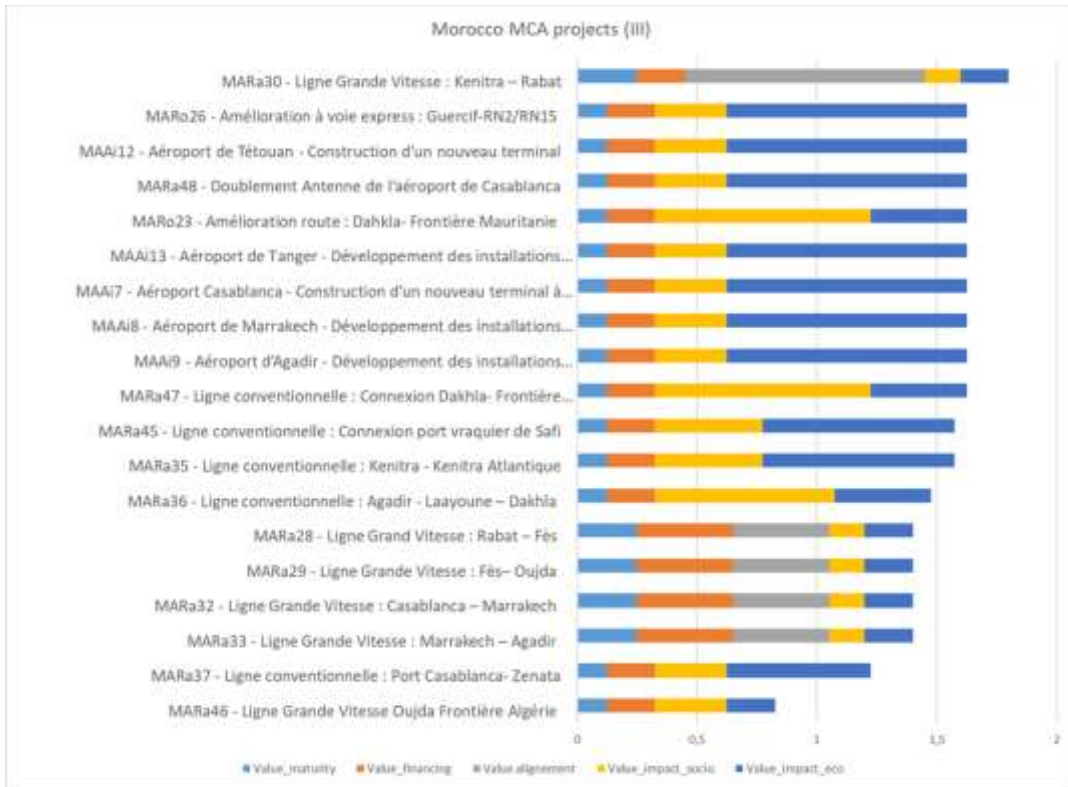


Figure 37. Benchmarking of infrastructure projects on the TMC- Morocco- III

### High Priority Projects

| Code   | Project  |
|--------|--|
| MAPo5  | Kénitra Atlantique   |
| MARo15 | Nouvelle Autoroute : Oujda(A2/RN6)-Frontière Algérie                   |
| MAPo3  | Dakhla Atlantique  |
| MAPo1  | Nador West Med   |
| MALo51 | Zone logistique d'Ait Melloul  |
| MALo52 | Zone logistique de Ras El Ma   |
| MALo53 | Zone logistique de Tamensourt  |
| MARo21 | Amélioration à voie express : Échangeur Jorf Lasfar – Port Jorf Lasfar |
| MARo19 | Nouvelle voie express : Accès au port d'Agadir                         |
| MARo16 | Nouvelle Autoroute : Projet échangeur Guercif-Nador-WestMed-Nador      |
| MAPo2  | Chantier naval d'Agadir  |
| MAAi10 | Aéroport de Rabat - Construction d'un nouveau terminal                 |
| MAPo4  | Port vraquier de Safi- Terminal phosphatier                            |
| MARo25 | Élargissement autoroute à 2x3 voies : Casablanca Ouest- Berrechid      |
| MARo24 | Élargissement autoroute à 2x3 voies : Tit Melill – Casablanca Lissarfa |
| MARo18 | Nouvelle Autoroute : Tit Melill- Berrechid                             |
| MAAi6  | Aéroport Casablanca - Construction d'une zone centrale                 |

Figure 38. Priority infrastructure projects on the TMC - Morocco

#### 4.4.4. Missing Link Projects Ranking, Tunisia

##### All Missing Link Projects

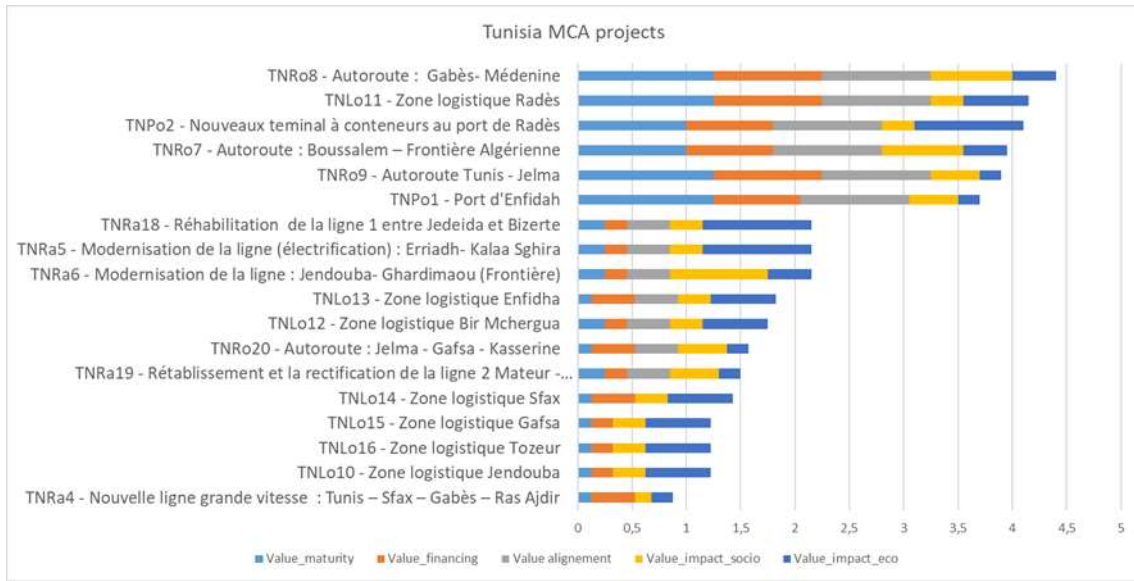


Figure 39. Benchmarking of infrastructure projects on the TMC - Tunisia

##### High Priority Projects

| Code   | Project   |
|--------|---|
| TNPo1  | Port d'Enfidah                                  |
| TNRo9  | Autoroute Tunis - Jelma                         |
| TNRo7  | Autoroute : Boussalem – Frontière Algérienne    |
| TNPo2  | Nouveaux terminal à conteneurs au port de Radès |
| TNLo11 | Zone logistique Radès                           |
| TNRo8  | Autoroute : Gabès- Médenine                     |

Table 40. Priority infrastructure projects on the TMC - Tunisia

## 4.5. Conclusions on TMC's Core Infrastructural State and Required Projects

The Trans-Maghreb Multimodal Corridor (TMC) is the set of linear infrastructures - railroads and roads - and nodal infrastructures - ports, airports and logistics platforms - that channel the most important transport flows in the Maghreb countries. The connection between the various capitals, areas of population agglomeration and infrastructures allowing international connections such as ports and airports make the TMC the essential axis of transport in the Maghreb.

The development of the TMC's potential as an infrastructure for economic and social development requires, first of all, that it be fully operational as a transport infrastructure. In other words, the set of infrastructures that make up the corridor must allow the continuity of transport flows with optimal conditions of fluidity and safety. This has been reflected in various international initiatives such as the successive conferences of ministers of the GTMO 5+5 since 2008, which have insisted on the importance of the corridor for the region and have urged decisions to be taken to guarantee its operability within the multimodal transport network of the GTMO 5+5 countries.

The importance of the TMC is reflected when analyzing the layout and location of its components. Its route, which runs parallel to the coastline, allows connection not only between the capitals but also with the main cities of the countries it crosses. Nouadibou in Mauritania; Agadir, Marrakech, Casablanca, Tangier or Fez in Morocco; Oran, Chlef, Settif or Constantine in Algeria; Sousse, Sfax or Gabès in Tunisia; and finally Misrata, Sirte, Benghazi or Tobruk in Libya.

In addition, a set of branches allows connection with port hubs such as Jadida, Safi or Nador in Morocco, Arzew, Bejaia, Annaba or Skikda in Algeria; and Bizerte or Zarzis in the case of Tunisia, thus enabling the connection of the ports with their hinterland. On the other hand, the connection between the major cities also guarantees access to the main airports in the region and therefore also constitutes the backbone of international passenger flows.

The socio-economic importance of the TMC can be shown by considering that this corridor provides service and accessibility to regions that represent 66% of population, the 70% of urban surface and the 66% of activity/industrial surface of the countries of the Central Maghreb.

Before considering their distribution according to modes of transport of existing infrastructure projects on the TMC or their distribution by country, the number of projects identified serves as an indicator of the importance given in the planning of the countries to the improvement of the infrastructures that make up the TMC. This fact reflects the role of the TMC in the structuring of transport infrastructures and flows in the various Maghreb countries and, therefore, the priority given in the transport policies of the Maghreb countries.

The number of projects per country is partly a reflection of the size of the surface area of each country and the length of the TMC infrastructure in each country. Thus, Morocco and Algeria, the countries where the TMC is the longest, have the largest number of projects. However, the large number of projects identified in the Moroccan case is due to other factors. On the one hand, the policy of construction and improvement of infrastructures implemented by this country in recent years. On the other hand, the commitment and collaboration of the Moroccan administrations with this project and the ease with which the required information has been provided, which has led to the identification of a large number of projects.

When considering the type of infrastructure by mode, it is rail projects that account for the greatest number. This fact becomes even more relevant if we take into account that road transport is the dominant mode for both passengers and goods in the Maghreb countries. The number of rail projects can be explained by two factors. First, a large part of the road network is not only already built, but, thanks to the investments of the last two decades, a large part of the TMC route is now characterized by high-capacity tracks.

On the other hand, and in line with a global trend in transport strategies to redistribute the modal split in favor of rail, there is an infrastructure planning policy in favor of rail mode development in the Maghreb countries. Secondly, in the case of the Maghreb countries, the railroad network currently still shows discontinuities in its layout, and therefore the need to create new sections, as well as a state of maintenance of the infrastructure that makes it necessary to improve and adapt it to their demands.

The number of logistics platform projects has reached 22, more than double the number of port and airport projects combined. The existence of this number of projects can be explained not only by the fact that they are simpler projects than other types of infrastructure, but also by the awareness of the new needs of freight transport, in which logistics services are seen as a fundamental element in its competitiveness.

The comparative evaluation of the projects, through a multi-criteria analysis, allows the establishment of a project score and, based on this, the selection of a set of priority projects. This evaluation was carried out on the basis of five criteria: project maturity, development of the project's financial plan, alignment and support of the project within national policies, economic impact and social impact. The consideration of the score obtained by each of them in the different criteria allows a better approximation of the result obtained and the obtaining of guidelines for the future development of the projects.

The definition of weights and criteria has led to the prioritization of those projects that are more advanced, i.e., with a higher degree of maturity and definition of the financing plan. In many cases, moreover, it is these projects that have greater national and political support. In the case of Algeria, these projects focus on the completion of the last sections of the East-West freeway, the road connections from this axis to the main cities and ports and the construction of the port of Cherchell.

Morocco's priority projects reflect the infrastructure development strategy in several areas: airports, ports and roads. In Mauritania, two road projects are positioned as priority projects. Finally, in Tunisia, in addition to road projects, there are projects related to the improvement of the port system. The priority projects identified therefore correspond to the countries' immediate priorities in terms of infrastructure development.

The identification of priority projects does not imply a lack of attention to the rest of the projects identified. These projects, although less advanced in their definition, show the infrastructure development strategies of the countries that will materialize in the short and medium term. This broader set of projects includes, among others, a large part of those projects that will involve the railway development of the TMC, as well as the deployment of a logistics infrastructure that will allow better management of freight transport flows. Support for the definition and design of these projects thus becomes a key element in the promotion of the strategies and policies of the Maghreb countries for the development of the infrastructures that make up the TMC.

## 5. FROM TRANSPORT TO TRADE CORRIDOR - MULTIMODALITY

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The previous chapter 4 TMC as Trade Corridor, identified and prioritized the missing links projects required to address the existing continuity, capacity and logistic limiting factors, thus enabling the TMC to act as an efficient Trade Corridor across the Maghreb region.

This chapter 5 Multimodality (multimodal integration), and the following chapter 6 Capillarity (expansion of the areas served by the TMC) plus the chapter 7 Connectivity, (enhanced connections with neighbouring regions and their respective corridors) include the updated assessment of the state of the TMC in those three aspects, and identifies and prioritizes the required actions to enable the TMC to transition from Transport Corridor to Trade Corridor, thus generating a larger effect of wealth creation, and socio-economic development for the region.

The multimodality perspective, which is the focus of this chapter, examines how different transport modes can be effectively integrated to create a seamless and more sustainable transportation system. The analysis reveals that enhancing TMC's multimodal infrastructure is crucial for maximizing the TMC's impact as a trade corridor, with 64 potential infrastructure projects identified and prioritized based on a multi-criteria analysis framework.

It should be noted that projects considered in this second phase generally have a lower degree of definition by country administrations compared to those in the first phase. The available information on multimodality projects is often less detailed and comprehensive, presenting a challenge for thorough analysis. Although this chapter provides an overview of various multimodality projects throughout the Maghreb region, particular attention is dedicated to ports and railways as they represent the backbone of any multimodal freight transportation system in the region.

### 5.1. Introduction

#### 5.1.1. Objective

The objective of this chapter is the identification, characterization, and prioritization of hard measures related to trade facilitation also known as infrastructural multimodal projects that will allow and improve transport multimodality, thereby enhancing the performance of the Trans-Maghreb Multimodal Corridor (TMC). By focusing on concrete infrastructure interventions, this chapter aims to outline a roadmap for developing the physical components necessary for an efficient multimodal freight transport system across the Maghreb countries.

The analysis and recommendations presented seek to identify key infrastructure projects that will facilitate modal shifts, improve interconnections between different transport networks, and enhance the overall efficiency of freight movement throughout the corridor. Through a structured approach to project assessment, this chapter provides decision-makers with a prioritized framework for investment in multimodal infrastructure development.

#### 5.1.2. Preliminary considerations

The analysis conducted in this chapter is based on the concept of multimodal freight transport, which must be distinguished from intermodal freight transport. Multimodal transport refers to the movement of goods using two or more modes of transport under a single contract, but with no standardized loading unit throughout the entire journey. This differs from intermodal transport, which involves the movement of goods in one and the same loading unit or vehicle by successive modes of transport without handling the goods themselves during transfers between modes.

The components of a multimodal freight transport system in the TMC corridor comprise four essential elements (see figure 41) that work together to ensure efficient movement of goods:

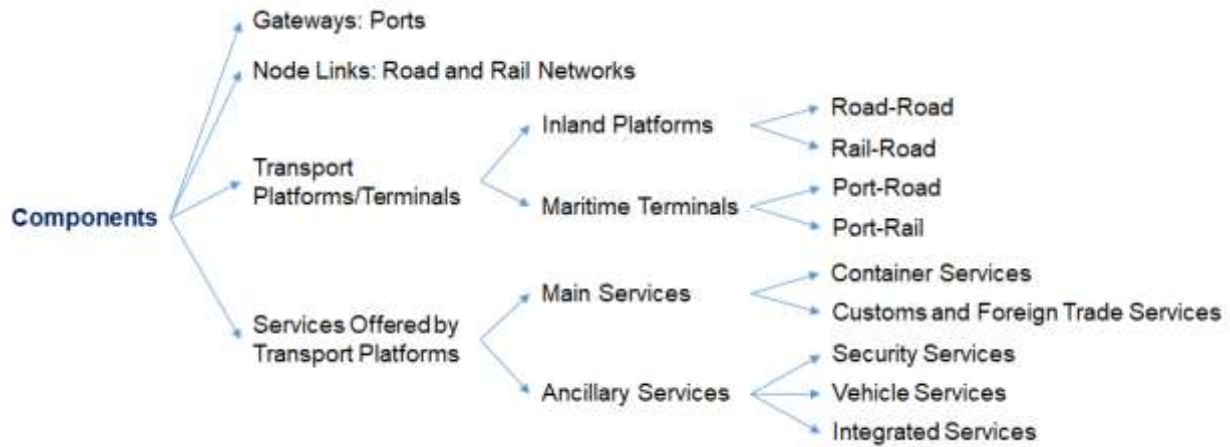


Figure 41. Components of the multimodal freight transport system. Source: CETMO

First, ports serve as the critical gateways of the freight transport system, functioning as the primary entry and exit points for international trade and connecting maritime and land transport modes. These infrastructure nodes are essential for the corridor's integration into global trade networks and represent the interface between sea and land transportation.

Second, road and rail networks constitute the links between the nodes of the system, providing the physical infrastructure for the movement of goods between terminals and distribution centres. The quality, capacity, and connectivity of these networks directly influence the efficiency of freight movement throughout the corridor.

Third, transport platforms or terminals represent the infrastructural nodes where modal shift takes place, allowing goods to transfer between different transportation modes. These specialized facilities are designed to facilitate the handling, storage, and transfer of cargo between various transport modes.

Fourth, the services offered by transport platforms or terminals characterize their multimodality capability and determine their effectiveness in facilitating seamless transitions between transport modes. These services add value to the physical infrastructure and enable efficient freight operations.

For the purpose of this analysis, we focus on two main types of transport terminals or platforms: inland platforms (road-road and rail-road) and maritime terminals (port-road and port-rail). These platforms can be further classified by the cargo typology they handle, primarily containers and semi-trailers or exclusively containers, each with specific operational requirements and characteristics.

General characteristics and type of cargo depending of type of inland platform and maritime terminal are defined in figure 42.

The services offered by transport terminals fall into two categories: main services and ancillary services. Main services include container handling and storage operations along with customs and foreign trade services that facilitate international commerce. Ancillary services encompass security services to protect cargo, vehicle services for maintenance and support, and integrated services that add value to the logistics chain. Complementary information on the services of transport platforms is shared in figure 43.

|          |           | Main Type of Cargo         | General Characteristics  |
|----------|-----------|----------------------------|--|
| Inland   | Road-Road | Container and semi-trailer | <ul style="list-style-type: none"> <li>• Goods consolidation oriented platform.</li> <li>• Available land for the unloading, storage and loading of goods.</li> <li>• Superstructure/Vehicles for the handling of goods.</li> </ul>  |
|          | Rail-Road | Container                  | <ul style="list-style-type: none"> <li>• Modal shift-oriented platform.</li> <li>• Specific areas for the unloading and loading of trains, the storage of goods prior to the change of mode, the storage of rolling stock awaiting use and the maintenance of equipment.</li> </ul>  |
| Maritime | Port-Road | Container and semi-trailer | <ul style="list-style-type: none"> <li>• Modal shift-oriented platform.</li> <li>• Container traffic requires large amounts of land for container storage, in addition to the superstructure and vehicles for their handling and movement.</li> <li>• Semi-trailer traffic requires smaller amounts of land and investment in superstructure, due to their ease of routing.</li> </ul> |
|          | Port-Rail | Container                  | <ul style="list-style-type: none"> <li>• Modal shift-oriented platform.</li> <li>• They require large amounts of land for container storage, in addition to the superstructure and vehicles for their handling and movement.</li> <li>• They are often connected to inland terminals, for more efficient goods handling.</li> </ul>  |

Figure 42. Classification of transport platform. Source: CETMO

|                    |                                    | Services Offered   | Potential Components   |
|--------------------|------------------------------------|--|--|
| Main Services      | Container Services                 | Related to the use and maintenance of containers.                      | <ul style="list-style-type: none"> <li>• Container area.</li> <li>• Container consolidation and deconsolidation facilities.</li> <li>• Container repair shops and services.</li> <li>• Empty container depot.</li> </ul>   |
|                    | Customs and Foreign Trade Services | Related to trade facilitation and passage of goods.                    | <ul style="list-style-type: none"> <li>• Customs and customs-related offices.</li> <li>• Tax inspection facility.</li> </ul>   |
| Ancillary Services | Security Services                  | Related to security of drivers and goods.                              | <ul style="list-style-type: none"> <li>• Access control.</li> <li>• Secure enclosed property.</li> <li>• Closed-circuit surveillance system.</li> </ul>  |
|                    | Vehicle Services                   | Related to the maintenance of transport modes present on the platform. | <ul style="list-style-type: none"> <li>• Fuel station.</li> <li>• Parking for heavy goods vehicles.</li> <li>• Repair shops.</li> <li>• Technical vehicle inspection services.</li> </ul>  |
|                    | Integrated Services                | Complementary services to transport.                                   | <ul style="list-style-type: none"> <li>• Administrative area.</li> <li>• Logistics and transport company offices and business centre.</li> <li>• Restaurant and hotel services.</li> <li>• Complementary commercial services.</li> <li>• Social, religious services, etc.</li> </ul> |

Figure 43. Classification of transport platform services. Source: CETMO

Transport platforms or terminals share common characteristics regarding capacity and handling of intermodal transport units. Capacity refers to the volume of freight that can be processed within a specific timeframe, while intermodal transport units are standardized loading units designed to facilitate transfers between transport modes without handling the goods themselves.

The inland platforms can be classified as road-road terminals, which facilitate transfers between different road vehicles, or rail-road terminals, which enable transfers between rail and road modes. Maritime terminals can be identified by port-road facilities for transfers between maritime and road transport, and port-rail facilities connecting maritime and rail transport. Each type of terminal has specific infrastructure requirements and operational characteristics that determine its efficiency and capacity.

Services offered by transport platforms are essential components of their functionality. Container services include handling, storage, and monitoring of containerized cargo. Customs and foreign trade services facilitate international trade through documentation processing, inspections, and regulatory compliance. Security services ensure the protection of cargo and facilities. Vehicle services provide maintenance and support for transport equipment. Integrated services add value through activities like consolidation, deconsolidation, and inventory management.

## 5.2. Content Description

The methodology used for analysing the multimodality upgrade of TMC consists of four complementary components.

The first component is to identify the present state of TMC from the Multimodality Perspective. This component provides a comprehensive and updated description of the current state of the TMC from a multimodality perspective, including the creation of a database with the characterization and grouping of existing maritime terminals. This database is complemented with an analysis of multimodal railway flows in the Maghreb countries, with origins and destinations of multimodal railway services, types of multimodal units transported, as well as descriptive and quantitative information about the flows.

The second component is a diagnosis of existing and planned multimodal infrastructure through a quantitative analysis by country, considering variables that describe the main functions of multimodal infrastructures.

The third component is the identification of the TMC multimodality interventions included in the governmental policies and planning of Maghreb countries, AND GAPS NOT INCLUDED to finally prioritize the identify the multimodality enhancing projects using a specific and differentiated Multi-Criteria Analysis (MCA). This analysis leverages the homogeneous datasets generated previously and explained in chapter 3 Methodology.

### 5.2.1. Present State of the Multimodal Infrastructure

#### *List of Existing Inland Platforms and Maritime Terminals*

A series of comprehensive tables by country have been developed to characterize the existing inland platforms and maritime terminals across the Maghreb countries. These tables provide a consistent framework for comparison and analysis using standardized descriptive variables.

For inland platforms, the tables include the following information:

- Name of the platform
- Typology (road-road, rail-road)
- Surface area
- Freight consolidation capabilities
- Customs service's availability
- Available modes of transport
- Storage capacity for TEU & ITU (Twenty-foot Equivalent Units & Intermodal Transport Units)
- New car storage facilities
- Current operational status

For maritime terminals, the tables include:

- Port location
- Terminal name
- Surface area
- Water depth
- Quay length
- Port crane availability
- Rail connection status
- Terminal uses (exclusive container or multi-purpose)
- Current operational status

These tables provide a comprehensive inventory of multimodal infrastructure for each Maghreb country, establishing a baseline for analysing the current state of multimodality in the region.

#### *Set of Maps on Main Characteristics of Existing Inland Platforms and Maritime Terminals*

Building on the database developed in previous output, a series of thematic maps have been created to visualize key multimodal infrastructure characteristics across the region. These maps provide a geographical representation of the distribution and characteristics of multimodal infrastructure across the Maghreb region, facilitating spatial analysis of infrastructure patterns and gaps.

For inland platforms includes maps depicting the operational status of existing inland platforms: existing or partially developed, and maps showing the available transport modes at each platform: road-road, rail-road

For maritime terminals have been generated maps displaying the geographical location of all maritime terminals along the TMC layout, representing the surface area of maritime terminals, providing visual comparison of terminal capacities, and illustrating the rail connection status of maritime terminals, highlighting their multimodal potential

#### *List of Multimodal Railway Services and Flows*

A comprehensive table identifies the existing multimodal railway services across the Maghreb countries. For each service, the table provides:

- Country of operation
- Origin point (typically an inland terminal or production facility)
- Destination point (typically a port or another inland terminal)
- Type of multimodal service (container or new car transport)
- Detailed description of the service
- Quantitative information on multimodal flows (when available)
- Source of information

This systematic identification of existing multimodal services provides insights into the current operational patterns of multimodal transport within the region.

#### *Map on Multimodal Railway Services*

Based on the information compiled in the previous output, a comprehensive map has been developed showing:

- The geographical layout of all identified multimodal railway services
- The connection between inland platforms and maritime terminals
- The type of goods transported (differentiated by containers and new cars)
- The railway infrastructure supporting these services

This map offers a visual representation of the existing multimodal railway network across the Maghreb region, highlighting the spatial distribution and connectivity of multimodal services.

#### *Identification of Existing Multimodal Services and Flows*

This section presents two outputs related to the description of the multimodal services and flows within the TMC: Multimodal Railway Services and Flows and map on Multimodal Railway Services,

### **5.2.2. Diagnosis of the Existing and Planned Multimodal Infrastructure**

This section presents the output related to the diagnosis of the current state including already planned projects of multimodal infrastructure with a quantification of the typologies of inland platforms and maritime terminals and their main services

A set of analytical tables has been developed to quantify the typologies of platforms and terminals and the services they provide. These tables provide a quantitative assessment of the current multimodal service capabilities in each Maghreb country, highlighting strengths and gaps in the existing infrastructure network. They are organized by country and by platform/terminal type, focusing on:

For inland platforms:

- Number of platforms providing customs facilities
- Number of platforms offering freight consolidation/deconsolidation services
- Number of platforms with TEU/ITU storage capabilities
- Number of platforms with new car storage facilities

For maritime terminals:

- Number of terminals by usage type (exclusive container or multi-purpose)
- Number of terminals with railway connections
- Number of terminals equipped with port-trainer cranes
- Number of terminals with new car platforms

### 5.2.3. Identification of Multimodality Infrastructural Projects

A detailed set of tables has been developed characterizing the infrastructural interventions related to inland platforms and maritime terminals included in the planning documents of Maghreb countries. These tables provide a comprehensive inventory of planned multimodal infrastructure interventions across the Maghreb region, establishing a foundation for comparative analysis and prioritization and use a common and synthetic set of variables for all countries, including:

- Project name and location
- National planning document reference
- Trade improvement potential
- Project maturity status
- Alignment with national, regional and international strategies
- Financing status and plan
- 

### 5.2.4. Prioritization of Identified Infrastructure Interventions

This section presents the three outputs related to the prioritization component of the methodology using a Multi-Criteria Analysis (MCA) tool.

#### *List of Multimodality Projects Ranked by MCA Score*

A comprehensive table ranking the top 25 multimodality projects across all Maghreb countries has been developed based on the Multi-Criteria Analysis (MCA) tool application. This ranking provides a clear prioritization of multimodality projects based on their overall performance across all evaluation criteria. The projects are ranked according to their total MCA score and classified into five categories:

- Category 1: Projects with MCA scores between 4.5 and 5
- Category 2: Projects with MCA scores between 4 and 4.5
- Category 3: Projects with MCA scores between 3.5 and 4
- Category 4: Projects with MCA scores between 3 and 3.5
- Category 5: Projects with MCA scores between 2.35 and 3
- 

#### *List of Multimodality Projects by Country and MCA Score*

A series of country-specific figures that provide a country-specific view of project prioritization, allowing for national-level analysis and planning. They include:

- All multimodality projects identified in each Maghreb country
- Their ranking according to MCA scores

- The individual scores achieved for each criterion (Alignment, Project Maturity, Financing, and Trade Improvement)

#### *Map on the Multimodal Interventions According to MCA Score*

A comprehensive map that provides a spatial representation of priority multimodality projects across the Maghreb region, highlighting geographical patterns and potential multimodal upgrades of the TMC. It includes:

- The geographical location of the top 25 multimodality projects identified in the first output of this section.
- Color-coding according to the five MCA score categories established in the first output of this section.

### 5.3. Present State of the Multimodal Infrastructure

This sub-chapter presents the interpretation and analysis of the outputs described in the previous sub-chapter, highlighting key insights about the current state and future development of multimodality along the Trans-Maghreb Corridor.

#### 5.3.1. Characterization and Grouping of Inland Platforms and Maritime Terminals

Two outputs have been elaborated related to the characterization and grouping of inland platforms and maritime terminals which analysis reveals several important findings regarding the current state of multimodal infrastructure in the Maghreb region.

##### List of Existing Inland Platforms and Maritime Terminals

Figure 44 and 45 show the main characteristics of inland platforms and container maritime terminals in Algeria.

| Name                          | Typology*   | Surface (ha) | Customs services | Modes of transport | StockageFEU&ITU | Status              |
|-------------------------------|---|--------------|------------------|--------------------|-----------------|---------------------|
| El Kerma                      | Zona extra portuaire  | 10           | -                | Rail&Road          | Yes             | Partially developed |
| Es Senia                      | Port Sec  | 5            | Yes              | Road               | Yes             | Developed           |
| Bab Zouar                     | Entrepot sous douane  | 8,5          | Yes              | Road               | Yes             | Developed           |
| Bardj El Bahri                | Entrepot sous douane  | 0,8          | Yes              | Road               | Yes             | Developed           |
| Rouiba (I)                    | Entrepot sous douane  | 1,5          | Yes              | Road               | Yes             | Developed           |
| Rouiba (II)                   | Port Sec  | 6            | -                | Rail&Road          | Yes             | Developed           |
| Rouiba (III)                  | Port Sec  | 3,25         | -                | Rail&Road          | Yes             | Developed           |
| Rouiba (IV)                   | Port Sec  | 9,2          | -                | Rail&Road          | Yes             | Developed           |
| El Hamiz                      | Port Sec  | 5            | -                | Road               | Yes             | Developed           |
| Khemis el khechna (Boumerdes) |   | 9,6          | -                | Road               | Yes             | Developed           |
| Rouiba                        | Zona extra portuaire  | 22           | -                | Rail&Road          | Yes             | Developed           |
| Ighil Ouberoiak               | Entrepot sous douane  | 4,8          | Yes              | Road               | Yes             | Developed           |
| Tixter I                      | Zona extra portuaire  | 20           | -                | Rail&Road          | Yes             | Developed           |
| Tahil                         | Zona extra portuaire  | 20           | -                | Rail&Road          | Yes             | Developed           |
| Skikda                        | Port Sec  | 7            | Yes              | Road               | Yes             | Developed           |
| Skikda                        | Zona extra portuaire  | 3,2          | -                | Road               | Yes             | Developed           |
| Annaba                        | Zona extra portuaire  | 10           | -                | Rail&Road          | Yes             | Developed           |
| Hamrouche Hamouda             | Zona extra portuaire<br>Definition in accordance to original denomination (in French) | 18           | -                | Rail&Road          | Yes             | Developed           |

Figure 44. Existing Inland Platforms in Algeria. Source: CETMO

| Port       | Terminal                       | Surface (m2) | Depth (m) | Length quai (m) | Portainer crane | Connexion rail | Uses                 | Status   |
|------------|--------------------------------|--------------|-----------|-----------------|-----------------|----------------|----------------------|----------|
| Oran       | Terminal à Conteneurs Oran     | 234.000      | 14        | 460             | -               | -              | Container            | Existing |
| Alger      | Terminal à Conteneurs Alger    | 304.000      | 10        | 772             | -               | -              | Exclusive            | Existing |
| Ghazaouet  | Terminal Ghazaouet             | 24.000       |           |                 | -               | -              | Multi-purpose use    | Existing |
| Béjaia     | Béjaia Mediterranean Terminal  | 100.000      | 12        | 500             | Yes             | Yes            | Exclusive conteneurs | Existing |
| Skikda     | Terminal Skikda                | 305.000      | 12        | 1.960           | -               | Yes            | Exclusive conteneurs | Existing |
| Annaba     | Terminal polyvalent Annaba     | 100.000      | 8         | 480             | -               | Yes            | Multi-purpose use    | Existing |
| Djen-Djen  | Container Terminal Djen-Djen   | 150.000      | 17        | 770             | Yes             | Yes            | Exclusive conteneurs | Existing |
| Mostaganem | Terminal Mostaganem            | 65.000       | 8         |                 | -               | -              | Multi-purpose use    | Existing |
| Alger      | Terminal à Conteneurs Alger II | 360.000      |           | 1.600           | -               | Yes            | Exclusive conteneurs | Existing |

Figure 45. Existing Container Maritime Terminals in Algeria. Source: CETMO

In Algeria, a total of 18 inland platforms and 9 maritime terminals have been characterised, 27 in total. It is the country with the highest number of terminals and platforms in the region. Half of the inland platforms are connected by road and rail.

Figure 46 shows the main characteristics of container maritime terminals in Mauritania. At this moment, it does not exist inland platforms in Mauritania. Only 1 maritime terminal dedicated exclusively to containers has been characterised in Mauritania

| Port       | Terminal         | Surface (m2) | Depth | Length qual | Portrainer crane | Connexion rail | Uses                 |
|------------|------------------|--------------|-------|-------------|------------------|----------------|----------------------|
| Nouakchott | Port de l'Amitié | 200.000      | 14    | 585         | -                | Non            | Exclusive conteneurs |

Figure 46. Existing Container Maritime Terminals in Mauritania. Source: CETMO

Figures 47 and 48 show the main characteristics of inland platforms and container maritime terminals in Morocco. In Morocco, 6 inland platforms and 7 maritime terminals, 13 in total, have been characterised. 5 of the 6 inland platforms are connected by road and rail. All maritime terminals are exclusively dedicated to containers.

| Name            | Typology*                                       | Surface (ha) | Customs services | Modes of transport | StockageEU&ITU | Status              |
|-----------------|---|--------------|------------------|--------------------|----------------|---------------------|
| Bensouda        | Conteneurs, Distribution, Céréales, Sour-douine | 33           | Yes              | Rail&Road          | Yes            | Partially developed |
| Sidi Ghanem     | Distribution, Conteneurs, Céréales, Port Sec    | 2            | Yes              | Rail&Road          | Yes            | Partially developed |
| Zenata          | Distribution, Conteneurs, Céréales              | 323          | -                | Rail&Road          | Yes            | Partially developed |
| Melloussa       | Cars  | 60           | -                | Rail&Road          | -              | Developed           |
| Casablanca Mita | Distribution, Conteneurs, port sec              | 32           | Yes              | Road               | Yes            | Developed           |
| Kenitra         | Cars  | -            | -                | Rail&Road          | -              | Developed           |

\* Definition in accordance to original denomination (in French)

Figure 47. Existing Inland Platforms in Morocco. Source: CETMO

| Port       | Terminal              | Surface (m2) | Depth | Length qual | Portrainer crane | Connexion rail | Uses                 | Status   |
|------------|-----------------------|--------------|-------|-------------|------------------|----------------|----------------------|----------|
| Casablanca | MarsaMaroc Casablanca | 600.000      | 12    | 600         | Yes              | Yes            | Exclusive conteneurs | Existing |
| Casablanca | Somaport              | 300.000      | 9     | 700         | Yes              | Yes            | Exclusive conteneurs | Existing |
| Agadir     | MarsaMaroc Agadir     | 100.000      | 10    | 280         | Yes              | -              | Exclusive conteneurs | Existing |
| Tanger Med | TC2                   | 400.000      | 18    | 812         | Yes              | Yes            | Exclusive conteneurs | Existing |
| Tanger Med | TC1                   | 400.000      | 18    | 1.845       | Yes              | Yes            | Exclusive conteneurs | Existing |
| Tanger Med | TC3                   | 340.000      | 18    | 800         | Yes              | Yes            | Exclusive conteneurs | Existing |
| Tanger Med | TC4                   | 760.000      | 18    | 2.000       | Yes              | Yes            | Exclusive conteneurs | Existing |

Figure 48. Existing Container Maritime Terminals in Morocco. Source: CETMO

Figures 49 and 50 show the main characteristics of inland platforms and container maritime terminals in Tunisia. In Tunisia, 4 inland platforms and 1 maritime terminal have been characterised, 5 in total. All the inland platforms characterised have road and rail connections, while the maritime terminal has a multiple use, for different types of goods.

| Name             | Typology*             | Surface (ha) | Customs services | Modes of transport | StockageEU&ITU | Status    |
|------------------|-----------------------|--------------|------------------|--------------------|----------------|-----------|
| Rades-Tunis PV   | Plateforme Logistique | -            | -                | Rail&Road          | Yes            | Developed |
| Sousse           | Plateforme Logistique | -            | -                | Rail&Road          | Yes            | Developed |
| Bizerte          | Plateforme Logistique | -            | -                | Rail&Road          | Yes            | Developed |
| Ghammouche-Gabès | Plateforme Logistique | -            | -                | Rail&Road          | Yes            | Developed |

\* Definition in accordance to original denomination (in French)

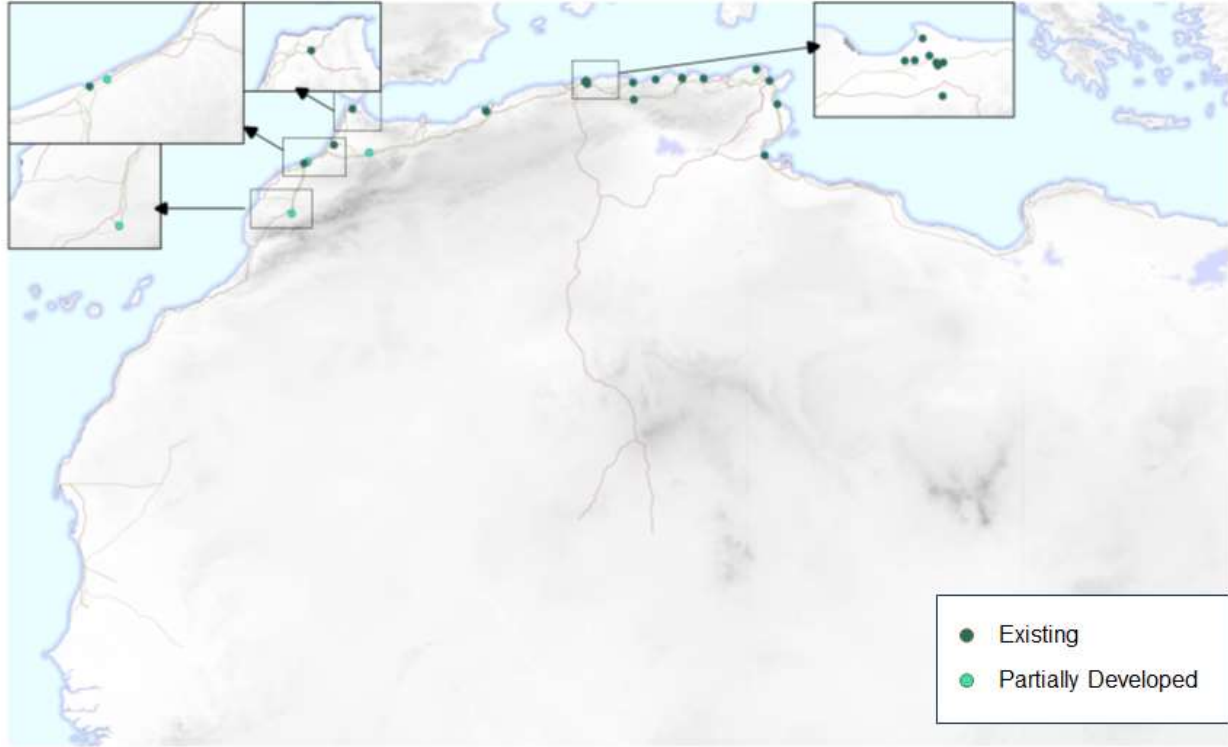
Figure 49. Existing Inland Platforms in Tunisia. Source: CETMO

| Port  | Terminal                 | Surface (m2) | Depth | Length qual | Portrainer crane | Connexion rail | Uses              |
|-------|--------------------------|--------------|-------|-------------|------------------|----------------|-------------------|
| Radès | Container Terminal Radès | 480.000      | 9     | 1.780       | -                | Yes            | Multi-purpose use |

Figure 50. Existing Container Maritime Terminals in Tunisia. Source: CETMO

*Set of Maps on Main Characteristics of Existing Inland Platforms and Maritime Terminals*

The first two maps, figures 51 and 52 represent some relevant characteristics of inland platforms in the TMC area.



*Figure 51. Status of existing inland platforms. Source: CETMO*

For inland platforms, on the one hand, a notable concentration of facilities is observed in the vicinity of Algiers, particularly in the Rouiba area, establishing this zone as a significant multimodal hub within Algeria. On the other hand, Morocco demonstrates a strategic approach to platform development, with existing platforms designed for phased implementation, allowing for future extension and service enhancement as demand grows. This reflects a forward-looking planning approach that accommodates evolving multimodal needs.

A key finding regarding transport connectivity is that the majority of existing inland platforms (18 out of 28) incorporate rail-road connections, demonstrating a regional recognition of the importance of rail connectivity for efficient multimodal operations. This rail-road integration is particularly strong in Tunisia, where all four existing platforms feature this connectivity. Similarly, in Morocco, four out of five existing platforms have rail-road connections, while in Algeria, nine out of 18 platforms feature this multimodal capability.

Now, figures 53, 54 and 55, represent some relevant characteristics of maritime terminals in the TMC area.

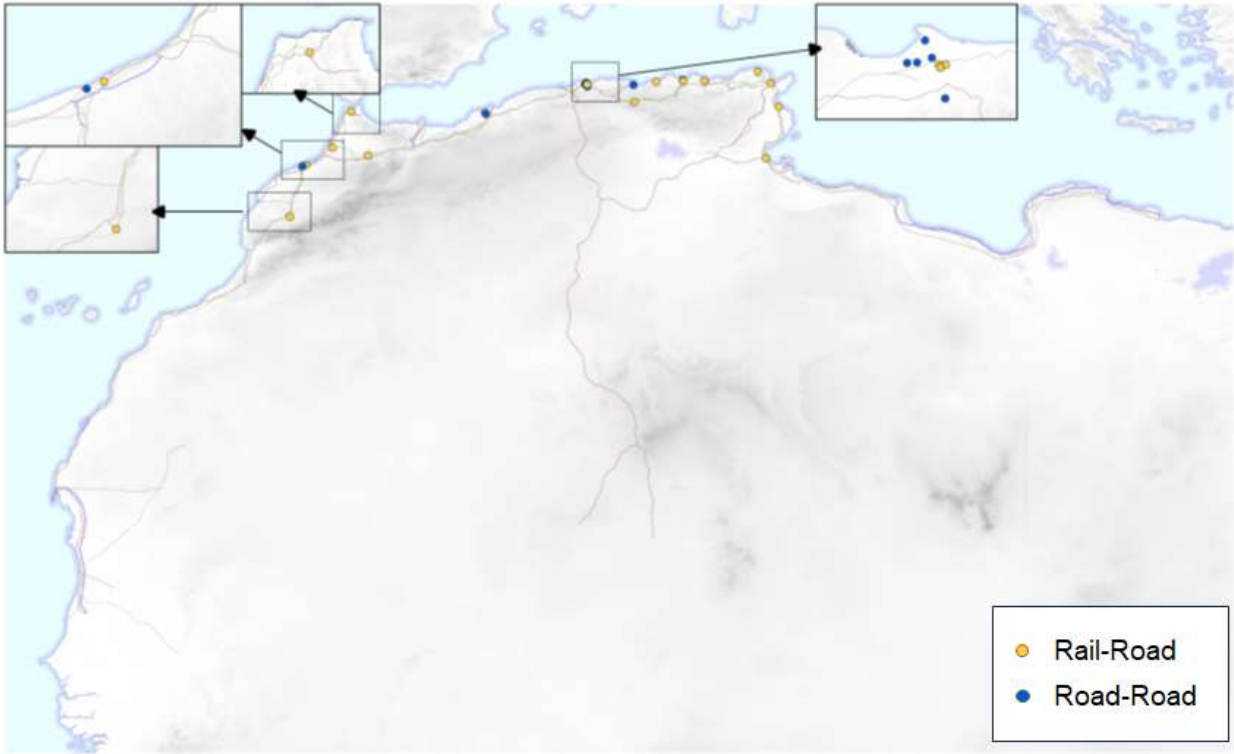


Figure 52. Existing inland platforms. Source: CETMO



Figure 53. Existing maritime terminals. Source: CETMO

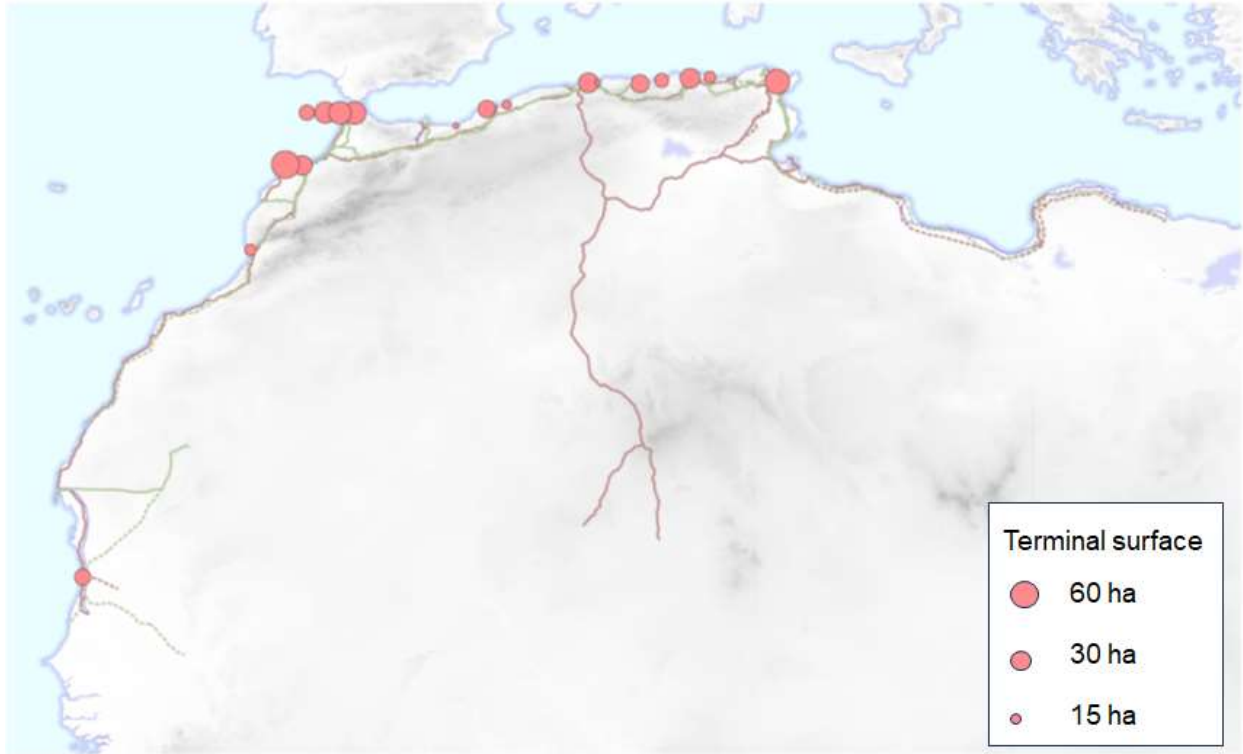


Figure 54. Surface of existing maritime terminals. Source: CETMO



Figure 55. Connection to railway of existing maritime terminals. Source: CETMO

For maritime terminals, the analysis reveals distinct patterns of container handling capacity distribution across the region.

In Algeria, maritime container terminal capacity is distributed across multiple ports, with the most significant facilities located in Algiers (660,000 m<sup>2</sup>), Skikda (304,000 m<sup>2</sup>), and Oran (234,000 m<sup>2</sup>). This distributed approach provides balanced multimodal access points along Algeria's coastline but may limit economies of scale compared to more concentrated facilities.

Morocco demonstrates a clear strategic concentration of maritime container terminal capacity, with dominant facilities at Tanger Med (1,900,000 m<sup>2</sup>) and Casablanca (900,000 m<sup>2</sup>). This concentrated approach enables efficient resource allocation and the development of specialized high-capacity facilities aligned with international shipping requirements.

Tunisia and Mauritania feature more centralized container terminal configurations, with primary facilities at the port of Radès (480,000 m<sup>2</sup>) and the port of Nouakchott (200,000 m<sup>2</sup>) respectively. This centralization reflects these countries' more limited coastlines and focuses resources on developing fewer but more capable facilities.

### 5.3.2. Identification of Existing Multimodal Services and Flows

Two specific outputs have been elaborated as the result of the identification of multimodal railway services and flows. They are the tables 56 and 57 identifying and describing the existing multimodal railway and flows in the region, as well as their multimodal flows, if available.

| Country | Origin     | Destination     | Type       | Description   | Flow                              | Source         |
|---------|------------|-----------------|------------|---|-----------------------------------|----------------|
| Morocco | Melloussa  | Tanger Med      | Cars       | Exportation of new cars. Service from Renault plant in Melloussa to Tanger Med    | 245.000 cars (2022)               | ONFC           |
|         | Kenitra    | Tanger Med      | Cars       | Exportation of new cars. Service from Stellantis plant in Melloussa to Tanger Med | 124.000 cars (2022)               | ONFC           |
|         | Tanger Med | Casablanca Mita | Containers | Flow of containers (Maersk) from Tanger Med tot Casa-Mita                         | 5.328 TEU 108 trains (2022)       | ONFC           |
|         | Marrakech  | Casablanca      | Containers | Flow from Société Marocaine D'Industries Alimentaires (SOMIA).                    |                                   | ONFC           |
|         | Fes        | Tanger-Med      | Containers | Flow from Société Marocaine D'Industries Alimentaires (SOMIA). Agroalimentaires   |                                   | ONFC           |
|         | Tanger-Med | Marrakech       | Containers | Dry port. It includes management of empty containers                              |                                   | ONCF           |
| Algeria | Bejaia     | Tixter          | Containers | Dry port. Management of import containers (full) and export (empty)               | 8.665 import / 6.582 export. 2019 | Port of Bejaia |
|         | Alger      | Rouiba          | Containers | Dry port. CNAN-MED and SNTF   |                                   | press          |
| Tunisia | Ghanouche  | Rades           | Containers | Export Flow from HAMMEMI (building materials)                                     |                                   | SNCFT          |
|         | Rades      | Bizerte         | Containers | Import flow of ICAR and STIP (automotive components). Fall of activity in 2021    |                                   | SNCFT          |
|         | Rades      | Sousse          | Containers | Import flow from ICAR (automotive components). Fall of activity in 2021           |                                   | SNCFT          |

Figure 56. Multimodal railway services and flows in the Maghreb region. Source: CETMO

Country-specific findings reveal distinct approaches to multimodal service development:

Algeria has implemented a strategic approach focused on decongesting seaports through the creation of dry ports connected by rail services. While the number of existing services is limited, this port-hinterland connection strategy establishes a framework that could support expanded multimodal operations. The rail connection between the port of Bejaia and the Tixter platform exemplifies this approach and could serve as a model for future development.

Morocco demonstrates the most developed structure of railway multimodal services in the region, supported by a well-defined national logistics strategy. The current configuration of services and distribution of terminals provides a solid foundation for further multimodal development. The success of the automotive transport system shows how effectively the country can implement multimodal solutions when coordinated planning and investment are applied.

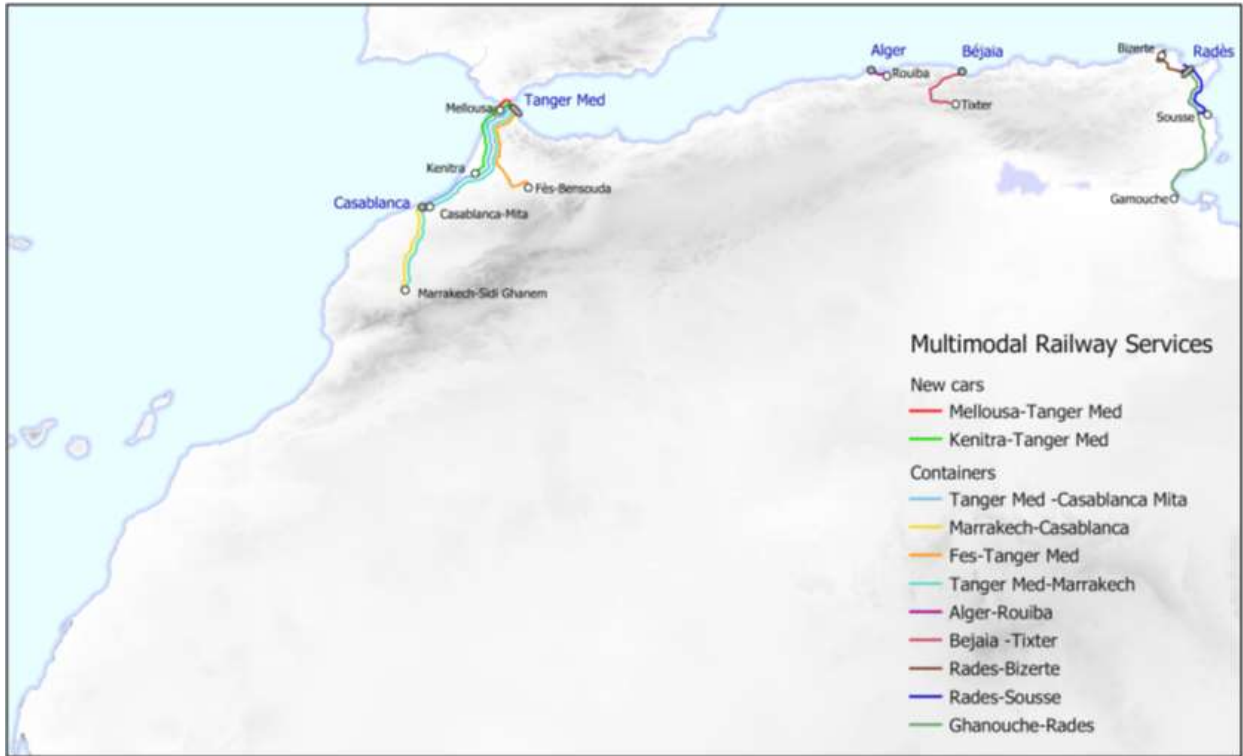


Figure 57. Multimodal railway services in the Maghreb. Source: CETMO

Tunisia has established a network of services and platforms with good territorial distribution, but actual multimodal flows remain very limited and are highly sensitive to economic fluctuations. The findings suggest that modernization of port infrastructure and development of new logistics platforms are prerequisites for expanding multimodal rail transport in the country.

A critical finding is the very limited modal share of multimodal container transport by rail in both Algeria and Morocco (see figure 57), where quantitative data is available. In both countries, the percentage of containers moved by train remains below 2% of total maritime container movements. This extremely low utilization of rail for container transport represents a major opportunity for improvement in the corridor's multimodal efficiency.

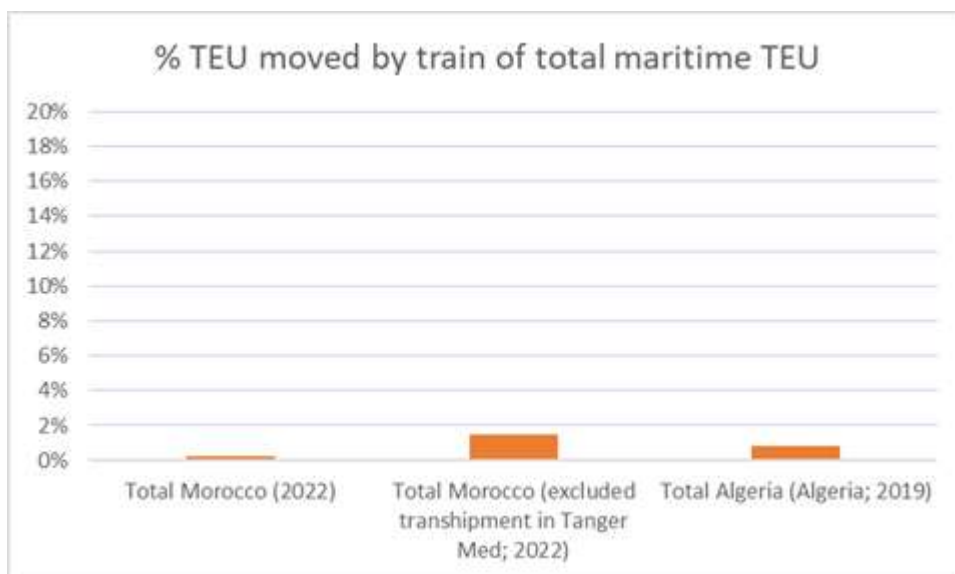


Figure 58. %TEU moved by train of total maritime TEU. Source: CETMO

In stark contrast, the multimodal transport of new cars from the automotive manufacturing facilities to the port of Tanger Med achieves nearly 80% rail modal share. This exceptional case demonstrates that high levels of multimodality can be achieved in the region when appropriate infrastructure, services, and commercial imperatives align. The success of this automotive export flow provides a potential model for developing other multimodal services in the region.

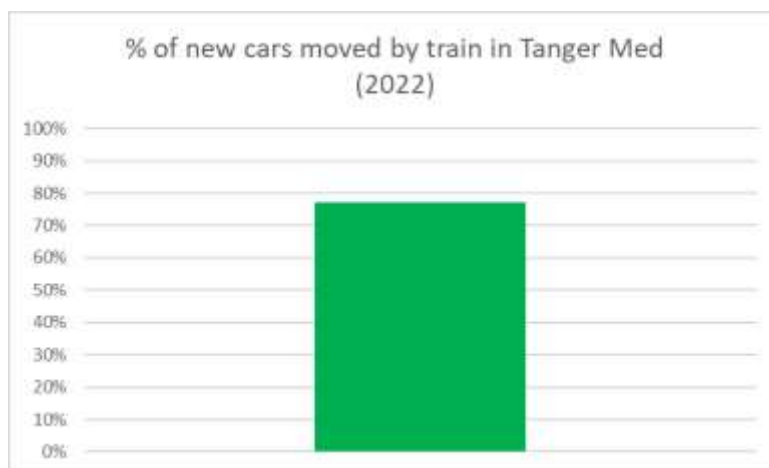


Figure 59. % of new cars moved by train in Tanger Med. Source: CETMO

### 5.3.3. Diagnosis of the Existing and Planned Multimodal Infrastructure

The output of this section consists of a set of analytical tables that quantifies the typologies of platforms and terminals and the services they provide. These tables are organized by country and by platform/terminal type.

The number of existing inland platforms and maritime terminals in Algeria, as well as the services provided are identified in tables/figures 60 and 61.

| Transport modes |           | Customs facilities |     | Freight (de)consolidation |     | TEU/ITU Stockage |     | New cars Stokage |     |
|-----------------|-----------|--------------------|-----|---------------------------|-----|------------------|-----|------------------|-----|
|                 |           | Yes                | Not | Yes                       | Not | Yes              | Not | Yes              | Not |
| Rail-Road       | 8         | 8                  | -   | -                         | 8   | -                | -   | 8                |     |
| Road-Road       | 10        | 8                  | 2   | 1                         | 9   | -                | -   | 10               |     |
| <b>Total</b>    | <b>18</b> | <b>18</b>          |     | <b>18</b>                 |     | <b>18</b>        |     | <b>18</b>        |     |

Figure 60. Number of inland platforms in Algeria and services provided. Source: CETMO

| Maritime terminals |           | Uses       |           | Railway connexion |     | Port-trainer cranes |     | New cars platform |     |
|--------------------|-----------|------------|-----------|-------------------|-----|---------------------|-----|-------------------|-----|
|                    |           | Polyvalent | Exclusive | Yes               | Not | Yes                 | Not | Yes               | Not |
| Container          | 9         | 3          | 6         | 5                 | 4   | 2                   | 7   | -                 | -   |
| RORO               | 8         | 2          | 6         | 6                 | 2   | -                   | -   | 1                 | 7   |
| <b>Total</b>       | <b>17</b> | <b>17</b>  |           | <b>17</b>         |     | <b>9</b>            |     | <b>8</b>          |     |

Figure 61. Number of maritime terminals in Algeria and services provided. Source: CETMO

In Algeria, inland platforms primarily function as extensions of port operations, serving as dry ports or customs warehouses focused on container management and customs processing. While the country has developed an extensive network of maritime terminals capable of handling multimodal flows, operational efficiency is constrained by equipment limitations (only two container terminals are equipped with port-trainer cranes) and the polyvalent use of terminals. Additionally, while railway connections exist, they are not consistently effective, limiting the potential for seamless multimodal operations.

The number of existing inland platforms and maritime terminals in Morocco, as well as the services provided are identified in the tables/figures 62 and 63.

| Transport modes |          | Customs facilities |     | Freight (de)consolidation |     | TEU/ITU Stockage |     | New cars Stokage |     |
|-----------------|----------|--------------------|-----|---------------------------|-----|------------------|-----|------------------|-----|
|                 |          | Yes                | Not | Yes                       | Not | Yes              | Not | Yes              | Not |
| Rail-Road       | 5        | 3                  | 2   | 1                         | 4   | 5                | -   | 2                | 3   |
| Road-Road       | 2        | 2                  | -   | 2                         | -   | 2                | -   | -                | 2   |
| <b>Total</b>    | <b>7</b> | <b>7</b>           |     | <b>7</b>                  |     | <b>7</b>         |     | <b>7</b>         |     |

Figure 62. Number of inland platforms in Morocco and services provided. Source: CETMO

| Maritime terminals |           | Uses       |           | Railway connexion |     | Port-trainer cranes |     | New cars platform |     |
|--------------------|-----------|------------|-----------|-------------------|-----|---------------------|-----|-------------------|-----|
|                    |           | Polyvalent | Exclusive | Yes               | Not | Yes                 | Not | Yes               | Not |
| Container          | 7         | -          | 7         | 6                 | 1   | 6                   | 1   | -                 | -   |
| RORO               | 4         | 1          | 3         | 4                 | 0   | -                   | -   | 1                 | 3   |
| <b>Total</b>       | <b>11</b> | <b>11</b>  |           | <b>11</b>         |     | <b>7</b>            |     | <b>4</b>          |     |

Figure 63. Number of maritime terminals in Morocco and services provided. Source: CETMO

Morocco has developed specialized and well-equipped container terminals that effectively support multimodal services to and from major ports. The strategic placement of rail-road terminals enables efficient multimodal freight flows between ports (particularly Casablanca and Tanger-Med) and major urban centres (Casablanca, Fes, Marrakech). A notable success is the specialized ro-ro terminal at Tanger Med, which facilitates efficient intermodal flows of new cars from rail-road terminals at automotive manufacturing facilities. While the existing ro-ro platforms and rail connections provide a foundation for expanding multimodal flows, the limited number of road-road inland terminals with logistics services (only two sites) constrains the overall efficiency of multimodal operations.

The number of existing inland platforms and maritime terminals in Tunisia, as well as the services provided are identified in the figures 64 and 65.

| Transport modes |          | Customs facilities |     | Freight (de)consolidation |     | TEU/ITU Stockage |     | New cars Stokage |     |
|-----------------|----------|--------------------|-----|---------------------------|-----|------------------|-----|------------------|-----|
|                 |          | Yes                | Not | Yes                       | Not | Yes              | Not | Yes              | Not |
| Rail-Road       | 4        | -                  | 4   | -                         | 4   | 4                | -   | -                | 4   |
| Road-Road       | -        | -                  | -   | -                         | -   | -                | -   | -                | 0   |
| <b>Total</b>    | <b>4</b> | <b>4</b>           |     | <b>4</b>                  |     | <b>4</b>         |     | <b>4</b>         |     |

Figure 64. Number of inland platforms in Tunisia and services provided. Source: CETMO

| Maritime terminals |          | Uses       |           | Railway connexion |     | Port-trainer cranes |     | New cars platform |     |
|--------------------|----------|------------|-----------|-------------------|-----|---------------------|-----|-------------------|-----|
|                    |          | Polyvalent | Exclusive | Yes               | Not | Yes                 | Not | Yes               | Not |
| Container          | 1        | 1          | 0         | 1                 | 0   | 0                   | 1   | -                 | -   |
| RORO               | 2        | 2          | -         | 1                 | 1   | -                   | -   | 1                 | 1   |
| <b>Total</b>       | <b>3</b> | <b>3</b>   |           | <b>3</b>          |     | <b>1</b>            |     | <b>2</b>          |     |

Figure 65. Number of maritime terminals in Tunisia and services provided. Source: CETMO

Tunisia's four rail-road terminals support intermodal container flows between a limited number of production centres and ports, primarily Radès. However, these flows are highly dependent on the economic performance of the associated production sites and are constrained by railway network maintenance issues. Container and ro-ro handling is concentrated at the port of Radès, but the lack of

specialized infrastructure and equipment limits the efficiency and potential expansion of multimodal flows.

The number of existing maritime terminals in Mauritania, as well as the services provided are identified in figure 66. Any inland platform has been identified.

| Maritime terminals |          | Uses       |           | Railway connexion |     | Port-trainer cranes |     | New cars platform |     |
|--------------------|----------|------------|-----------|-------------------|-----|---------------------|-----|-------------------|-----|
|                    |          | Polyvalent | Exclusive | Yes               | Not | Yes                 | Not | Yes               | Not |
| Container          | 1        | -          | 1         | -                 | 1   | 1                   | -   | -                 | -   |
| RORO               | 2        | 2          | 0         | 2                 | 0   | -                   | -   | 0                 | 2   |
| <b>Total</b>       | <b>3</b> | <b>3</b>   |           | <b>3</b>          |     | <b>1</b>            |     | <b>2</b>          |     |

Figure 66. Number of maritime terminals in Mauritania and services provided. Source: CETMO

Mauritania faces significant constraints on multimodal development due to the complete absence of inland multimodal terminals, which prevents efficient freight routing beyond the immediate port area. While the country's only container terminal is well-equipped and exclusively dedicated to container handling, it lacks railway connection, preventing the development of rail-based multimodal flows. The existing railway connection at the port of Nouadhibou is dedicated to iron ore transport rather than general freight, further limiting multimodal options.

## 5.4. Multimodality Infrastructure Enhancing Projects

The result of the characterisation of the identified interventions is a set of tables by country and by type of platform (inland platform and maritime terminal) that shows an exhaustive list of development approaches across the Maghreb countries. All these tables can be consulted in the **Annex 3**.

A total of 64 interventions have been identified across the region, with a strong focus on the development and improvement of inland platforms (58 projects) compared to maritime terminals (8 projects). Among the maritime terminal interventions, almost all (7 out of 8) focus on developing new infrastructure rather than improving existing facilities, indicating a strategic emphasis on expanding maritime capacity rather than merely enhancing current operations.

The distribution of planned interventions varies significantly by country, reflecting different national priorities and development stages:

Algeria has identified 11 infrastructure projects to enhance TMC multimodality, with 8 focusing on inland platforms and 3 on maritime terminals. Algeria's strategy is based on improving both port facilities and their hinterland connections.

Morocco demonstrates the most ambitious planning in the region, with 45 planned interventions to improve TMC multimodality. Of these, 40 target inland platforms and 5 address maritime terminals. This intensive focus on inland platform development reflects Morocco's comprehensive national logistics strategy and its commitment to developing an extensive multimodal network throughout the country.

Tunisia's planning approach is similar in scale to Algeria's, with 10 planned interventions comprising 7 inland platform projects and 3 maritime terminal projects. This portfolio reflects Tunisia's strategic focus on developing both port facilities and their hinterland connections.

Mauritania has the fewest planned interventions with only 3 projects, all focused on developing new inland platforms. Despite the limited number, these interventions are strategically distributed at different points along the TMC, reflecting a targeted approach to developing key multimodal nodes within the country's more limited transport network.

## 5.5. Prioritization of Multimodality Enhancing Projects

### 5.5.1. Top 25 TMC Multimodality Projects

Outputs of the prioritization of identified infrastructure are based on the application of a Multi-Criteria Analysis (MCA) tool and consists on:

- List of Multimodality Projects Ranked by MCA Score
- List of Multimodality Projects by Country and MCA Score
- Map on the Multimodal Interventions According to MCA Score

The 25 most relevant projects in the improvement of the TMC multimodality, based on the results of the MCA tool, are listed and ranked in the figure 67 according to their total MCA score and classified into five categories.

|    | Country | Name of platform   | Description   | Value - Trade Improvement | Value - Maturity | Value - Alignment | Value - Financing | Total |
|----|---------|--|---------------|---------------------------|------------------|-------------------|-------------------|-------|
| 1  | Algeria | Maritime Platform Chercell Platform conteneurs I -II-III | Container     | 1,5                       | 1,25             | 1,25              | 1                 | 5     |
| 2  | Algeria | Maritime Platform Chercell- RORO                         | RoRo          | 1,5                       | 1,25             | 1,25              | 1                 | 5     |
| 3  | Morocco | Maritime Platform Dakhla Atlantique - containers         | Container     | 1,5                       | 1,25             | 1,25              | 1                 | 5     |
| 4  | Morocco | Maritime Platform Nador West Med - RoRo                  | RoRo          | 1,5                       | 1,25             | 1,25              | 1                 | 5     |
| 5  | Morocco | Maritime Platform Dakhla Atlantique - RoRo               | RoRo          | 1,5                       | 1,25             | 1,25              | 1                 | 5     |
| 6  | Morocco | Maritime Platform Nador Marsa Maroc - containers         | Container     | 1,5                       | 1,25             | 1,25              | 1                 | 5     |
| 7  | Algeria | Inland Platform El Kerma-Oran                            | Rail&Road     | 1,2                       | 1,25             | 1,25              | 1                 | 4,7   |
| 8  | Tunisia | Inland Platform Radès                                    | Rail&Road     | 1,2                       | 1,25             | 1,25              | 1                 | 4,7   |
| 9  | Tunisia | Maritime Platform Enfidha à conteneurs                   | Containers    | 1,5                       | 1,25             | 1,25              | 0,6               | 4,6   |
| 10 | Tunisia | Maritime Platform Enfidha Roulier                        | RoRo          | 1,5                       | 1,25             | 1,25              | 0,6               | 4,6   |
| 11 | Morocco | Maritime Platform Kenitra Atlantique                     | Sea&road&Rail | 1,5                       | 0,75             | 1,25              | 0,6               | 4,1   |
| 12 | Tunisia | Maritime Platform à conteneurs au port de Radès          | Containers    | 1,5                       | 0,75             | 1,25              | 0,6               | 4,1   |
| 13 | Morocco | Inland Platform Ras-El-Ma                                | Road          | 0,3                       | 1,25             | 1,25              | 1                 | 3,8   |
| 14 | Morocco | Inland Platform Ain Dalia                                | Rail&Road     | 0,9                       | 1                | 1,25              | 0,6               | 3,75  |
| 15 | Morocco | Inland Platform Tamentsourt                              | Road          | 0,15                      | 0,75             | 1,25              | 1                 | 3,15  |
| 16 | Morocco | Inland Platform Nador                                    | Rail&road     | 0,6                       | 0,75             | 1,25              | 0,4               | 3     |
| 17 | Morocco | Inland Platform Dakhla-West Africa                       | Road          | 0,6                       | 0,75             | 1,25              | 0,4               | 3     |
| 18 | Morocco | Inland Platform Zenata II                                | Rail&Road     | 1,2                       | 0,25             | 1,25              | 0,2               | 2,9   |
| 19 | Morocco | Inland Platform Béni-Mellal                              | Road          | 0,3                       | 0,75             | 1,25              | 0,4               | 2,7   |
| 20 | Morocco | Inland Platform Midelt -Zaida                            | Road          | 0,15                      | 0,75             | 1,25              | 0,4               | 2,55  |
| 21 | Morocco | Inland Platform Laayoune - El Mansa                      | Road          | 0,6                       | 0,25             | 1,25              | 0,4               | 2,5   |
| 22 | Morocco | Inland Platform Oulad Saleh                              | Road          | 0,15                      | 0                | 1,25              | 1                 | 2,4   |
| 23 | Morocco | Inland Platform Aït-Melloul                              | Road          | 0,15                      | 0                | 1,25              | 1                 | 2,4   |
| 24 | Morocco | Inland Platform Oulad Taleb - Kenitra                    | Road          | 0,15                      | 0,75             | 1,25              | 0,2               | 2,35  |
| 25 | Tunisia | Inland Platform Enfidha                                  | Rail&Road     | 1,2                       | 0,125            | 0,625             | 0,4               | 2,35  |

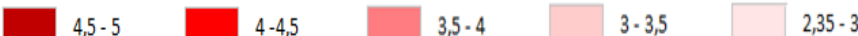


Figure 67. Top 25 of TMC Multimodality Projects. Source: CETMO

The application of the MCA tool to prioritize multimodal infrastructure interventions reveals several significant findings arising from the table above.

The high number of projects achieving top MCA scores (10 projects with scores between 4.5 and 5, including 6 with perfect 5.0 scores) demonstrates the significant potential for high-impact multimodal development in the region. This finding indicates that many planned interventions are well-aligned with national and regional strategies, demonstrate high maturity levels, have solid financing plans, and offer substantial trade improvement potential.



### 5.5.2. Prioritization of Multimodality Infrastructure Projects - Algeria

A series of country-specific figures has been elaborated as result of the application of the MCA, what allows for a more detailed analysis of each country's reality, revealing distinct national patterns and priorities.

Figure 69 shows the MCA results obtained for the Algerian projects.

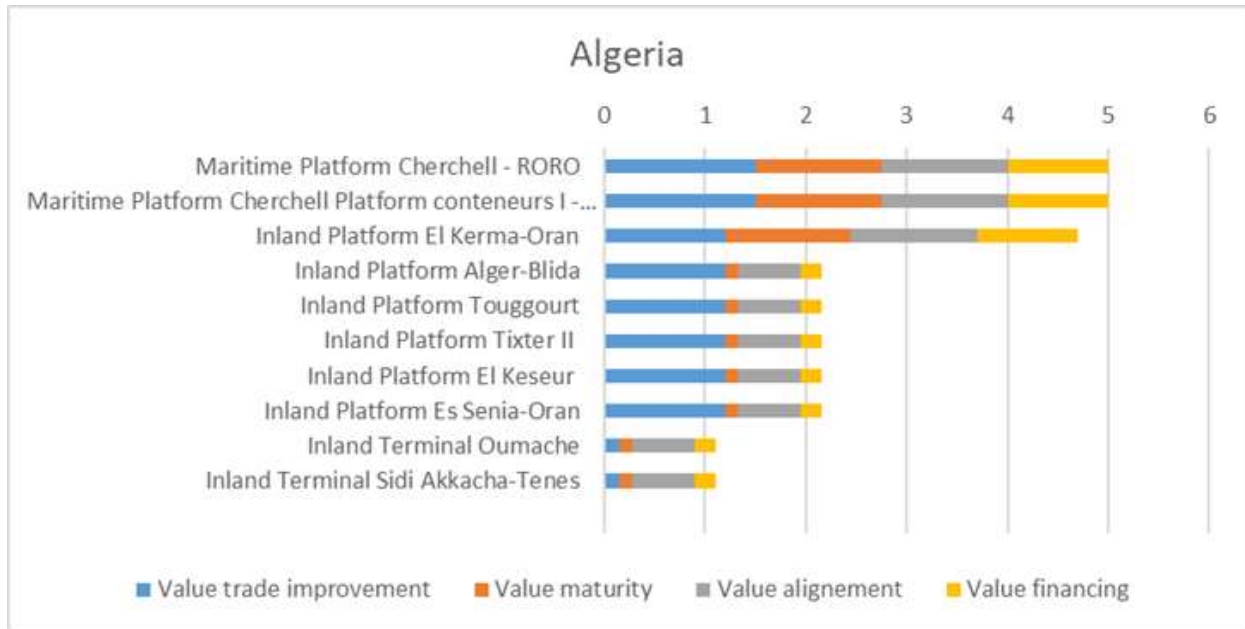


Figure 69. Prioritization of multimodality projects in Algeria. Source: CETMO

In Algeria, the maritime terminals planned for the new port of Cherchell emerge as the most strategically important projects for enhancing multimodality. Among inland platforms, only the El-Kerma-Oran terminal achieves a high score, primarily due to its advanced development status. The findings note an information gap regarding infrastructure planning and development in Algeria, suggesting that new information could potentially alter these prioritization results.

Given the large number of planned projects on multimodality in Morocco, figure 69 shows the MCA results obtained by the top 50% of projects, those with the best scores.

### 5.5.3. Prioritization of Multimodality Infrastructure Project - Mauritania

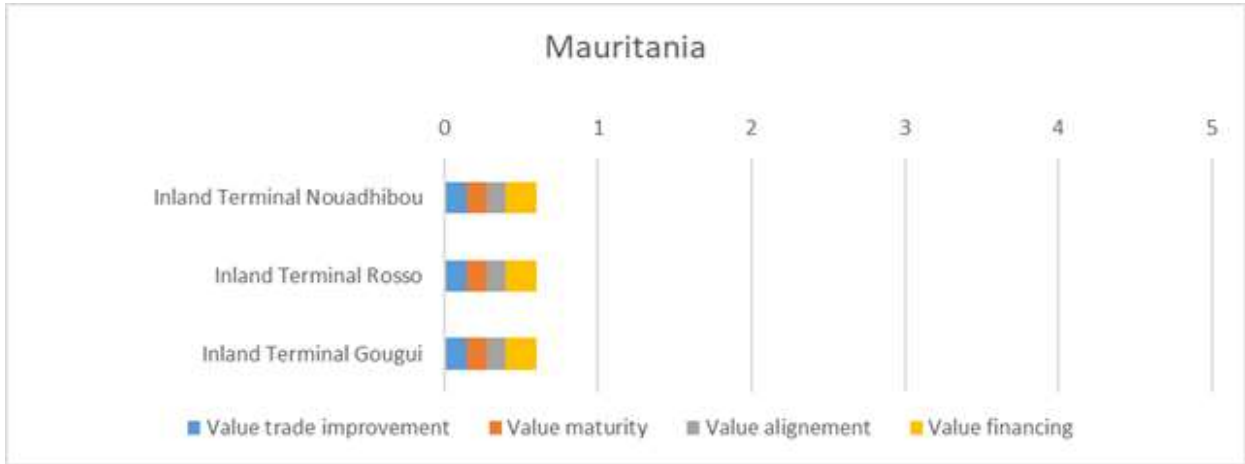


Figure 70. Prioritization of multimodality projects in Mauritania. Source: CETMO

In Mauritania, all projects receive relatively low scores, reflecting their preliminary conceptual status. The limited available information on the design and specifications of these platforms explains their lower performance in the MCA evaluation, which relies on detailed project information to assess maturity, alignment, and other criteria.

### 5.5.4. Prioritization of Multimodality Infrastructure Project - Morocco

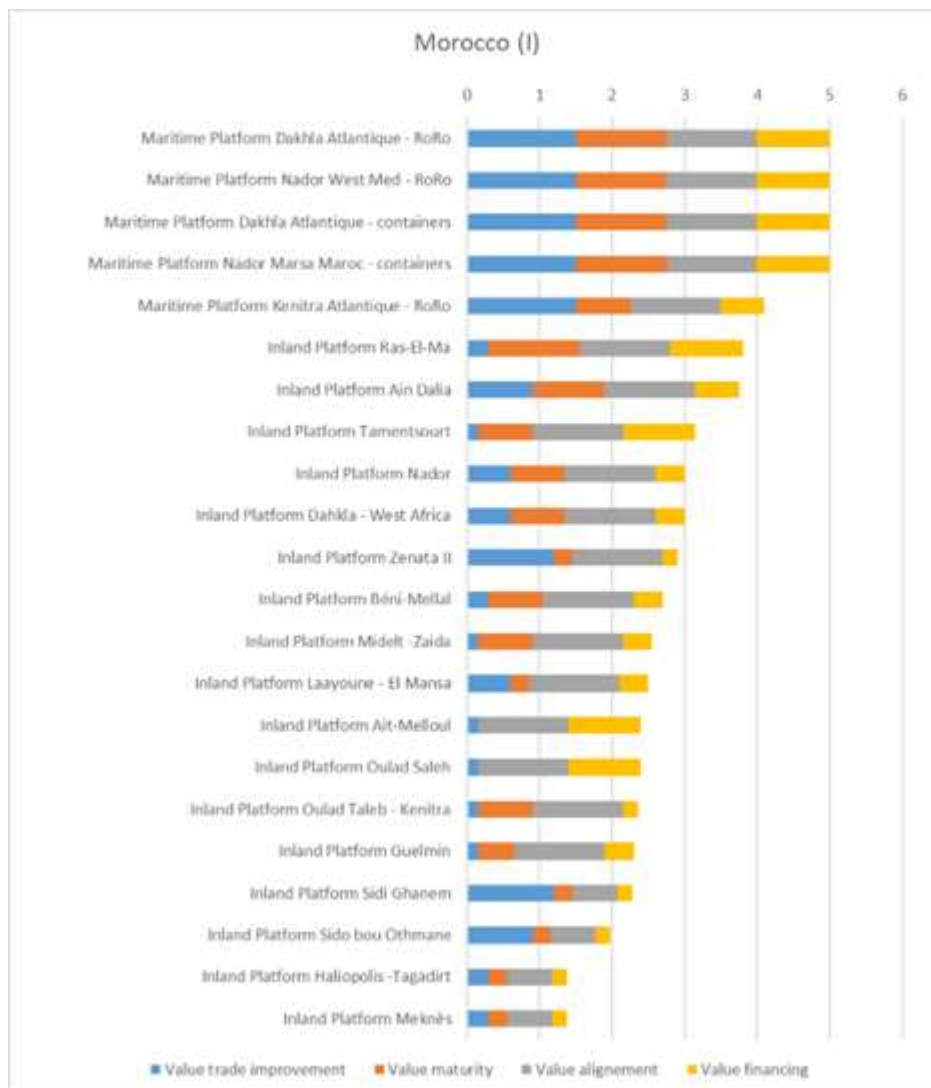


Figure 71. Prioritization of multimodality projects in Morocco (I). Source: CETMO

In Morocco, the maritime platform projects at Dakhla Atlantique and Nador West Med (both container and ro-ro facilities) achieve the highest scores. The varying scores of other planned platforms reflect the sequential implementation priorities within Morocco's ambitious logistics development strategy. Projects scoring above 3 represent the main priorities for multimodal development, with most scoring particularly well on the alignment criterion. The geographical distribution of high-scoring projects reveals the emergence of a new infrastructure axis from Agadir to Tangiers via Marrakech, Beni Mellal, and Fes, running parallel to the main TMC. The significant variation in project scores reflects Morocco's phased approach to developing a comprehensive nationwide network of logistics platforms over an extended timeframe.

To complete the information on multimodality projects in Morocco, figure 70 shows the 50% of projects that have obtained a lower score from the MCA.

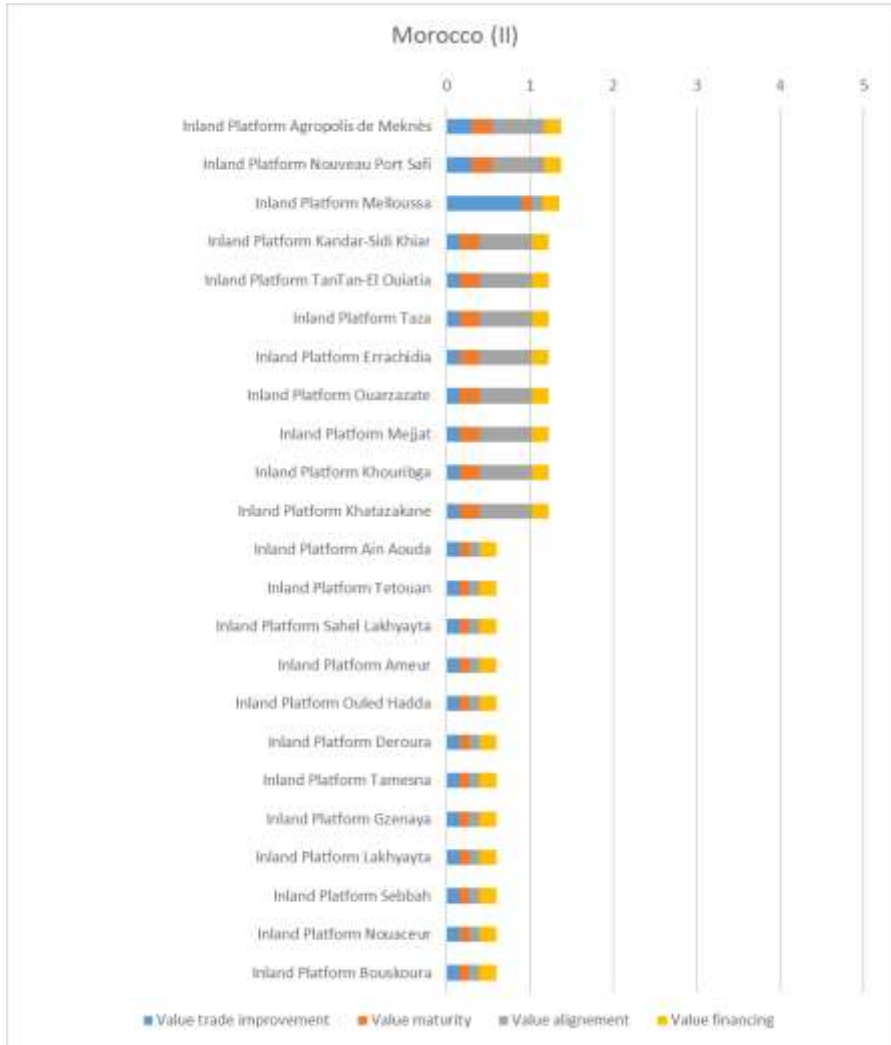


Figure 72. Prioritization of multimodality projects in Morocco (II). Source: CETMO

### 5.5.5. Prioritization of Multimodality Infrastructure Project - Tunisia

Figure 72 shows the MCA results obtained for the Tunisian projects.

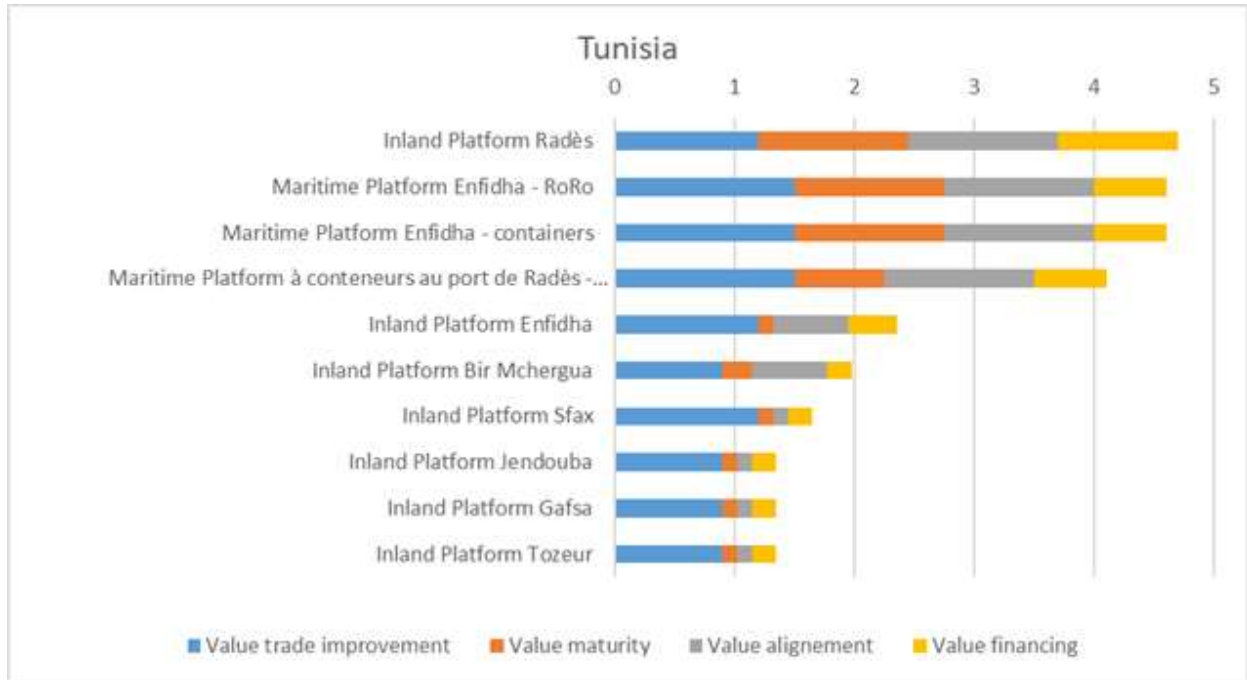


Figure 73. Prioritization of multimodality projects in Tunisia. Source: CETMO

In Tunisia, the inland terminal related to the port of Radès and the planned maritime terminals at Radès and Enfidha achieve the highest scores. This finding highlights the critical importance of maritime infrastructure for fully developing multimodal capabilities and the central role of maritime trade in shaping multimodal flows in Tunisia.

## 5.6. Conclusions on Multimodality and Projects to Enable a Trade Corridor

The comprehensive analysis of multimodality along the Trans-Maghreb Corridor (TMC) reveals several critical conclusions that have significant implications for the corridor's future development as a trade corridor.

The current state of multimodality in the TMC demonstrates a clear mismatch between infrastructure availability and operational effectiveness. While the region has established a foundation of multimodal infrastructure—particularly with maritime terminals and some inland platforms—the actual utilization of this infrastructure for multimodal operations remains extremely limited, as evidenced by the less than 2% modal share for rail container transport in both Algeria and Morocco. This disconnect between infrastructure and operations represents both a challenge and an opportunity for the corridor's development as a trade corridor.

The exceptional success of Morocco's automotive export system, with nearly 80% rail modal share for new car transport to Tanger Med, serves as a powerful proof-of-concept that effective multimodality can be achieved in the Maghreb region when appropriate infrastructure, services, business models, and institutional frameworks align. This success story provides valuable lessons that could be applied to container transport and other commodity flows throughout the corridor.

The prioritization of multimodal projects reveals a strategic recognition across all Maghreb countries of the critical importance of maritime interfaces for developing effective multimodal systems. The predominance of maritime terminal projects among the highest-rated interventions confirms that port modernization and expansion represent fundamental prerequisites for enhancing the corridor's multimodal performance and, consequently, its effectiveness as a trade corridor.

While all Maghreb countries demonstrate some high-quality multimodal project proposals, Morocco's comprehensive and strategically phased approach to logistics infrastructure development emerges as a potential model for regional development. Morocco's strategy of systematically developing a network of platforms across its territory, with clear prioritization and sequencing, could inform similar approaches in other Maghreb countries.

The significant variations in the current state of multimodal infrastructure and operations across the Maghreb countries presents both a challenge and an opportunity for corridor-wide integration. Harmonizing development approaches and establishing compatible multimodal systems will be essential for realizing the full potential of the TMC as an integrated trade corridor rather than a collection of national transport networks.

The effectiveness of future multimodal development will depend not only on infrastructure investments but also on the development of appropriate regulatory frameworks, operational models, and private sector engagement. The current low utilization of existing multimodal infrastructure suggests that addressing soft infrastructure elements—including regulations, procedures, and services—will be as critical as physical infrastructure investments for enhancing the corridor's trade facilitation capability.

For the TMC to evolve effectively from a Transport corridor to a Trade corridor, the multimodal infrastructural improvements (hard measures), must be developed in close coordination with other trade facilitation measures (soft measures), including customs modernization, procedural harmonization, and digital integration. The strategic location of customs services at multimodal platforms represents a positive step in this direction, but further integration of physical and procedural elements will be necessary.

In conclusion, the multimodality upgrade of the Trans-Maghreb Corridor represents a critical element in its evolution from a Transport Corridor to a Trade Corridor. By addressing the identified infrastructure gaps, operational limitations, and integration challenges, while building on demonstrated successes and high-potential interventions, the TMC can significantly enhance its contribution to regional trade facilitation and economic integration.

## 6. TMC CAPILLARITY ASSESSMENT AND EXPANSION PROJECTS

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The Trans-Maghreb Corridor (TMC) project aims to enhance regional integration and economic development across the Maghreb countries. This chapter presents a comprehensive analysis of the extent of zones served by the TMC identifying and prioritizing infrastructure projects that can extend the corridor's benefits to regions not yet directly served by it. The analysis reveals that enhancing capillarity connections to surrounding zones is crucial for maximizing the TMC's impact as a trade corridor, with 36 potential infrastructure projects identified and prioritized based on a multi-criteria analysis framework.

### 6.1. Introduction

This chapter 6 Capillarity (expansion of the areas served by the TMC) along with previous chapter 5 Multimodality and the following chapter 7 Connectivity, (enhanced connections with neighbouring regions and their respective corridors) assesses the present situation and identifies and prioritizes the required actions to enable the TMC to transition from Transport Corridor to a full-effect Trade Corridor.

The Trans-Maghreb Multimodal Corridor (TMC) represents a strategic infrastructure backbone connecting the Maghreb region. While the main corridor serves as the primary transportation artery across the region, its effectiveness as a trade facilitator depends significantly on its connectivity with surrounding economic zones. The importance of linking the TMC with these surrounding zones stems from the need to improve transport connectivity of these regions and, consequently, strengthen the development of the TMC as a comprehensive trade corridor.

Enhancing connectivity between the main corridor and surrounding economic zones creates a capillary network that extends the benefits of the TMC beyond its immediate path. This expanded reach allows for greater economic integration, more efficient supply chains, and improved access to markets for regions that might otherwise remain isolated. By improving these connecting infrastructures, the TMC transforms from a linear transport route into a comprehensive network that can drive regional economic development.

The surrounding zones often contain significant economic resources, industrial centres, agricultural areas, and population concentrations that can contribute to and benefit from improved connectivity to the TMC. Identifying and prioritizing infrastructure projects that connect these zones to the main corridor is therefore essential for maximizing the corridor's impact on regional trade and economic development.

#### 6.1.1. Objective

The objective of this chapter is to identify and prioritize infrastructure projects for increasing connectivity to the most relevant regions of the Maghreb that are not directly served by the Trans-Maghreb Multimodal Corridor. Through systematic analysis and evaluation, this chapter aims to establish a strategic framework for developing a comprehensive capillary network that extends the benefits of the TMC to surrounding economic zones, thereby enhancing the overall effectiveness and impact of the corridor as a trade and economic development catalyst for the Maghreb region.

#### 6.1.2. Preliminary considerations

For the purposes of this analysis, there are some concepts that need to be introduced first. These are the definition of Relevant Economic Zones (REZ), the definition and use of Euclidean distance, the definition of connectivity and the definition of accessibility analysis:

### *Definition of Relevant Economic Zones regarding the TMC*

Relevant Economic Zones (REZ) are defined as sub-national administrative divisions of countries involved in the TMC capillary analysis (Mauritania, Morocco, Algeria, and Tunisia) that are not directly crossed by the main corridor but have significant economic relevance to the corridor's functionality.

These zones are identified based on their administrative boundaries and are characterized by demographic and economic indicators that suggest their potential contribution to and benefit from improved connectivity with the TMC.

The administrative divisions considered in this analysis vary by country:

- Mauritania: Wilaya
- Morocco: Province or Prefecture
- Algeria: Wilaya
- Tunisia: Region

### *Definition and use of Euclidean distance*

Euclidean distance is defined as the straight-line distance between two points. In this analysis, it refers specifically to the straight-line distance between the centroid (typically the main city or capital) of each REZ and the nearest point on the TMC. This measure serves as a parameter to characterize the proximity of REZs to the TMC, providing a standardized metric for comparing the relative accessibility of different zones. While Euclidean distance does not account for actual travel routes or topographical challenges, it offers a consistent baseline for initial assessment of a region's physical proximity to the corridor.

### *Definition of connectivity*

Connectivity in the context of this analysis refers to the existence and quality of transport infrastructure (specifically road and railway networks) linking the REZs to the TMC. The primary characteristics considered in evaluating connectivity are:

- Road connectivity: Existence of road connections between REZs and the TMC, categorized by road type (conventional roads or expressways/motorways).
- Railway connectivity: Existence of rail connections between REZs and the TMC, categorized by railway type (electrified or non-electrified, single or double track).

These characteristics provide a basis for evaluating the current state of connectivity between surrounding zones and the main corridor, and for identifying gaps where infrastructure improvements are needed.

### *Definition of Accessibility analysis*

Accessibility analysis is defined as the evaluation of the economic relevance of regions in relation to their distance to the TMC. This analysis combines demographic factors (as proxies for economic activity) with distance metrics to assess the potential value of improving connectivity to specific zones. The accessibility analysis aims to identify which regions would benefit most from improved connections to the TMC, considering both their economic significance and their current level of accessibility.

## 6.2. Content Summary

The methodology used for analysing the TMC connectivity with surrounding zones consists of five components, as detailed in the Methodology Chapter. Each methodological step delivers a specific set of tables and cartographic representations. These components are:

1. Identification and definition of Relevant Economic Zones (REZ). This component establishes the geographic scope of the analysis by identifying and characterizing the relevant zones surrounding but not directly crossed by the TMC. It consists of three steps: the definition of Relevant Economic Zones (REZ), the characterization of regions based on common indicators and the representation of Relevant Economic Zones (REZ) in the TMC surrounding by its main city or regional capital, serving as the centroid of the region.
2. Characterisation and assessment of the Connectivity of the REZ with the TMC. It assesses the current state of transport infrastructure connecting the identified REZs to the TMC. It consists of three steps: Identification of the REZs connection to the TMC road network and the typology of these road connections, identification of the REZs connection to the TMC railway network and the characteristics of these railway lines, and representation of these connectivity characteristics. The information identified in previous steps has been represented by specific regional maps and grouped in national tables, providing a comprehensive overview of the current connectivity between each REZ and the TMC.
3. Accessibility Analysis. This component evaluates the feasibility and cost/benefit of connecting different REZs to the TMC. It consists of three steps: the definition of the Regional Relevance Index (RRI) as a representative index for the accessibility analysis of REZs to the TMC; the calculation of the RRI for all REZs identified across the involved countries (Mauritania, Morocco, Algeria, Tunisia); and finally, the RRI values obtained have been represented by a specific regional map and by tables grouped by country.
4. Identification of Capillarity Projects. This component consists of the identification of the planned projects of the road and rail networks connecting the REZ centroids with the TMC. These projects are interventions that increase the TMC connectivity. Projects identified are those defined in the GTMO 5+5 network. Road and railway projects connecting the REZ to TMC are listed in table grouped by country and transport mode.
5. Prioritization of Capillarity Projects. This component applies a Multi-Criteria Analysis (MCA) tool for the prioritization of identified infrastructure interventions (projects) to increase connectivity with the REZs

### 6.3. Present Situation of TMC's Capillarity.

The following two maps, represent the administrative sub-national divisions presently served by the TMC defined as those directly crossed by the TMC and whose centroids are well connected (grey, except Libya that is not included) and not yet served (orange) as well as their centroids. They are intended to provide a clearer picture of the regions identified as REZs, and the location of their centroids as the most important hubs of the REZs.

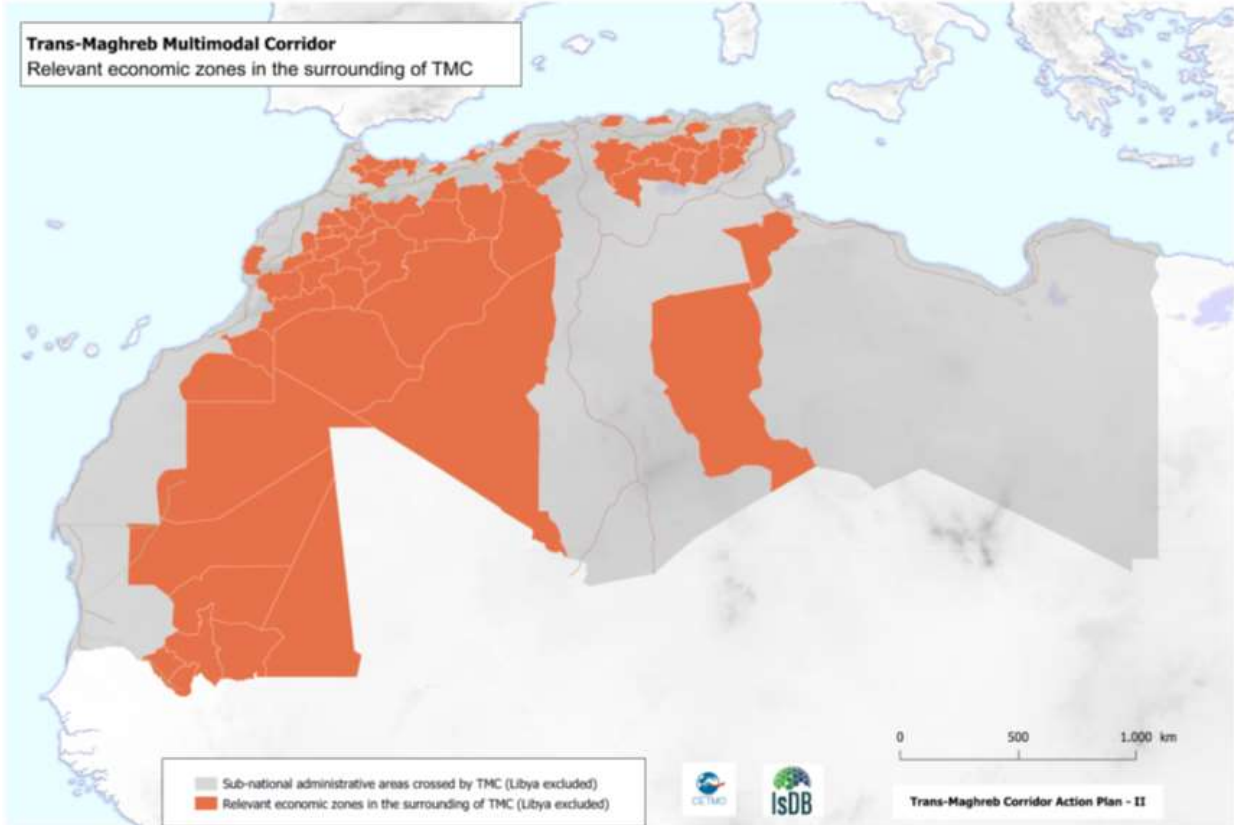


Figure 74. Relevant Economic Zones (REZ) in the TMC surrounding. Source: CETMO

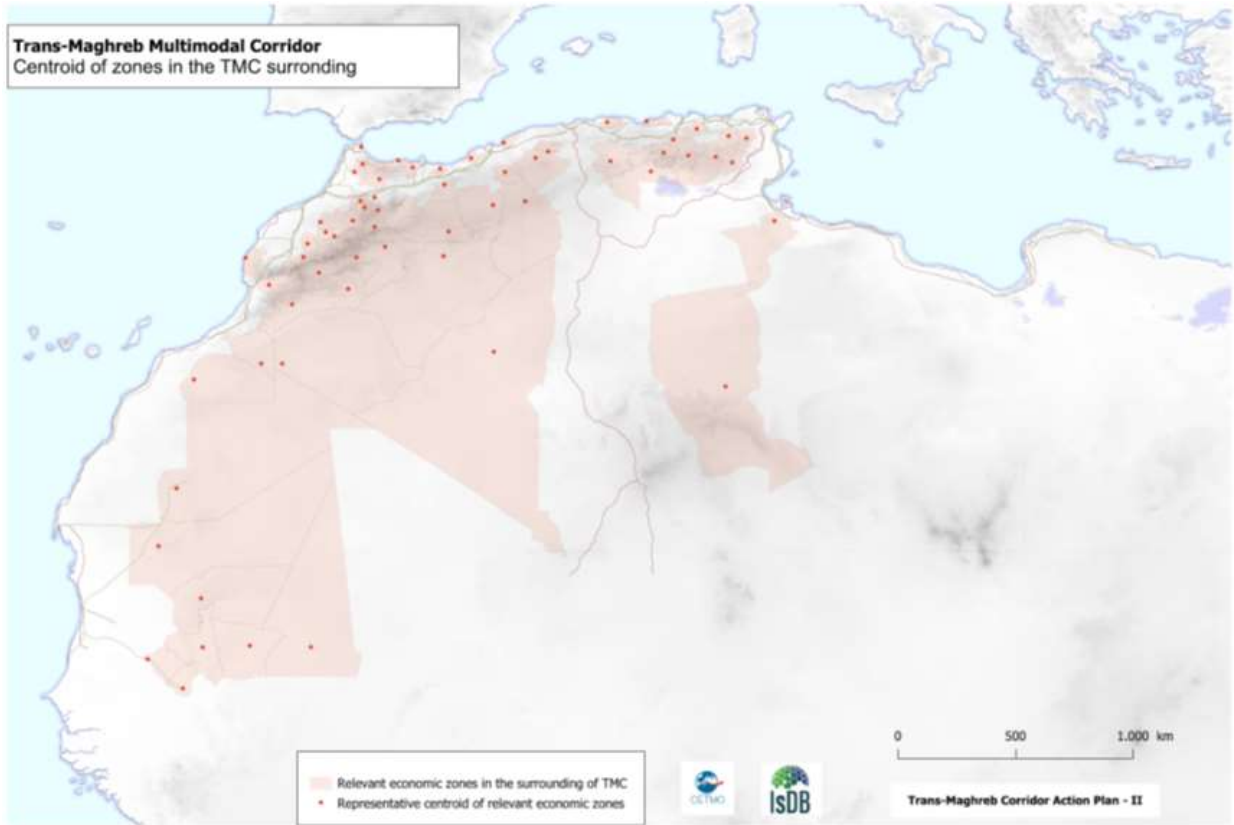


Figure 75. Centroid of Relevant Economic Zones (REZ) in the TMC surrounding. Source: CETMO

The analysis of REZs surrounding the TMC reveals significant patterns in population distribution and proximity to the corridor

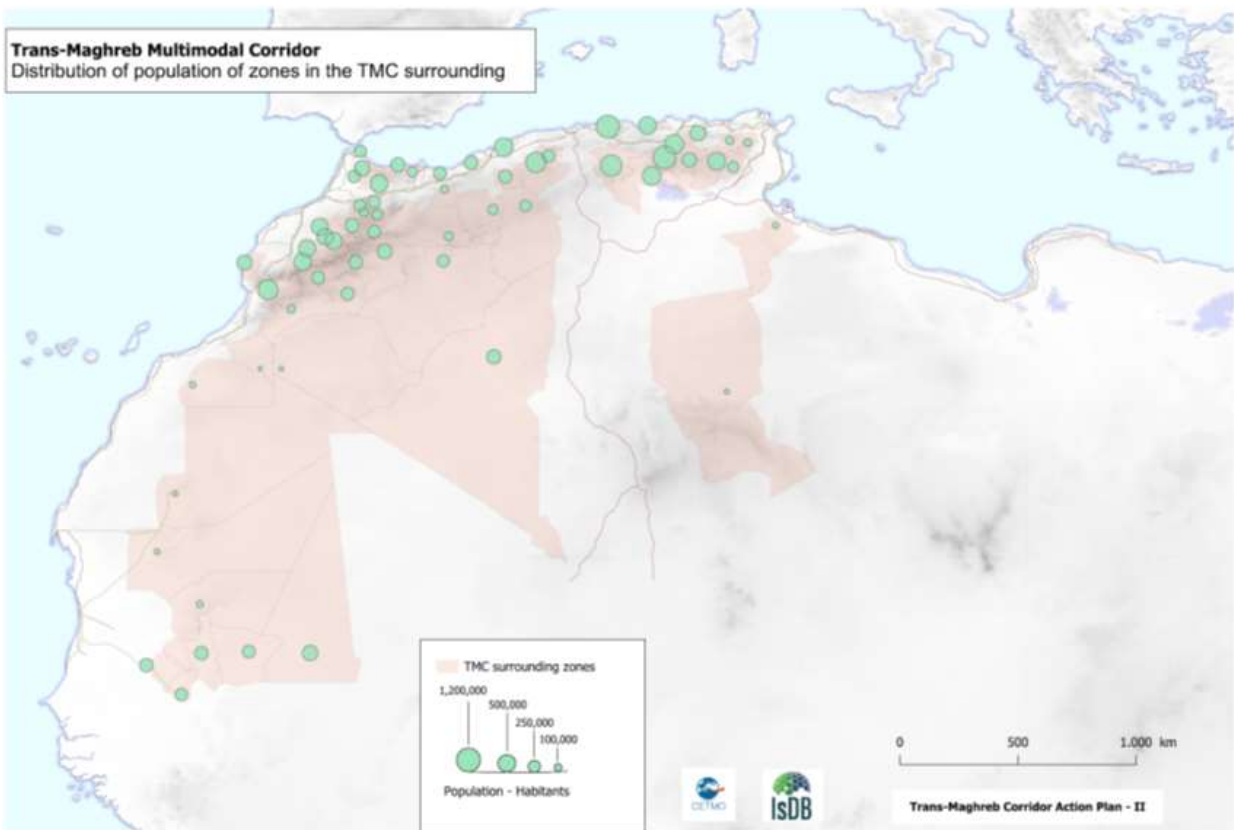


Figure 76. Distribution of population of zones in the TMC surrounding. Source: CETMO

In terms of population, REZs are located on the one hand, parallel to the route of the TMC on its Mediterranean side, either close to the Mediterranean coast or in the inland part of the territory. On the other hand, on the Atlantic side of the corridor, REZs can be found in the Mauritanian Wilaya bordering the ECOWAS countries in the extreme south.

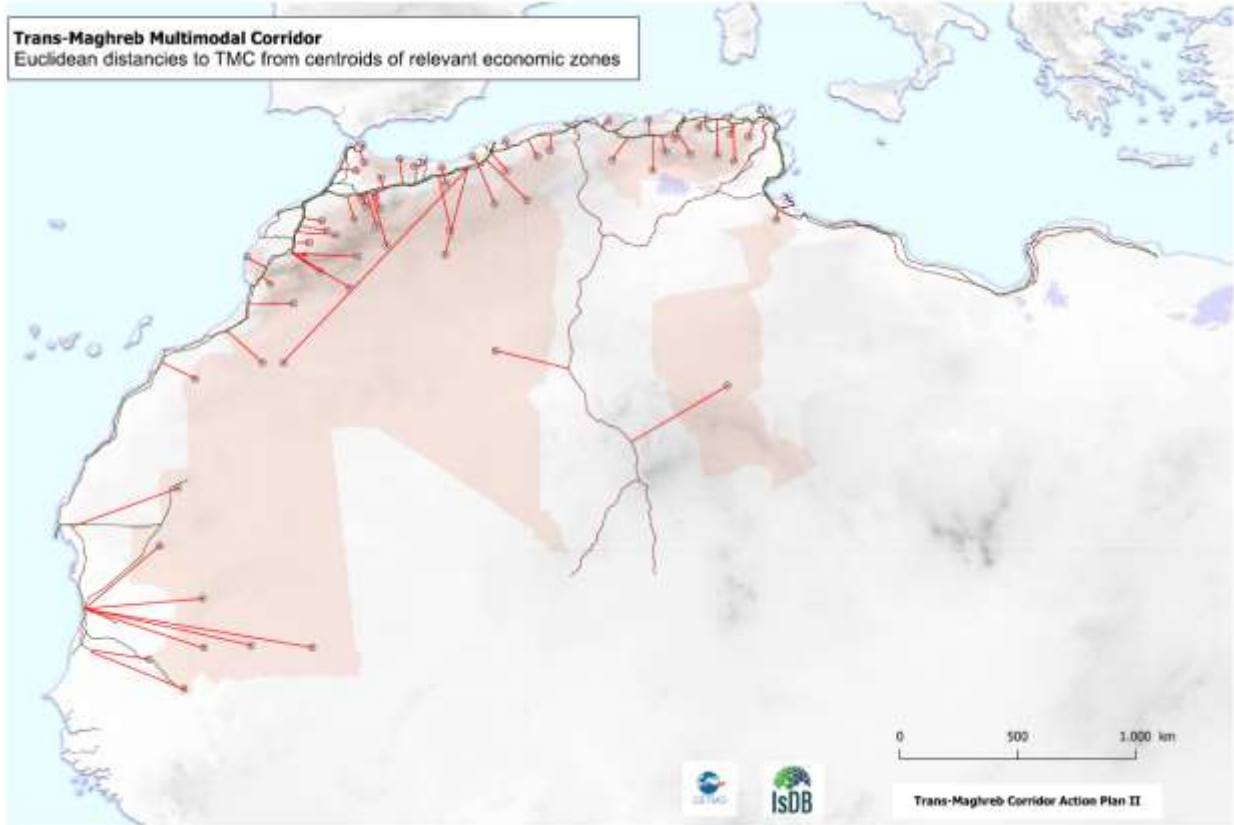


Figure 77. Euclidean distances to TMC from centroid of REZs. Source: CETMO

Figure 77 shows the representation of the REZs Euclidean distance to the TMC and reflects how the size, shape and internal administrative subdivision of countries are conditioning factors in the calculation of distances to the TMC.

### 6.3.1. Characteristics of the Relevant Economic Zones

The graphical information on REZs is complemented by detailed information on population and Euclidean distance by region in country tables.

20 REZs have been identified in Algeria as shown in figure 78 the centroid of 7 of the 10 REZs with the largest population are less than 85 km from the TMC, indicating that significant population centres are relatively close to the corridor despite not being directly crossed by it. The two least populated regions are by far the furthest away from the TMC.

29 REZs have been identified in Morocco as shown in figure 78, In the case of Morocco, there is not such an obvious relationship between the population and distance to the TMC. In fact, 16 of the 29 REZs identified have a distance to the TMC of less than 100 km. 7 if the 10 most populated REZs were selected.

| Algeria        |                |                   |                                |
|----------------|----------------|-------------------|--------------------------------|
| Region         | Urban node     | Population (hab)* | Euclidean distance to TMC (km) |
| Tizi Ouzou     | Tizi Ouzou     | 1.127.607         | 42                             |
| Batna          | Batna          | 1.119.791         | 67                             |
| Msila          | Msila          | 990.591           | 114                            |
| Tiaret         | Tiaret         | 846.823           | 81                             |
| Ain Mlila      | Ain Mlila      | 766.013           | 29                             |
| Mostaganem     | Mostaganem     | 737.118           | 28                             |
| Biskra         | Biskra         | 721.356           | 149                            |
| Tebessa        | Tebessa        | 648.703           | 155                            |
| Jijel          | Jijel          | 636.948           | 63                             |
| Guelma         | Guelma         | 482.430           | 29                             |
| Adrar          | Adrar          | 399.714           | 795                            |
| Khenchela      | Khenchela      | 386.683           | 113                            |
| Ain Temouchent | Ain Temouchent | 371.239           | 42                             |
| Saida          | Saida          | 330.641           | 97                             |
| Tissemsilt     | Tissemsilt     | 294.476           | 62                             |
| Bechar         | Bechar         | 270.061           | 384                            |
| El Bayadh      | El Bayadh      | 228.624           | 245                            |
| Naama          | Medheria       | 192.891           | 180                            |
| Illizi         | Illizi         | 52.333            | 1.135                          |
| Tindouf        | Tindouf        | 49.149            | 1.144                          |

Figure 78. List of Relevant Economic Zones (REZ) in the TMC Surrounding – Algeria. Source: CETMO

| Morocco - I          |                      |                   |                                |
|----------------------|----------------------|-------------------|--------------------------------|
| Region               | Urban node           | Population (hab)* | Euclidean distance to TMC (km) |
| Taroudannt           | Taroudannt           | 855.100           | 45                             |
| Al Haouz             | Ait Ourir            | 646.819           | 50                             |
| Taounate             | Taounate             | 637.742           | 55                             |
| El Kelea des Sraghna | El Kelea des Sraghna | 594.698           | 66                             |
| Beni Mellal          | Beni Mellal          | 587.471           | 172                            |
| Khouribga            | Khouribga            | 570.291           | 78                             |
| Fquih Ben Salah      | Fquih Ben Salah      | 523.109           | 119                            |
| Chefchaouen          | Chefchaouen          | 483.638           | 54                             |
| Essaouira            | Essaouira            | 449.774           | 84                             |
| Errachidia           | Errachidia           | 425.250           | 228                            |
| Al Hoceima           | Al Hoceima           | 396.462           | 109                            |
| Khenifra             | Khenifra             | 378.361           | 98                             |
| Tinghir              | Tinghir              | 342.556           | 274                            |
| Zagora               | Zagora               | 316.881           | 281                            |

\* HCP. 2021

| Morocco - II |            |                   |                                |
|--------------|------------|-------------------|--------------------------------|
| Region       | Urban node | Population (hab)* | Euclidean distance to TMC (km) |
| Ouarzazate   | Ouarzazate | 313.127           | 139                            |
| Midelt       | Midelt     | 305.520           | 139                            |
| Berkane      | Berkane    | 301.403           | 31                             |
| Sefrou       | Sefrou     | 299.218           | 132                            |
| Ouazzane     | Ouazzane   | 297.047           | 67                             |
| El Hajeb     | El Hajeb   | 266.642           | 18                             |
| M'Diq-Fnideq | Fnideq     | 261.740           | 21                             |
| Boulemane    | Boulemane  | 200.972           | 68                             |
| Driouch      | Driouch    | 189.817           | 27                             |
| Ifrane       | Ifrane     | 160.114           | 48                             |
| Figuig       | Figuig     | 139.856           | 236                            |
| Tata         | Tata       | 112.378           | 192                            |
| Jerada       | Jerada     | 108.902           | 37                             |
| Es-Semara    | Smara      | 75.055            | 156                            |
| Assa         | Assa-Zag   | 43.657            | 206                            |

\* HCP. 2021

Figure 79. List of Relevant Economic Zones (REZ) in the TMC Surrounding – Morocco. Source: CETMO

In the case of Mauritania, 8 REZs have been identified as shown in figure 80. Given the morphological characteristics of the country with a large part of the country occupied by desert and its size, the centroid of the REZs is located more than 400 km. from the TMC in 7 of the 8 REZs. Of particular interest is the border area with ECOWAS.

| Mauritania       |               |                   |                                |
|------------------|---------------|-------------------|--------------------------------|
| Region           | Urban node    | Population (hab)* | Euclidean distance to TMC (km) |
| Hodh ech Chargui | Nema          | 466.848           | 978                            |
| Gorgol           | Kaedi         | 350.291           | 254                            |
| Assaba           | Kiffa         | 349.834           | 525                            |
| Hodl el Gharbi   | Aiun el Atrus | 306.621           | 727                            |
| Guidimaka        | Selibabi      | 285.752           | 432                            |
| Tagant           | Tidjikaj      | 80.217            | 500                            |
| Adrar            | Atar          | 59.555            | 410                            |
| Tiris Zemmour    | Zuerate       | 52.855            | 473                            |

\* ONS. 2016

Figure 80. List of Relevant Economic Zones (REZ) in the TMC Surrounding – Mauritania. Source: CETMO

In Tunisia, 4 REZs have been identified as shown in figure 81, three out of the four REZs are within 65 Km. of the TMC. The most populated region, Kasserine, is also the furthest from the TMC at 157 Km.

| Tunisia   |            | Population (hab)* | Euclidean distance to TMC (km) |
|-----------|------------|-------------------|--------------------------------|
| Region    | Urban node |                   |                                |
| Kasserine | Kasserine  | 229.200           | 157                            |
| Le Kef    | Le Kef     | 121.500           | 36                             |
| Siliana   | Siliana    | 111.700           | 63                             |
| Tataouine | Tataouine  | 71.900            | 47                             |

\*INS. 2022

Figure 81. List of Relevant Economic Zones (REZ) in the TMC Surrounding – Tunisia. Source: CETMO

### 6.3.2. Assessment of the Current Connectivity of the TMC with the REZs

Two maps have been developed to represent the current connectivity of REZs with the TMC. More specifically, they represent the road connectivity with the TMC (figure 82) and the railway connectivity with the TMC (figure 83).

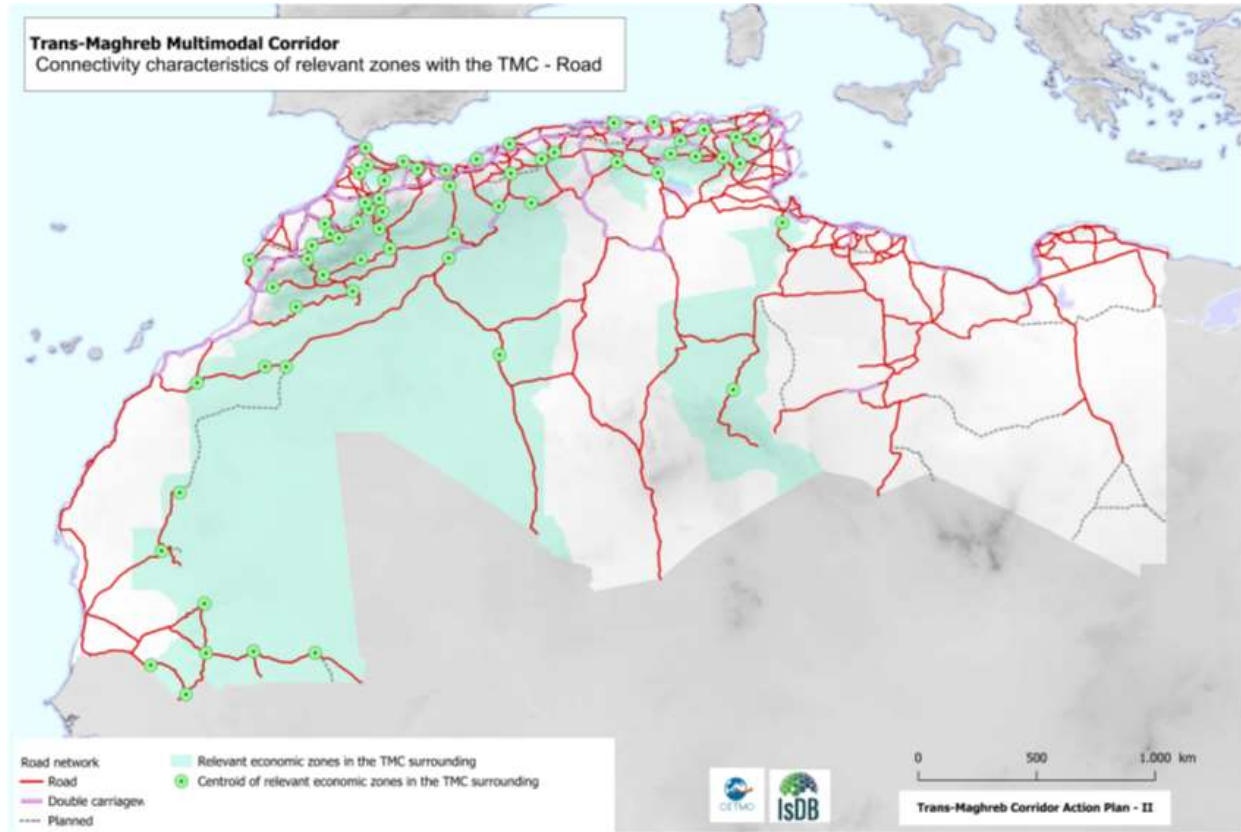


Figure 82. Map of road connectivity characteristics of relevant zones with the TMC. Source: CETMO

The definition of road and railway connectivity characteristics is based on the GTMO 5+5 multimodal network. The definition of this network and its projects is based on unified criteria, becoming a reference for common regional transport analysis and planning.

The graphical information on the connectivity characteristics of the REZs is complemented by country tables where, from most populated region to least populated region, the name of the region and urban node and the current road and railway connection to TMC are detailed.

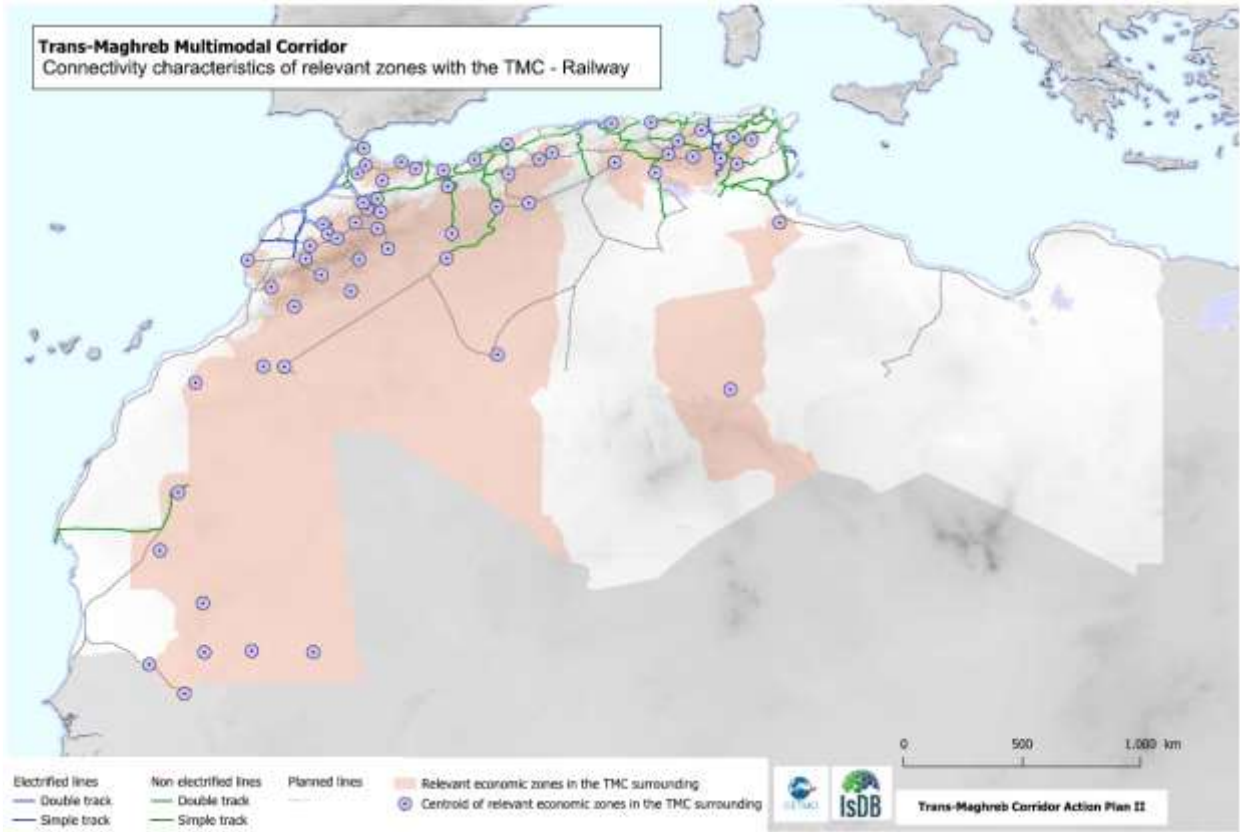


Figure 83. Railway connectivity characteristics of relevant zones with the TMC. Source: CETMO

| Algeria        |                |                                |                                   |
|----------------|----------------|--------------------------------|-----------------------------------|
| Region         | Urban node     | Current Road Connection to TMC | Current Railway Connection to TMC |
| Tizi Ouzou     | Tizi Ouzou     | Express way                    | Double track. Electrified         |
| Batna          | Batna          | Express way                    | Single track. Non electrified     |
| Msila          | Msila          | Road                           | None                              |
| Tiaret         | Tiaret         | Road                           | None                              |
| Ain Mlila      | Ain Mlila      | Road                           | Single track. Non electrified     |
| Mostaganem     | Mostaganem     | Express way                    | Single track. Non electrified     |
| Biskra         | Biskra         | Express way                    | Single track. Non electrified     |
| Tebessa        | Tebessa        | Road                           | Single track. Electrified         |
| Jijel          | Jijel          | Road                           | None                              |
| Guelma         | Guelma         | Road                           | None                              |
| Adrar          | Adrar          | Road                           | None                              |
| Khenchela      | Khenchela      | Road                           | None                              |
| Ain Temouchent | Ain Temouchent | Express way                    | Single track. Non electrified     |
| Saida          | Saida          | Road                           | Single track. Non electrified     |
| Tissemsilt     | Tissemsilt     | Road                           | None                              |
| Bechar         | Bechar         | Road                           | Single track. Non electrified     |
| El Bayadh      | El Bayadh      | Road                           | None                              |
| Naama          | Mecheria       | Road                           | Single track. Non electrified     |
| Illizi         | Illizi         | Road                           | None                              |
| Tindouf        | Tindouf        | Road                           | None                              |

Figure 84. List of REZ in the TMC surrounding and connectivity characteristics – Algeria. Source: CETMO

The assessment of current connectivity between REZs and the TMC reveals varying levels of infrastructure development across the four countries.

Figure 84 shows that in Algeria, 4 out of the 10 REZs with the largest population have express ways connecting to the TMC, indicating a relatively good level of high-capacity road connectivity for major population centres. However, 4 of them have no rail connection to the TMC, highlighting a gap in multimodal connectivity options.

Figure 85 shows that in Morocco, 5 out of the 10 REZs with the largest population have express ways or motorways connecting to the TM, suggesting a similar level of road infrastructure development as Algeria. However, only one of these REZs has rail connection to the TMC, also indicating a significant gap in rail connectivity.

| Morocco - I          |                      |                                |                                   |
|----------------------|----------------------|--------------------------------|-----------------------------------|
| Region               | Urban node           | Current Road Connection to TMC | Current Railway Connection to TMC |
| Taroudannt           | Taroudannt           | Express way                    | None                              |
| Al Haouz             | Ait Ourir            | Road                           | None                              |
| Taounate             | Taounate             | Road                           | None                              |
| El Kelea des Sraghna | El Kelea des Sraghna | Road                           | None                              |
| Beni Mellal          | Beni Mellal          | Motorway                       | None                              |
| Khouribga            | Khouribga            | Motorway                       | Double track. Electrified         |
| Fquih Ben Salah      | Fquih Ben Salah      | Road                           | None                              |
| Chefchaouen          | Chefchaouen          | Express way                    | None                              |
| Essaouira            | Essaouira            | Express way                    | None                              |
| Errachidia           | Errachidia           | Road                           | None                              |
| Al Hoceima           | Al Hoceima           | Express way                    | None                              |
| Khenifra             | Khenifra             | Road                           | None                              |
| Tinghir              | Tinghir              | Road                           | None                              |
| Zagora               | Zagora               | Road                           | None                              |

Figure 85. List of REZs and connectivity characteristics – Morocco. Source: CETMO

Figure 86 shows that in Mauritania, the 8 REZs has a simple road connection to the TMC. The least populated of Mauritania's Wilaya is the only one with a rail link to the TMC, due to the importance of the mineral extraction industry.

| Mauritania       |               |                                |                                   |
|------------------|---------------|--------------------------------|-----------------------------------|
| Region           | Urban node    | Current Road Connection to TMC | Current Railway Connection to TMC |
| Hodh ech Chargui | Nema          | Road                           | None                              |
| Gorgol           | Kaedi         | Road                           | None                              |
| Assaba           | Kiffa         | Road                           | None                              |
| Hodl el Gharbi   | Aiun el Atrus | Road                           | None                              |
| Guidimaka        | Selibabi      | Road                           | None                              |
| Tagant           | Tidjikaj      | Road                           | None                              |
| Adrar            | Atar          | Road                           | None                              |
| Tiris Zemmour    | Zuerate       | Road                           | Single track. Non electrified     |

Figure 86. List of REZs and connectivity characteristics – Mauritania. Source: CETMO

Finally, figure 87 shows that in Tunisia, four REZs has a simple road connection to the TMC. The 2 most populated of Tunisia's regions also have rail connection to the TMC, with non-electrified single track.

| Tunisia   |            |                                |                                   |
|-----------|------------|--------------------------------|-----------------------------------|
| Region    | Urban node | Current Road Connection to TMC | Current Railway Connection to TMC |
| Kasserine | Kasserine  | Road                           | Single track. Non electrified     |
| Le Kef    | Le Kef     | Road                           | Single track. Non electrified     |
| Siliana   | Siliana    | Road                           | None                              |
| Tataouine | Tataouine  | Road                           | None                              |

Figure 87. List of REZs connectivity characteristics – Tunisia. Source: CETMO

### 6.3.3. REZ's Regional Relevance Index (RRI)

The Regional Relevance Index (RRI) has been defined as the economic relevance of regions in relation to their distance to the TMC and it has been identified as the representative index for an approximate estimation of the feasibility and cost/benefit of better connecting a REZs to the TMC.

From the population and Euclidean distance obtained above, the RRI has been calculated as the ratio of the population (as a proxy of economic production/importance) to the Euclidean distance to the national section of TMC (measured in km). The abstract value normalized over 1,000 is the RRI.

This index (RRI) has been calculated for all REZs and the centroid of each REZ has been classified following a colour-coding scheme. The result is the figure 88.

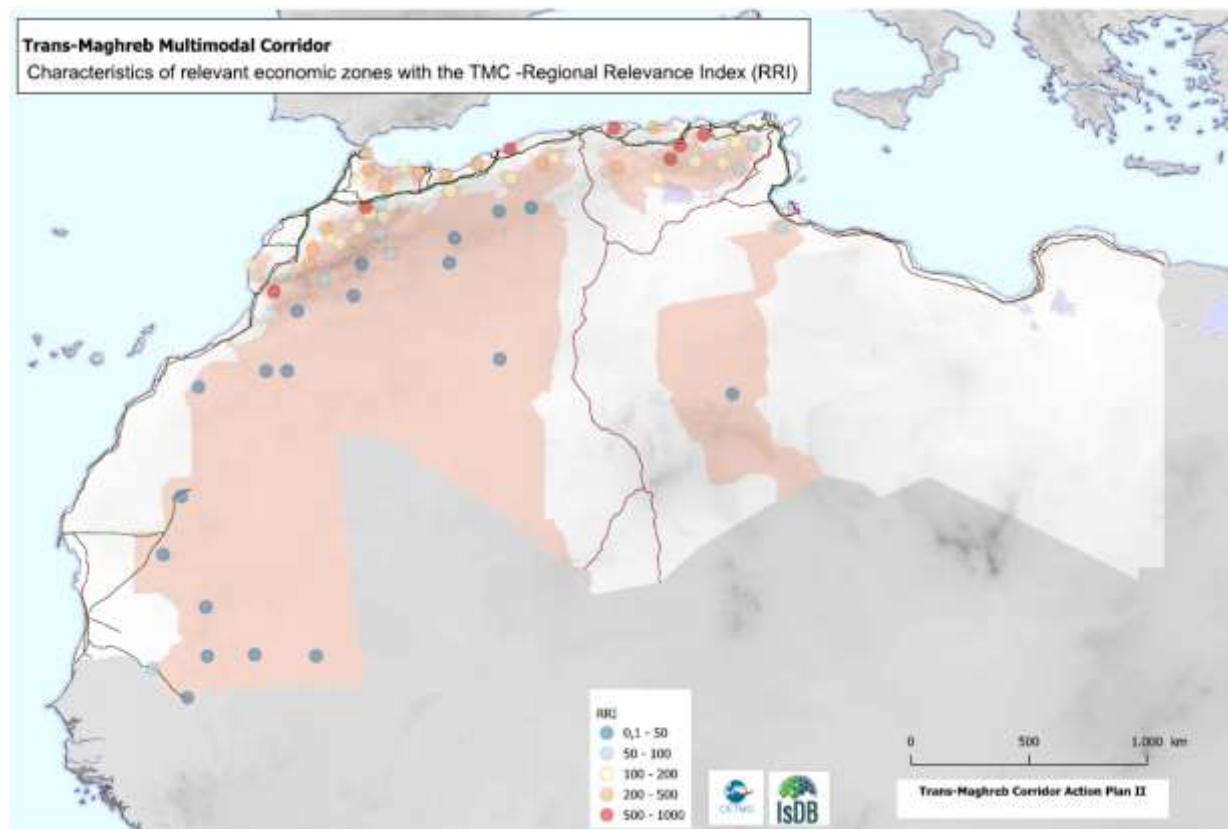


Figure 88. Regional Relevant Index (RRI) by centroid of REZs. Source: CETMO

The accessibility analysis, conducted through the Regional Relevance Index (RRI), reveals several key patterns:

- The most relevant regions are those near to the Mediterranean coastal area, and consequently close to the TMC. This pattern is consistent across the three countries bordering the Mediterranean (Morocco, Algeria and Tunisia), reflecting the concentration of population and economic activity along coastal zones.
- These zones are also those where population, activity and infrastructures are located, creating a mutually reinforcing pattern of development and connectivity.
- Concentration of population and short distances to TMC in coastal areas explain the higher scores of the RRI of these zones. This finding suggests that improving connectivity to these high-RRI zones would likely yield the greatest socioeconomic benefits relative to the infrastructure investment required.
- Mauritania represents a particular case, as the size of the country and the small number of Wilayas and the existence of a desert in a large part of its territory means that the population is concentrated in areas far from the TMC, resulting in a low RRI value.

The map on RRI by centroid of REZs is complemented by country tables showing the specific value of RRI for each REZs, as well as its Population and Euclidean distance to TMC (in km).

Figure 90 shows that Algeria has five REZs with an RRI above 500 and four REZs with an RRI between 200 and 500. These values indicate that these are highly populated regions with their main urban node very close to the TMC. More specifically, 7 of these 9 REZs are located at a distance of less than 70 Km. from the TMC and 6 of them have a population of more than 700,000 inhabitants.

| Urban node     | Region         | Population | Euclidean distance to TMC (km) | Accessibility index |
|----------------|----------------|------------|--------------------------------|---------------------|
| Tizi Ouzou     | Tizi Ouzou     | 1.127.607  | 42                             | 1000                |
| Ain Mlila      | Ain Mlila      | 766.013    | 29                             | 976,7               |
| Mostaganem     | Mostaganem     | 737.118    | 28                             | 973,6               |
| Guelma         | Guelma         | 482.430    | 29                             | 621,7               |
| Batna          | Batna          | 1.119.791  | 67                             | 618,9               |
| Tiaret         | Tiaret         | 846.823    | 81                             | 389,5               |
| Jijel          | Jijel          | 636.948    | 63                             | 373,9               |
| Ain Temouchent | Ain Temouchent | 371.239    | 42                             | 325,7               |
| Msila          | Msila          | 990.591    | 114                            | 322,2               |
| Biskra         | Biskra         | 721.356    | 149                            | 179,7               |
| Tissemsilt     | Tissemsilt     | 294.476    | 62                             | 176,7               |
| Tebessa        | Tebessa        | 648.703    | 155                            | 155,1               |
| Khenchela      | Khenchela      | 386.683    | 113                            | 126,9               |
| Saida          | Saida          | 330.641    | 97                             | 126,5               |
| Mecheria       | Naama          | 192.891    | 180                            | 39,7                |
| El Bayadh      | El Bayadh      | 228.624    | 245                            | 34,6                |
| Bechar         | Bechar         | 270.061    | 384                            | 26,0                |
| Adrar          | Adrar          | 399.714    | 795                            | 18,6                |
| Illizi         | Illizi         | 52.333     | 1135                           | 1,7                 |
| Tindouf        | Tindouf        | 49.149     | 1144                           | 1,6                 |

Figure 90. List of RRI of the REZs in the TMC surrounding – Algeria. Source: CETMO

In the case of Morocco, figure 91 shows that there are two REZs with an RRI value above 500 and 8 REZs with an RRI value between 200 and 500. These regions are characterised by their proximity to the TMC,

all of them being less than 80 Km. from the TMC. Five of these regions have a population of more than 500,000 inhabitants. The population of the other 4 regions is between 180,000 and 500,000 inhabitants.

| Urban node           | Region               | Population | Euclidean distance to TMC (km) | Accessibility index |
|----------------------|----------------------|------------|--------------------------------|---------------------|
| Taroudannt           | Taroudannt           | 855.100    | 45                             | 696,4               |
| El Hajeb             | El Hajeb             | 266.642    | 18                             | 553,9               |
| Ait Ourir            | Al Haouz             | 646.819    | 50                             | 481,9               |
| Fnideq               | M'Diq-Fnideq         | 261.740    | 21                             | 462,8               |
| Taounate             | Taounate             | 637.742    | 55                             | 430,3               |
| Berkane              | Berkane              | 301.403    | 31                             | 357,1               |
| El Kelea des Sraghna | El Kelea des Sraghna | 594.698    | 66                             | 332,3               |
| Chefchaouen          | Chefchaouen          | 483.638    | 54                             | 330,3               |
| Khouribga            | Khouribga            | 570.291    | 78                             | 270,4               |
| Driouch              | Driouch              | 189.817    | 27                             | 258,1               |
| Essaouira            | Essaouira            | 449.774    | 84                             | 198,5               |
| Ouazzane             | Ouazzane             | 297.047    | 67                             | 164,0               |
| Fquih Ben Salah      | Fquih Ben Salah      | 523.109    | 119                            | 163,0               |
| Khenifra             | Khenifra             | 378.361    | 98                             | 143,3               |
| Al Hoceima           | Al Hoceima           | 396.462    | 109                            | 135,3               |
| Beni Mellal          | Beni Mellal          | 587.471    | 172                            | 126,5               |
| Ifrane               | Ifrane               | 160.114    | 48                             | 124,3               |
| Jerada               | Jerada               | 108.902    | 37                             | 109,6               |
| Boulemane            | Boulemane            | 200.972    | 68                             | 109,3               |
| Sefrou               | Sefrou               | 299.218    | 132                            | 83,8                |
| Ouarzazate           | Ouarzazate           | 313.127    | 139                            | 83,5                |
| Midelt               | Midelt               | 305.520    | 139                            | 81,5                |
| Errachidia           | Errachidia           | 425.250    | 228                            | 69,2                |
| Tinghir              | Tinghir              | 342.556    | 274                            | 46,3                |
| Zagora               | Zagora               | 316.881    | 281                            | 41,8                |
| Figuig               | Figuig               | 139.856    | 236                            | 22,0                |
| Tata                 | Tata                 | 112.378    | 192                            | 21,7                |
| Smara                | Es-Semara            | 75.055     | 156                            | 17,8                |
| Assa-Zag             | Assa                 | 43.657     | 206                            | 7,8                 |

Figure 91. List of RRI of the REZs in the TMC surrounding – Morocco. Source: CETMO

As discussed above, Mauritania represents a particular case in the RRI analysis. Figure 92 shows that only one REZ achieves a RRI value above 50 (51.2). The other 7 REZs identified have a RRI value below 50. The Mauritanian REZs with the highest RRI values are those located on the border with Senegal.

| Urban node    | Region           | Population | Euclidean distance to TMC (km) | Accessibility index |
|---------------|------------------|------------|--------------------------------|---------------------|
| Kaedi         | Gorgol           | 350.291    | 254                            | 51,2                |
| Kiffa         | Assaba           | 349.834    | 525                            | 24,7                |
| Selibabi      | Guidimaka        | 285.752    | 432                            | 24,5                |
| Nema          | Hodh ech Chargui | 466.848    | 978                            | 17,7                |
| Aiun el Atrus | Hodl el Gharbi   | 306.621    | 727                            | 15,6                |
| Tidjikaj      | Tagant           | 80.217     | 500                            | 5,9                 |
| Atar          | Adrar            | 59.555     | 410                            | 5,4                 |
| Zuerate       | Tiris Zemmour    | 52.855     | 473                            | 4,1                 |

Figure 92. List of RRI of the REZs in the TMC surrounding – Mauritania. Source: CETMO

Finally, as far as Tunisia is concerned, most of its regions are crossed by the TMC. Figure 93 shows that 1 of the 4 identified REZs has an RRI value between 100 and 200 and for the other three REZs the RRI value is between 50 and 100. The low RRI value is determined by a low number of inhabitants (compared to the REZs of the other countries analysed). All the Tunisian REZs are located close to the TMC, with three of them at a distance of less than 65 km.

| Urban node | Region    | Population | Euclidean distance to TMC (km) | Accessibility index |
|------------|-----------|------------|--------------------------------|---------------------|
| Le Kef     | Le Kef    | 121.500    | 36                             | <b>124,0</b>        |
| Siliana    | Siliana   | 111.700    | 63                             | <b>65,9</b>         |
| Tataouine  | Tataouine | 71.900     | 47                             | <b>56,6</b>         |
| Kasserine  | Kasserine | 229.200    | 157                            | <b>54,1</b>         |

Figure 93. List of RRI of the REZs in the TMC surrounding – Tunisia. Source: CETMO

## 6.4. Identified TMC's Capillarity Increase Projects

This output presents the list of road and railway projects that would increase the TMC connectivity with REZs. The identified projects are based on the GTMO 5+5 multimodal network, as a reference transport network in the region.

Road and railway projects connecting the REZ to TMC are listed in table grouped by country and transport mode. These tables also define the section covered by the project as well as its length.

As shown in figures 94 and 95 six road projects and ten railway projects have been identified in Algeria to increase connectivity of the REZs to the TMC. All identified projects, both road and rail, have the same objectives. In the case of road projects, the objective is the construction of express ways and in the case of rail projects, the objective is the construction of conventional railway lines.

These objectives show, on the one hand, the importance of the road network, building high-capacity infrastructure, and on the other hand, the commitment to rail transport with the construction of new lines.

| Urban node | Region     | Type of road | Name of road; section           | Length (km) |
|------------|------------|--------------|---------------------------------|-------------|
| Tiaret     | Tiaret     | Express way  | N23. Relianze-Tiaret            | 93          |
| Jijel      | Jijel      | Express way  | N77. El Eulma-Jijel             | 147         |
| Tissemsilt | Tissemsilt | Express way  | N19. Echangeur Chlef-Tissemsilt | 108         |
| Tebessa    | Tebessa    | Express way  | N16. Drean-Tebessa              | 193         |
| Saida      | Saida      | Express way  | N6. Mascara-Saida               | 63          |
| Mecheria   | Naama      | Express way  | N6. Saida-Mecheria              | 161         |

Figure 94. List of road infrastructure projects to increase TMC connectivity – Algeria. Source: CETMO

| Urban node | Region     | Type of line | Section               | Length (km) |
|------------|------------|--------------|-----------------------|-------------|
| Mostaganem | Mostaganem | Conventional | Relianze-Mostaganem   | 53          |
| Guelma     | Guelma     | Conventional | Oued Zenati-Guelma    | 96          |
| Tiaret     | Tiaret     | Conventional | Relianze-Tiaret       | 84          |
| Jijel      | Jijel      | Conventional | Setif - Jijel         | 76          |
| Msila      | Msila      | Conventional | Bousaada - M'Sila     | 63          |
| Khenchela  | Khenchela  | Conventional | Kenchela - Chahbounia | 25          |
| Saida      | Saida      | Conventional | Mohammadia-Saida      | 81          |
| El Bayadh  | El Bayadh  | Conventional | Mecheria-El Bayadh    | 118         |
| Adrar      | Adrar      | Conventional | Bechar-Adrar          | 539         |
| Tindouf    | Tindouf    | Conventional | Bechar- Tindouf       | 805         |

Figure 95. List of railway infrastructure projects to increase TMC connectivity – Algeria. Source: CETMO

In the case of Morocco, figures 96 and 97 the five road projects and twelve railway projects identified to increase the connectivity of REZs with TMC.

As in the case of Algeria, the road projects identified in Morocco are aimed at increasing the capacity of the road network, since they involve the construction of one express way and four toll motorways.

Regarding the Moroccan railway projects, they aim to continue the extension and improvement of the railway network throughout the country from the construction of conventional lines. They are also not neglecting the development of a high-performance rail network for passengers, as demonstrated by the high-speed projects connecting Atlantic coast and the south with Marrakech.

| Urban node           | Region               | Type of road  | Name of road; section               | Length (km) |
|----------------------|----------------------|---------------|-------------------------------------|-------------|
| Taounate             | Taounate             | Express way   | RN8. Fes-Taounate                   | 81          |
| El Kelea des Sraghna | El Kelea des Sraghna | Toll Motorway | Axe Autoroutier structurant Central | 759         |
| Ouazzane             | Ouazzane             | Toll Motorway | Fes - Ouazzane                      | 130         |
| Khenifra             | Khenifra             | Toll Motorway | Beni Mellal - Khenifra              | 150         |
| Ifrane               | Ifrane               | Toll Motorway | Fes - Ifrane                        | 90          |

Figure 96. List of road infrastructure projects to increase TMC connectivity – Morocco. Source: CETMO

| Urban node           | Region               | Type of line              | Section                          | Length (km) |
|----------------------|----------------------|---------------------------|----------------------------------|-------------|
| Taroudannt           | Taroudannt           | Conventional + High Speed | Marrakech-Agadir Tadourannt      | 242         |
| El Hajeb             | El Hajeb             | Conventional              | Meknes-El Hajeb                  | 25          |
| Berkane              | Berkane              | Conventional              | Oujda junction - Berkane         | 30          |
| El Kelea des Sraghna | El Kelea des Sraghna | Conventional              | Sidi Azzouz-El Kelea des Sraghna | 45          |
| Chefchaouen          | Chefchaouen          | Conventional              | Tanger-Chefchaouen               | 91          |
| Essaouira            | Essaouira            | Conventional + High Speed | Marrakech-Essaouira              | 161         |
| Khenifra             | Khenifra             | Conventional              | Kenifra Errachidia meknes        | 160         |
| Al Hoceima           | Al Hoceima           | Conventional              | Hassi Berkane - Al Hoceima       | 128         |
| Beni Mellal          | Beni Mellal          | Conventional              | Oued Zem-Beni Mellal             | 105         |
| Ifrane               | Ifrane               | Conventional              | Meknes-Ifrane                    | 65          |
| Midelt               | Midelt               | Conventional              | Kenifra Errachidia meknes        | 160         |
| Errachidia           | Errachidia           | Conventional              | Khenifra-Errachidia              | 225         |

Figure 97. List of railway infrastructure projects to increase TMC connectivity – Morocco. Source: CETMO

In Mauritania, only two projects have been identified to improve connectivity with the TMC, as shown in figure 98. Both projects aim at building a conventional railway line and refer to the line that should connect Nouakchott, the capital of the country, with Selibabi, near the border with Senegal and Mali.

| Urban node | Region    | Type of line | Section          | Length (km) |
|------------|-----------|--------------|------------------|-------------|
| Kaedi      | Gorgol    | Conventional | Nouakchott-Kaedi | 412         |
| Selibabi   | Guidimaka | Conventional | Kaedi-Selibabi   | 180         |

Figure 98. List of railway projects to increase TMC connectivity – Mauritania. Source: CETMO

The identification of Capillarity projects across the four countries reveals several significant findings: Thirty-six projects have been identified to improve the TMC's capillarity, representing potential interventions to enhance connectivity between the corridor and surrounding economic zones.

Logically, most of the Capillarity projects identified are in Algeria and Morocco, since they were also the countries with the largest number of REZs. This distribution reflects the greater geographic extent and population of these two countries compared to Tunisia and Mauritania.

Due to the increased development of the road network, two thirds of the projects identified (24) refer to rail projects. This finding highlights the significant gap in rail connectivity compared to road infrastructure across the region. The fact that a third of the identified projects (12) are road projects, despite having a more developed network, reflects the importance of this type of infrastructure for regional connectivity and trade development, particularly for reaching areas not currently served by high-capacity roads.

## 6.5. Capillarity Projects Prioritization

### 6.5.1. Top 25 Projects

The application of a multi-criteria analysis (MCA) tool to the list of thirty-six capillarity projects identified above allows the ranking and classification of these projects at regional level based on the scores obtained. Figure 99 shows the total and partial project maturity, alignment, financing and socioeconomic impact scores of the top 25 projects, and figure 100 shows its cartographic representation (as all the maps here included are at a larger size also part of the **Annex 4**).

| Country    | Intervention   | Value maturity | Value alignment | Value financing | Value socioeconomic | Total |
|------------|--|----------------|-----------------|-----------------|---------------------|-------|
| Morocco    | Express way-RNB. Fes-Tounate   | 1,25           | 1               | 1               | 1,75                | 5     |
| Algeria    | Express way-N14. Khemis-Miliana -Tiaret                              | 1,25           | 1               | 1               | 1,75                | 5     |
| Algeria    | Railway line-Relianze-Tiaret   | 1,25           | 1               | 1               | 1,75                | 5     |
| Algeria    | Autoroute-Autoroute El Eulma-Jijel                                   | 1,25           | 1               | 1               | 1,4                 | 4,65  |
| Algeria    | Railway line-Mecheria-El Bayadh                                      | 1,25           | 1               | 1               | 0,35                | 3,6   |
| Algeria    | Railway line-Bechar -Tindouf   | 1,25           | 1               | 1               | 0,35                | 3,6   |
| Morocco    | Railway line-Agadir - Tadourant                                      | 0,25           | 1               | 0,4             | 1,75                | 3,4   |
| Morocco    | Toll Motorway-Axe Autoroutier Central Marrakech-El Kelea des Sraghna | 0,5            | 1               | 0,4             | 1,4                 | 3,3   |
| Morocco    | Railway line-Oujda junction-Berkane                                  | 1              | 0,5             | 0,4             | 1,4                 | 3,3   |
| Morocco    | Toll Motorway-Axe Autoroutier Central Fes-Ouazzane                   | 0,5            | 1               | 0,4             | 1,05                | 2,95  |
| Morocco    | Toll Motorway-Axe Autoroutier Central Beni Mela-Khenifra             | 0,5            | 1               | 0,4             | 1,05                | 2,95  |
| Algeria    | Railway line-Oued Zenati-Guelma                                      | 0,25           | 0,5             | 0,4             | 1,75                | 2,9   |
| Morocco    | Railway line-Chichaoua-Essaouira                                     | 0,25           | 1               | 0,4             | 1,05                | 2,7   |
| Morocco    | Toll Motorway-Axe Autoroutier Central Fes-Ifrane                     | 0,5            | 1               | 0,4             | 0,7                 | 2,6   |
| Algeria    | Railway line-Seti-Fijel  | 0,25           | 0,5             | 0,4             | 1,4                 | 2,55  |
| Algeria    | Railway line-Bousaada-M'Sila   | 0,25           | 0,5             | 0,4             | 1,05                | 2,2   |
| Morocco    | Railway line-Meknes-El Hajeb   | 0,125          | 0,1             | 0,2             | 1,75                | 2,175 |
| Tunisia    | Toll Motorway-Jelma - Kasserine                                      | 0,75           | 0,5             | 0,4             | 0,35                | 2     |
| Morocco    | Railway line-Kenifra-Ifrane  | 0,125          | 0,5             | 0,2             | 1,05                | 1,875 |
| Morocco    | Railway line-Tanger-Chefchouen                                       | 0,125          | 0,1             | 0,2             | 1,4                 | 1,825 |
| Morocco    | Railway line-Sidi Azzouz-El Kelea des Sraghna                        | 0,125          | 0,1             | 0,2             | 1,4                 | 1,825 |
| Algeria    | Railway line-Relianze-Mastaganem                                     | 0,25           | 0,5             | 0,4             | 0,35                | 1,5   |
| Algeria    | Railway line-Bechar-Adrar  | 0,25           | 0,5             | 0,4             | 0,35                | 1,5   |
| Morocco    | Railway line-Hassi Berkane-Al Hozzima                                | 0,125          | 0,1             | 0,2             | 1,05                | 1,475 |
| Algeria    | Express way-N16. Dreaan-Tebessa                                      | 0,125          | 0,1             | 0,2             | 1,05                | 1,475 |
| Algeria    | Autoroute-Echangeur Chlef-Tissemilt                                  | 0,125          | 0,1             | 0,2             | 1,05                | 1,475 |
| Mauritania | Railway line-Kaedi-Selibabi  | 0,5            | 0,1             | 0,2             | 0,35                | 1,15  |
| Mauritania | Railway line-Nouakchott-Kaedi  | 0,5            | 0,1             | 0,2             | 0,35                | 1,15  |
| Morocco    | Railway line-Marrakech-Ourzazate                                     | 0,125          | 0,1             | 0,2             | 0,7                 | 1,125 |
| Morocco    | Railway line-Meknes-Ifrane   | 0,125          | 0,1             | 0,2             | 0,7                 | 1,125 |
| Morocco    | Railway line-Kenifra-Midelt  | 0,125          | 0,1             | 0,2             | 0,7                 | 1,125 |
| Algeria    | Express way-N6. Mascara-Saida  | 0,125          | 0,1             | 0,2             | 0,7                 | 1,125 |
| Algeria    | Railway line-Mohammadia-Saida  | 0,125          | 0,1             | 0,2             | 0,7                 | 1,125 |
| Morocco    | Railway line-Khenifra-Errachidia                                     | 0,125          | 0,1             | 0,2             | 0,35                | 0,775 |
| Algeria    | Express way-N6. Saida-Mecheria                                       | 0,125          | 0,1             | 0,2             | 0,35                | 0,775 |

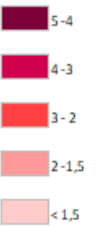


Figure 99. Prioritization of capillarity interventions according to MCA scores. Source: CETMO

The first 17 priority projects concern Algeria and Morocco. This concentration reflects both the larger number of projects identified in these countries and their generally higher scores across the MCA criteria.

Nine projects have been classified in the 2 most important priority categories, with a MCA score between 3 and 5, representing the interventions likely to deliver the greatest benefits relative to their implementation challenges.

Of the 9 projects identified as most priority, 4 refer to road projects (2 in Algeria and 2 in Morocco) and 5 to rail projects (3 in Algeria and 2 in Morocco). This balanced distribution between modes suggests that both road and rail infrastructure remain important for enhancing the TMC's connectivity with surrounding zones.

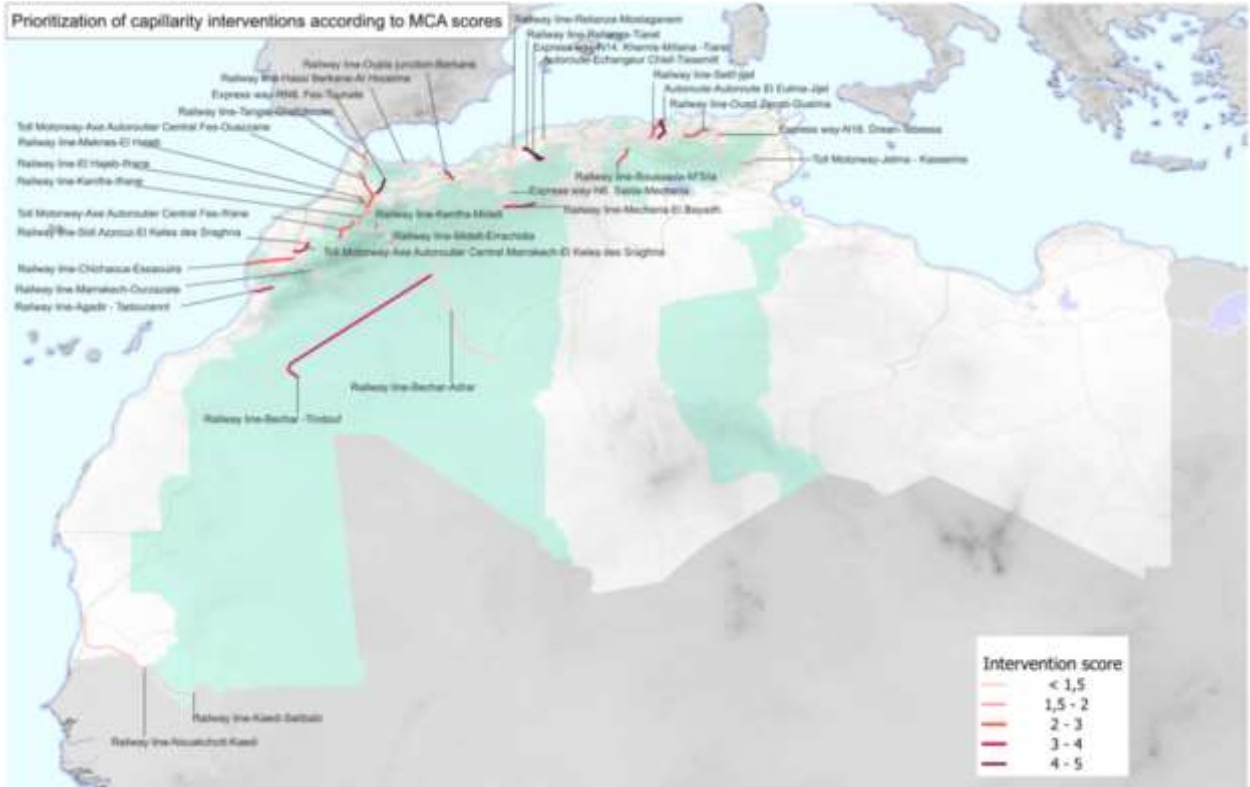


Figure 100. Prioritization of capillarity projects according to MCA scores. Source: CETMO

### 6.5.2. Capillarity Increase Projects by Country - Algeria

Following the regional analysis of the results obtained from the MCA, a more detailed analysis has been carried out for each of the countries concerned. For this purpose, figures by country have been drawn up showing in descending order the value obtained in the MCA for each of the projects from the partial scores of the criteria used.

Figure 101 shows the results obtained for the Algerian projects.

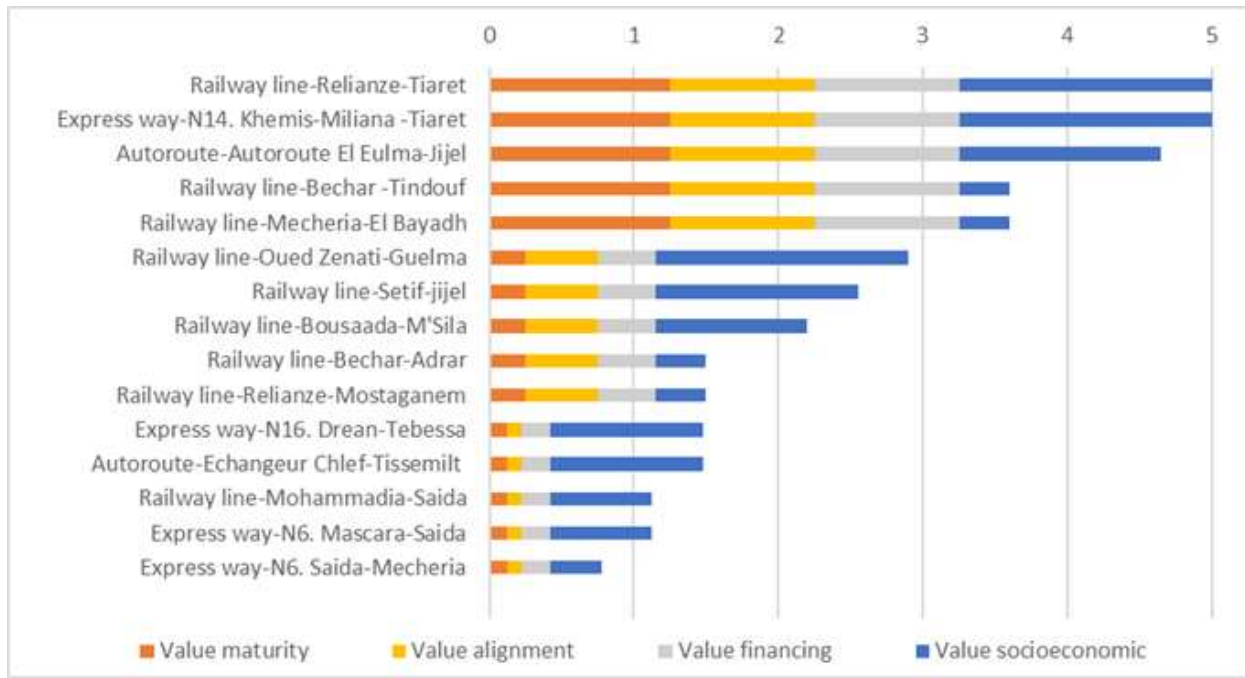


Figure 101. Prioritization of capillarity projects in Algeria. Source: CETMO

In Algeria, the projects with higher score are those with a very advance stage of development, including in some cases projects with ongoing works. This finding reflects the significant weight given to project maturity in the MCA framework.

This fact explains the high score of projects with lows score in accessibility as it is the case of the mining railway to Tindouf. Despite serving a less populated area (thus having a lower RRI), the project's advanced development stage and strategic importance elevate its overall priority.

The geographical location of the projects shows that increasing connectivity derived from North-South perpendicular extension of the TMC, following the ambitious infrastructure national plans. This pattern aligns with Algeria's strategic approach to infrastructure development

### 6.5.3. Capillarity Increase Projects by Country - Mauritania

The evaluation of the two projects identified in Mauritania is detailed in figure 102. In Mauritania, the lack of information on the projects, outside the TMC or coastal axis, prevents a comprehensive analysis of connectivity. This limitation highlights the need for improved data collection and sharing to support more effective regional infrastructure planning.

Additionally, as in the case of Tunisia, the scale considered in the accessibility analysis may impede the definition of other projects of minor scale. A most detailed analysis will require more detailed information and other administrative units of reference.

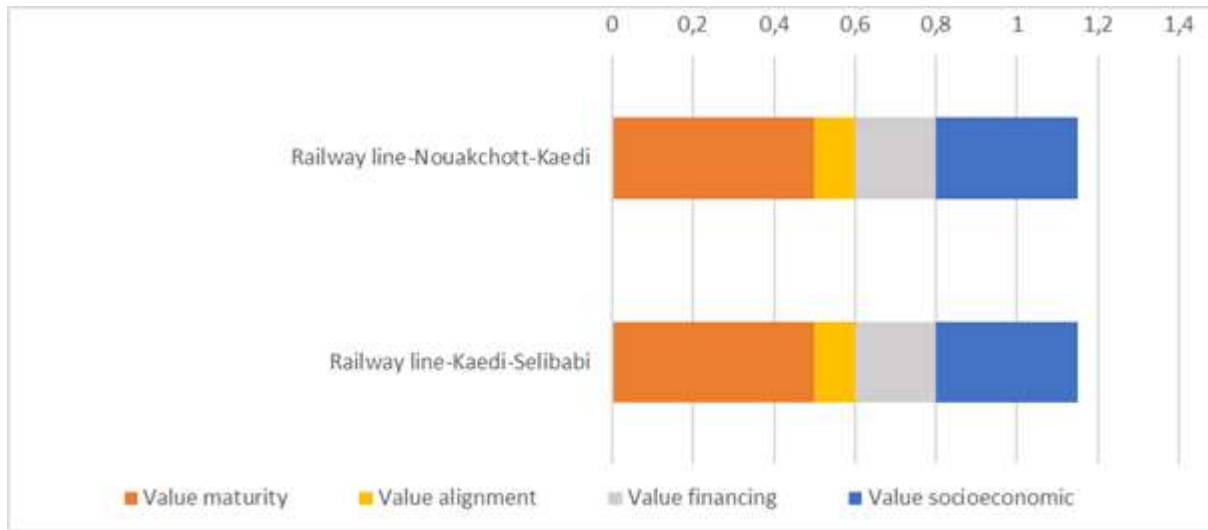


Figure 102. Prioritization of capillarity projects in Mauritania. Source: CETMO

### 6.5.4. Projects by Country - Morocco

In the case of Morocco, the projects with highest score are those with strong alignment and advanced stages of planning, while socioeconomic impact, resulting from accessibility analysis, obtain a high score in most of the projects.

The geographical location, of the projects shows the development of a new infrastructural axe from Agadir to Tangiers through Marrakech, Beni Mellal and Fes, running parallel to TMC. This pattern suggests a strategic approach to creating redundant transportation corridors that can enhance the resilience and capacity of the national transport network.

These findings are drawn from figure 103.

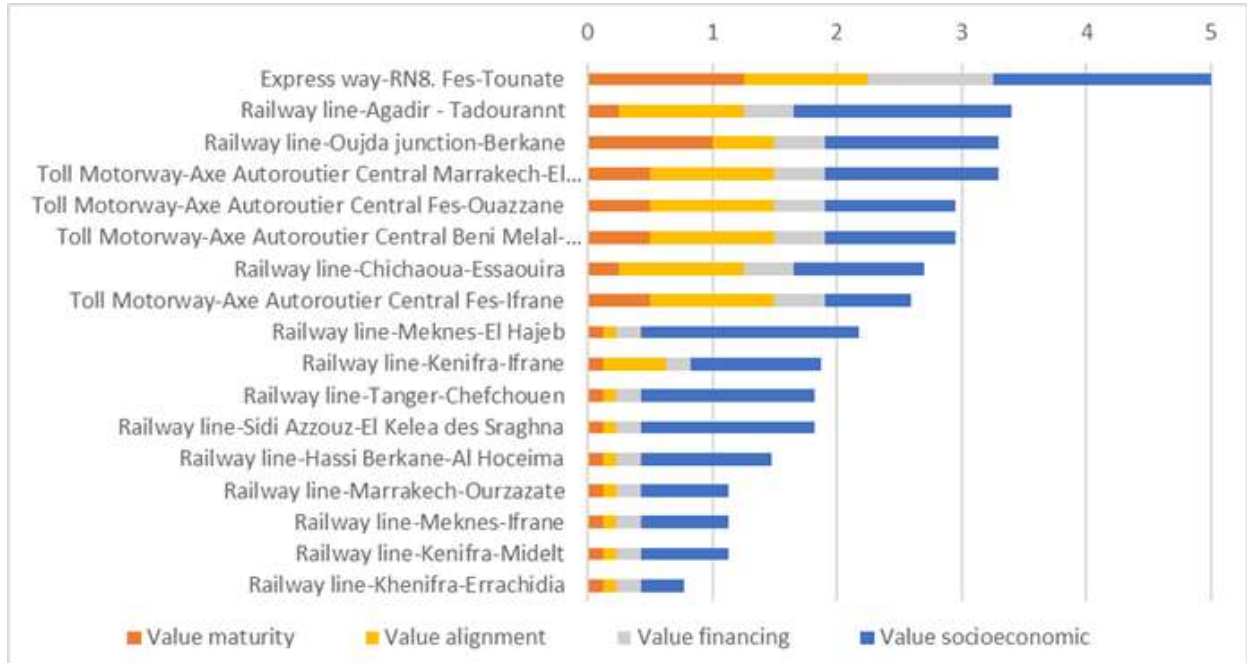


Figure 103. Prioritization of capillarity projects in Morocco. Source: CETMO

### 6.5.5. Capillarity Increase Projects by Country - Tunisia

Finally, in the case of Tunisia, only a project has been identified. It is an extension of the motorway running from Tunis to Jelma, which is part of the trans-Sahara road and it is currently under works.

The size of the country and the layout of the Trans Maghreb Corridor and Trans-Sahara road provide a direct accessibility of most of the region to these international axes.

The scale of the accessibility analysis may impede the definition of other projects of minor scale. A most detailed analysis will require more detailed information and other administrative units of reference.

The evaluation of the project identified in Tunisia is detailed in figure 104.



Figure 104. Prioritization of capillarity projects in Tunisia. Source: CETMO

## 6.6. Conclusions on Capillarity Increase

The analysis of connectivity between the Trans-Maghreb Multimodal Corridor (TMC) and surrounding economic zones reveals several key conclusions and implications for the future development of the TMC as a trade corridor:

The pattern of population distribution and economic activity in the Maghreb region, concentrated primarily along Mediterranean coastal areas and in specific inland zones, creates both opportunities and challenges for enhancing the TMC's connectivity. While many significant population centres are relatively close to the corridor (particularly in Algeria, Morocco, and Tunisia), connecting them effectively requires targeted infrastructure investments that address specific gaps in the current transport network.

The analysis of current connectivity reveals substantial disparities between road and rail infrastructure across the region. While road connections exist to most Relevant Economic Zones (REZs), many of these are conventional roads rather than high-capacity expressways. Rail connectivity is even more limited, with many significant population centres lacking any rail connection to the TMC. This gap in multimodal transport options could represent a missed opportunity on the corridor's sustainability as a trade facilitator and economic catalyst especially at national level.

The accessibility analysis, conducted through the Regional Relevance Index (RRI), provides a systematic framework for identifying which zones would benefit most from improved connectivity with the TMC. The concentration of high-RRI zones along coastal areas suggests that prioritizing connectivity improvements to these zones would likely yield the greatest socioeconomic benefits relative to investment costs. However, this should be balanced with strategic considerations regarding the development of inland regions and cross-border connections, particularly in the case of Mauritania's border with ECOWAS countries.

The identification of thirty-six capillarity projects across the four countries provides a concrete roadmap for enhancing the TMC's connectivity with surrounding zones. The predominance of rail projects (two-thirds of the total) highlights the significant gap in rail infrastructure compared to road networks, suggesting that addressing this imbalance should be a priority for creating a truly multimodal corridor system.

The prioritization of capillarity projects through Multi-Criteria Analysis (MCA) reveals that projects in advanced stages of development, with strong alignment with national and regional strategies, and serving areas with high socioeconomic relevance, should be given priority in implementation planning. The concentration of high-priority projects in Algeria and Morocco reflects both the greater number of projects identified in these countries and their generally higher scores across the MCA criteria.

At a regional level, the balanced distribution of high-priority projects between road and rail modes suggests that both types of infrastructure remain important for enhancing the TMC's connectivity and effectiveness. The nine projects classified in the highest priority categories represent the interventions most likely to deliver significant benefits in terms of improved connectivity and socioeconomic impact.

The geographic patterns of prioritized projects suggest different strategic approaches across countries: in Algeria, the focus is on North-South connections perpendicular to the TMC (following the territory penetration model), while in Morocco, there is evidence of developing a parallel infrastructure axis from Agadir to Tangiers. These complementary approaches can enhance the resilience and capacity of the regional transport network.

For Mauritania and Tunisia, the analysis suggests that more detailed information and consideration of smaller administrative units may be necessary to fully capture connectivity needs and opportunities. This points to the importance of enhanced data collection and sharing across the region to support more comprehensive planning efforts.

In conclusion, enhancing the connectivity between the Trans-Maghreb Multimodal Corridor and surrounding economic zones represents a critical dimension of developing the TMC as an effective trade corridor. The systematic identification and prioritization of capillarity projects presented in this chapter provides a foundation for strategic investment planning that can maximize the corridor's contribution to regional economic integration and development. By addressing the identified gaps in connectivity, particularly in rail infrastructure, and prioritizing interventions based on a balanced consideration of project maturity, strategic alignment, socioeconomic impact, and financing prospects, the TMC can evolve from a linear transport route into a comprehensive network that drives economic growth across the Maghreb region.

## 7. TMC CONNECTIVITY WITH NEIGHBOURING REGIONS

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The Trans-Maghreb Multimodal Corridor (TMC) represents a critical infrastructure initiative with significant potential to enhance regional connectivity and trade between Maghreb and its neighbouring regions. This chapter presents a comprehensive analysis of the TMC's connectivity potential covering trade relationships and infrastructure connections.

Through this comprehensive analysis, the chapter seeks to highlight both opportunities and challenges in enhancing the TMC's connectivity with neighbouring regions, thereby contributing to the corridor's development as a relevant trade corridor.

### 7.1. Introduction

The development of the Trans-Maghreb Multimodal Corridor (TMC) as an effective trade corridor necessitates robust connections with neighbouring regions and in particular with their own corridors. The geographical position of the Maghreb countries (Algeria, Libya, Morocco, Mauritania, and Tunisia) places them at a strategic crossroads between Europe and Africa, offering significant opportunities to serve as a gateway for trade flows between these continents. This unique position could potentially transform the region into a logistics hub, enhancing economic integration throughout Maghreb while facilitating connections with both European markets and Sub-Saharan economies.

The TMC's potential as a trade corridor can only be fully realized when it functions not as an isolated infrastructure but as an integrated component of a broader network connecting Maghreb with surrounding regions. Understanding the existing and potential trade relationships, as well as the current state and future plans for physical infrastructure connections, is therefore essential for developing the TMC to its full potential.

#### 7.1.1. Objective

The objective of this chapter is to conduct an assessment of the potential relations of the TMC countries with neighbouring regions in terms of trade (trade patterns and complementarities between TMC countries and neighbouring regions), as well as existing transport and border infrastructure and provide updated information on planned infrastructure projects that will enhance the connectivity,

#### 7.1.2. Preliminary considerations

For the purposes of this analysis, three main neighbouring regions have been identified, in addition to the Maghreb itself:

1. ECOWAS (Economic Community of West African States): This regional group comprises 15 West African countries, including Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. The ECOWAS region would be involved in connecting the TMC to the south, following the Atlantic coast and facilitating access to the sea for some of its landlocked countries.
2. The European Union (EU): With particular focus on the European GTMO 5+5 countries (France, Italy, Malta, Portugal, and Spain), the EU constitutes the primary trading partner for most Maghreb countries. The historical, cultural, and economic ties between these regions make this relationship particularly important for the TMC's trade development.
3. Other Neighbouring African Countries (ONAC): This grouping includes other African countries that border or are in proximity to the Maghreb region but are not part of ECOWAS. Its countries do not form a consolidated regional grouping of countries on their own. This includes countries like Egypt,

Sudan, Chad, and Cameroon that represent important potential connections for the TMC, mainly to the east.

### 7.1.3. Methodology Summary

The assessment of trade flows and trade composition focuses on examining current trade patterns, volumes, and structures to identify potential complementarities and opportunities for enhanced trade flows. It implies downloading and processing of Data, the elaboration of Trade Complementarity Index (TCI) matrices and, finally, an analysis of Maghreb External Trade Conditions and Routing

Additionally, the assessment of the situation of transport infrastructures and border crossings focuses on the physical infrastructure necessary to facilitate the trade relationships. The analysis was conducted through the following steps:

- Identification of the layouts of trans-African Highways.
- Identification of the layouts of other regional corridors in Western Africa.
- Preliminary classification of transport corridors.
- Identification of the most suitable areas connecting the Maghreb with other African regions
- Finally, a detailed analysis on the most suitable areas connecting the Maghreb with other African regions.

The last section includes a detailed characterization of the current infrastructures and border crossings connecting with the TMC or its potential area of influence, as well as the planned infrastructures, in the areas of interest previously identified.

## 7.2. Content Description

### 7.2.1. Analysis of Trade Flows and Composition of Trade

The analysis of trade flow and composition of trade encompasses the external trade analysis of each of the Maghreb Countries, the creation of the Trade Complementarity Index and thirdly the evolution of the maritime transport share and updated modal split.

For each Maghreb country, this study assesses the total export and import values, the intra-Maghreb, and Maghreb to EU, ECOWAS and ONAC trade balances, more specifically, tables depicting the trade balances of each Maghreb country at different levels of aggregation are included. They provide a foundation for understanding the current trade dynamics of the region and identifying opportunities for enhancement.

The Trade Complementarity Index (TCI) provides an additional tool to determine trade complementarity and allow the development of tables with TCI rankings to ensure that attention is drawn to the most strategically important complementarities rather than simply the highest numerical values.

The analysis of the evolution of the maritime transport share and updated modal split provides insight of the weight of maritime trade of particular importance between the Maghreb and EU's countries.

The analysis of these specific relationships considers the absence of quantitative data on the routing of goods between some regions. But since the EU provides data by mode of transport and accounts for about 50% of the total Maghreb external trade, it has been considered a good example to understand the routing of goods in the Maghreb. Furthermore, the potential for trade relations between the European GTMO 5+5 countries and the ECOWAS region that could benefit Maghreb logistics chains, it is also considered interesting to analyze the current routing of trade relations between these two regions.

On the other side, Maghreb trade relations with ECOWAS and ONAC has not been considered due to the lack of detailed data on the routing of trade and to the low percentage (around 2%) they represent in the Maghreb's foreign trade.

### 7.2.2. Analysis of the Situation of Transport Infrastructures and Border Crossings

The first infrastructure-related output consists on the representation and classification of neighbouring regions' corridors and the areas of interest to connect.

It identifies and represents the layout of the Trans-African corridors as defined by the AfDB. More specifically, the following eight trans-African highways (TAH) are represented:

- Trans-African Highway 1: Cairo – Dakar Corridor
- Trans-African Highway 2: Trans-Sahara Highway Corridor
- Trans-African Highway 3: Tripoli – Windhoek – Cape Town Highway
- Trans-African Highway 4: Cairo – Gaborone – Cape Town Highway
- Trans-African Highway 5: Dakar – Bamako – Ouagadougou Highway
- Trans-African Highway 6: N'Djamena – Djibouti Highway
- Trans-African Highway 7: Dakar – Lagos Highway
- Trans-African Highway 8: Lagos – Mombasa Highway

Also included is the identification and layout of other existing or planned corridors in Western Africa based on information obtained from the African Development Corridors Database, an initiative of the Regional Centre for Mapping of Resource for Development (RCMRD), which is under the auspices of the United Nations Economic Commission for Africa (UNECA) and the African Union (AU).

Official documentation from the AfDB and the PIDA, as well as other international and regional organizations and bodies as the World Bank (WB) or the Africa Transport Policy Program (SSATP), has also been consulted. The following ten regional corridors are represented:

- Abidjan – Bamako
- Abidjan – Ouagadougou
- Bamako – San Pedro
- Cotonou – Niamey
- Dakar – Bamako – N'Djamena
- Douala – N'Djamena
- Lagos- KANO – Jibiya
- Lomé – Ouagadougou
- Tema – Ouagadougou
- Trans-Sahara Highway

Additionally, these corridors are classified according to the mode of transport included and their main function that can be either:

- Extension of the TMC. It refers to the extension and connection to other highway corridors, and therefore to economic and trade areas.
- Access element to connect landlocked areas or countries. It refers to the provision of access to landlocked countries, offering new routes to trade flows from these areas.
- Complementary accesses to African corridors. It refers to complementary corridors that are not directly connected to Maghreb, but they may improve its accessibility and connectivity.

A specific focus is dedicated to the areas of interest and their main corridors to be connected to the Trans-Maghreb Corridor (TMC). These five areas of interest are:

- The extension of TMC to Dakar Lagos Highway (Nouakchott-Rosso-Saint Louis-Dakar).
- The connection to Dakar –Bamako-Ouagadougou Highway(Mauritania-Senegal-Mali).
- The extension of TMC to Trans-Sahara Corridor and Bamako (Algeria – Mali – Niger).
- The extension of TMC to Highway (Libya– Niger – Chad).
- The extension of TMC to Cairo-Dakar Highway (Tubruk – Sallum).

The existing infrastructure and planned transport projects (road networks as well as cross border facilities) to service the five high priority connectivity areas are further analysed characterizing their degree of development.

## 7.3. Analysis of Trade Flows and Composition of Trade

### 7.3.1. External Trade of Algeria

Most update accessible information is from 2017. As shown in the figures 105 and 106 roughly half of the external trade of Algeria is established with the European Union, more specifically, it is 53.3% of exports and 42.8% of imports. The relation with other neighbouring regions and countries is far smaller. As far as external trade with the Maghreb is concerned, exports represent 3.6% and imports 1.3%.

An analysis of the main exported and imported products reveals that 51.1% of total exports are *Mineral fuels, lubricants and related materials* to the European Union. These products entail 96.1% of total exports. The main imports to Algeria are *Machinery and transport equipment* (14.9%), *Manufactured goods classified chiefly by material* (8.1%) and *Chemicals and related products* (7.4%) from European Union.

| Region  | Export (USD M) | Import (USD M) | Trade Balance (USD M) | Export (World %) | Import (World %) |
|---------|----------------|----------------|-----------------------|------------------|------------------|
| ECOWAS  | 81.12          | 123.58         | -42.46                | 0.23%            | 0.27%            |
| EU      | 18,759.97      | 19,707.82      | -947.85               | 53.31%           | 42.79%           |
| MAGHREB | 1,272.80       | 591.56         | 681.24                | 3.62%            | 1.28%            |
| ONAC    | 474.90         | 429.94         | 44.96                 | 1.35%            | 0.93%            |
| WORLD   | 35,191.12      | 46,053.02      | -10,861.90            | 100.00%          | 100.00%          |

Figure 105. Trade Balances of Algeria. Source: UNComtrade

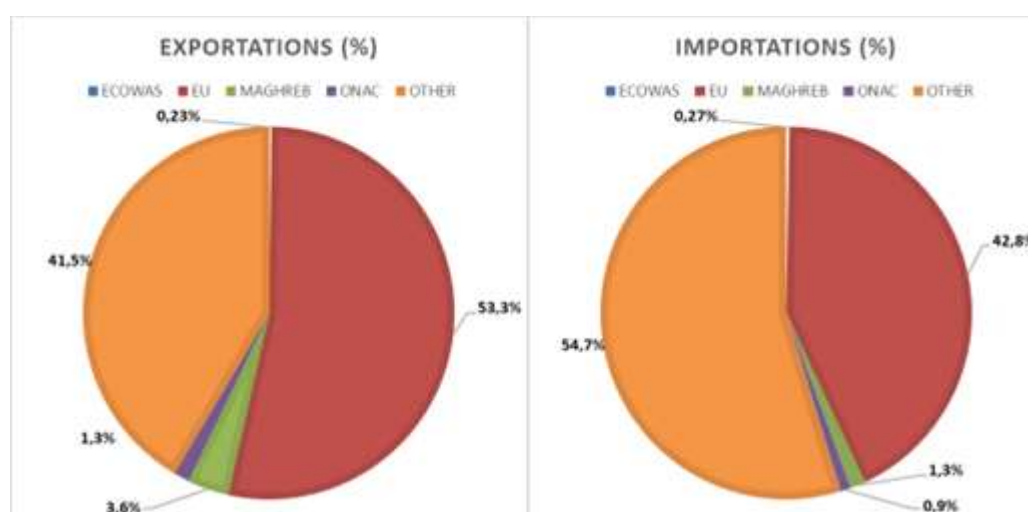


Figure 106. Algeria's Regional Exports and Imports. Source: UNComtrade

Algeria's external trade is heavily dominated by hydrocarbon exports, primarily to European markets. The country shows a significant trade surplus at the global level, but this is almost entirely due to oil and gas exports. Non-hydrocarbon trade remains limited, with imports consisting mainly of manufactured goods, machinery, and food products. Trade with ECOWAS and ONAC regions is minimal, indicating untapped potential for diversification.

### 7.3.2. External Trade of Libya (2019)

The figures 107 and 108 indicate the importance of the EU in Libya's external trade with neighbouring regions, as 60.1% of exports from Libya are directed to the European Union, being the values for other

neighbouring regions nearly zero. In the case of imports, the percentage of foreign trade from the European Union rises to 32.2%. The share of the relations with ONAC and Maghreb countries are 5.3% and 4.2%, respectively.

In terms of the main products exported and imported, 94.4% of exports are *Mineral fuels, lubricants and related materials*, and 59.7% are directed to the European Union, while the main imports flows are *Mineral fuels, lubricants and related materials* (12.2%), *Machinery and transport equipment* (6.2%) and *Food and live animals* (6.2%) from the European Union.

| Region       | Export (USD M)   | Import (USD M)   | Trade Balance (USD M) | Export (World %) | Import (World %) |
|--------------|------------------|------------------|-----------------------|------------------|------------------|
| ECOWAS       | 0.47             | 0.60             | -0.12                 | 0.00%            | 0.00%            |
| EU           | 17,599.56        | 5,037.59         | 12,561.97             | 60.10%           | 32.16%           |
| MAGHREB      | 125.50           | 655.33           | -529.83               | 0.43%            | 4.18%            |
| ONAC         | 56.06            | 830.67           | -774.62               | 0.19%            | 5.30%            |
| <b>WORLD</b> | <b>29,285.91</b> | <b>15,663.80</b> | <b>13,622.11</b>      | <b>100.00%</b>   | <b>100.00%</b>   |

Figure 107. Trade Balances of Libya. Source: UNComtrade

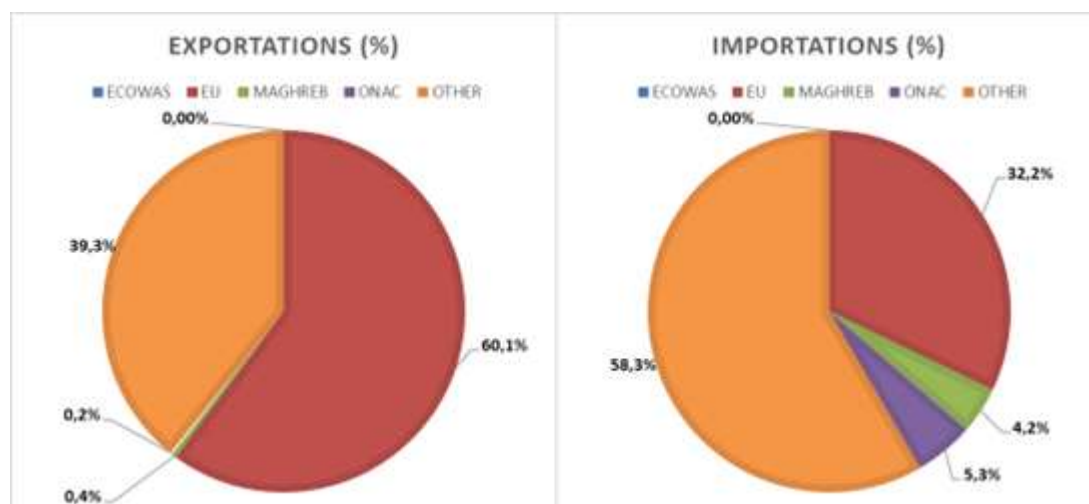


Figure 108. Libya's Regional Exports and Imports. Source: UNComtrade

Libya's trade structure similarly revolves around oil exports, with the EU as its primary trading partner. Political instability has affected trade patterns in recent years, but the hydrocarbon sector continues to dominate exports. Connections with Sub-Saharan Africa are underdeveloped, despite geographical proximity to Chad and Sudan.

### 7.3.3. External Trade of Mauritania (2022)

Mauritania is the Maghreb country with the least dependence on trade relations with the EU. As presented in figures 109 and 110 the European Union is the most import trade partner among the economic areas considered. It accounts 22.2% of exports and 36.0% of imports. As far as the Maghreb is concerned, these percentages are 4.3% for exports and 5.9% for imports. And in the case of ECOWAS region, 7.9% for exports and 2.8% for imports.

Analysing the main exported and imported products, it is observed that the main exports flows of Mauritania are *Food and live animals* (11.1%) and *Crude materials, inedible, except fuels* (9.7%) to the European Union. Other relevant export flows are *Food and live animals* (7.6%) to ECOWAS and *Crude*

materials, inedible, except fuels (4.3%) to Maghreb. For imports, Mineral fuels, lubricants and related materials (19.0%) from the European Union is the most important flow.

| Region       | Export (USD M)  | Import (USD M)  | Trade Balance (USD M) | Export (World %) | Import (World %) |
|--------------|-----------------|-----------------|-----------------------|------------------|------------------|
| ECOWAS       | 297.25          | 144.57          | 152.68                | 7.87%            | 2.82%            |
| EU           | 839.70          | 1,842.32        | -1,002.62             | 22.23%           | 35.98%           |
| MAGHREB      | 163.70          | 302.84          | -139.14               | 4.33%            | 5.92%            |
| ONAC         | 1.11            | 28.65           | -27.55                | 0.03%            | 0.56%            |
| <b>WORLD</b> | <b>3,778.02</b> | <b>5,119.81</b> | <b>-1,341.79</b>      | <b>100.00%</b>   | <b>100.00%</b>   |

Figure 109. Trade Balances of Mauritania. Source: UNComtrade

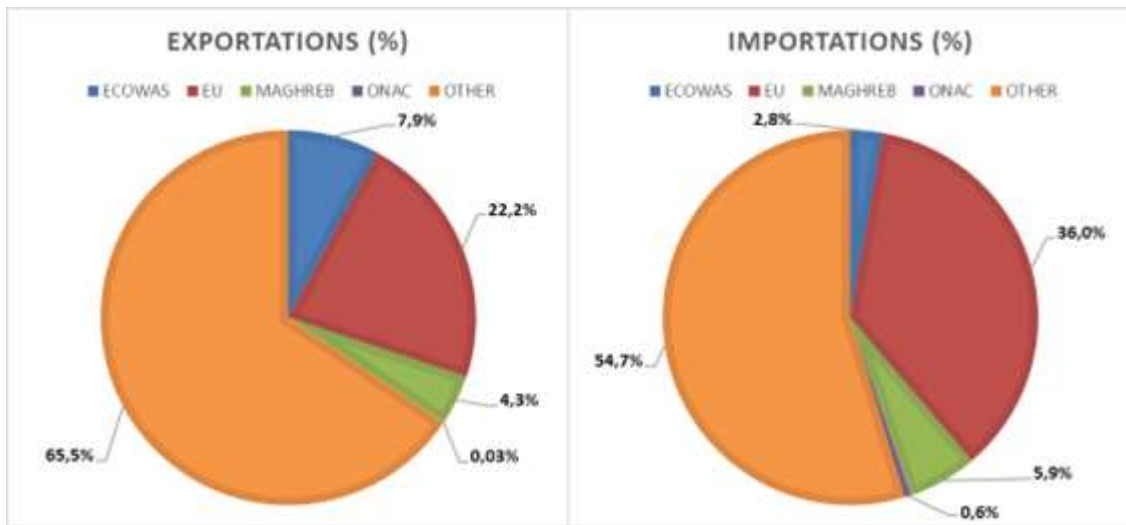


Figure 110. Mauritania's Regional Exports and Imports. Source: UNComtrade

Mauritania's exports are concentrated in extractive industries (iron ore, gold, copper) and fisheries. The country serves as a natural bridge between the Maghreb and ECOWAS regions, with growing trade relationships with both, though inadequate transport infrastructure limits the potential of these connections.

#### 7.3.4. External Trade of Morocco (2022)

In the case of Morocco, the EU is the main trade partner of Morocco as reflected in the figures 111 and 112. More specifically, it amounts 56.9% of exports and 45.4% of imports. Trade relations with the nearest African countries fall clearly below the figures of the European trade. The most relevant values for the rest of the neighbouring regions are 3.9% of exports flows to ECOWAS region and 1.4% of imports flows to ONAC region.

In terms of exported and imported products, the main flow of exports from Morocco are *Machinery and transport equipment* (27.0% of total exports), which is directed to the European Union. Other important export flows to the European Union are *Food and live animals* (10.9%) and *Miscellaneous manufactured articles* (9.8%). Moreover, the most remarkable import flow is *Machinery and transport equipment* (15.3%) from the EU.

| Region       | Export (USD M)   | Import (USD M)   | Trade Balance (USD M) | Export (World %) | Import (World %) |
|--------------|------------------|------------------|-----------------------|------------------|------------------|
| ECOWAS       | 1,661.36         | 169.58           | <b>1,491.79</b>       | 3.94%            | 0.23%            |
| EU           | 24,004.26        | 32,985.53        | <b>-8,981.27</b>      | 56.90%           | 45.45%           |
| MAGHREB      | 569.66           | 579.16           | <b>-9.50</b>          | 1.35%            | 0.80%            |
| ONAC         | 95.68            | 1,021.56         | <b>-925.87</b>        | 0.23%            | 1.41%            |
| <b>WORLD</b> | <b>42,183.47</b> | <b>72,577.71</b> | <b>-30,394.23</b>     | <b>100.00%</b>   | <b>100.00%</b>   |

Figure 111. Trade Balances of Morocco. Source: UNComtrade

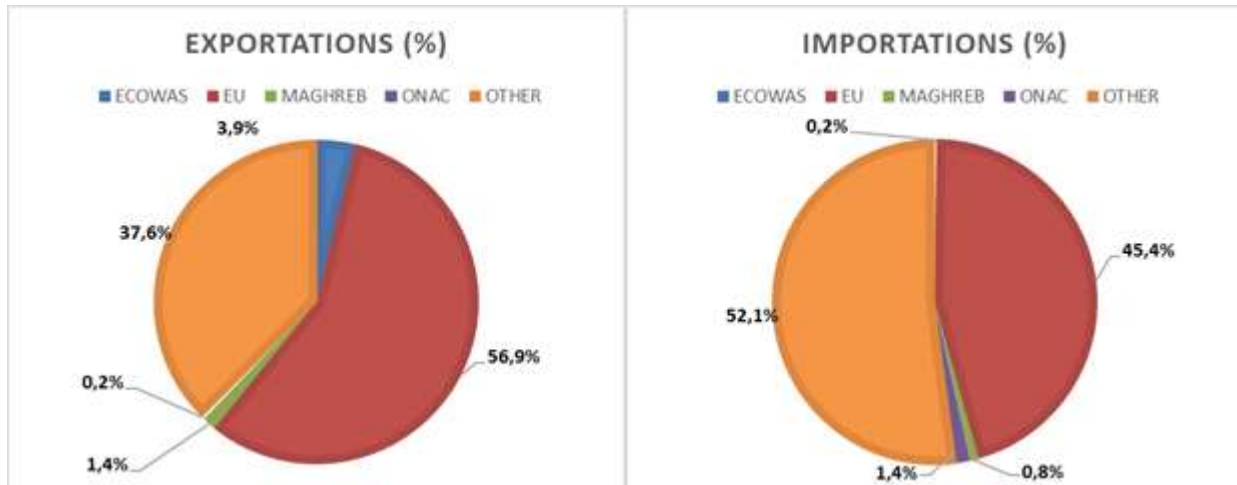


Figure 112. Morocco's Regional Exports and Imports. Source: UNComtrade

Morocco shows the most diversified export base among Maghreb countries, with significant exports in agricultural products, textiles, automotive parts, and phosphates. The country maintains strong trade ties with the EU, particularly with France and Spain, while also actively developing trade relations with ECOWAS countries.

### 7.3.5. External Trade of Tunisia (2022)

The figures 113 and 114 show the importance of the EU in Tunisia's external trade. More specifically, The EU accounts for 67,6% of Tunisian exports and 45,3% of imports. It is also noticeable the share of the Maghreb countries in the Tunisian foreign trade. Both, exports and imports account for more than 7%.

Analysing the main exported and imported products, it is observed that the main export flows are *Machinery and transport equipment* (26,3%) and *Miscellaneous manufactured articles* (22,5%) to the EU. Regarding imports, *Manufactured goods* (11,4%) and *Machinery and transport equipment* (11,1%) from the European Union are the most important flows. It is also noticeable the flow of *Mineral fuels, lubricants and related materials* coming from Maghreb, which represent 6,0% of total imports.

| Region       | Export (USD M)   | Import (USD M)   | Trade Balance (USD M) | Export (World %) | Import (World %) |
|--------------|------------------|------------------|-----------------------|------------------|------------------|
| ECOWAS       | 342.77           | 50.89            | <b>291.88</b>         | 1.85%            | 0.19%            |
| EU           | 12,540.40        | 12,074.88        | <b>465.52</b>         | 67.62%           | 45.27%           |
| MAGHREB      | 1,412.97         | 1,894.13         | <b>-481.16</b>        | 7.62%            | 7.10%            |
| ONAC         | 69.35            | 329.38           | <b>-260.03</b>        | 0.37%            | 1.23%            |
| <b>WORLD</b> | <b>18,545.38</b> | <b>26,672.67</b> | <b>-8,127.28</b>      | <b>100.00%</b>   | <b>100.00%</b>   |

Figure 113. Trade Balances of Tunisia. Source: UNComtrade

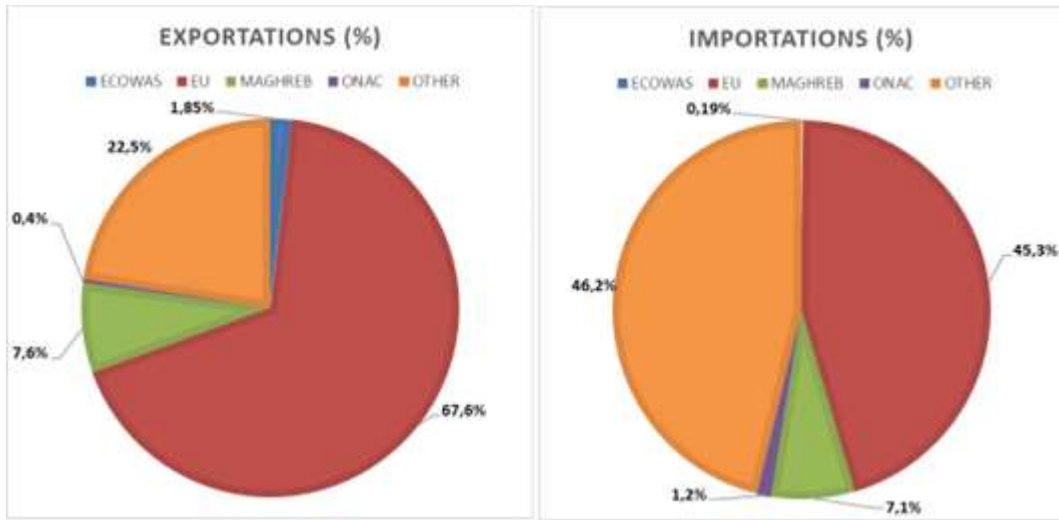


Figure 114. Tunisia's Regional Exports and Imports. Source: UNComtrade

Tunisia's external trade is characterized by significant integration into European value chains, particularly in textiles, automotive components, and electrical equipment. The country faces a persistent trade deficit, with limited trade diversification toward African markets.

### 7.3.6. Trade Complementarity Index (TCI)

As shown in the table 115 Tunisia is the country that shows the greatest complementarity with the other countries in the region. It is followed by Morocco's complementarities with Libya, Tunisia and Algeria, and, ii) Mauritania's complementarities with Algeria and Libya. It should be noted that despite the medium-low value of the TCI in the case of Libya, the structure of Mauritania's imports represents one of Libya's main complementarities at the global level.

|            | Algeria | Libya | Morocco | Mauritania | Tunisia |
|------------|---------|-------|---------|------------|---------|
| Algeria    |         | 9     | 35      | 38         | 45      |
| Libya      | 19      |       | 44      | 37         | 50      |
| Morocco    | 20      | 21    |         | 11         | 53      |
| Mauritania | 21      | 37    | 23      |            | 34      |
| Tunisia    | 16      | 22    | 35      | 12         |         |

Figure 115. Intra-Maghreb TCI. Source: UNComtrade and World Bank

A figure on intra-Maghreb trade complementarity is included in **Annex 5**.

Despite geographical proximity, intra-Maghreb trade remains below potential, with TCI values generally in the medium range (20-60). The highest complementarity is observed between Morocco and Tunisia reflecting their relatively more diversified economic structures. Algeria and Libya show lower complementarity with other Maghreb countries due to their hydrocarbon-dominated export structures.

### Maghreb TCI with GTMO 5+5 European countries:

The table 116 shows that Tunisia's foreign trade is the most complementary with the European GTMO 5+5 countries together with Morocco's relations with Spain, France and Portugal. Regarding Algeria and Libya, the complementarity of their foreign trade with Malta is double that of the rest of the European GTMO 5+5 countries, representing one of the main complementarities for both countries.

|          | Algeria | Libya | Morocco | Mauritania | Tunisia |
|----------|---------|-------|---------|------------|---------|
| Spain    | 16      | 19    | 41      | 13         | 55      |
| France   | 12      | 19    | 40      | 10         | 55      |
| Italy    | 14      | 22    | 34      | 12         | 50      |
| Malta    | 30      | 42    | 35      | 8          | 50      |
| Portugal | 14      | 19    | 42      | 11         | 54      |

Figure 116. Maghreb TCI with GTMO 5+5 European countries. Source: UNComtrade and World Bank

A figure on Maghreb TCI with GTMO 5+5 European countries is included in **Annex 5**.

High complementarity exists between Maghreb countries and European GTMO 5+5 countries. This reflects the historical trade patterns and integration of North African economies with European markets. The highest complementarity is between Tunisia and France, followed by Tunisia and Spain.

### Maghreb TCI with ECOWAS countries:

Table 117 below shows the Maghreb countries' TCI with the countries of the ECOWAS region. It shows that Tunisia's export profile is the one that best matches the imports of the countries in the ECOWAS region. However, in general, relations between the Maghreb and ECOWAS countries show low TCI values.

The most prominent TCI value is that between Mauritania's exports and Guinea-Bissau's imports, which are very close countries.

|               | Algeria | Libya | Morocco | Mauritania | Tunisia |
|---------------|---------|-------|---------|------------|---------|
| Benin         | 19      | 25    | 29      | 17         | 42      |
| Burkina Faso  | 27      | 34    | 29      | 6          | 41      |
| Côte d'Ivoire | 20      | 25    | 30      | 12         | 44      |
| Cabo Verde    | 12      | 18    | 32      | 30         | 47      |
| Ghana         | 6       | 7     | 44      | 36         | 44      |
| Guinea        | 17      | 17    | 35      | 35         | 37      |
| Gambia        | 17      |       | 31      | 11         | 34      |
| Guinea-Bissau | 17      | 21    | 33      | 55         | 37      |
| Mali          | 27      | 33    | 40      | 37         | 43      |
| Niger         | 10      | 15    | 28      | 16         | 44      |
| Nigeria       | 31      | 20    | 26      | 8          | 42      |
| Senegal       | 25      | 30    | 27      | 9          | 42      |
| Sierra Leone  | 4       | 7     | 37      | 33         | 39      |
| Togo          | 13      | 20    | 38      | 9          | 50      |

Figure 117. Maghreb TCI with ECOWAS countries. Source: UNComtrade and World Bank

A figure on Maghreb TCI with GTMO 5+5 European countries is included in **Annex 5**. Complementarity between Maghreb and ECOWAS countries varies significantly, with Tunisia showing the highest potential, followed by Morocco. Notable complementarities exist between Mauritania and Guinea-Bissau and between Algeria and Nigeria.

*European GTMO 5+5 TCI with ECOWAS countries:*

Except for Malta, the European GTMO 5+5 countries generally have high TCI values relative to the ECOWAS countries. So, the development of relations between countries in both regions could also be beneficial for the Maghreb region as a potential connecting region.

|               | Spain | France | Italy | Malta | Portugal |
|---------------|-------|--------|-------|-------|----------|
| Benin         | 55    | 49     | 49    | 32    | 51       |
| Burkina Faso  | 53    | 52     | 51    | 32    | 52       |
| Côte d'Ivoire | 61    | 58     | 57    | 33    | 58       |
| Cabo Verde    | 66    | 55     | 55    | 29    | 61       |
| Ghana         | 66    | 64     | 63    | 31    | 67       |
| Guinea        | 56    | 53     | 58    | 35    | 51       |
| Gambia        | 47    | 39     | 36    | 22    | 43       |
| Guinea-Bissau | 47    | 49     | 42    | 41    | 49       |
| Mali          | 57    | 52     | 51    | 59    | 54       |
| Niger         | 47    | 53     | 48    | 29    | 47       |
| Nigeria       | 54    | 57     | 55    | 32    | 52       |
| Senegal       | 54    | 52     | 52    | 28    | 54       |
| Sierra Leone  | 57    | 60     | 60    | 29    | 58       |
| Togo          | 72    | 66     | 64    | 37    | 69       |

Figure 118. European GTMO 5+5 TCI with ECOWAS countries. Source: UNComtrade and World Bank

A figure on European GTMO 5+5 TCI with ECOWAS countries is included in **Annex 5**.

European GTMO 5+5 countries show high complementarity with ECOWAS countries, suggesting potential for the Maghreb to position itself as a transit hub for EU-African trade if adequate infrastructure connections are developed.

*Maghreb TCI with ONAC countries:*

The analysis of the TCI values shown in table 119 on Maghreb TCI with Other Neighbouring African Countries indicates that the pattern seen with the ECOWAS countries is repeated: Tunisia is the Maghreb country with the greatest complementarity.

|          | Algeria | Libya | Morocco | Mauritania | Tunisia |
|----------|---------|-------|---------|------------|---------|
| Cameroon | 18      | 30    | 33      | 14         | 45      |
| Egypt    | 20      | 20    | 26      | 15         | 43      |

\* Chad and Sudan values not shown as Chad's foreign trade data are not available, and Sudan's data (2011) are not representative.

Figure 119 Maghreb TCI with ONAC countries. Source: UNComtrade and World Bank

A figure on Maghreb TCI with ONAC countries is included in **Annex 5**.

*European GTMO 5+5 TCI with ONAC countries:*

Table 120 on European GTMO 5+5 TCI with Other Neighbouring African Countries allows the same reflections to be made as with the analysis of the relationship between European GTMO 5+5 countries and ECOWAS countries: the high values of the European GTMO 5+5 countries on TCI suggest a possible connecting function for the Maghreb countries.

|          | Spain | France | Italy | Malta | Portugal |
|----------|-------|--------|-------|-------|----------|
| Cameroon | 59    | 57     | 56    | 36    | 56       |
| Egypt    | 62    | 59     | 55    | 34    | 60       |

\* Values for Chad and Sudan are not shown because Chad's foreign trade data are not available, and Sudan's data (2011) are not representative.

Figure 120. European GTMO 5+5 TCI with ONAC countries. Source: UNComtrade and World Bank

A figure on European GTMO 5+5 TCI with ONAC countries is included in **Annex 5**.

European GTMO 5+5 countries show high complementarity with ONAC countries, suggesting potential for the Maghreb to position itself as a transit hub for EU-African trade if adequate infrastructure connections are developed.

**7.3.7. Evolution of the Maritime Transport Share and Updated Modal Split**

This section examines the results of the figures regarding the evolution of the percentage of maritime transport in the total trade flows and the tables regarding modal distribution presented in Output 3 of subchapter 2.

*Routing of trade flows between Maghreb and EU*

In 2022, maritime transport was the main mode of transport, especially in Libya, Mauritania and Tunisia, with percentages of over 80% (by euros) and exceeding 92% (by weight) in Mauritania, Morocco and Tunisia. These percentages are represented in figure 121.

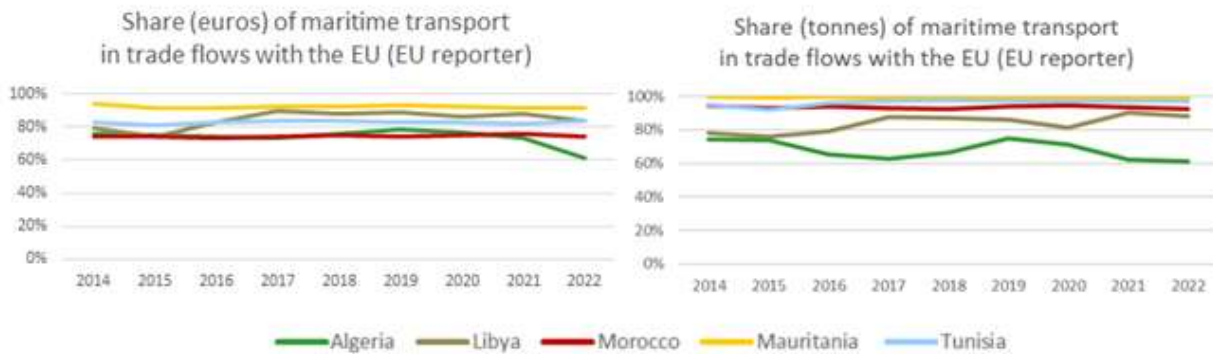


Figure 121. Share of maritime transport in Maghreb trade flows with the EU. Source: Eurostat

Analysing the situation of each Maghreb country in euros and in weight:

National evolution by euros:

- Algeria: It remains stable between 79% and 73%, except in 2022 when it has decreased to 61%.
- Libya: It grew to 89%, but in 2022 stands at 84%.
- Morocco: It has always remained stable between 76% and 72%.
- Mauritania: Its values has always been above 91%.
- Tunisia: It remains stable between 81% and 84%.

National evolution by weight:

- Algeria: It decreased from 71% in 2020 to 61% in 2022.
- Libya: It grew 12 points between 2014-2021 to reach 90%.
- Morocco: It has always registered percentages above 92%.
- Mauritania: It has always registered percentages around 99%.
- Tunisia: Since 2016, its percentages are above 96%.

It is clear that maritime transport is by far the most used mode of transport in the Maghreb trade relations with the EU, but there is still between 40% and 8% of goods (depending on the country) for which the routing is unknown.

Table 122 below presents the mode of transport used for trade flows between the Maghreb and the EU by 2022, to give an idea of the importance of the other modes of transport depending on the Maghreb country.

#### Main modal split shares (euros):

| TRANSPORT MODE  | Algeria | Libya | Morocco | Mauritania | Tunisia |
|-----------------|---------|-------|---------|------------|---------|
| Sea             | 61%     | 84%   | 74%     | 92%        | 84%     |
| Rail            | 0%      | 0%    | 0%      | 0%         | 0%      |
| Road            | 1%      | 0%    | 20%     | 4%         | 11%     |
| Air             | 3%      | 1%    | 4%      | 4%         | 4%      |
| Fixed Mechanism | 35%     | 15%   | 1%      | 0%         | 0%      |

#### Main modal split shares (tones):

| TRANSPORT MODE  | Algeria | Libya | Morocco | Mauritania | Tunisia |
|-----------------|---------|-------|---------|------------|---------|
| Sea             | 61%     | 88%   | 92%     | 99%        | 97%     |
| Rail            | 0%      | 0%    | 0%      | 0%         | 0%      |
| Road            | 0%      | 0%    | 7%      | 1%         | 2%      |
| Air             | 0%      | 0%    | 0%      | 0%         | 0%      |
| Fixed Mechanism | 38%     | 11%   | 0%      | 0%         | 1%      |

Figure 122. Modal split regarding Maghreb trade flows with the EU. Source: Eurostat

The modal split of trade flows mainly reveals that in Algeria and Libya, goods that are not moved by maritime transport are mainly moved by fixed mechanism, such as pipelines. It reaches percentages of over 35% for Algeria and 11% in Libya in both euros and weight.

In Morocco and Tunisia, goods that are not moved by sea are mainly transported by road. The 20% and 11% share of road transport in Morocco and Tunis in euros are particularly significant. In Morocco and Tunisia, goods that are not moved by sea are mainly transported by road. The importance of road transport is mainly due to the ro-ro services established with the EU.

#### Routing of trade flows between European GTMO 5+5 countries and ECOWAS

In 2022, maritime transport was the main mode of transport, especially in Portugal, Italy and France, exceeding 90% (by euros). In the analysis by weight, this percentage reaches 99% for France, Italy and Portugal and 98% for Malta. These percentages are represented in figure 123.

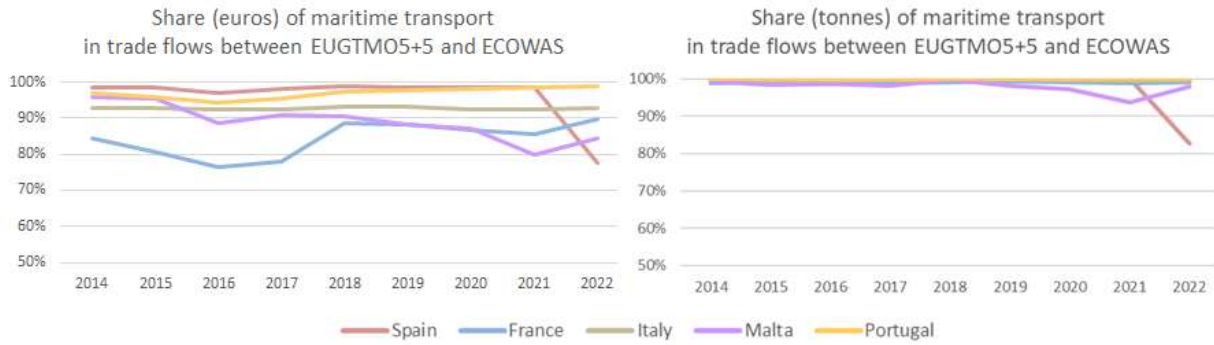


Figure 123. Share of maritime transport in European GTMO 5+5 trade flows with ECOWAS region.  
Source: Eurostat

National evolution by euros:

- Spain: Transport by fixed mechanisms increased up to 21% in 2022.
- France: Maritime transport has stabilised near 90%.
- Italy: Maritime transport has always been stable around 93%.
- Malta: Maritime transport follows a decreasing trend due to increase in air transport.
- Portugal: Maritime transport is stable around 98%.

National evolution by weight:

- Spain: Transport by fixed mechanisms increased up to 17% in 2022.
- France: Maritime transport is stable around 99%.
- Italy: Maritime transport is stable near 100%.
- Malta: Air transport had a slight increase up to 6% in 2021.
- Portugal: Maritime transport is stable near 100%.

The joint analysis of the routing of trade relations presented in this section makes it possible to establish that maritime transport overwhelmingly dominates trade between Maghreb countries and the EU (in general over 70% of total value), as well as between EU countries and ECOWAS (over 85%). This reflects both geographical realities and the underdevelopment of land transport connections across the Sahara and the Atlantic Coast.

For Maghreb-EU trade, the modal distribution shows maritime transport accounting for 85-99% of trade volume (varying by country and with the exception of Algeria), road transport up to 7% (primarily for Morocco ro-ro services) and rail and air transport being negligible (less than 1%).

The percentage of maritime transport in total trade flows has remained relatively stable over the past decade, suggesting that efforts to develop alternative transport modes have had limited impact thus far. Current trade between Europe and West Africa primarily follows sea routes that bypass the Maghreb entirely, highlighting the opportunity for the TMC to provide alternative, potentially more efficient routing options.

## 7.4. Neighbouring Regions' Corridors

### 7.4.1. Corridors' Layout and Characteristics

The first map 124 shows the layout of the Trans-African corridors as are defined by AfDB.



Figure 124. Trans-African Highway Corridors.

The Trans-African Highway (TAH) corridors are a network of transcontinental road projects in Africa being developed by the United Nations Economic Commission for Africa (UNECA), the AfDB and the African Union (AU) in cooperation with regional international entities. They aim to promote trade and alleviate poverty in the continent through highway infrastructure development and the management of road-based trade corridors.

First proposed in 1971, their progress has been slow. It is expected that the completion of this project will offer new perspectives for intra-African trade.

Although eight TAH are shown, five of them are of priority interest to the TMC due to their proximity. The most relevant corridors are:

- Trans-African Highway 1 Cairo-Dakar Corridor
- Trans-African Highway 2 Trans-Sahara Highway Corridor
- Trans-African Highway 3 (Tripoli–Windhoek-Cape Town Highway
- Trans-African Highway 5 Dakar-Bamako-Ouagadougou Highway
- Trans-African Highway 7 Dakar Lagos Highway

The following map 125 represents the layout existing and planned of other regional corridors placed in Western Africa. More specifically, ten corridors are represented.

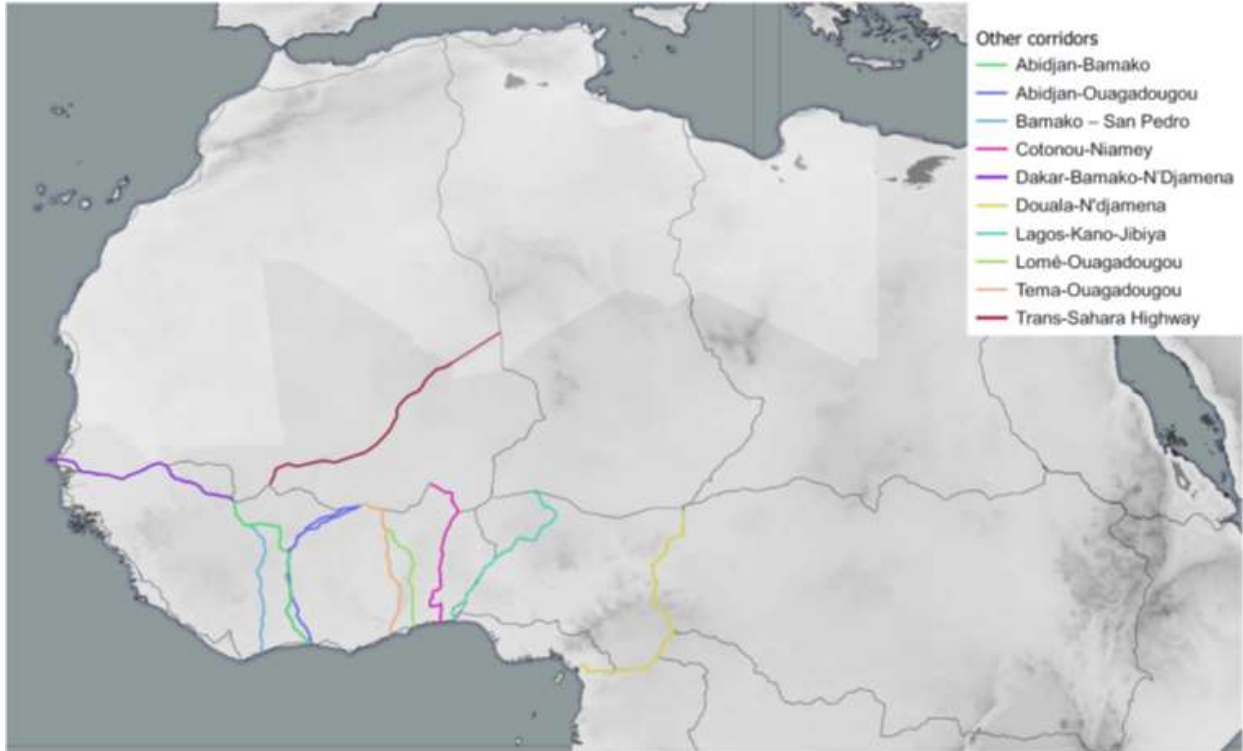


Figure 125. Other regional corridors.

Most of these corridors are existing and planned smaller corridors that help to provide a higher and more direct regional connectivity in Western Africa. These corridors are designed to improve connection between different TAH and provide access between TAH and coastal areas (ports and cities). The development of these connections is particularly beneficial for landlocked countries and areas.

*Maps classifying the neighbouring regions' corridors*

The following two maps 126 and 127 classify the regional corridors represented above according to their main interest and function and types of transport served.

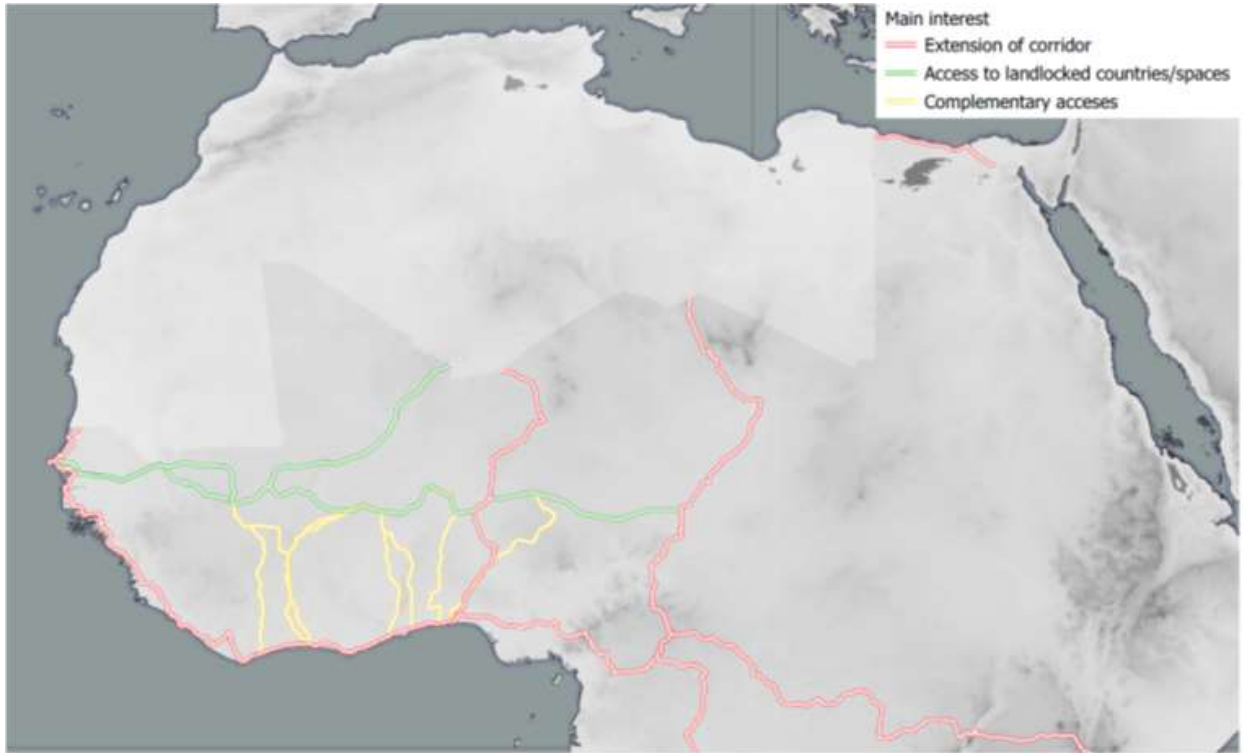


Figure 126. Classification of the neighbouring regions' corridor according to their main function.

Comparing this map with the different corridors represented above, it is observed that the main interest for corridors TAH1, TAH2, TAH3, TAH7 and TAH8 is the extension of the TMC to connect with other economic and trade areas.

Secondly, corridors TAH5, TAH6, the sub-Saharan section of the Trans-Sahara Highway and the Dakar – Bamako – N'Djamena corridor offer access to landlocked countries and spaces, enabling new routes for their trade flows.

Finally, corridors Bamako – San Pedro, Abidjan – Bamako, Abidjan – Ouagadougou, Tema – Ouagadougou, Lomé – Ouagadougou, Cotonou – Niamey, Lagos – Kano – Jibiya and Douala – N'Djamena provide complementary accessibility, indirectly facilitating the link to the TMC.

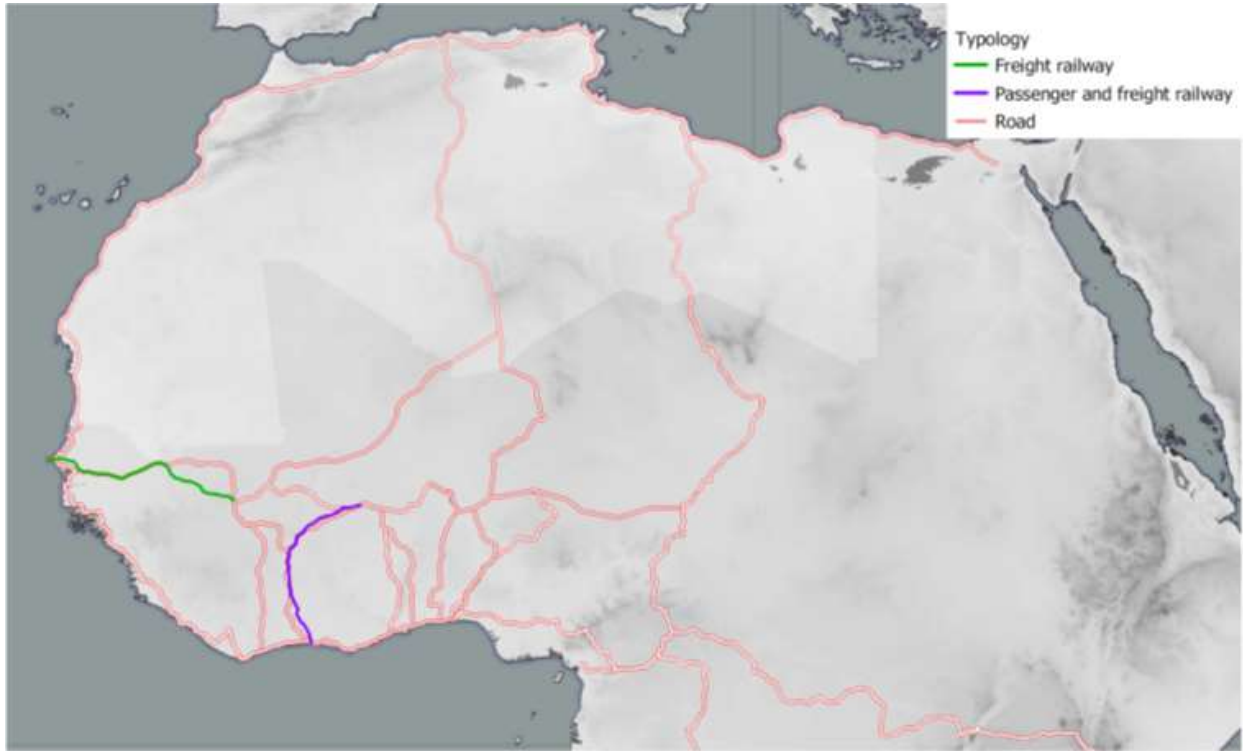


Figure 127. Classification of the neighbouring regions' corridor according to the mode of transport served.

The above map 127 shows that most of the existing and planned corridors are road infrastructure. They layout and connections permit the creation of a network. There are only two corridors related to rail infrastructure. The Dakar – Bamako – N'Djamena corridor concerns freight railway, whereas the Abidjan – Ouagadougou corridor concerns passenger and freight railway. It is noted that railway lines are very limited, and they are not connected between them. Thus, they do not create a network.

*Map on the areas of interest to connect with the neighbouring regions' corridors*

Finally, this last map 128 identifies and represents five areas of higher interest for connecting Maghreb countries to other African corridors and territories. The areas represented are as follows:

- The extension of TMC to Dakar Lagos Highway (Nouakchott-Rosso-Saint Louis-Dakar).
- The connection to Dakar –Bamako-Ouagadougou Highway(Mauritania-Senegal-Mali).
- The extension of TMC to Trans-Sahara Corridor and Bamako (Algeria – Mali – Niger).
- The extension of TMC to Highway (Libya– Niger – Chad).
- The extension of TMC to Cairo-Dakar Highway (Tubruk – Sallum).

## 7.5. Key Connections

This map provides an overview of the key connection points between the TMC and neighbouring regions, highlighting the critical areas for infrastructure development and connectivity enhancement. However, further analysis is needed related to the status of infrastructure, functions, complementary accessibility to define infrastructure interventions. This information is provided in the next output.

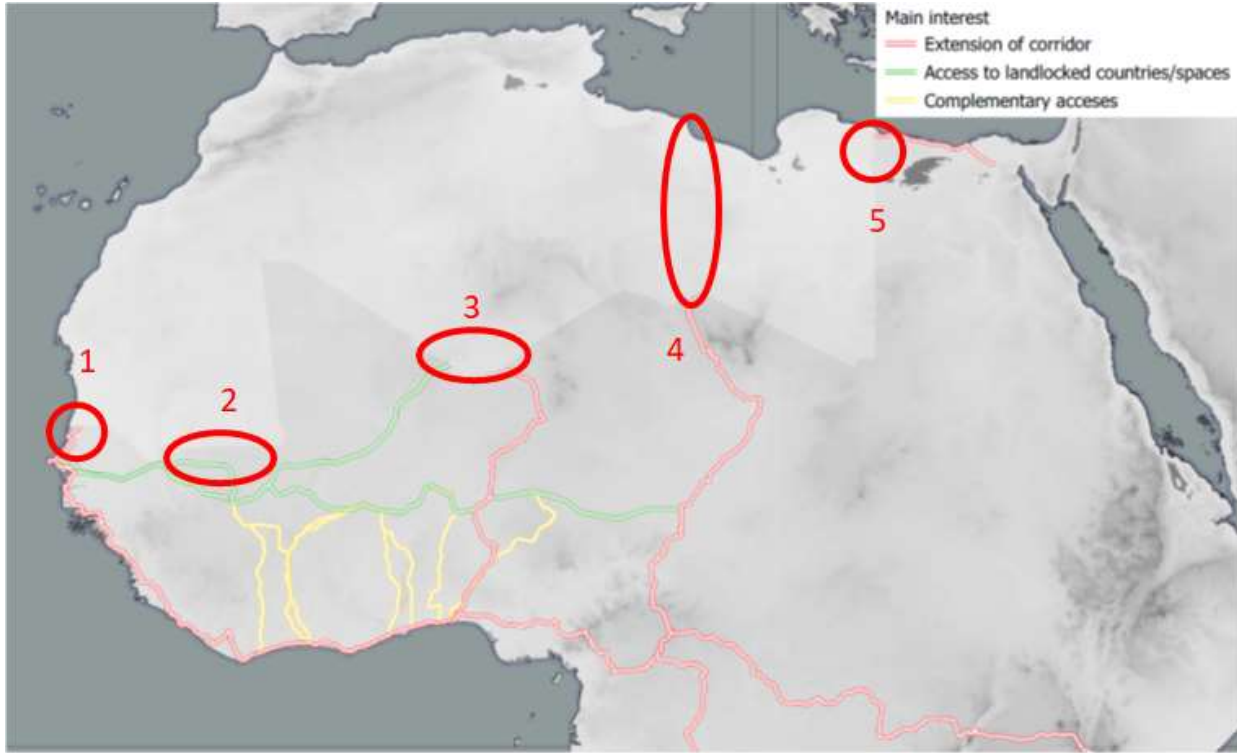


Figure 128. Areas of interest to connect with the neighbouring regions' corridors

This section on Output 4: Maps on Neighbouring Regions' Corridors examines the potential to create transport networks from the infrastructure of the TMC and its neighbouring regions, based on the maps presented above.

There is significant potential to create an integrated road network connecting the TMC with neighbouring regions, as most trans-African corridors and regional corridors in West Africa are primarily road-based.

Creating an integrated rail network faces considerable challenges due to the lack of continuity of railway lines connecting the different countries and limited coverage of rail networks in many countries.

### 7.5.1. Extension of TMC to Dakar Lagos Highway (Nouakchott-Rosso-Saint Louis-Dakar)

The analysis is this and the following areas of interest are based on official project reports and their level of progress as well as on official press communications and media articles.

The connection between Mauritania and Senegal in this area of interest includes 5 key transport infrastructures as detailed in map 129. Currently, the road connection between Mauritania and Senegal is made by ferry across the Senegal River in the town of Rosso. In Mauritania, the Road RN2 connects the capital Nouakchott to Rosso, which is part of the Trans-Maghreb Multimodal Corridor. It is a two-lane road, with upgrading and rehabilitation works since the early 2010. Even though, traffic of heavy vehicles and lack of maintenance produce the continuous worsening of road conditions.

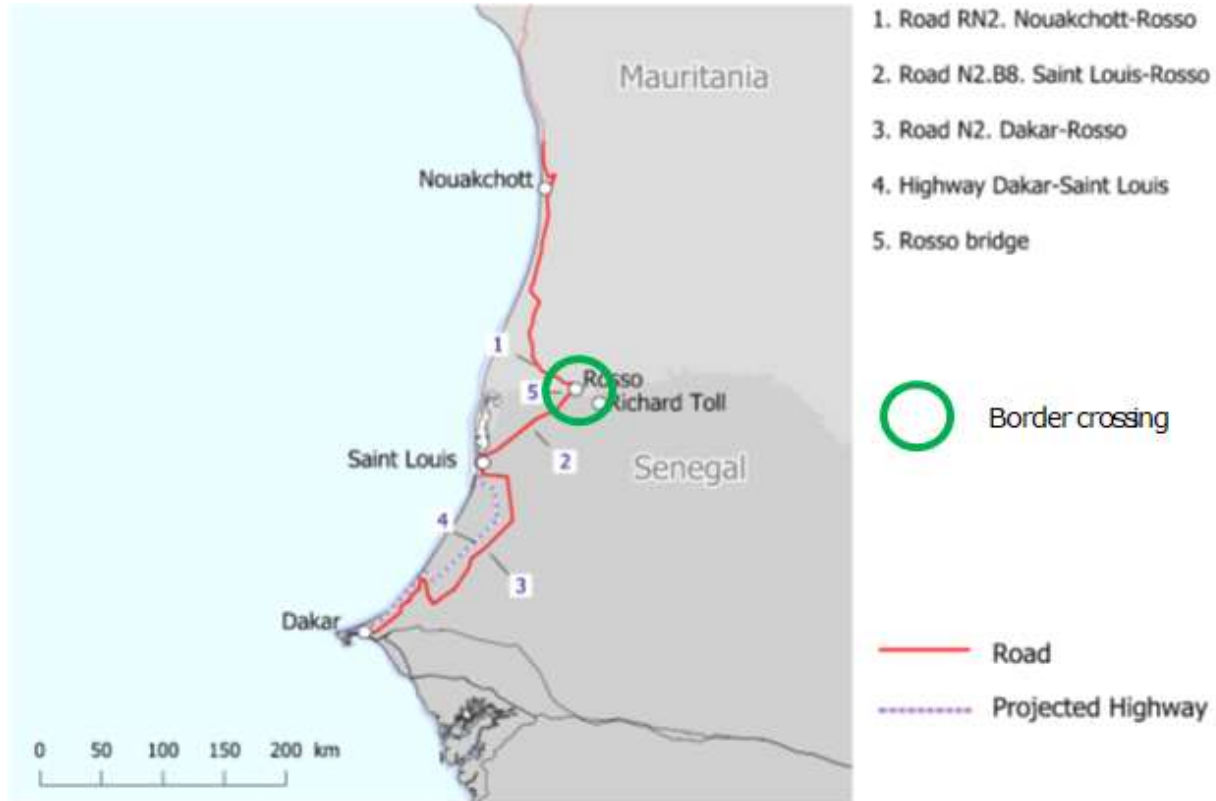


Figure 129. Extension of TMC to Dakar Lagos Highway (Nouakchott-Rosso-Saint Louis-Dakar).

The main project currently undergone is the bridge of Rosso over the Senegal River, to be finished in 2026. Currently, works are delayed (17% in May 2024). It includes the improvement of accesses road, rural and urban roads as well as new border post.

The other relevant project is the highway (2X2 lanes) between Dakar and Saint Louis, managed by AGEROUTE, expected for 2026-2027, with the first works contracts approved (pending approval of ministry of finances, June 2024). A highway project between Nouakchott and Rosso in Mauritania is in a preliminary conception phase.

### 7.5.2. Rosso Border Crossing

Rosso is the main land border crossing between Mauritania and Senegal. Currently, customs procedures are carried out in two separate posts, at both side of Senegal river.

The ongoing project of Rosso bridge include the modernization of border infrastructure, with the construction of a One-Stop border crossing point. It is estimated that crossing time will be reduced from 1 hour to 10 minutes.

The study of conception and functionalities of the new border crossing point is undergoing. In January 2025, this study is delayed, and it is considered a critical point for the complete development of the comprehensive project of Rosso Bridge. The new crossing point is expected to be finished in 2027.

### 7.5.3. Connection to Dakar –Bamako-Ouagadougou Highway (Mauritania-Senegal-Mali)

The connection between Mauritania, Senegal and Mali in this area of interest includes 4 key transport infrastructures as detailed in map 130.

The main connection between Nouakchott and Bamako is established by the paved road connecting Diema (on Trans-African Highway 5 (Dakar-Bamako) and Aïoun El Atrouss (on Route de l'Espoir) crossing the town of Gougui (Mali).

This connection will be reinforced in Mauritania by projects such as the new highway Nouakchott-Boutilimit and the rehabilitation of the road between Boutilimit and Aleg, both on the Route de l'Espoir.

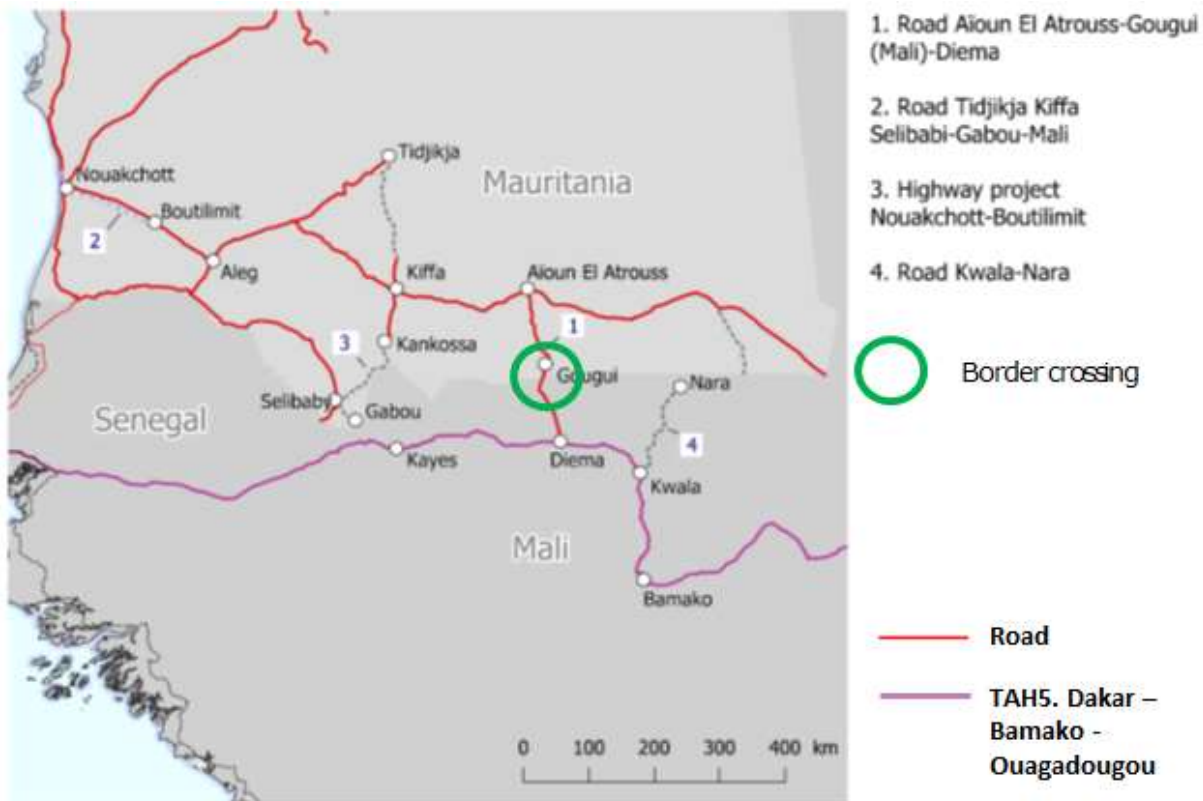


Figure 130. Connection to Dakar –Bamako-Ouagadougou Highway (Mauritania-Senegal-Mali).

An ongoing project is aimed to create a paved road between Tidjikja, Kiffa, Kankossa and Gabou and, finally, to the border with Mali, financed by Arab Fund for Economic and Social Development. The relevance of this roads derives from its threefold aim. First, to improve connections with Mali, second, to improve connection between North and South of Mauritania, and third, from a regional point of view, between the Sahel and the Maghreb.

In January 2022, before the coup d'état in august this year, a draft decree of the Government of Mali promoted a project, of a paved road between Mourdiah and Nara, which links with the ongoing project

of the Kwala-Mourdiah paved road. It was presented in media as a link to improve connections and exchanges with Mauritania. Current security and social crisis in Mali may prevent the development of such project.

#### 7.5.4. Gouigi Border Crossing

Gouigi is the main border crossing between Mauritania and Mali, it is located in the axe Nouakchott-Bamako. In both countries, the check point facilities are on the road, with one lane by sense. It has not segregation lines by type of transit (goods-passengers).

Several initiatives have been implemented to enhance cooperation between custom agencies and personal of Mauritania and Mali, as well as the adoption of specialised digital tools. These initiatives are more focused on flows of persons than goods.

#### 7.5.5. Extension of TMC to Trans-Sahara Corridor and Bamako (Algeria – Mali – Niger)

The connection between Algeria, Mali and Niger in this area of interest includes 4 key transport infrastructures as detailed in map 131.

The Trans-Sahara corridor links Algiers (Algeria) and Tunis (Tunisia) with Lagos (Nigeria) and Bamako (Mali) and provides access to the landlocked countries of the Sahel. The link between Algiers and Lagos coincides with the Trans-Africa Highway 2.

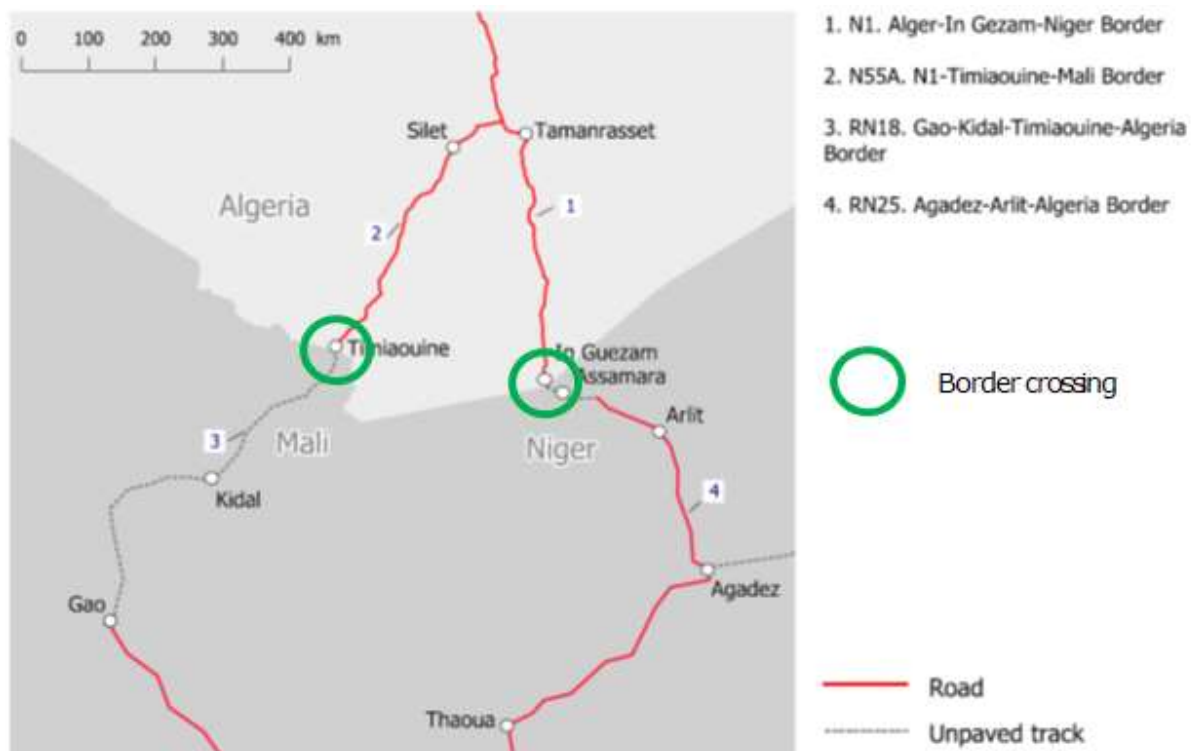


Figure 131. Extension of TMC to Trans-Sahara Corridor and Bamako (Algeria – Mali – Niger).

The Algerian layout is composed practically by paved sections, with 2x2 lanes express-ways in the Northern sections.

In Niger, the road between Arlit, Assamara has represented the last missing link to connect with the Algerian border. Nowadays, this section is completed (125 km, in 2022) or with works undergone.

Another missing link remains in Mali, which prevents the continuity of the corridor from the Algerian border to Kidal and Gao. It is part of the Trans Sahara Highway. Despite of their importance, existing political and military conflicts prevents its development.

### 7.5.6. Timiaouine and in Guezam border crossing

Algeria is developing a process of modernisation of its border point. This process is framed in a strategy to improve and facilitated Algerian exports to neighbour African countries, and it is linked to extension of Algerian logistical infrastructures.

In 2022, the border crossing post of in Guezam was modernised. Besides building for police and customs agents, the new point includes a scanner, spaces for plant and animal health inspections.

The Timiaouine border crossing is expected to be modernised as well. In this sense, the terms of reference of the project were issued in 2022.

### 7.5.7. Extension of TMC to Highway (Libya– Niger – Chad)

The connection between Libya, Niger and Chad in this area of interest includes 4 key transport infrastructures as detailed in map 132.

The Trans African Highway 3, Tripoli-Capetown is the longest Trans-African Corridor. At the same time, it contains long sections as missing links, being one of them the section between the South of Libya and Ndjamena in Chad. Altogether, the paved road network of Libya reaches the Niger at Tummo border post, running West of the layout of the Tripoli Cape Town axis.

The Libyan section reaching Tummo border post continues, in Mali, as an unpaved track (Piste sommaire, in accordance to national classification of roads) to the city of Gao, where connect with the paved road of the Trans-Africa Highway 2 Algiers-Lagos.

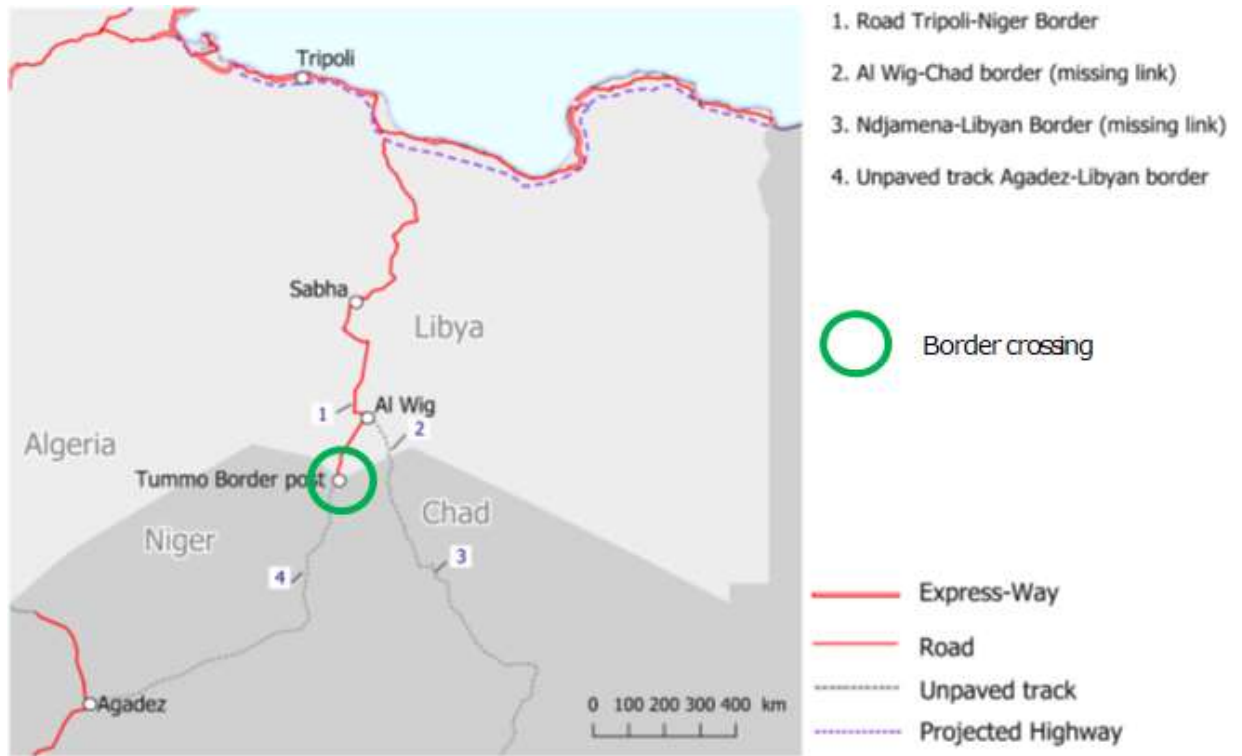


Figure 132. Extension of TMC to Highway (Libya– Niger – Chad).

In 2023, a draft memorandum between Niger and Libya (Government of Tripoli) for the construction of the Misrata-Tamanhint-Agadez road, was signed. There is no information reliable on the content or status of this memorandum.

### 7.5.8. Tummo border crossing

Tummo post stands as the border crossing between Libya and Niger. It consists in a very simple check point without any specialised service to enhance trade

### 7.5.9. Extension of TMC to Cairo-Dakar Highway (Tubruk – Sallum)

The connection between Libya and Egypt in this area of interest includes 3 key transport infrastructures as detailed in map 133. The main connection between Libya and Egypt is located in the Amsaad-Sollum border post. In this point converge the Libyan Coastal road, concretely the last section between Tobruk and Amsaad, and the Road 40 from Alexandria to Sallum in Egypt. Both routes belong to the Dakar-Cairo trans-Africa Highway.

The Egyptian section is an express way (2x2 lanes). The Libyan section is a 2 lanes road. The upgrading of this infrastructure or the construction of a new parallel infrastructure as a highway was foreseen as a long-term project, with an important enrolment from Italy. Currently there is no reliable information on the status of this project.

Recently, Libya (Eastern Government) has signed a memorandum of understanding with an Egyptian company to construct the Libyan section of an international road connecting Egypt, Libya, and Chad. There is no reliable information on the content of the memorandum and details of the project.

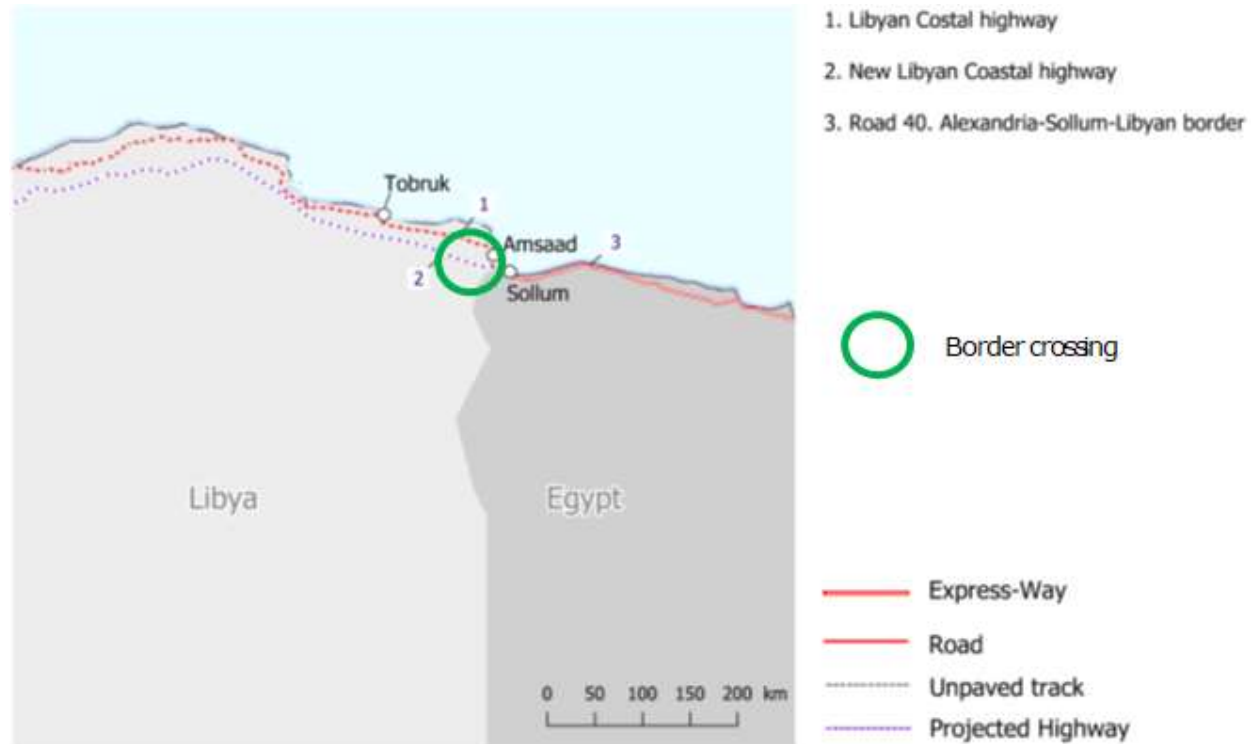


Figure 133. Extension of TMC to Cairo-Dakar Highway (Tubruk – Sallum).

### 7.5.10. Amsaad – Solum border crossing

The main border crossing for passengers and goods between Libya and Egypt is located in Amssad (Libya) and Sollum (Egypt). The Border crossing of Amsaad is organized by separating the lanes between trucks and cars. There exist dedicated spaces for queuing and parking. Currently, congestion impedes a smooth flow of trucks.

Border crossing of Sollum has also separate areas for goods and passengers. Recently, it has modernized to include more logistical services to boost trade between the two countries. Road network has been renewed, and warehouses and refrigerators has been developed.

## 7.6. Conclusions on TMC's Connectivity with Neighbouring Regions

### 7.6.1. Conclusions on Trade Flows and Composition of Trade

The analysis of foreign trade patterns and complementarities leads to several important conclusions: Morocco, and especially Tunisia, have the potential to establish trade relations more easily than the other Maghreb countries, thanks to the composition of their exports.

Although in general, Algeria, Libya and Mauritania have lower TCI values than Morocco and Tunisia, there are some possible specific relationships with countries in neighbouring regions that rank among their top TCI values at the global level. This would be the case of the Algeria-Nigeria, Algeria-Malta, Libya-Malta, Libya-Mauritania and Mauritania-Guinea Bissau relationships.

In some cases, the potential of the Maghreb countries lies not so much in direct trade (export and import), but in being part of the logistics and transport chain of trade between other countries. Hence the importance of developing ports and logistics networks achieving good transport infrastructures. This point may be especially interesting in the relationship with ECOWAS countries.

Although in practice, trade relations go beyond theoretical analysis and also depend on other factors (international trade agreements, existence of efficient infrastructure and facilitation measures, national interests, among others), there is still potential for developing trade relations with countries in neighbouring regions.

Maritime transport plays a dominant role in the trade relations of the countries of the trans-Maghreb multimodal corridor, as evidenced by trade relations with European Union. It is particularly important in the tonnage analysis with some countries exceeding the 92% share (Mauritania, Morocco and Tunisia).

Transport by fixed mechanism has a stable market in oil-producing countries such as Algeria and Libya. In 2022, it reaches a share of around 38% and 11% respectively (in tonnes) in their relations with EU.

Road transport is particularly relevant in the relations of Morocco and Tunisia with the EC (share of 20% and 10% respectively, in euros), thanks to the existence of consolidated ro-ro services, which facilitate the agile exit of goods from the port.

Rail transport does not have a significant share in international trade relations. Currently, its use as multimodal transport is mainly based on domestic flows.

The increasing distance between countries, together with the lack of a consolidated and efficient land infrastructure and agreements, are factors favouring the use of maritime transport, as reflected in the trade relations between the European GTMO 5+5 countries and the ECOWAS region, where maritime transport has a 98-99% share over the last ten years.

The potential increase in trade relations between the European GTMO 5+5 countries and the ECOWAS region could be an opportunity for the Maghreb countries to use their ports as entry and exit points for goods. To this end, Maghreb ports should have a high performance and be complemented by an efficient transport and logistics network, as well as a series of trade facilitation measures.

In the Maghreb countries' trade relations with ECOWAS countries, Mauritania may play a central role. Improving its land infrastructures should contribute to the consolidation of Mauritania's own and Morocco's existing trade relations with Senegal, as well as favouring trade relations with Mali, as a landlocked country.

### 7.6.2. Conclusions on Neighboring Regions Connection

The analysis of infrastructure and corridor connections leads to the following conclusions:

Several infrastructure projects reflect the interest of countries of the Maghreb and the Sahel to reinforce the connectivity between Maghreb and neighbouring regions. The stage of development of these projects varies considerably from one country to other.

Mauritania and Senegal are developing projects aiming to boost regional connectivity, even if in some cases are affected by delays. The Rosso Bridge, including also new accesses and new border facilities, is the most representative project of the efforts of these two countries. Other projects to reinforce regional connectivity are:

- Highway Dakar-Saint Louis in Senegal
- Highway Nouakchott-Boutilimit in Mauritania, and
- Road Tidjikja-Gabou in Mauritania.

The Rosso Bridge and the Highway Dakar-Saint Louis are projects on the Trans-African Highway 1 Cairo-Dakar Corridor and become the direct extension of TMC into Senegal.

The link between Tidjikja and Gabou, which continues to Zuerate and the north of Mauritania is part of a greater axe, that runs parallel to the TMC in Mauritania and will connect the Sahel and the Maghreb.

The foreseen infrastructural continuity of the Trans-African Highway 1 between Morocco and Senegal may imply the reinforcement of flows between Morocco, Mauritania and Senegal. Moreover, it may become a backbone for flows and exchanges in Western Africa.

Other connection projects to extend the network of the countries of Maghreb to neighbouring regions are under uncertainty, due to regional instability. This is the case of the extension of the Trans-Sahara road to Mali, whereas the Niger section is nearly completed.

The extension of Libyan road network to neighbouring countries is also affected by current instability, despite the existence of governmental memorandums to develop international connections to Egypt, Chad and Niger.

The no completion of these projects will affect especially the landlocked countries of the Sahel preventing a land connection with the Mediterranean.

The upgrading and modernisation of border crossing infrastructures appear as actions conceived to improve and smooth trade flows. The planned new border crossing between Mauritania and Senegal in Rosso, the plan to improve border points in Algeria and the recent upgrading of the Egyptian Sollum border facilities are prove of these actions. The case of Mauritania and Algeria reflects the interest of these countries on trade exchanges with Sahel countries.

## 8. SUMMARY AND CLOSING REMARKS

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The Trans-Maghreb Multimodal Corridor (TMC) currently provides service to 66% of the population, 70% of the urban areas, and 66% of the industrial and activity zones across the Maghreb region. Its configuration extends parallel to the coastline, linking capital cities and major urban centers such as Nouadibou in Mauritania; Agadir, Marrakech, Casablanca, Tangier and Fez in Morocco; Oran, Chlef, Settif and Constantine in Algeria; Sousse, Sfax and Gabès in Tunisia; and finally Misrata, Sirte, Benghazi and Tobruk in Libya. Additionally, various branches connect to important maritime transport hubs like Jadida, Safi and Nador in Morocco; Arzwe, Bejaia, Annaba and Skikda in Algeria.

A defining characteristic of the present state of the TMC as Transport Corridor, and its main limitation, is the discontinuity between Algeria and Morocco which also severs Tunisia. Indeed the TMC presently acts as two separated corridors, one serving Algeria and Tunisia and the second Morocco and Mauritania. While this hampers the wealth creation, regional integration and socioeconomic development potential of the corridor, still both segments make a substantial contribution to national vertebration and sub-regional integration, particularly between Morocco and Mauritania.

The potential of the Morocco-Mauritania segment as Transport and Trade Corridor is significantly increased by the fact that most North South axis and EU-Sahel-Equatorial Africa connections are, either still theoretical exercises or remain in stand-by due the political instability. In this context the ECOWAS-Mauritania-Morocco-Mediterranean Ports-EU link becomes the only potentially feasible trade axis. The Mauritania-Morocco segment of the TMC emerges as a key component and hub of a potential transcontinental corridor, which in turn may overweight the limitations generated by the TMC's discontinuity between Algeria and Morocco.

The present infrastructural state as Transport Corridor of both segments can be considered operational, with an established infrastructural core and well defined national transport development and investment plans. National administrations are aware that additional projects are needed for the corridor to achieve its complete potential as a transport facilitator. The identification and prioritization of 106 infrastructure Missing Link projects indicates the unrealized transport facilitation opportunities, and also outlines the main deficiencies and prioritizes corrective actions.

Missing Links Project distribution by country reflects the geographical size and TMC route length within each nation. Morocco and Algeria, having the longest TMC sections, have the highest number of required projects. The particularly extensive list of projects in Morocco also reflects the country's active infrastructure development policies.

Near 40% of the Missing Link projects required are railway related. This is due to the present predominance of road transport in the region, combined with the fact that substantial portions of road infrastructures are already high-capacity ones after the investments over the last two decades. Additionally it responds to the fact that infrastructure development objectives and planning across the Maghreb increasingly favors rail development, aligning with global trends toward more sustainable transport systems.

Regarding the state and required projects to facilitate and enhance the TMC as Trade Corridor, this study assesses three complementary dimensions: Multimodality Infrastructure, Capillarity reach and Connectivity to other regions and corridors.

An assessment of the state of multimodality infrastructures reveals a noticeable mismatch between the available infrastructure and operational effectiveness and use. While the region has developed a foundational multimodal infrastructure—particularly in maritime terminals and some inland platforms—the practical utilization of these facilities for integrated transport operations remains limited. This is illustrated by the fact that rail container transport accounts for less than 2% of modal share in both

Algeria and Morocco. This disparity between infrastructure development and operational integration presents both challenges and opportunities for the corridor's evolution as a trade facilitator.

There is a striking exception the development of a successful export business ecosystem centered in Tanger Med, leveraging near-shoring trends in global production networks, and European firms increasingly looking to North Africa as a viable production and logistics hubs. This success is sustained by an effective and sophisticated multimodal transport system, with 80% rail modal share. It provides a powerful proof-of-concept that effective multimodality can be achieved in the region, as well as valuable insights into how effective multimodality can be realized when appropriate infrastructure, services, and commercial frameworks are aligned.

Additionally Morocco's methodical approach developing a network of logistics platforms, with clear sequencing and prioritization, may also offer useful lessons for other Maghreb countries seeking to improve their multimodal transport systems.

Among the most priority multimodal infrastructure projects required identified in this study, maritime terminal developments feature prominently. This indicates that port modernization and expansion constitute essential prerequisites for enhancing the corridor's multimodal capabilities and, consequently, its effectiveness as a trade corridor.

Summarizing, the current multimodal infrastructure state indicates that a tentative set of core components has been established, but not leveraged. Therefore an additional set of projects are required as identified and prioritized in this study. Additionally the underutilization of existing multimodal infrastructure indicates that for the TMC to successfully transition from a transport corridor to a trade corridor, physical infrastructure improvements need to be complemented by regulatory frameworks, modernized customs procedures, harmonized processes, digital systems integration, and active private sector participation.

Regarding Capillarity, lets start noting that population and economic activity distribution in the Maghreb, concentrates largely along Mediterranean coastal areas with few specific inland regions, particularly in Mauritania. Currently, the corridor directly serves 66% of the population, while numerous significant population centers remain insufficiently connected despite their relative proximity to the corridor, particularly in Algeria, Morocco, and Tunisia.

This study has identified and assessed the Relevant Economic Zones that lack adequate TMC service (REZs). Most are situated parallel to the corridor on its Mediterranean side. On the Atlantic side, REZs are found in Mauritanian Wilaya that border ECOWAS countries in the southernmost region. Most REZs are indeed close to the present layout of the TMC; in Algeria, the 10 most populated REZs are all located within 85 km of the TMC, indicating that important population centers are relatively accessible to the corridor despite lacking direct connection. Similarly in Morocco, 7 of the 10 most populated REZs are situated less than 100 km from the TMC.

This proximity presents clear enhancement possibilities and indicates that extending the corridor's reach could be accomplished with moderate investment levels. Only Mauritania presents a different scenario, as its large territorial size and predominantly desert landscape result in TMC-to-REZ distances exceeding 400 km. The border region with ECOWAS countries holds particular strategic importance in this case.

The study identified 36 capillarity enhancement projects across the four countries, providing a practical framework for improving the TMC's connectivity with surrounding zones. Rail projects constitute two-thirds of these initiatives, highlighting the considerable gap in rail infrastructure compared to road networks and suggesting that addressing this imbalance would support the development of a genuinely multimodal corridor system.

Geographic distribution of prioritized projects reveals different national development strategic approaches: Algeria focuses on north-south connections perpendicular to the TMC (following a territory penetration model), while Morocco is developing a parallel infrastructure axis from Agadir to Tangiers. These complementary approaches would enhance network resilience and capacity throughout the region.

The assessment of TMC's connectivity to other regions and corridors, includes a preliminary study of trade complementarities and the identification of key connections and its present state. Analysis of trade patterns and complementarities indicates low trade complementarity, even though not enough to justify the extremely low intra-regional trade that amounts to just 5% of the total trade volume. The analysis also reveals that Morocco and especially Tunisia have greater potential to establish trade relationships with neighboring regions due to their export composition.

There appears to be considerable untapped potential for trade between Maghreb countries and neighboring regions, particularly with ECOWAS countries. Trade Complementarity Indices identify several promising relationships that could be developed through appropriate infrastructure and trade facilitation measures..

Within the context of Maghreb-ECOWAS trade relations, Mauritania could play a pivotal role. Enhancing its land transport infrastructure would not only strengthen Mauritania's existing trade connections with Senegal but could also benefit Morocco's trade with Senegal and support commerce with landlocked Mali.

Maghreb countries, particularly Algeria and Libya, would benefit from diversifying their export structures beyond hydrocarbons to establish more sustainable trade relationships with neighboring regions. Morocco and Tunisia with a comparatively diverse export portfolio have the greatest potential to expand trade relationships with neighboring regions due to their export composition.

In some instances, Maghreb countries' potential may lie less in direct import-export activities and more in facilitating logistics and transport chains between other trading partners. Growing trade relations between European GTMO 5+5 countries and the ECOWAS region could create opportunities for Maghreb countries to position their ports as strategic entry and exit points. To capitalize on this potential, Maghreb ports would need to offer efficient operations supported by effective transport and logistics networks, complemented by trade facilitation measures.

The Maghreb region's geographical position could allow it to function as a transit hub connecting Europe and Sub-Saharan Africa, particularly benefiting landlocked Sahel countries. However, realizing this potential requires substantial improvements in transport infrastructure and border crossing efficiency.

The study identified five strategic connection areas between the TMC and neighboring regions. Mauritania and Senegal are implementing projects to enhance regional connectivity, though some face implementation delays. The Rosso Bridge project, which includes new access roads and border facilities, exemplifies these efforts. Additional regional connectivity projects include the Dakar-Saint Louis highway in Senegal, the Nouakchott-Boutilimit highway in Mauritania, and the Tidjikja-Gabou road in Mauritania.

Other connection projects extending from Maghreb countries to neighboring regions face uncertainty due to political instability. This applies to the Trans-Sahara road extension to Mali (though the Niger section is nearly complete) and Libya's planned road connections to Egypt, Chad, and Niger, despite existing governmental agreements.

Beyond physical infrastructure, harmonized regulations for customs procedures, technical standards, and transport operations are essential for effective connectivity. Border crossing facilities require both adequate physical infrastructure and streamlined procedures. New or modernized border crossing

infrastructure is already planned between Mauritania and Senegal at Rosso, with similar improvements underway at Algeria's border points and recently completed at Egypt's Sollum facilities.

In conclusion, the development of the Trans-Maghreb Multimodal Corridor represents a multifaceted initiative with a very large potential for enhancing regional and national integration and economic development. The transformation of the TMC from a functional transport corridor to a comprehensive trade corridor requires coordinated attention across three complementary dimensions: multimodality integration, capillarity expansion, and connectivity with neighboring regions.

While challenges exist, from discontinuities and infrastructure gaps to regulatory harmonization needs, there are also promising opportunities for creating a more integrated network that increasingly provides trade facilitation, wealth creation and socioeconomic development by serving the Maghreb countries and by becoming a strategic connection between Europe and Sub-Saharan Africa.

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