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CO-EVOLVE

Promoting the co-evolution of human activities and natural systems for the development of sustainable coastal and maritime tourism

Deliverable 3.11.1

State of the Art and Future Development of Transport and Accessibility at Mediterranean Scale

Activity 3.11

Enabling factors for co-evolution – Mediterranean scale: Transports and accessibility

WP 3

IUAV

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Contents

List of Figures

List of Tables

1. Introduction

This report aims to provide a synthesis of the touristic Transport and Accessibility (hereinafter T&A) enabling factors in a Mediterranean coastal scale. The land-sea interaction has been taken into account in order to initiate the T&A data collection process. Therefore, identifying the passenger ports, further divided into the cruise and passenger ferry ports have been considered as the baseline to begin with the touristic T&A analysis. The airports have been identified based on the nearest proximity from the cruise ports. Additionally the identified cruise ports and airports have been analyzed on their distances towards the city centers and other major transport nodes providing hinterland accessibility together with identifying the offered touristic intermodality features, such as the public transport bus, taxi service, car rental and personal car parking facilities. As many of the identified cruise ports also serve as passenger ferry ports, the port infrastructure and ship accessibility analysis carried out for the cruise ports may serve some of the identified ferry ports as well.

Considering the synergies with the cruise and recreational boating tourism and based on the latest available open data sources, an exhaustive analysis has been carried out for the identified cruise ports in a Mediterranean scale and for the identified Marinas within the Adriatic region. A Mediterranean country-wide analysis has been carried out for the ferry passenger ports in addition to a growth analysis on the major ferry and airports. The data request survey feedback from the Pilot Area (hereinafter PA) coordinators have been integrated as well in order to carry out the value added PA scale analysis. The T&A policy domain has been studied in a European scale with a focus on intermodality while ensuring the passenger rights. This report also presents the data synergies which may support the T&A relevant indicators adapted by the Tourism Sustainability Toolkit (Deliverable 3.16.2).

Based on international scientific literature and relevant European project results, the T&A theory and transport-tourism relationship has been analyzed in order to support the selection of information approached by this study. Additionally passenger intermodality and T&A features for the rural, peripheral and insular regions have been taken into consideration in order to address the bottlenecks and their possible solutions, which may be adapted for future developments.

Data analyzed in this report can be accessed from a consolidated touristic T&A “Database”, developed as part of the Deliverable 3.11.2. Additionally, based on these data, a comprehensive geo-spatial analysis in a Mediterranean scale can be accessed from an “Atlas of Maps”, which has been developed as part of the Deliverable 3.11.3.

2. The Concept Definitions

The concept of accessibility is of critical importance within the disciplines of transport geography, spatial planning and topography or network analysis (Lekakou and Vitsounis, 2011). Despite this, there does not exist any clear and unambiguous definition of what exactly constitutes ‘accessibility’ (Cullinane and Wang, 2009). Accessibility is related to distance between destinations (Litman, 2003; Lekakou and Vitsounis, 2011). Accessibility can also be defined in terms of consumption possibilities (Fortuna et al., 2001).

There are two main types of accessibility- Positional and Personal (Gutierrez, 1988). While the temporal accessibility falls into the first category, this may also be translated into financial accessibility in a sense that time spent travelling may be considered as not productive in working hours (Luis, 2002). In this way and through surveys on the transport companies’ fares, it is possible to consider financial accessibility between two or more nodes of one network (Hernandez, 1996).

A straightforward description of accessibility is related to connectivity (Baradaran & Ramjerdi, 2001). A location is assumed to be accessible if it is connected to other locations via a link to a road or railroad network (Bruinsma & Rietveld, 1998) or to an airport or harbor (Lekakou and Vitsounis, 2011). Wilmsmeier and Sánchez (2008) defined transport connectivity as the access to regular and frequent transport services and the level of competition in the service supply. The extent of accessibility can also be calculated as the number of different links and modes to which the specific location has access (Lekakou and Vitsounis, 2011). However despite the simplicity in concept of such indicators, their calculation or measurement has practical difficulties (Lekakou and Vitsounis, 2011).

According to a study carried out by Lekakou and Vitsounis (2011), accessibility is inversely proportional to the distance, but clearly linked to the number of sea trips (i.e. ship calls), the number of companies (concentration) and the quality of ships (speed). Taking the maritime transport as an example, Hoffmann (2005) explained the connectivity index can be calculated as the frequency (i.e. number of calls between a pair of ports), capacity (i.e. number of passengers) and the concentration (i.e. number of companies) for a particular place. These connectivity factors - frequency, capacity and concentration also describe the island transport market and affect the island level of integration into coastal network (Lekakou and Vitsounis, 2011). Therefore, this Deliverable presents the analyzed data focusing on these connectivity factors, for the identified Mediterranean passenger ports.

Table 1: T&A Enabling Factors for the Coastal and Maritime Tourism Activities

		Marine Side		**Terrestrial Side**	
Transport Infrastructures	**Nodes**	Ports/Harbours and Passenger Terminals, Marinas		Airports, Railway stations, Bus stops and terminals	
	Networks	Shipping lanes and navigable waterways		Roads and Highways, Rail roads	
Transport Modes: Types of Vessels and Vehicles		Commercial usage/Public usage	Cruise Ships, Ro-Ro Passenger ferries, Water bus and water taxi	Commercial/ Public usage	Passenger planes, High Speed trains, train, bus, taxi
		Recreational/ Private usage	Motor boats, Sail boats and yachts	Private usage	Cars

Source: Authors’ elaboration

3. Transport and Tourism Relationship

Transport has been considered a key factor in the success of sustainable tourism development (Gossling et al., 2009; Page & Connell, 2009). Accessibility for a touristic destination in order to attract tourists largely depends on the availability and efficiency of transports needed to travel to that destination (Duval, 2007). In the contrary, the extent of influence of poor accessibility on destinations can discourage visitors from attempting to reach these places altogether (Dickinson and Dickinson, 2006). In rural areas, transport systems also lend themselves to a provision of access for tourism (Hall et al., 2005; Page and Ge, 2009) and rural transport may be characterized and driven by tourism requirements in regions where there is a high level of importance attributed to the revenue leisure visitors can bring to peripheral areas (Payet, 2010). This presents an argument to support increased attention on transport services in rural communities while the tourism market in urban areas has little influence on public transport, which is generally centered on the local population requirements (Thompson and Schofield's, 2007).

Economically, the opportunity for access and a fluidity of movement to and from an area are intrinsic to its sustainable growth, and mobility has a significant effect on a region's competitiveness and prosperity (Duval, 2007; Page, 2009). While isolation can be prohibitive to the movement of local people out of an area, it can also curb the arrival of visitors thus impacting upon the potential to develop a tourism market and in turn a source of local income (Payet, 2010). Efficient and regular inter-island transportation may foster increased multi-island trips and boost development among the insular regions (Bardolet and Sheldon, 2008).

Effective transport systems are fundamental to destination development and therefore the ability to generate sustainable visitor markets (Gossling et al., 2009; Page & Connell, 2009; Prideaux, 2000). Some would argue that they demonstrate the most important component of tourism since they facilitate the necessary movement of people (Currie and Falconer, 2013). The fluctuating relationship between transport systems and tourism markets is therefore reciprocal in nature since together they will reinforce and influence each other and the actions and effectiveness of one party will directly affect the other (Currie and Falconer, 2013).

Research dictates, tourist satisfaction can be greatly increased by the collaboration of services within a destination (Baggio et al., 2010; Butler, 2002) and more can be achieved when there is an integrated approach to destination management with a collaborative act by the stakeholders (Cawley & Gillmor, 2008; Hall & Lew, 2009). The inclination for tourists to incorporate a variety of components into their overall experience indicates that the quality of transportation and the ease with which it is undertaken will have a significant effect on the attractiveness of a destination thus promoting the argument for the evidential interest of a relationship between these two industries (Currie and Falconer, 2013).

Additionally, events and festivals can be commonly used to exemplify the collaboration between transport and tourism (Currie and Falconer, 2013). This is perhaps because they give stakeholders the opportunity to reflect on intensified situations where there would be a mutual dependency which is, an attraction or purpose for visiting (the event itself) and access provision in the form of transportation links required to attend the event (Currie and Falconer, 2013). However, transport operators are not always in a position to offer the desired flexibility to meet demands in terms of their capacity to deliver a supporting role (Currie and Falconer, 2013). As Currie and Falconer (2013) elaborated, whilst one operator may be in a position to supply additional provision, this does not guarantee a seamless consequence.

4. Impact of Transport Industry Consolidation

Industry consolidation can have an impact on mobility (Lekakou and Vitsounis, 2011). The structural distinction of the transport industry which is heavily influenced by public sector intervention contrasts with the complex network of independent Small and Medium-sized Enterprises (SMEs) that make up the tourism industry (Currie and Falconer, 2013). This was the case for the airlines industry in the United States, where reduced competition led to fare increases and reduced availability of access to services for the general public (Tam and Hansman, 2003). As a consequence, smaller, low-growth and low-demand markets were threatened when transport companies threatened the connectivity by abandoning several routes. The lack of competition in the industry means consumers endure higher prices and have poorer quality which lowers the accessibility (Lekakou and Vitsounis, 2011).

In the case of maritime transport, reduction in the number of companies and ship calls while raising transport cost per passenger impacts upon offered quantitative and qualitative features and even innovation (Vickers, 2005). While the air transport paradigm suggests that travelers in concentrated markets, with single-carrier domination, tend to pay higher fares (Goetz and Vowles, 2009), equivalent evidence from coastal shipping markets are largely absent in the international literature (Lekakou and Vitsounis, 2011).

5. The Insular Regions – Archipelago and Islands

Accessibility and the requirement of good transport links to reach remote regions are pivotal and reflect the feasibility of tourism development in archipelagos (Currie and Falconer, 2013). A reliance on transport is heightened in island areas since visitors are unable to reach these peripheral destinations by land (Currie and Falconer, 2013). Transport provisions tend to serve, first and foremost, the island communities who inhabit these regions thus they are a service critical not only to tourism but also for the sustainability of the local population (Currie and Falconer, 2013).

Efficient sea transport is a requirement for the social and economic development of archipelagos while air transport is much faster but more expensive (Luis, 2002). Because of the high cost of air travel, short sea shipping is the principal mode for achieving social and financial integration, both between the islands and with the outside world (Luis, 2002). However, inter-island mobility still does not provide relative territorial continuity because of the slowness of the vessels as well as the lack of timetable synchronization to provide optimum intermodality amongst three or more islands (Luis, 2002). Therefore improved modern transportation, in particular air transport is crucial for islands and archipelagos which are only accessible by air and sea (Bardolet and Sheldon, 2008).

Additionally, insular regions in general face a series of problems that undermine their accessibility to the mainland (Lekakou and Vitsounis, 2011). The barrier formed by the sea prevents the use of private vehicles except via Ro-Ro ferries and inter-island transport is restricted to only ships or aeroplanes (Luis, 2002). As the complications of the insular regions do not allow the possibility to “copy” a ready solution from other markets (Lekakou and Vitsounis, 2011), customized solutions may be more suitable. The greater the number of trips together with ship and air transport capacity, the greater accessibility will be between the nodes on the different islands (Luis, 2002). Even so this will also depend on timetable planning that may or may not facilitate intermodality with land transport together with an adequate availability of time at a destination (Luis, 2002).

Mainland inhabitants can always fall back on the alternative of private transport when the public service is deficient or does not supply their needs (Luis, 2002). In an archipelago, as there is no private road transport alternative for reaching another island and the planning of the timetable, availability of seats and the possibility of being able to travel at a certain time are of vital importance (Lutter et a l., 1992; Hernandez, 1996; Cozar et al., 1998). Therefore, visitors will be mainly reliant on public transport services in order to reach their destinations, thus raising the bar for transport element within the tourism agenda (Currie and Falconer, 2013).

As in other archipelagos in developed countries, the tendency over the last few years has been to de-centralize shipping routes that have traditionally been concentrated on each island’s main ‘capital’ city (Knowles, 1996). This allowed improved temporal accessibility since the average speed by road is greater than the 20 knots or less of a conventional ship (Luis, 2002). Accessibility is undoubtedly improved although the pressure on the roads is increased by taking into account that one ferry ship can carry nearly 250 cars (Luis, 2002). This aggravates the traffic problem on land and particularly at certain times of the day (Luis, 2002), such as coinciding with the local traffic during the morning rush hour.

One of the main requirements for adequate territorial integration in archipelagos is the level of temporal accessibility between islands (Luis, 2002) as the timing plays an important role (Luis, 2002). Taking this into consideration, the availability of time, usually in one day, for undertaking any activity in a specific place on an island visited may easily become a problem of economic accessibility (Luis, 2002). This is because if the return trip cannot be completed by ferry within one day, the costs increase considerably by either having to use air transport, if available, or having to pay for a hotel room and losing part of the next working day (Luis, 2002).

6. Passenger Intermodality

Within the scope of Task 3.11, the following definitions for intermodal transport, provided by the European research projects and studies, have been used as guidance:

a) **Definition of more technical dimension –** A route of an individual passenger or goods unit consisting of a combined chain from origin to destination involving at least two different modes, excluding walk for passengers (SORT-IT 1999).

b) **Definition oriented to quality of service offered to the user –** Passenger inter-modality is a policy and planning principle that aims to provide a passenger, using different modes of transport in a combined trip chain, with a seamless journey (Towards Passenger Intermodality in the EU 2004, LINK 2007-2010, KITE 2007-2008).

Although the first definition excludes walking as one of the transport modes of intermodal travel, it is wrong to dismiss walking wholly (Stupalo et al., 2013). Towards Passenger Intermodality in the EU (2004) study analyzed walking as transfer from home to urban public transport stops, from interchanges to physical destinations and the aspects of walking around interchanges.

Change of transport, by changing transport mode, or even change of transport between the same modes of transport, represent a discomfort for the passenger, especially for the passengers with reduced mobility, passengers traveling with heavy baggage and for the passengers traveling for the first time specially if they don't know the language needed (Stupalo et al., 2013). Also changes to service provision within an intermodal transport chain could have a negative impact upon a variety of links making the slightest adjustment disruptive to the interconnectivity of services (Currie and Falconer, 2013).

7. Data Mining Methods

The T&A land-sea interaction and trans-boundary relevance has been taken into consideration in order to identify and analyze the coastal and marine touristic T&A enabling factors in a Mediterranean scale. Therefore, passenger ports, further categorized into cruise and ferry ports, served as the baseline for the data mining process as the land-sea interface points (Ryckbost et al., 2016). Additionally, emphasize had been given on the transport nodes (e.g. passenger ports, airports, bus or train stations) rather than on the interlinking transport networks (e.g. roads, motor ways, shipping lanes or railway tracks).

According to the WP3 guideline, the spatial scope of the data acquisition had been focused on the entire Mediterranean by including the non-EU Mediterranean countries in parallel to the EU Member States, on the basis of data availability.

7.1 Identifying the Cruise Ports

Based on the latest available sources, the cruise ports had been identified from the member list of the MedCruise, the Association for the Mediterranean Cruise Ports. Although they represent the entire Mediterranean area, they are an underestimate as the relatively fewer non MedCruise Member Ports had not been taken into account (Pallis et al., 2016a). However, the MedCruise Member Ports represent more than 80% of the cruise activities per country and therefore, provides meaningful insights on the trends (Pallis et al., 2016a). Based on the United Nations Code for Trade and Transport Locations (LOCODE), these ports had been mapped by digitizing and where appropriate, by merging with the ports listed by the European Marine Observation and Data Network (EMODnet).

7.2 Identifying the Passenger Ferry Ports

The ferry ports had been identified from the Ferrylines, a global comprehensive ferry portal and mapped in a similar way as the Cruise Ports, which has been explained in section 7.1. In order to analyze the current growth trend of the top ferry passenger ports (i.e. non-cruise passengers) and individual Mediterranean countries, relevant open access data from the EUROSTAT and European Sea Ports Organization (ESPO) had been collected. While EUROSTAT relies on data feed from the National Competent Authorities, the source of ESPO data are the Port Authorities themselves. Despite the fact that sea passenger transport by ferries is a worldwide phenomenon involving also the vehicles, relevant information are less official in nature (Adriatic Sea Tourism Report, 2017). Therefore, a Mediterranean Basin-wide analysis includes the future development and seasonality trends only for the Adriatic Region.

7.3 Identifying the Airports

Open access online data sources such as the Google Maps, Trip Advisor and individual Airport websites had been consulted to identify the airports located in the nearest distance from the cruise ports, which are giving access to the Mediterranean coastal touristic sites of interest. Various passenger and flight analysis had been carried out for the main airports from the EUROSTAT data. Additionally, as part of the data request survey conducted among the CO-EVOLVE partners, the feedback from the Valencia Port Foundation had been integrated for identifying the Spanish airports.

7.4 Identifying Port Infrastructure and Hinterland Accessibility

For many tourists, the port means the start of a holiday and an essential part of their travelling experience (Ryckbost et al., 2016). Therefore, the hinterland accessibility from the identified passenger ports and airports had been further investigated by giving attention to the accessibility provisions for other transport nodes and touristic site of interest. These include the distance to the city center and the nearest intercity train station or bus terminal through the availability of taxi service, car rentals, shuttle service, city public transport modes (e.g. city bus, tram, metro, train, water bus) and car parking for private vehicles.

Data on T&A features for the cruise ports and their hinterland accessibility had been primarily collected from the statistical reports published by the MedCruise, which are a compilation of data provided by its individual Member Port Authorities and/or Cruise Terminal Operators. Other supplementary open data sources had been the European Sea Ports Organization (ESPO) and Global Ports Holding, which is the world's largest cruise port operator with an established presence in the Mediterranean.

Concerning the hinterland accessibility from the airports and in order to bridge the data gaps, open access data from the Google Maps had been consulted to identify the distances, transport modes and infrastructures.

7.5 Identifying the Marinas for Recreational Boating

Considering the synergies with the Recreational Boating tourism and based on the availability of reliable information, data on locations and numbers of the marinas including the numbers of berthing capacities providing accessibility to the recreational boaters had been collected for the Adriatic Region only. The locations had been mapped from the ADRIPLAN project findings and an Adriatic Regional Area-wide statistical data analysis had been carried out by reviewing Adriatic Sea Tourism Report (2017), which conducted an ad-hoc research for updating a comprehensive database on the numbers of marinas and berths in 2017. Statistical data from surveys conducted as part of their research process had been recorded in Adriatic Sea Tourism Report (2017) from sixty five out of 331 marinas, representing 19.3% of all active operators.

7.6 Added Value: Pilot Area Scale Analysis

Primary data on Pilot Area (hereinafter PA) accessibility from various transport nodes had been collected through a data request survey conducted among the PA Coordinators. In order to bridge the data gaps, additional data had been collected from open access online sources (e.g. Google Maps).

8. State of the Art: Mediterranean Scale Analysis

T&A data collected in a Mediterranean scale during the study phase had been analyzed and a consolidated list of key findings has been presented in this deliverable. The Mediterranean Country-wide and Regional (East and West Mediterranean) cruise ports' analysis may include statistical data for the Atlantic cruise ports of Portugal (Azores, Madeira, Lisbon and Portofino), Spain (Canary Islands and Huelva) and Turkish Black Sea port (Trabzon).

8.1 Cruise Ports

Mediterranean is the world's second biggest cruise region and 16% of the global cruise ships deployment is hosted by her ports (Pallis et al., 2016b). The Mediterranean also accounts for the most cruise passenger visits within Europe (Ryckbost et al., 2016). As the cruise industry in Europe is mainly destination-led, the leading cruise ports are often regarded as "must-see" destinations due to their touristic attractiveness (Ryckbost et al., 2016). Other ports can also become attractive because of their strategic position or easy accessibility through well connected airports (Ryckbost et al., 2016). However, despite huge developments in port facilities, the destination and the geopolitical situation remain the prime driver in the cruise passenger's buying decision (Ryckbost et al., 2016).

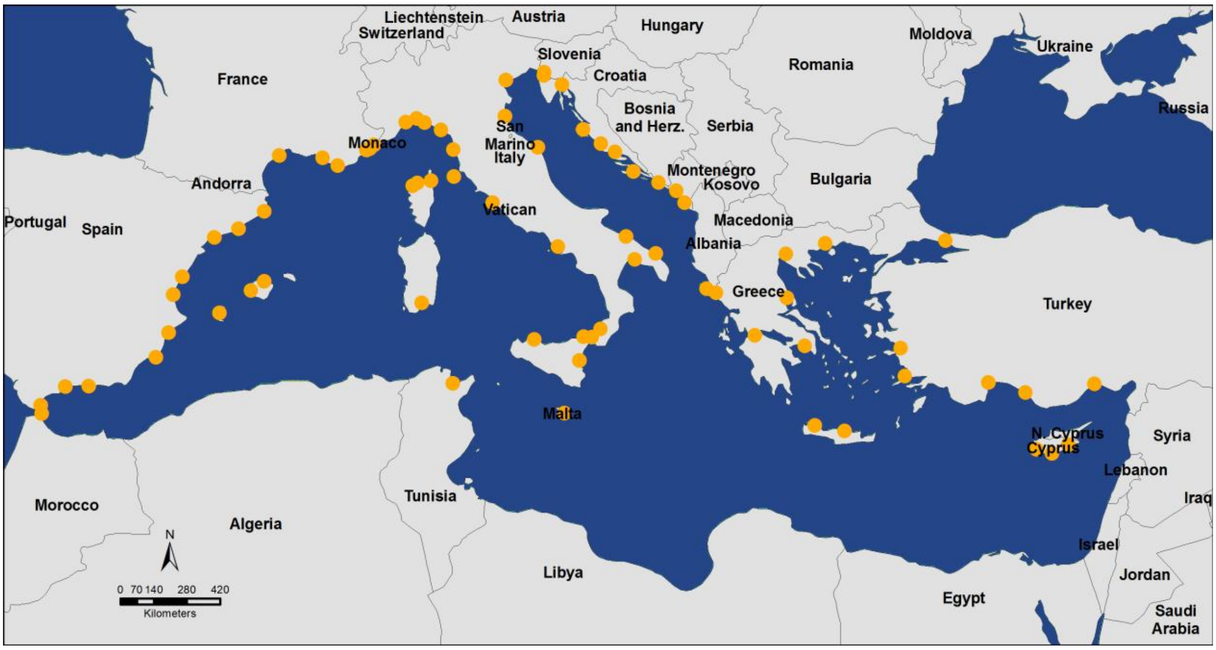

Figure 1: 79 Identified Cruise Ports with Nearest Airport and Hinterland Accessibility
Source: Elaborated through extracted data from EMODnet and MedCruise (2017)

8.1.1 Basin-wide Analysis

The shares on the cruise passenger numbers recorded by the ports dictates the West Med Region as the largest cruise region within the Mediterranean as it welcomed more than half of the total passenger movements (72.1%) in 2015, which is almost nineteen million passengers (Pallis et al., 2016a). Adriatic Region follows the lead (16.5%) with more than five million passengers (Adriatic Sea Tourism Report, 2017). Similar trend applies for the cruise calls and in both cases, the East Mediterranean Region recorded the least shares.

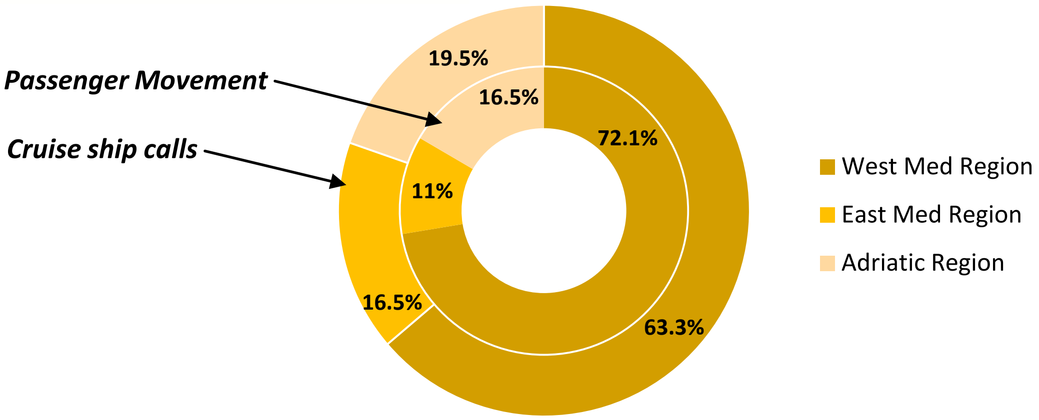

Figure 2: Mediterranean Basin-Wide Cruise Passenger Movement and Calls in 2015
Source: Elaborated through extracted data from Pallis et al. (2016a)

The West Med Region ports also show the highest growth in cruise passenger movements with no declining trend. While ports from the Adriatic Region demonstrate an annual decline (-1.47%) in 2015 with an overall increase (9.72%) in a five yearly timeline, the East Med Region registers an annual increase (0.73%) in 2015 with a five yearly overall declining trend (-1.91%).

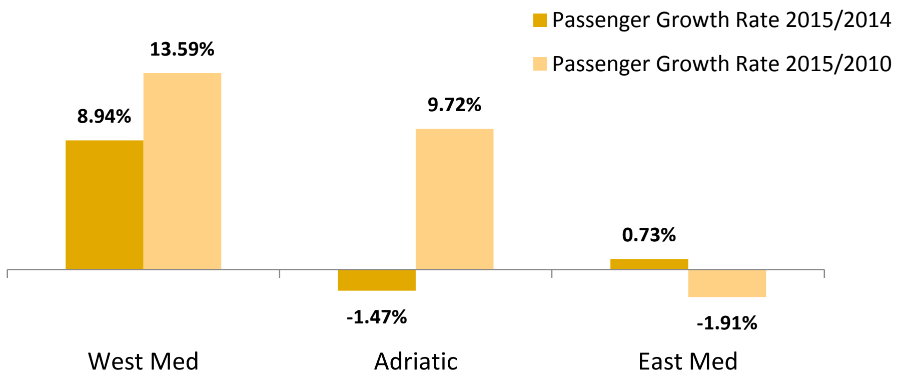

Figure 3: Mediterranean Basin-wide Cruise Passenger Growth
Source: Elaborated through extracted data from Pallis et al. (2016a)

Analysis on the major cruise ports per region suggests the top West Med ports are hosting significantly higher number of passengers with two ports exceeding two million ceiling in 2015. In the Adriatic, only Venice hosted more than one and a half million passengers in 2015 as the top regional cruise port.

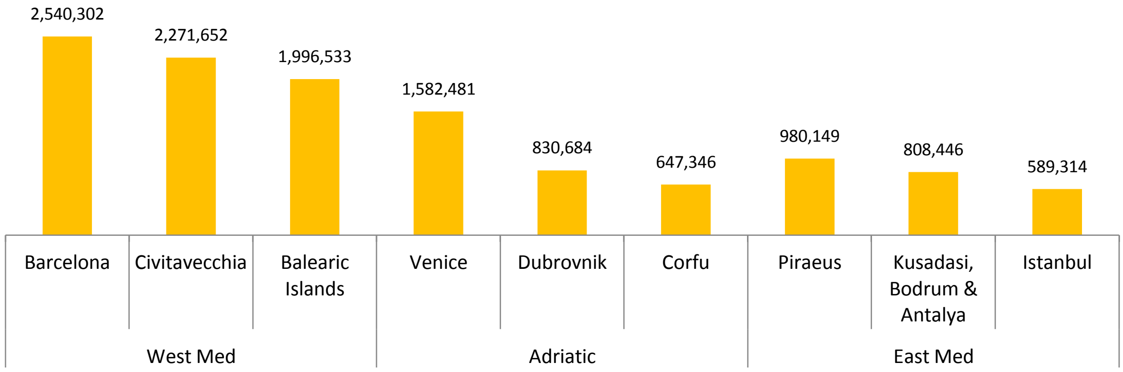

Figure 4: Mediterranean Basin-wide Major Cruise Ports in terms of Passenger Numbers in 2015
Source: Elaborated through extracted data from Pallis et al. (2016a)

The top three West Med cruise ports in terms of the number of passengers handled also maintain their ranks as the main regional ports considering the cruise ship visits or calls in 2015. In the Adriatic, Venice maintains the top position also in terms of the cruise calls. While in the East Med Region, Turkish ports Kusadasi, Bodrum and Antalya collectively gains the top position (660 calls); Greek port Piraeus independently recorded 621 cruise calls in 2015.

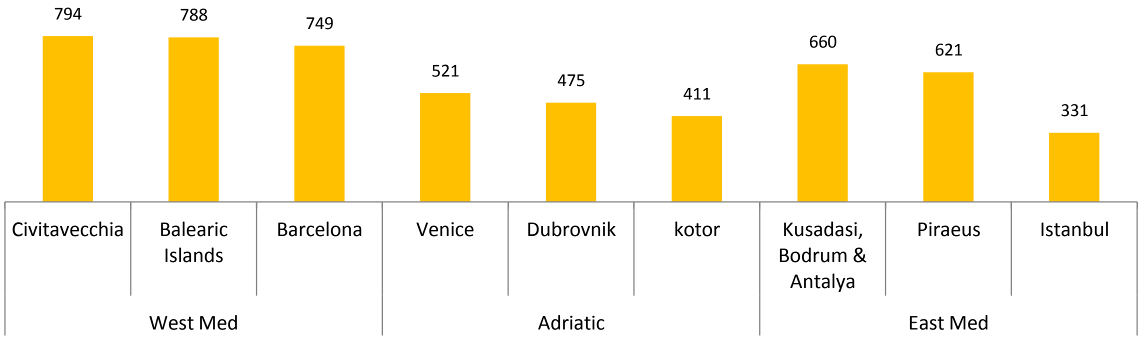

Figure 5: Mediterranean Basin-wide Major Cruise Ports in terms of Cruise Ship Calls in 2015
Source: Elaborated through extracted data from Pallis et al. (2016a)

8.1.2 Growth Analysis

The identified cruise ports have observed a progression from almost 8.6 million passenger movements in 2000 to over 27 million in 2015 and since the last 10 years, a 72.3% rise in cruise passenger movements (Pallis et al., 2016b). In 2016, Mediterranean cruise ports welcomed more than 34 million cruise passengers, which includes the non MedCruise Member Ports as well (Adriatic Sea Tourism Report, 2017). While Barcelona is the top Mediterranean cruise port in terms of passengers handled, it is also the European leader (MedCruise, 2017).

Among the top ten ports, while Spanish Balearic Island ports recorded the biggest annual growth (25.80%) in 2015, Venice being a major cruise port, recorded the major annual decline (-8.73%). With Marseille registering remarkably high five yearly growth (107.23%); Barcelona, Civitavecchia, Naples and Tenerife continued to register both annual and a five yearly positive growth trend. In the declining trend of the top ports, Greek port Piraeus shows considerable declines in cruise passenger movements.

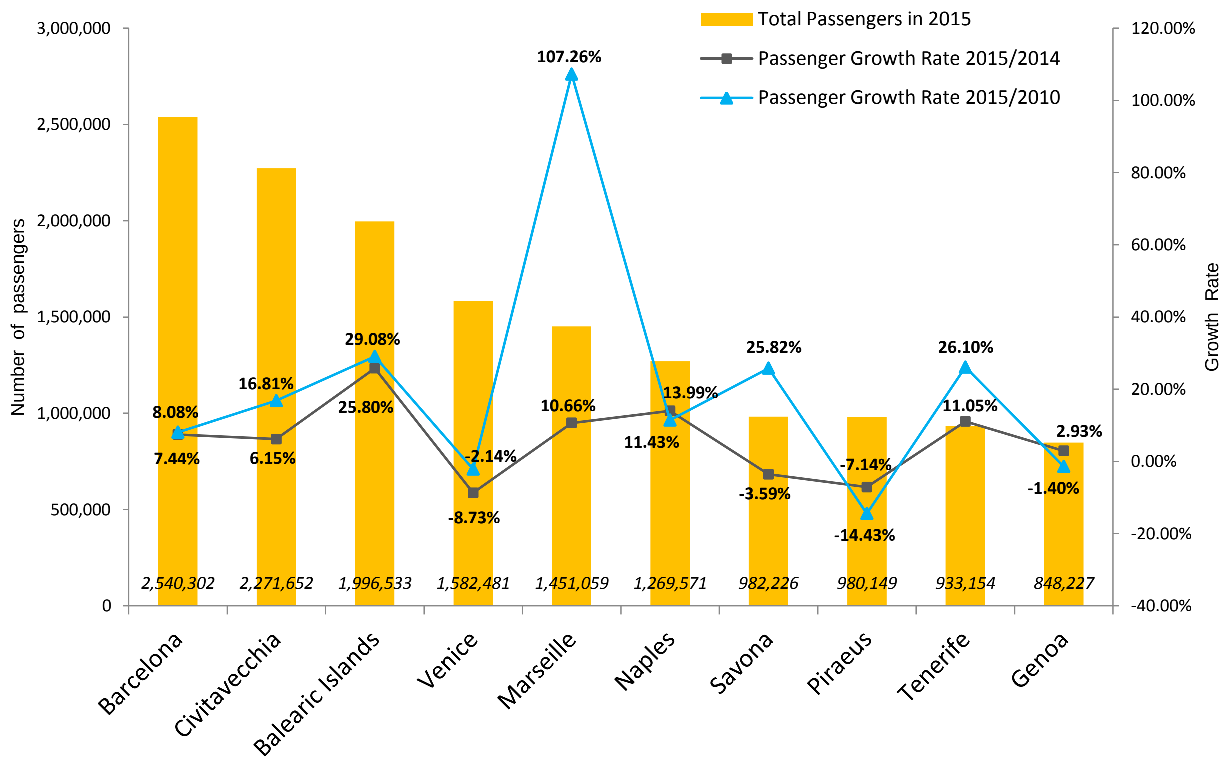

Figure 6: Top Ten Cruise Ports in terms of Number of Passengers in 2015 with Growth Rates

Source: Elaborated through extracted data from Pallis et al. (2016a)

Analysis of the annual and five yearly most remarkable growths in terms of the number of passengers dictates remarkable positive growth has been achieved by the ports which are not ranked among the top ten positions (Figure 3). The trend also shows observed positive growth are far greater than the recorded negative growths. This indicates an overall growth in cruise tourism and cruise passenger movements in the Mediterranean.

Figure 7: Major Annual (a) and Five Yearly (b) Variations on Total Passengers Hosted in 2015
Source: Elaborated through extracted data from Pallis et al. (2016a)

While a higher number of total cruise calls can be expected to result in a higher number of passengers hosted by a port and vice versa, this does not necessarily imply when the sizes of the ships are taken into consideration (Pallis et al., 2016a). Barcelona being the top Med cruise port in terms of number of passengers (Figure 6), shows a decline for both annual and five yearly growth rates for calls (Figure 8). This suggests, relatively bigger cruise ships of the latest generation are calling the port of Barcelona with a higher passenger carrying capacity. Based on the number of cruise ship calls in 2015, Marseille shows remarkable five yearly growth (31.94%) followed by the Spanish port Tenerife (30.75%), although both recorded a decline in annual growth. Venice being the Top Adriatic cruise port registers a positive trend in annual cruise calls (6.76%), Dubrovnik registers the highest negative growth in both annual (-36.84%) and five yearly (-32.62%) timeline. The declining trends for calls may also be a result of larger cruise ship deployments (Pallis et al., 2016a).

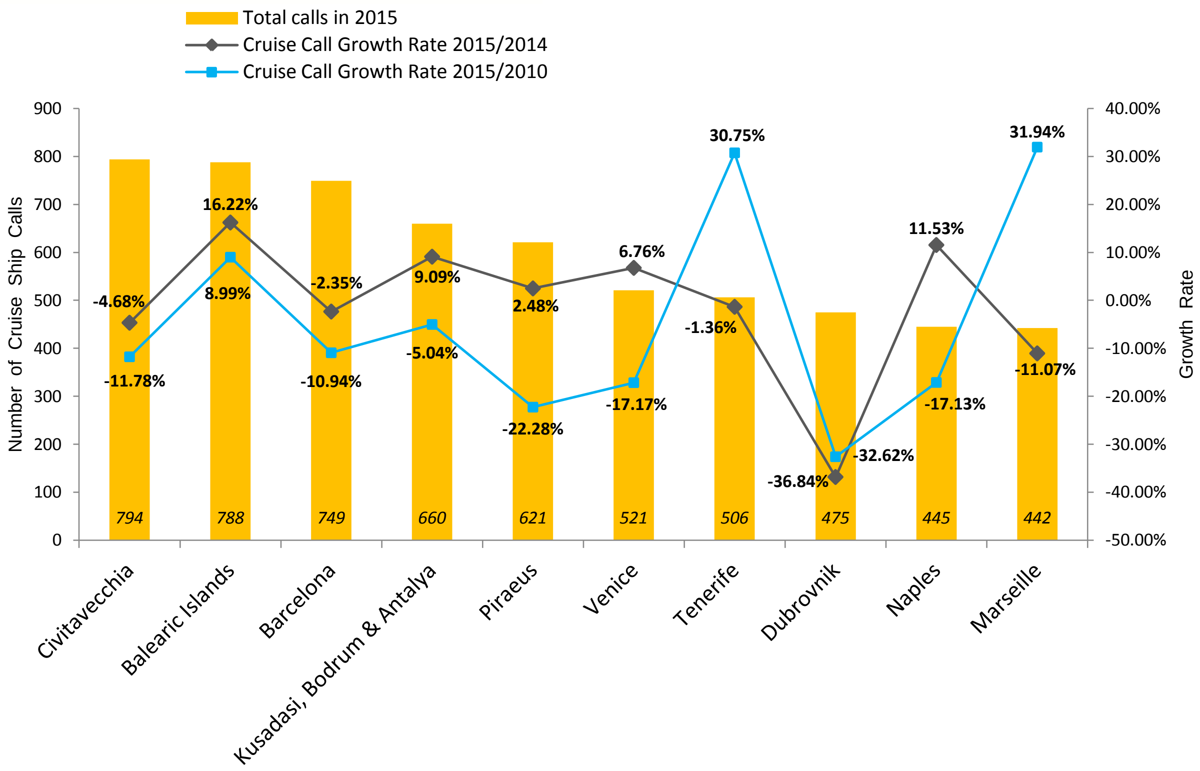

Figure 8: Top Ten Med Cruise Ports in terms of Cruise Calls with Annual and Five Yearly Growths
Source: Elaborated through extracted data from Pallis et al. (2016a)

A growth analysis has been carried out as well for the most remarkable positive and negative changes. This result shows that the smaller cruise ports are achieving tremendous growth comparing to the larger ports, both in annual and a five yearly span as of in 2015. Considering the records of increasing and decreasing trends, again the data dictates the positive growth in calls is higher than the lowest negative growth achieved.

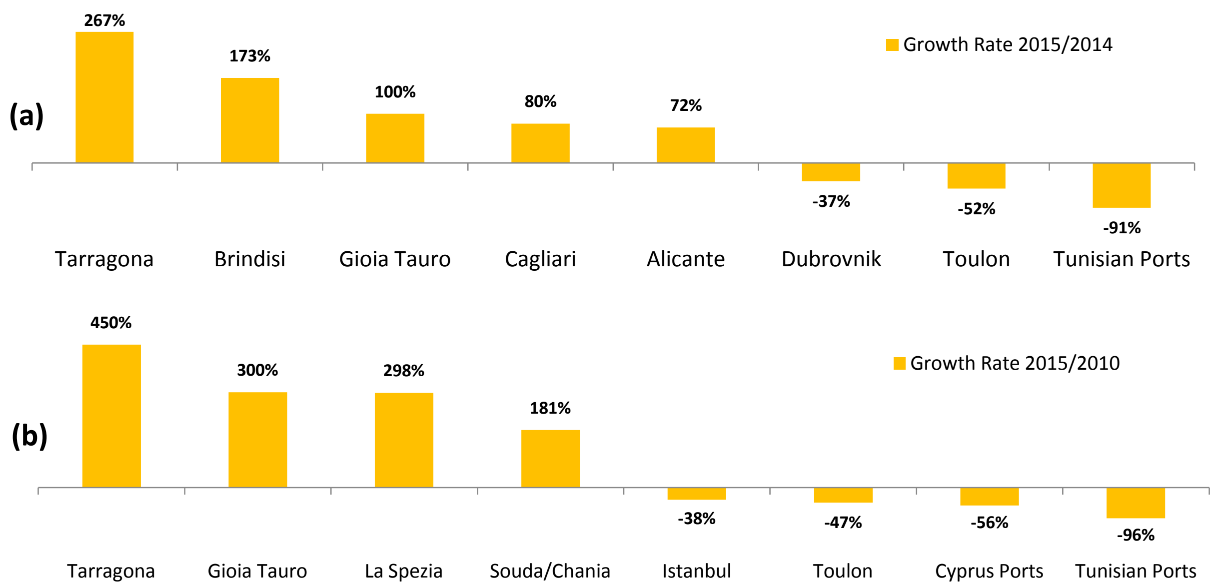

Figure 9: Major Annual (a) and Five Yearly (b) Variations on Cruise Calls in 2015
Source: Elaborated through extracted data from Pallis et al. (2016a)

8.1.3 Country-wide Analysis

Italy ranks first in the Mediterranean by hosting more than ten million cruise passengers in 2015. Montenegro ranking the eighth position, shows the largest annual (42.90%) and five yearly (204.46%) growths in 2015. Hosting more than six million cruise passengers and being second in the list, Spain shows a higher annual growth (12.92%) than Italy (6.30%). While Tunisia and Greece recorded a declining trend; Italy, Spain, Croatia and Turkey continue to register a steady positive overall growth.

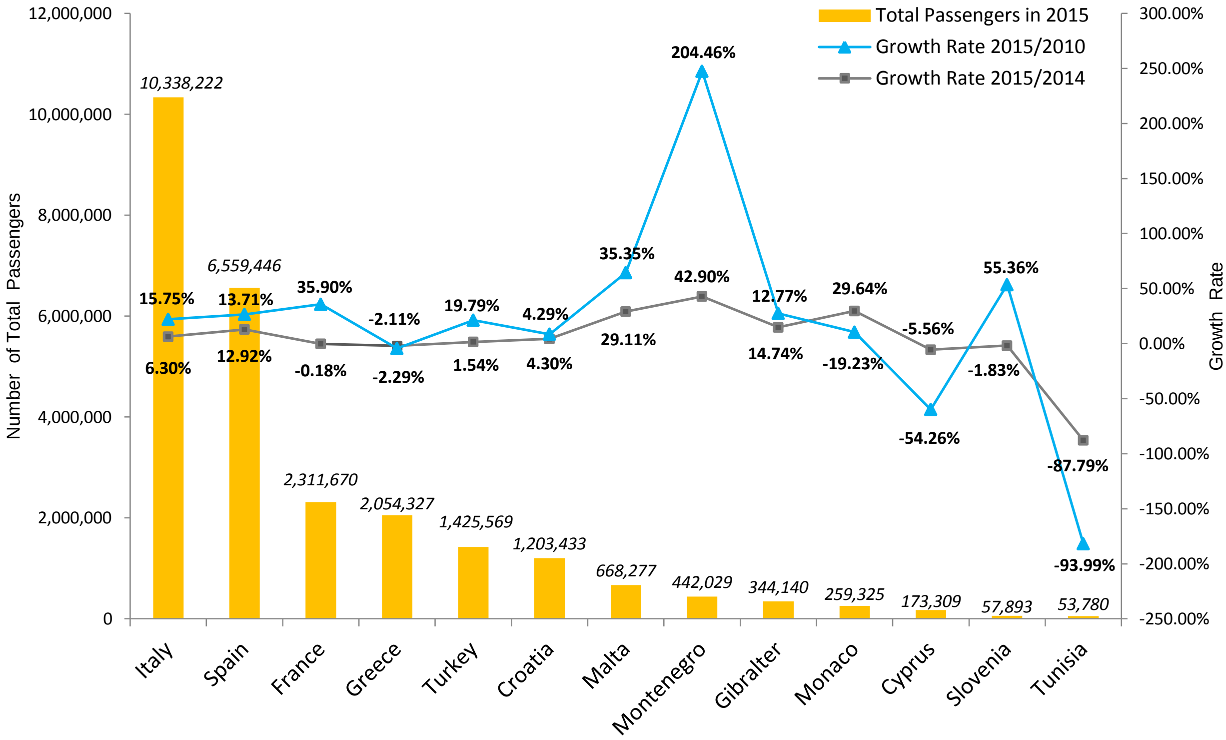

Figure 10: Country-wide Cruise Passenger Movements in 2015 with Annual and Five Yearly Growths
Source: Elaborated through extracted data from Pallis et al. (2016a)

According to the figures published by the Maltese National Statistics Office (NSO), 2016 was a record year with a total 682,222 cruise passengers visiting Malta, indicating an increase of 2% growth from 2015. With the Italian (38%) and Spanish (24.11%) ports being at the forefront in hosting the cruise passengers, other countries' share in welcoming the cruise passengers collectively contributes to the overall cruise tourism growth in the Mediterranean.

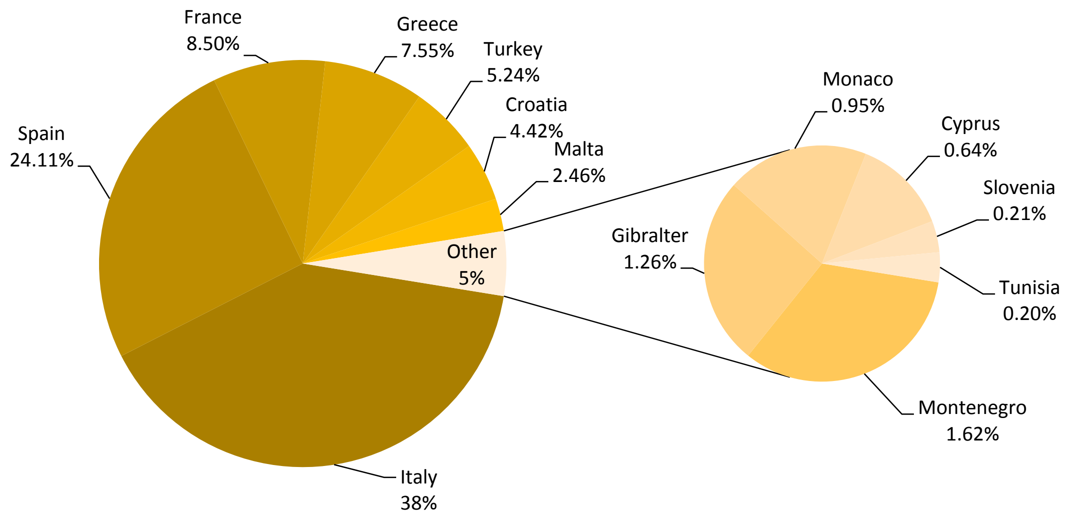

Figure 11: Share of Cruise Passengers per Mediterranean Country in 2015

Source: Elaborated through extracted data from Pallis et al. (2016a)

Concerning the cruise calls, Italy also leads the Mediterranean with more than three thousand calls in 2015, followed by Spain (2,695) and Greece (1,380). Although Greece recorded an annual growth (4.23%) in 2015, it experienced a declining trend comparing to 2010. While Montenegro lags the Greek, French and Croatian ports in terms of the number of calls, it achieved the highest five yearly growth rates (33.01%). France and Croatia registered a declining trend in both annual and five yearly time span in 2015. Whereas, Cyprus and Tunisia recorded a remarkable decline in cruise ship visits among their ports.

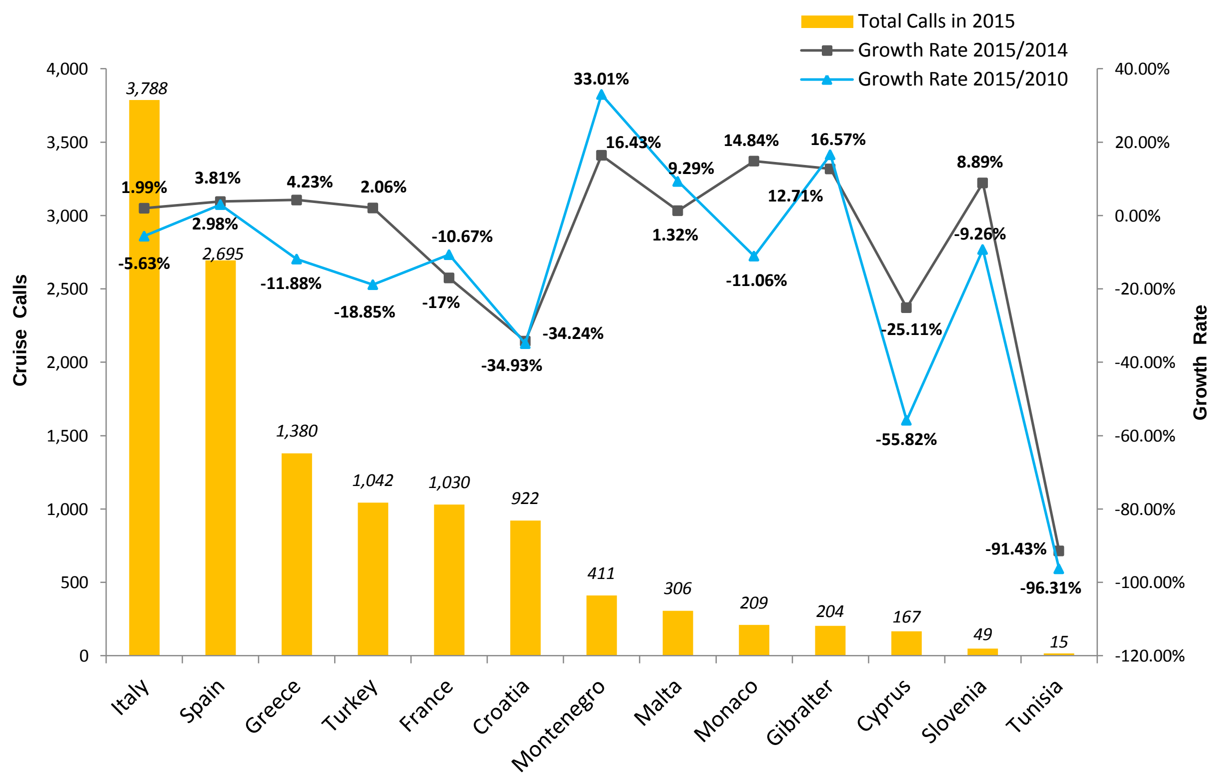

Figure 12: Country-wide Cruise Ship Calls in 2015 with Annual and Five Yearly Growth

Source: Elaborated through extracted data from Pallis et al. (2016a)

The share of the cruise calls by each Mediterranean Country represents the relative number of the cruise ships hosted by their ports. Italy (28.96%) and Spain (20.60%) continue to maintain their top share in hosting the cruise ships similar to their shares in hosting the passengers. While French Mediterranean ports secured the third top share in hosting the cruise passengers (Figure 11), in terms of the share of the cruise calls, they are led by the Greek and Turkish ports.

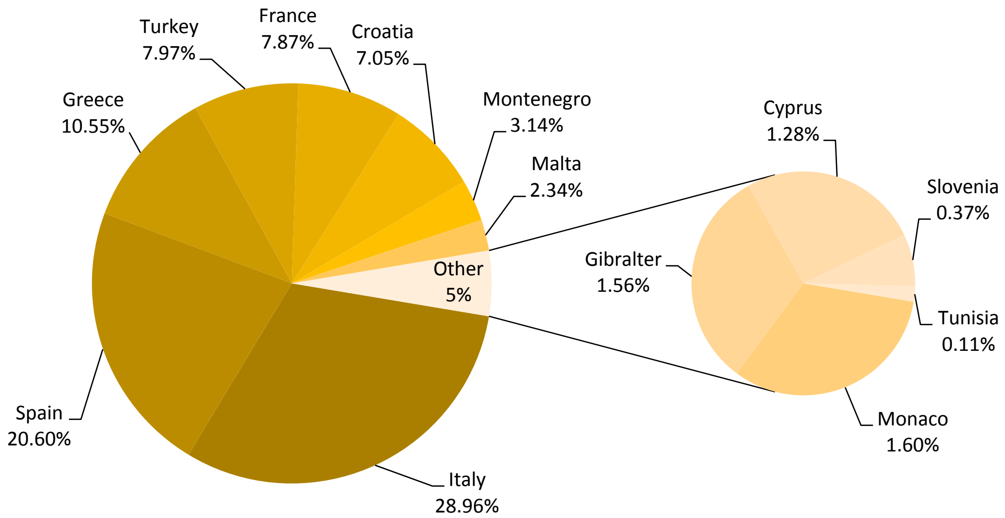

Figure 13: Share of Cruise Calls per Mediterranean Country in 2015
Source: Elaborated through extracted data from Pallis et al. (2016a)

Analyzing the Mediterranean Country-wide numbers of hosted cruise passengers to the number of the cruise calls suggests an overall proportional relationship between these two factors. The countries with higher passenger records also registered relatively higher number of cruise calls and vice-versa. However, the records for Greece and Montenegro show a relatively higher number of cruise calls against the number of passengers which indicates relatively smaller ships calling their ports.

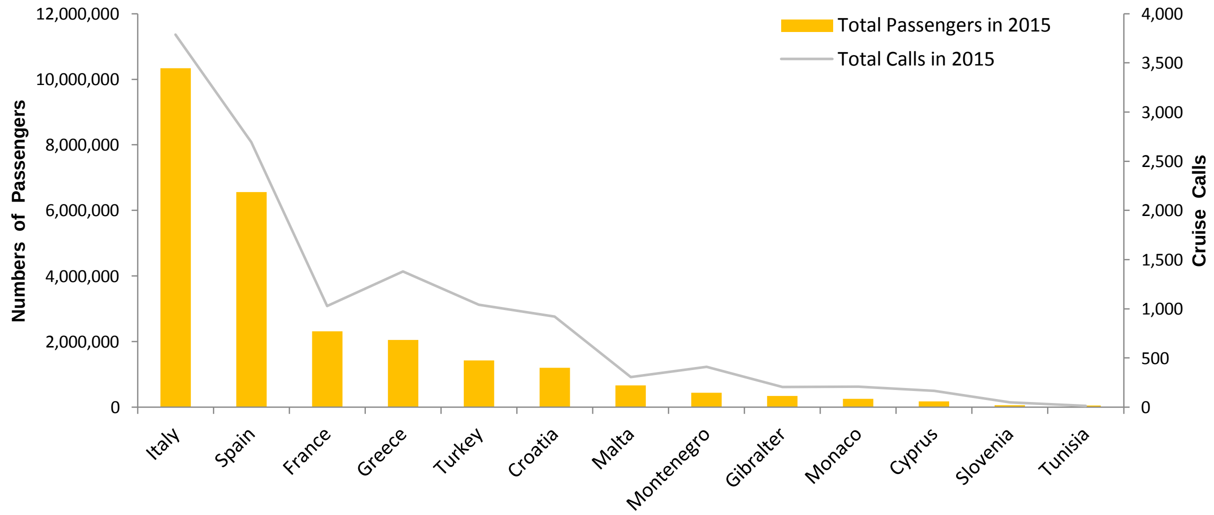

Figure 14: Country-wide Relationship between the Number of Cruise Passengers and Cruise Calls
Source: Elaborated through extracted data from Pallis et al. (2016a)

8.1.4 Cruise Ports by Types Analysis

The types of the cruise ports had been identified based on the way they host the passengers. As defined by the ESPO Code of Good Practices for Cruise and Ferry Ports, 'Turnaround porting', also known as 'Homeporting' by the cruise industry, is when a cruise liner starts and finishes its voyage/itinerary at the same port meaning the same passengers visit the port city twice. While 'Transit porting' is when a cruise ship visits a port as a part of its itinerary and the passengers visit the port city once as part of their shore excursion. The Cruise Lines International Association (CLIA) facts suggest, cruise passengers spent an average of 81€ at embarkation port cities and spent another 62€ at each port visit on their cruise itinerary (Ryckbost et al., 2016).

Inter-porting is another cruise tourism term in practice. This is when a cruise ship welcomes new passengers from another port apart from its turnaround port and the new passengers finish their trip at the same port from where they embarked. Most of the Mediterranean cruise ports operate both as a transit and turnaround port (53.5%). While there is also a large number of ports offer only transit services to the ships and passengers (43.6%), some of them also offer inter-porting. This indicates a mutual cooperative and competitive trend among the Mediterranean cruise ports and a continual thrive to provide better amenity and hinterland connectivity to the cruise passengers.

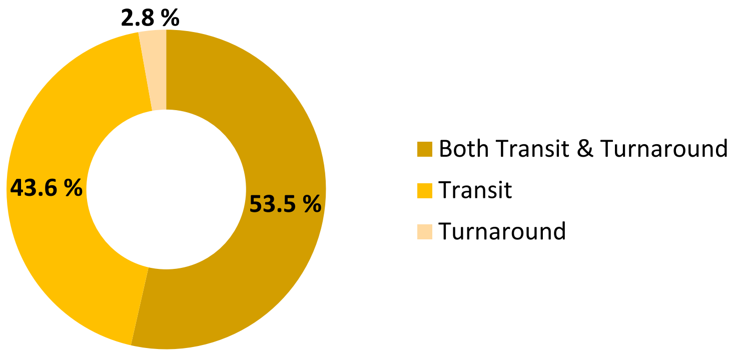

Figure 15: Types of the Identified Cruise Ports in the Mediterranean
Source: Elaborated through extracted data from Pallis et al. (2016b)

Venice is the top turnaround port in the entire Mediterranean, closely followed by Barcelona (Pallis et al., 2016a). With over one million turnaround passengers, Barcelona is also the fourth largest turnaround port in the world (MedCruise, 2017). Istanbul registers the most impressive five yearly growth (120.37%) in terms of hosting passengers for homeporting, followed by Marseille (87.49%). As the most negative five yearly growth has been observed in Piraeus (-33.30%), the difficult Greek economic and social conditions seems relevant for this record (Pallis et al., 2016a).

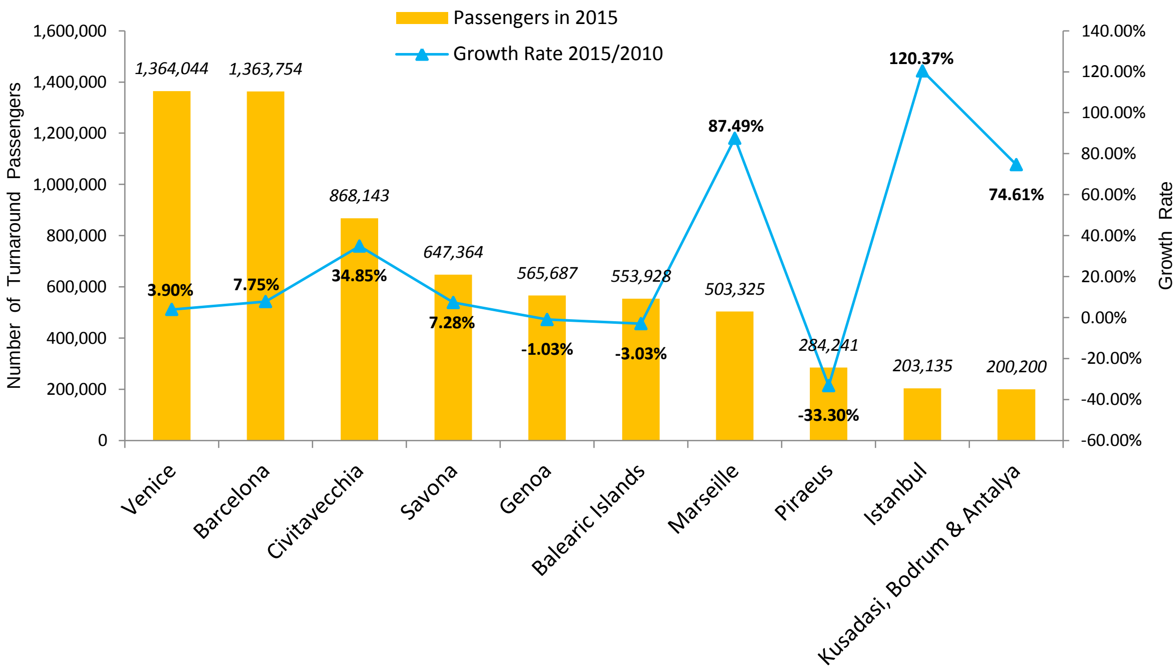

Figure 16: Top Ten Turnaround Med Cruise Ports in 2015 with Five Yearly Growth Rate
Source: Elaborated through extracted data from Pallis et al. (2016a)

Valletta not being among the top Mediterranean turnaround ports, shows remarkable growth (379%) in a five yearly scale. Additionally, since 2010 to 2015, Italian cruise ports La Spezia, Brindisi and Caglieri established themselves as new turnaround ports and therefore, theoretically possessing the highest growth rates (Pallis et al., 2016a).

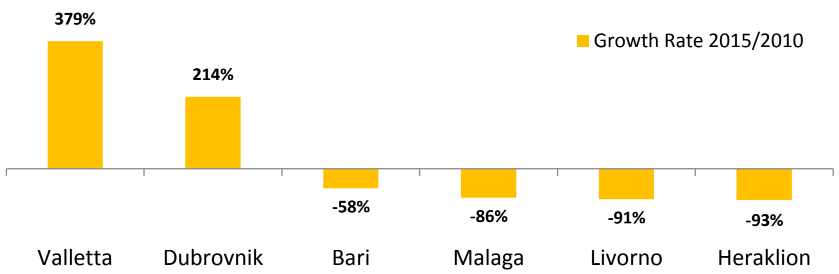

Figure 17: Major Five Yearly Variations of the Turnaround Ports in 2015
Source: Elaborated through extracted data from Pallis et al. (2016a)

A basin-wide analysis on the main turnmaround ports suggests Barcelona and Civitavecchia maintaining their position within the West Med Region, while Venice tops in the Adriatic. Although the Greek port Piraeus tops the list for the East Med, the number of turnaround passengers embarking or disembarking is much fewer than the West Mediterranean main ports and Venice from the Adriatic.

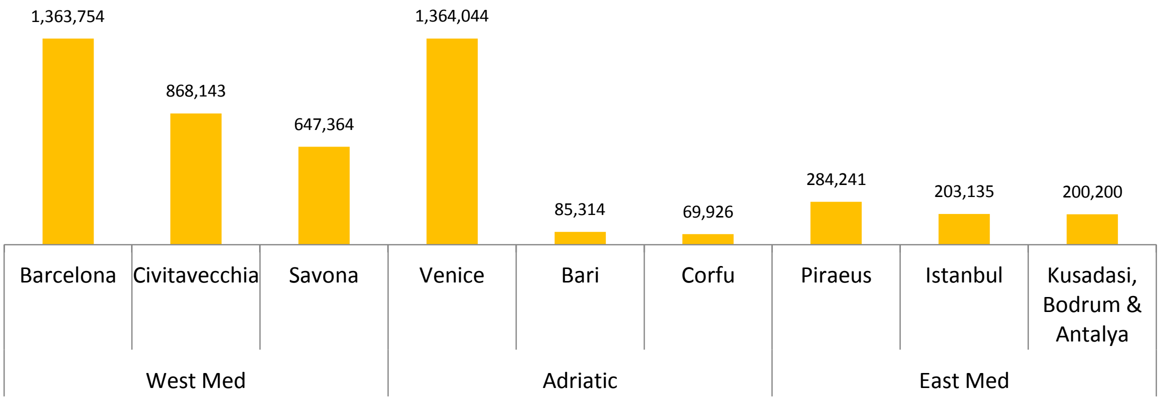

Figure 18: Med Basin-wide Major Turnaround Ports in terms of Passenger Numbers in 2015

Source: Elaborated through extracted data from Pallis et al. (2016a)

While the Spanish Balearic Island Ports recorded the highest number of transit passengers in 2015, Marseille shows the highest growth (119.56%) in hosting transit passengers over a five year span. Naples (17.21%) and collectively some of the Turkish Ports (11.06%) show a notable positive growth in transit passenger movements between 2010 and 2015. Dubrovnik recorded a major decline (-16.07%) which may be as a result of the declining trend in cruise calls for this port (Figure 8).

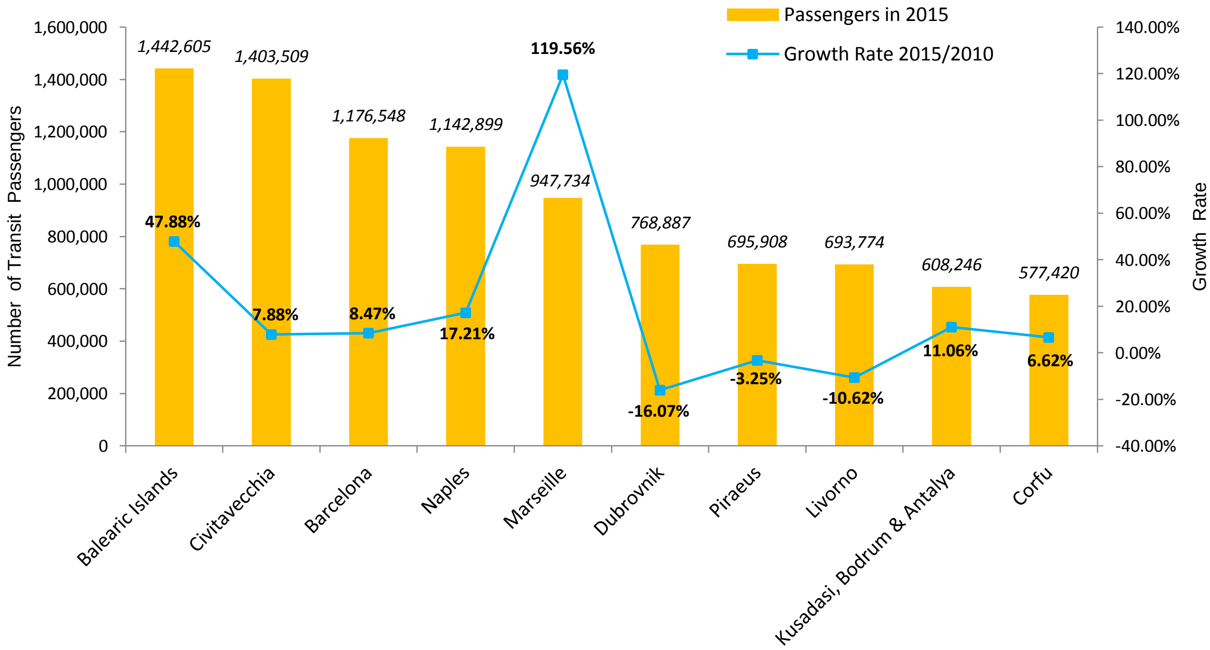

Figure 19: Top Ten Transit Cruise Ports in 2015 with Five Yearly Growth Rate

Source: Elaborated through extracted data from Pallis et al. (2016a)

Similar to the growth rate of the turnaround ports, the transit ports which are not ranked among the top ten list, show remarkable growth. Gioia Tauro (2211%) and La Spezia recorded (1387%) an outstanding growth in hosting transit passengers over the five years time span. Whereas the Tunisian Ports (-93.99%) experienced the highest decline followed by the Cypriot ports (-54.26%). Again the analysis shows the positive growths achieved by the Mediterranean ports are far greater than the most negative growth being recorded.

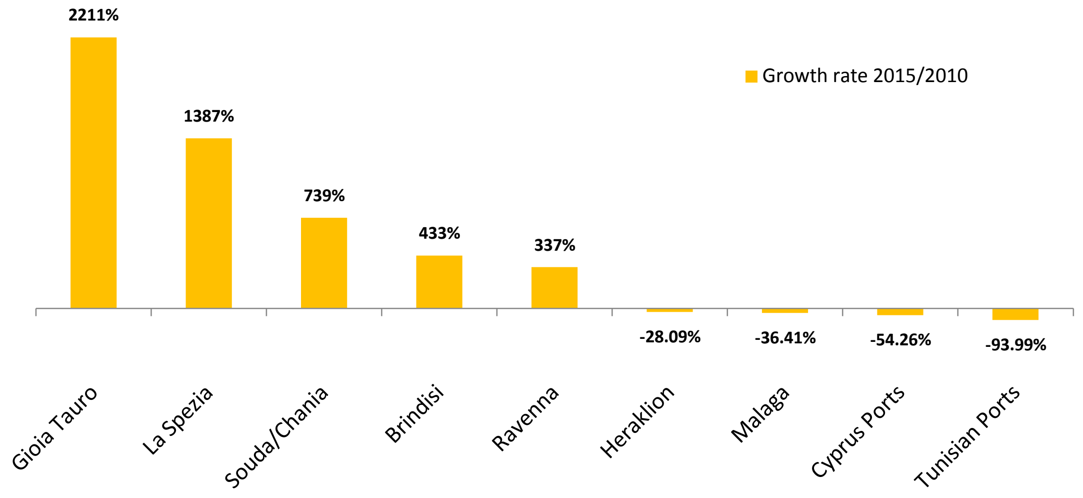

Figure 20: Major Five Yearly Variations of the Transit Ports in 2015

Source: Elaborated through extracted data from Pallis et al. (2016a)

Considering the basin-wide analysis of the main transit ports, Barcelona and Civitavecchia holds their position within the top three ports in the West Med, led by the Balearic Islands ports. While Dubrovnik tops the list for the Adriatic transit ports, the East Med top transit ports are the same as for the turnaround ports (Figure 18).

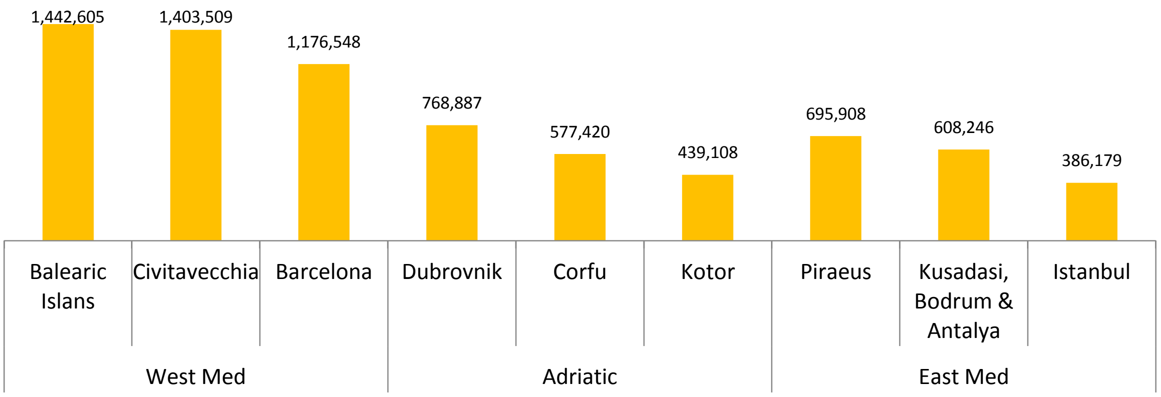

Figure 21: Med Basin-wide Major Transit Ports in terms of Passenger Numbers in 2015

Source: Elaborated through extracted data from Pallis et al. (2016a)

The West Med Region also accounts for the largest number of the transit and turnaround passengers intended for a Mediterranean cruise experience, followed by the Adriatic Region.

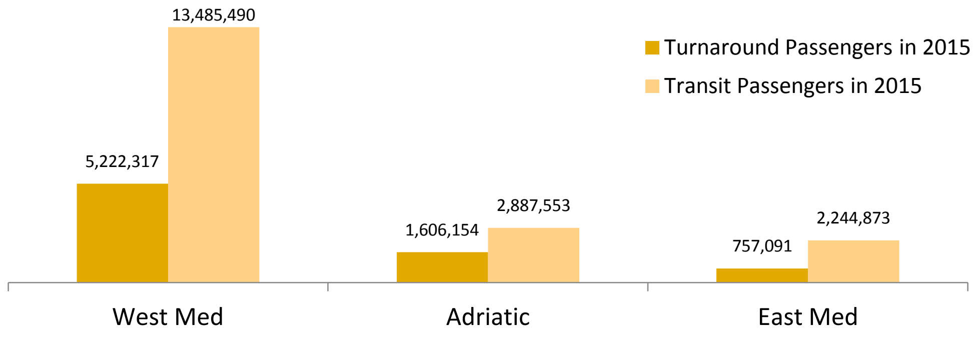

Figure 22: Mediterranean Basin-wide Total Turnaround and Transit Passenger Movements
Source: Elaborated through extracted data from Pallis et al. (2016a)

Italy tops the list of the Mediterranean countries in hosting the shares for the both turnaround (51%) and transit (35%) passengers, followed by Spain (26% and 19% respectively). According to CLIA, followed by Spain, Italy is also the market leader in Europe for cruise passenger embarkations or home porting (Ryckbost et al., 2016). While France and Greece have similar shares in hosting the transit passengers (9% each), Greece and Turkey possess same shares in hosting the turnaround passengers (5% each).

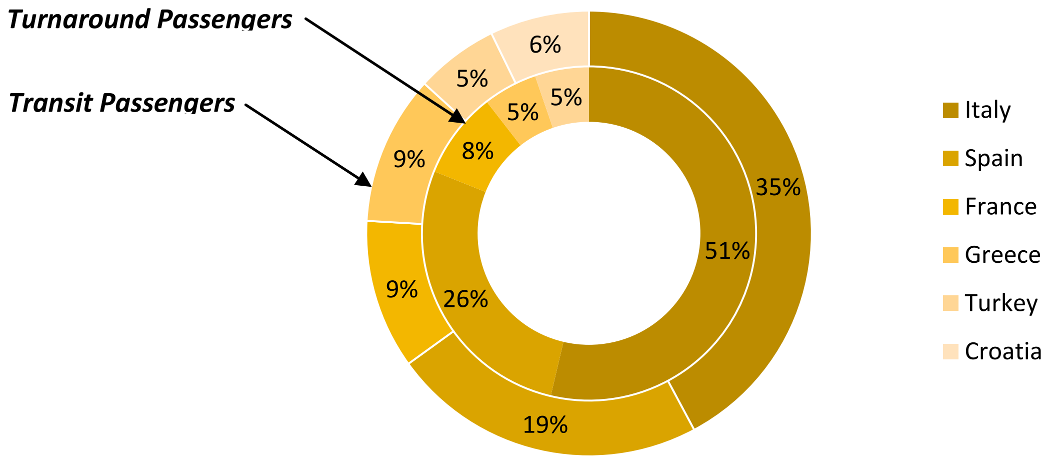

Figure 23 Country-wide Share of Turnaround and Transit Passenger Movements in 2015
Source: Elaborated through extracted data from Pallis et al. (2016a)

8.1.5 Seasonality Analysis

While holiday season indicates the peak cruise activity, the seasonal character of the cruise tourism largely depends upon the geographical location and the weather trends (Ryckbost et al., 2016). This seasonality not only can be interpreted as a challenge for the infrastructure and services, but also creates pressure for the people living around the port and for businesses depending on the port activity (Ryckbost et al., 2016).

The monthly analysis of the Med cruise traffic records the highest passenger movements and subsequent cruise calls for the month of October in 2015. October also registered similar trends for the preceding years of 2014 and 2013 (Pallis et al., 2016a). Mediterranean observes the peak cruise season from May to October with a monthly almost three million passenger movements. During the months from December to February, the drop of both the numbers of passengers and the cruise calls indicate less cruise tourism activity during the winter season. Also while considering the seasonality, for each month, the numbers of the passenger movements are directly proportional to the numbers of the cruise calls.

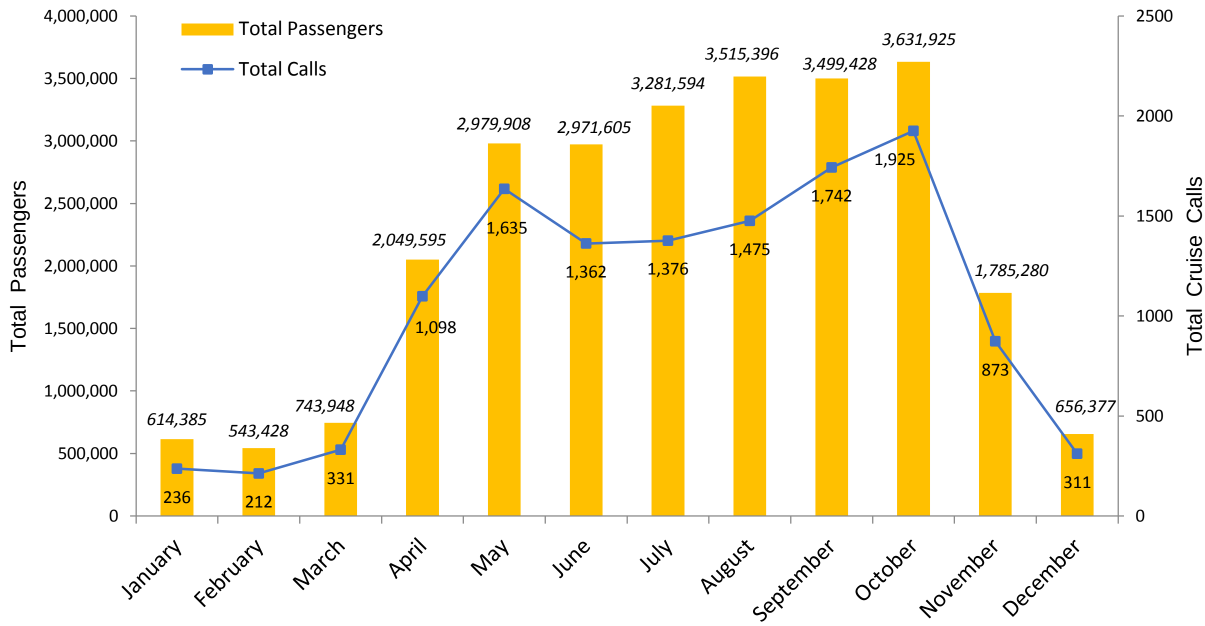

Figure 24: Total Med Cruise Passenger Movement and Cruise Calls per Month in 2015

Source: Elaborated through extracted data from Pallis et al. (2016a)

Mediterranean Basin-wide seasonality analysis of cruise passenger movements shows a higher share for the months of June, July and August for all the basins. In the winter months from December to February, all the individual sub-basins register the lowest share, while Adriatic being the least on the list (0.22%). However, Adriatic Region shows the highest share in cruise passenger movements (47.39%) during the summer months from June to August. While the West Mediterranean Region shows a relatively balanced distribution of cruise passenger movements around the year, it also registers the highest share (9.2%) during the winter months.

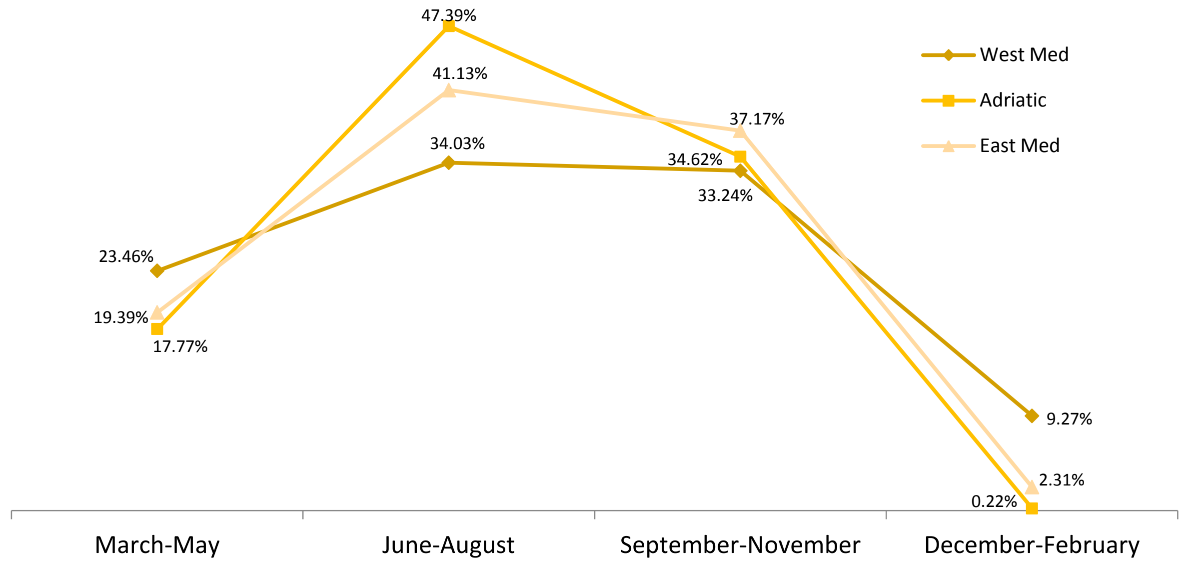

Figure 25: Basin-wide Seasonal Share of Total Passenger Movements in 2015
Source: Elaborated through extracted data from Pallis et al. (2016a)

Driven by the potentiality of increased winter cruise tourism, the top regional ports operating during the winter months have been identified. The trend dictates the West Mediterranean ports topping the chart against their Adriatic and East Mediterranean counterparts. The ports which did not record any cruise traffic during the winter months of 2014 and 2015 are – Gioia Tauro, Igoumenitsa, Mersin, Patras, Portofino, Ravenna, Rijeka, Sete, Taranto and Tarragona (Pallis et al., 2016a).

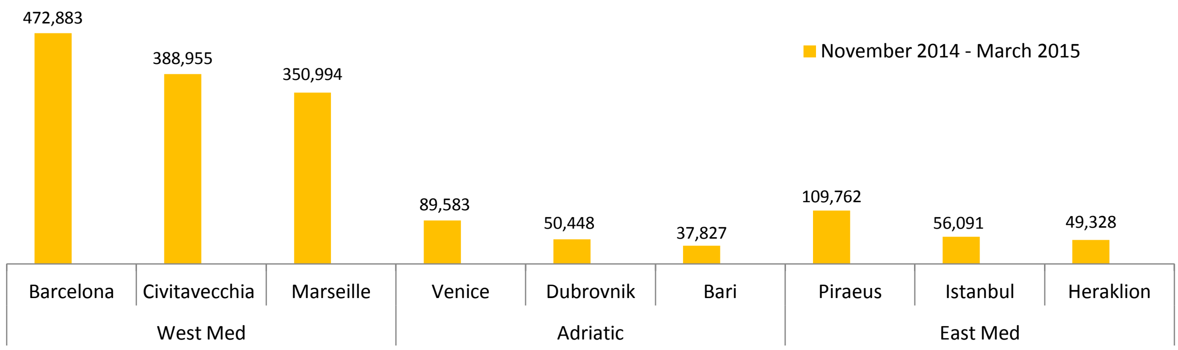

Figure 26: Med Basin-wide Major Winter Cruise Ports in terms of Passenger Movements in 2015
Source: Elaborated through extracted data from Pallis et al. (2016a)

8.1.6 Future Trends

A drop in Adriatic cruise traffic is foreseen for 2017 (Adriatic Sea Tourism Report, 2017). However, three new Italian Adriatic ports – Ortona, Pesaro and Sistiana are expected to join cruise itineraries in 2017 (Adriatic Sea Tourism Report, 2017). The Maltese NSO forecast for 2017 raises the bar even higher for Malta, with a target of over 700,000 cruise passenger movements through 330 port calls. According to Transport Malta, the cruise industry is growing each year and is increasingly contributing towards Malta's economic growth and prosperity.

8.2 Passenger Ferry Ports

Defined by the International Convention for the Safety of Life at Sea (SOLAS), a ferry is a passenger ship with Ro-Ro cargo spaces or special category spaces sailing on short sea routes. Some ferries are also showing characteristics of a cruise ship by including an overnight stay and emphasising on onboard leisure and comfort rather than profiling themselves as a functional way of transportation (Ryckbost et al., 2016). Ferry traffic is a crucial aspect of tourism in many countries as the ferry ports are the gates and sometimes even the only way to access many touristic islands (Ryckbost et al., 2016). The ferry tourist's main goal is to reach the destination as quickly as possible as the holidays are becoming shorter, cheaper and there is not enough time and money to prolong the passenger stay in the port (Ryckbost et al., 2016). Therefore, ferry ports must offer the smoothest and cheapest way to embark or disembark and must provide smooth connections with the highway (Ryckbost et al., 2016).

The overall majority of the European maritime passengers are also the ferry passengers and the Mediterranean Region comes with the highest share (Ryckbost et al., 2016). Therefore, 362 passenger ferry ports have been identifed across the Mediterranean during the study phase.

Figure 27: Identified Passenger Ferry Ports

Source: Elaborated through extracted data from EMODnet and Ferrylines

Unlike the fluctuating itinerary and seasonal trend of the cruise ships, ferries offer relatively regular passenger services (Adriatic Sea Tourism Report, 2017) almost round the year, although some seasonal routes exist. As ferries provide low cost crossings for both goods and passengers and offer occasions to cross the intra-European borders, they can be considered as an important contributor to European cohesion and integration (Ryckbost et al., 2016), which may also apply for the Mediterranean Region.

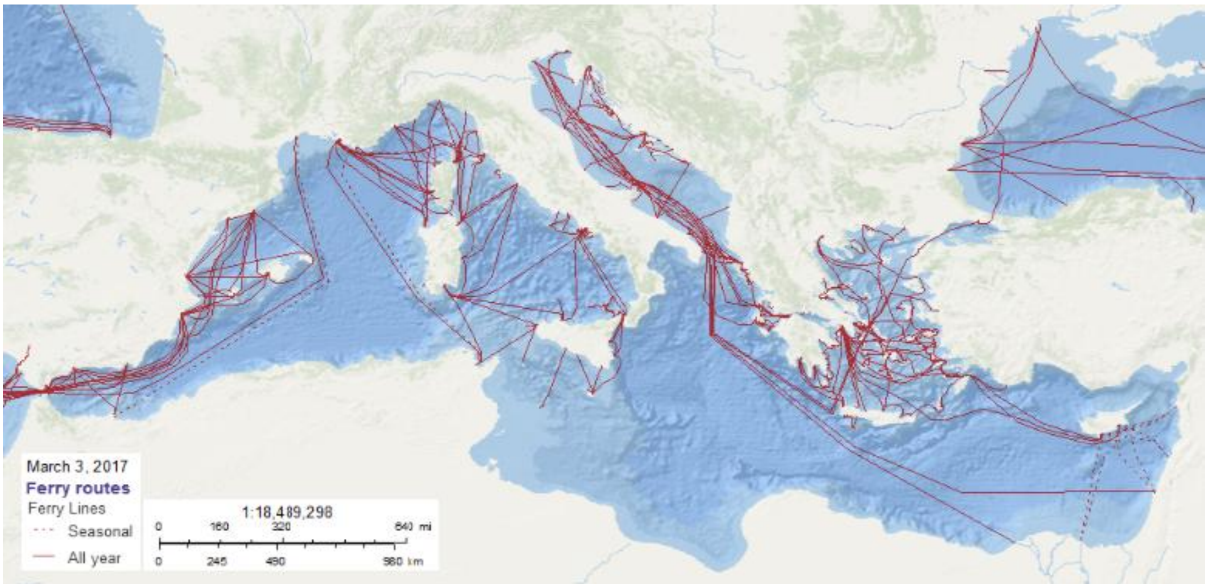

Figure 28: Major Ferry Routes in the Mediterranean
Source: European Atlas of the Seas

8.2.1 Growth Analysis

With a 20.7% share of the total ferry passengers in the world, more than 460 million ferry passengers had been recorded in 2015 together with 213,000 cars and 10.2 million buses in the Mediterranean (Adriatic Sea Tourism Report, 2017). Additionally, Greek and Italian ports handled roughly twice as many passengers in 2014 as in any other EU Member States (EUROSTAT).

A growth analysis carried on the identified Mediterranean ferry ports ranking within the top 20 EU non-cruise passenger ports suggests relatively steady annual growth, while the five yearly growths varies distinctly. Although the top four ports show little positive annual growth rate (around 0.5% each) in 2015, they experienced remarkable decrease in passenger movements in a five yearly time span. On the contrary, Algeciras, Cirkewwa and collectively Mgarr and Gozo ports demonstrate steady growths in 2015. While Spanish port Palma Mallorca recorded both the highest annual (14.40%) and five yearly (25.70%) growths, Italian ferry port Capri registered the lowest declining trend.

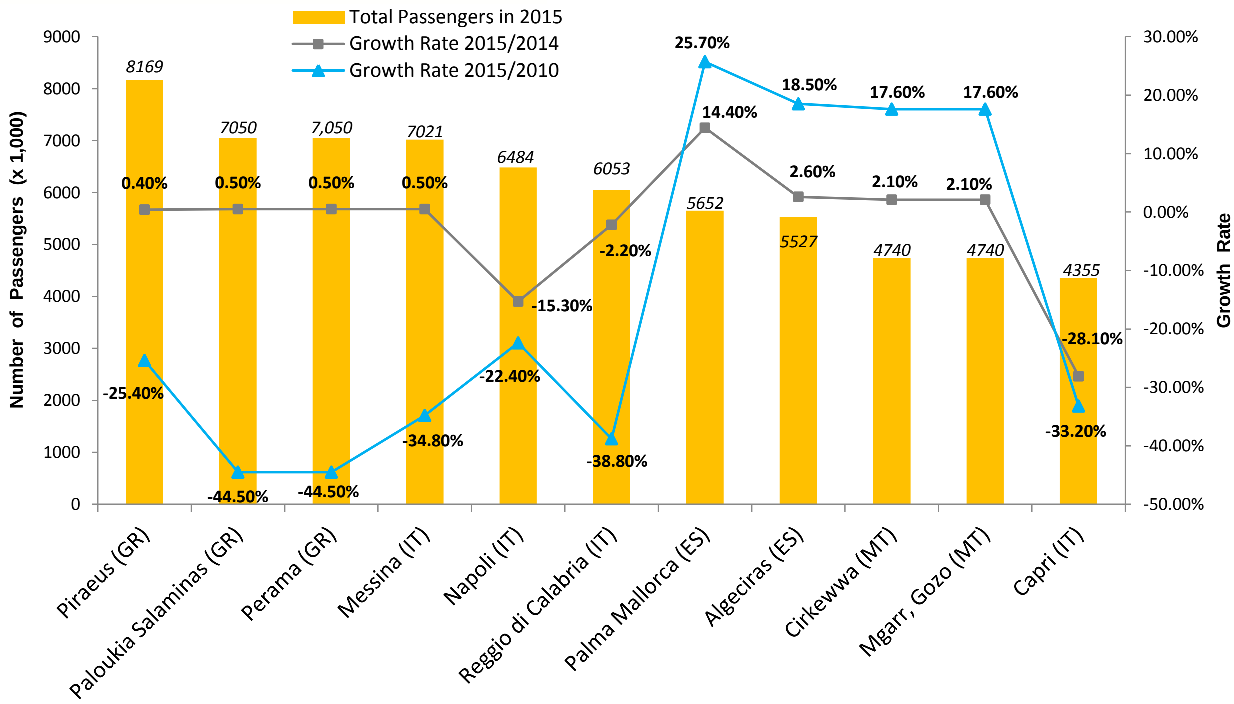

Figure 29: Country-wise Top Ferry Ports in terms of Passenger[1] Movements with Growth Rates

Source: Elaborated from EUROSTAT data

[1] A sea passenger is defined by EUROSTAT as any person that makes a sea journey on a merchant ship while service staffs are not regarded as passengers and neither the infants in arms. Double-counting may arise when both the embarkation and the disembarkation ports reported data although it had been excluded as far as possible by EUROSTAT.

The ferry traffic within the identified ports includes both international and domestic traffic. The international traffic can be further categorized into the intra-EU and extra-EU passenger movements. Data dictates, Croatia enjoyed remarkable growth on ferry passenger movements during 2014-2015 periods. As of 2015, Italy and Greece remained the main countries in terms of EU maritime passenger transport, despite both countries recorded decreasing trends in ferry passenger movements.

Table 2: Med Country-wide National and International Ferry Passenger Movements and Growths

MED Country	2014				2015				Total growth rate 2014-2015 (%)
	Total PAX (x 1,000)	of which %			Total PAX (x 1,000)	of which %			
		National	International			National	International		
			Intra EU	Extra EU			Intra EU	Extra EU	
Greece	32,744	95	5	0	32,060	95	5	0	-2.1
Spain_Mediterranean and Canary Islands	14,229	66	5	29	14,938	67	4	29	+5.0
France_Mediterranean	7,312				7,102				-2.9
Croatia	11,578	95	5	0	13,272	96	4	0	+14.6
Italy	38,604	87	10	2	37,411	87	10	3	-3.1
Malta (2)	4,643	100	0	0	4,740	100	0	0	+2.1
Turkey_Mediterranean	1,567				1,601				+2.2
Albania (1)					1,186				
Montenegro (1)					39				
Slovenia					11				

(1) 2015 Provisional estimates

(2) International passenger transport to/from Valletta not included

Source: Elaborated from EUROSTAT data and Adriatic Sea Tourism Report (2017)

Countries with busy ferry connections to and from well-populated islands register a larger volume of seaborne passenger and a higher share of national maritime passenger transport (EUROSTAT). This applies to the two leading maritime passenger countries – Italy and Greece, as well as countries like Spain and Croatia in the Mediterranean. While having ferry links to Morocco, Spain recorded one of the highest shares of extra-EU seaborne passenger transport in 2015; Italy hosted both the highest number of port calls and the largest gross tonnage of vessels calling the ports in a European scale (EUROSTAT).

Relative to the EU scale national population in 2014, the importance of maritime passenger transport was particularly high in Malta (22.6 passengers per inhabitant), followed by Greece (6.9) and Croatia (5.6) (EUROSTAT). The number of maritime passengers per inhabitant averaged less than 1.0 in each of the remaining EU Mediterranean Member States, except Italy (EUROSTAT).

Some countries and ports had experienced substantial decreases in the number of seaborne passengers over time. According to EUSROSTAT and Ryckbost et al. (2016), these sudden drops are typically caused by:

a) Structural changes and transition towards fixed links (e.g. openings of new bridge or tunnel connections and subsequent closure of ferry links)
b) The rapid growth in low cost flights in recent years

8.2.2 Basin-wide Analysis: Adriatic Region

In the last decade, the Adriatic ferry passenger movements have fluctuated around the value of 15 million (Adriatic Sea Tourism Report, 2017). However, the number of calls in the last five years did not reach the values recorded till 2010 due to larger ferry ship capacities and higher occupancy rates (Adriatic Sea Tourism Report, 2017). In 2016, more than 17 million passengers travelled on a ferry, hydrofoil or fast catamaran in the Adriatic, with additional travelers crossing domestic channels and reaching islands by sea (Adriatic Sea Tourism Report, 2017). Given the geographical features, Croatia leads the Adriatic in terms of ferry traffic (Adriatic Sea Tourism Report, 2017).

8.2.3 Seasonality

The peak of Adriatic ferry traffic both in terms of passengers and calls, is in August, when passenger movements reach 22.4% of the total. About half of the ferry passenger traffic is concentrated from June to August (Adriatic Sea Tourism Report, 2017).

8.2.4 Future Trends

Adriatic Region may experience slightly higher ferry traffic in 2017 than 2016, in terms of passenger movements (around +1.5%) and calls (around +0.3%) (Adriatic Sea Tourism Report, 2017).

8.3 Port Infrastructure and Ship Accessibility

The berthing location of a ship within the port may considerably influence the passengers' accessibility to and from the hinterlands. The analysis of the berthing locations dictates almost 20% of the identified Mediterranean cruise ports offer berthing close to the town/city centers, enabling easy access for the passengers. While 29% ports offer cruise dedicated berthing (i.e. excluding the cargo/commercial berthing piers) for the ships, 25% of the ports offer berthing in a passenger terminal.

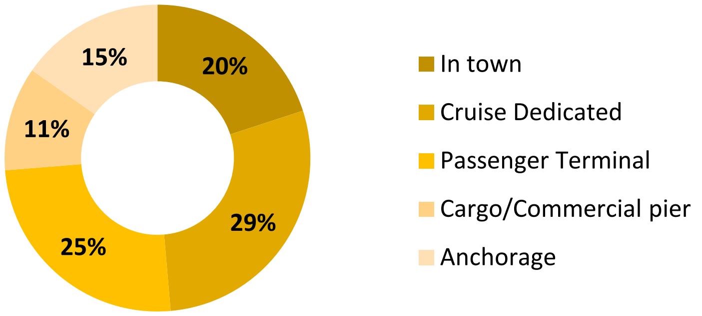

Figure 30: Port Infrastructure – Classes of Berths Offered by the Identified Cruise Ports
Source: Elaborated through extracted data from Pallis et al. (2016b)

The numbers of berths have been additionally identified in a Mediterranean scale in order to assess the ports' capability of hosting multiple cruise ships and therefore, to predict the amount of passengers. Most of the cruise ships have an average maximum passenger capacity of 1,000 to 3,000 persons and some larger ships may carry up to more than 4,000 passengers onboard, as it was found by a study (Backar et al, 2015) carried out by the Maritime Group of the Baltic Marine Environment Protection Commission (HELCOM). However, the berthing capacities for the cruise ships dictate most of the Mediterranean ports are capable of handling multiple ships simultaneously. Whereas, only 15 ports offer less than three berths, two of the identified cruise ports offer only anchorage (i.e. no berthing arrangements) and passengers are being transported by ship tender service.

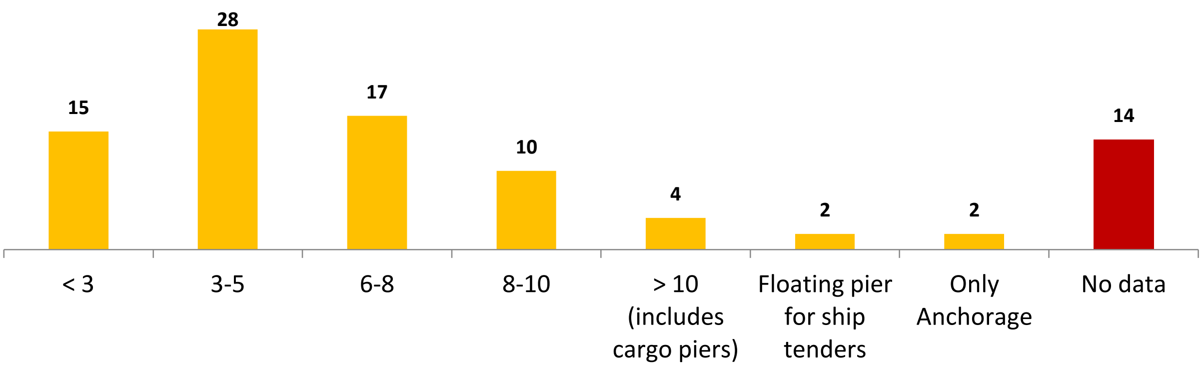

Figure 31: Number of Med Cruise Ports and their Number of Berthing Capacity as in 2015
Source: Elaborated through extracted data from MedCruise (2017) and Global Ports Holding

Additionally, ships' dimensions have been taken into account in order to assess the accessibility of the cruise ships among the identified cruise ports. Most of the ports are able to host the latest generation of largest cruise ships with the overall length exceeding 350 meters and draughts (i.e. the underwater part of a ship) exceeding 12 meters. This indicates the excellent accessibility offered by these ports for hosting the largest cruise ships and handling thousands of cruise passengers.

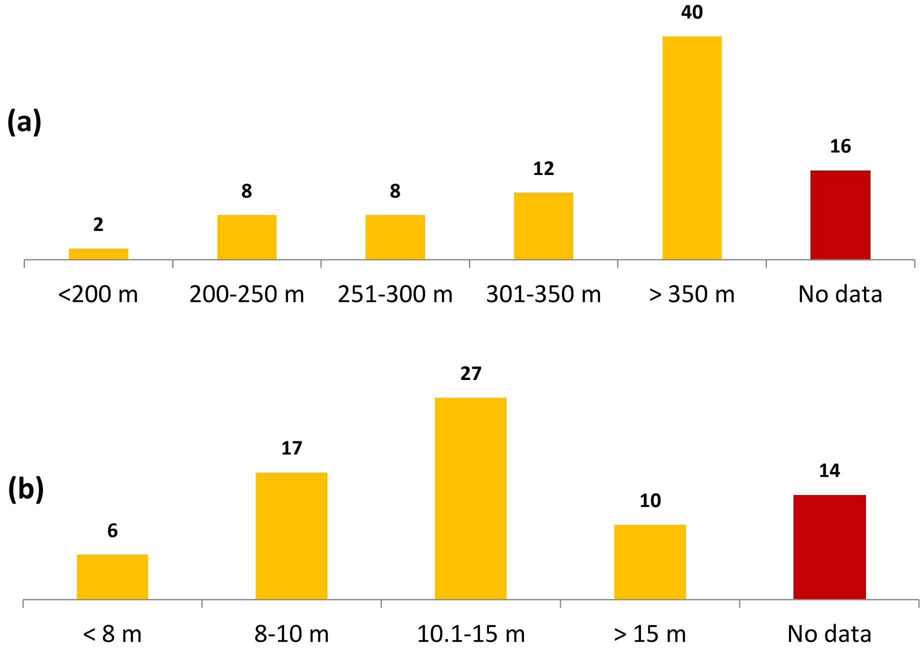

Figure 32: Number of Cruise Ports with their Maximum Allocable Lengths (a) and Draughts (b)
Source: Elaborated through extracted data from MedCruise (2017) and Global Ports Holding

ADRIPLAN project findings suggest passenger terminals as a prerequisite for the efficient and pleasant service provided to passengers at the beginning or at the end of their touristic activities. Therefore, the availability and the numbers of the passenger terminals among the identified cruise ports in a Mediterranean scale have been assessed. The analysis shows most of the ports offer at least one fully functional passenger terminal. Please note that, some cruise ports has different operating sections. This is why the overall numbers of the offered, not offered and no data on passenger terminals may seem higher than the total number of the identified ports.

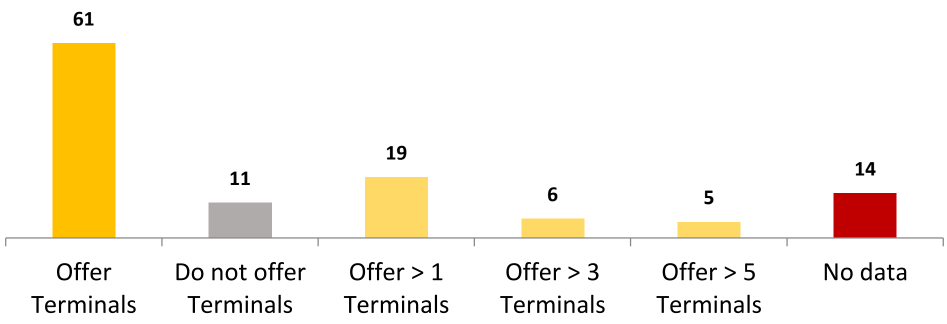

Figure 33: Port Infrastructure – Numbers of the Identified Cruise Ports offering Passenger Terminals
Source: Elaborated through extracted data from MedCruise (2017) and Global Ports Holding

8.4 Hinterland Accessibility from the Identified Passenger Ports

Considering the synergies with the Cruise Tourism, hinterland accessibility from the passenger ports had been investigated based on all the identified cruise ports. However, as many of the identified cruise ports also serve as ferry passenger ports, the port infrastructure and hinterland accessibility analysis may serve the both type of ports in particular cases.

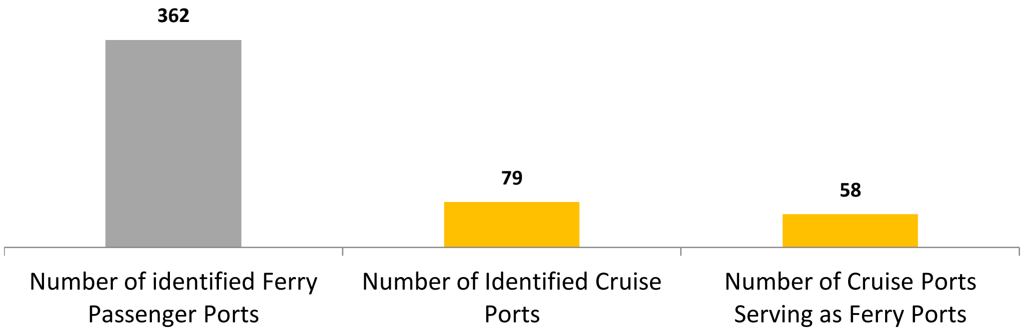

Figure 34: Ferry Passenger Ports' Hinterland Accessibility Synergy with the Identified Cruise Ports
Source: Elaborated from Figures 1 and 27

As more than half of the identified cruise ports (48) are located within less than 500 meters from the city center, the bulk of the Mediterranean cruise ports enjoy excellent locations which grant passengers easy access to the hinterland to begin with their touristic experience. In cases where the distance is further than 500 meters, most of the ports provide accessibility to intermodal transports to reach the city center of other touristic sites of interest. The relatively close proximity of the intercity bus terminals and train stations also enable the passengers to extend their tours beyond the port city area.

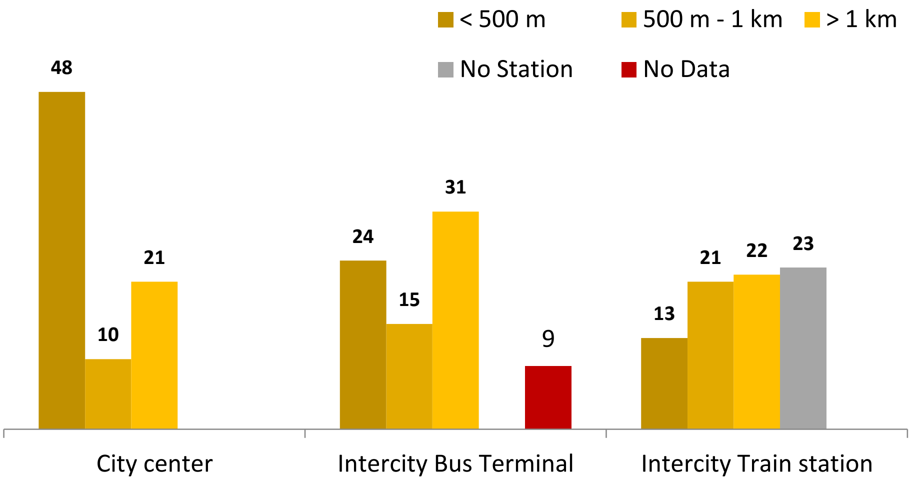

Figure 35: Numbers of Identified Passenger Ports and their Hinterland Accessibility Distance
Source: Elaborated through extracted data from MedCruise (2017), Global Ports Holding and Google Maps

Additionally more than half of the identified closest airports from the cruise ports are situated within thirty kilometers distance, among which 21 airports are impressively located in less than ten kilometers distance. It's worth to mention that, Ceuta and Monaco cruise ports provide helicopter services for their passengers respectively to the Malaga and Nice airports (MedCruise, 2017).

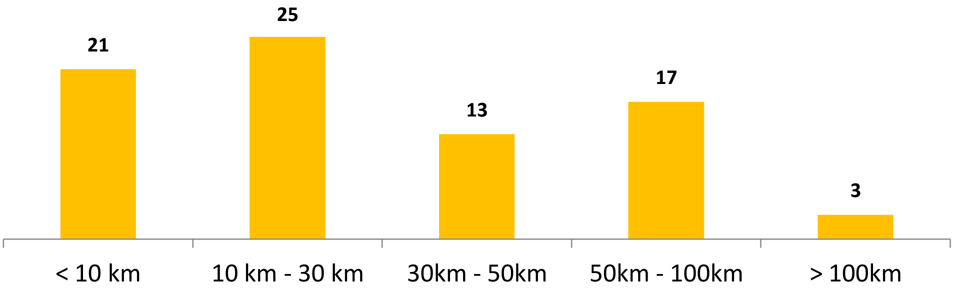

Figure 36: Number of Identified Passenger Ports and their Distance from the Nearest Airports

Source: Elaborated through extracted data from MedCruise (2017), Global Ports Holding and Google Maps

The passenger intermodality options provided by the cruise ports include a wide range of choices from taxi service and car rentals to the public transport bus. Although study suggests an adequate presence of taxi service, car rentals and parking space for private vehicles in these ports; high data inadequacy has been experienced for the available public transport modes, except the bus (offered by 62 ports) and metro (offered by only 10 ports). Venice has been confirmed with high confidence as the only port offering water bus as a public transport mode.

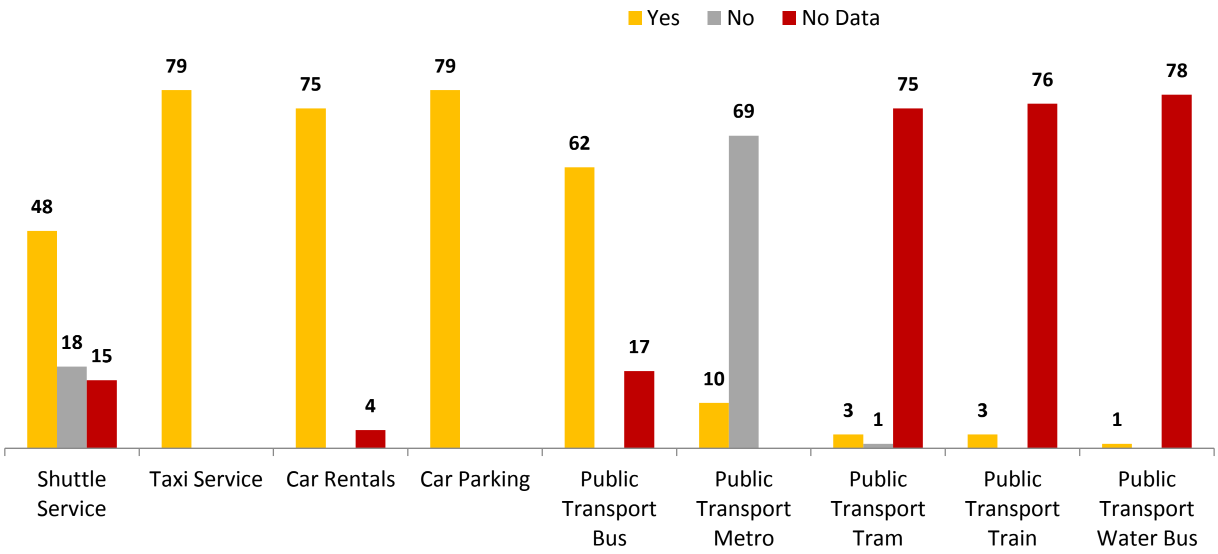

Figure 37: Numbers of Identified Cruise Ports with Passenger Intermodality Options

Source: Elaborated through extracted data from MedCruise (2017), Global Ports Holding and Google Maps

30.9% of the Mediterranean cruise ports offer airport related services and 29.4% provide automatic transfer of cruise passengers' luggage to the airports (Pallis et al., 2016b). Therefore, a mutual cooperation does exist between the cruise port operators and other transport stakeholders in order to provide seamless T&A services to the passengers/tourists. Study suggests, bulk of the cooperation is with the bus operators (44%), followed by the airport authorities (28%).

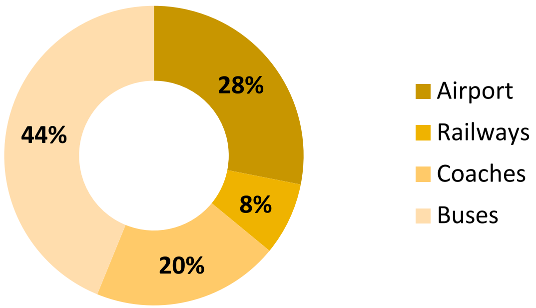

Figure 38: Share of Collaboration between the Cruise Port Operators and other Transport Modes
Source: Elaborated through extracted data from Pallis et al. (2016b)

Data for the operating function of the cruise passengers' shore transport indicate privatization of this sector as the majority is operated by the private entity (50%). Among the identified cruise ports, the individual port authorities seem responsible for 25% of the passengers' shore transport arrangements.

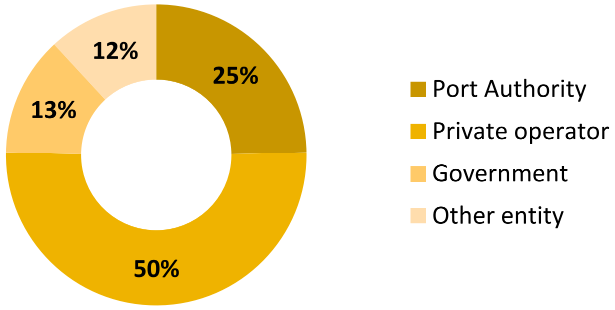

Figure 39: Operating Function for Passengers' Shore Transport among the Identified Cruise Ports
Source: Elaborated through extracted data from Pallis et al. (2016b)

8.5 Airports

Sixty one airports had been identified based on the proximity from the identified cruise ports across the Mediterranean coastal NUTS 3 Regional scale.

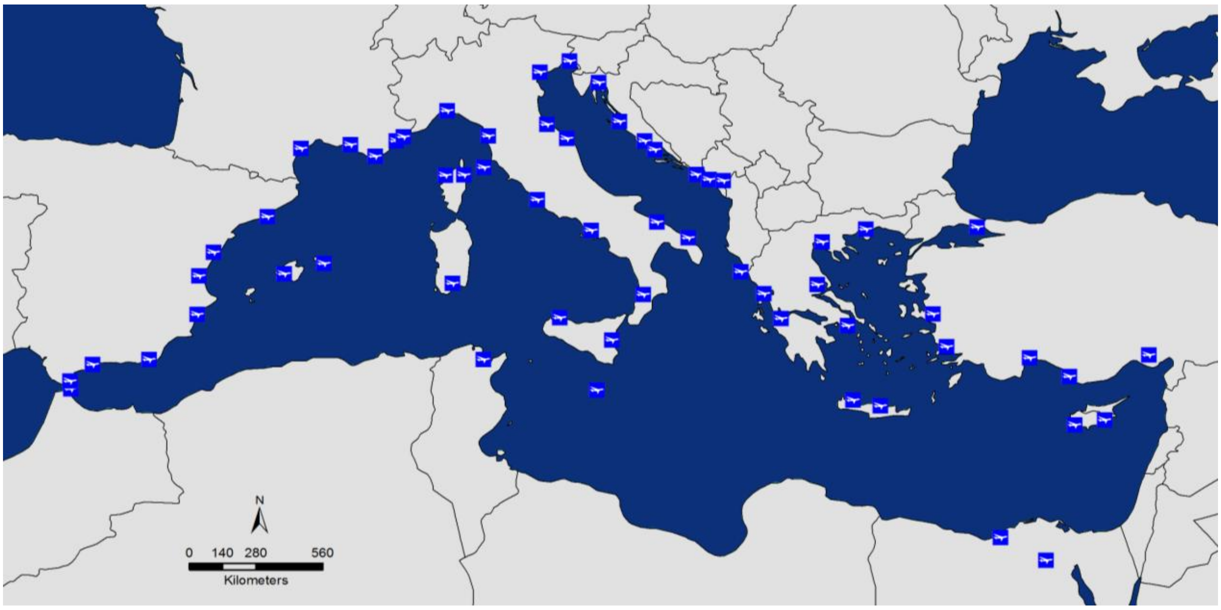

Figure 40: Identified Airports with Hinterland Accessibility to the Coastal Areas
Source: Elaborated from Google Maps Data

Based on the number of total passengers handled in 2015 among the identified airports, the top seven Mediterranean coastal airports have been analyzed. According to the EU scale ranking, two of the airports are among the top ten list and total five of them are within the top thirty list. While country-wise analysis suggests Italy, France and Greece each hosting one of these airports; Spain individually hosts three of these major airports.

Table 3: Top Mediterranean Coastal Airports in a European Scale in 2015

Airport	Country	EU Rank
Leonardo da Vinci International Airport	Italy	8
Barcelona El Prat Airport	Spain	9
Palma De Mallorca Airport	Spain	13
Athens International Airport Eleftherios Venizelos	Greece	23
Malaga Airport Costa Del Sol	Spain	26
Nice Côte d'Azur Airport	France	28
Larnaca International Airport	Cyprus	62

Source: Elaborated from EUROSTAT data

The Leonardo da Vinci airport in Rome tops the list of the Mediterranean coastal airports with more than forty million passengers in 2015 together with a 5.2% annual growth compared to 2014. The Barcelola El Prat airport follows with more than thirty nine million passengers and with slightly higher annual growth (5.4%) in 2015. However, the Athens International Airport registers the highest annual growth (19.10%).

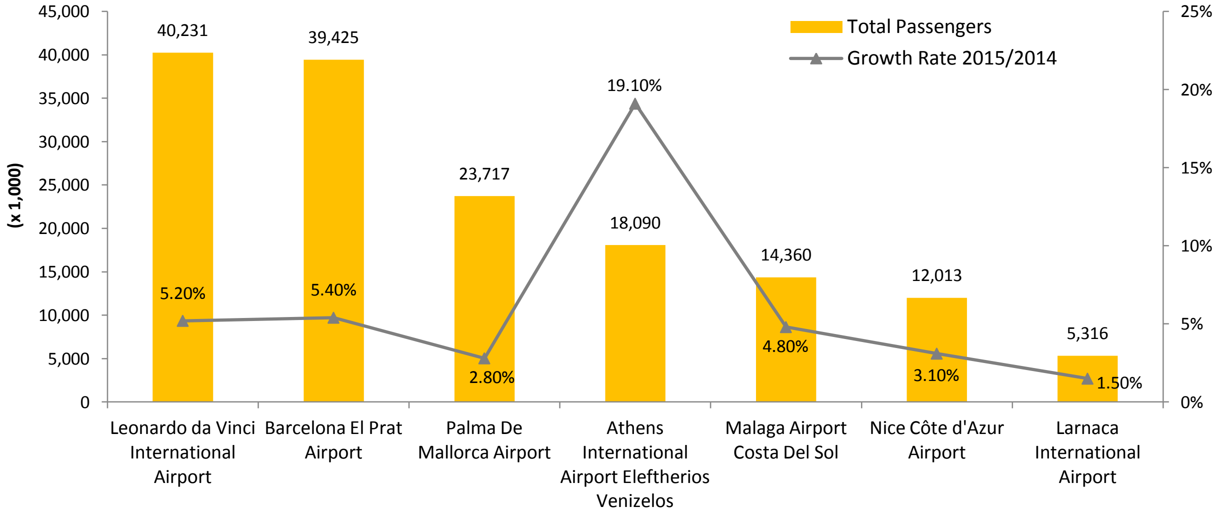

Figure 41: Main Airports with Total Number of Passengers and Annual Growth in 2015
Source: Elaborated from EUROSTAT data

The national and international passenger analysis suggests more international passengers have been handled than national/domestic passengers in each of these main airports. While Barcelona El Prat Airport leads the chart with more than twenty eight and half million international passengers, Leonardo da Vinci Airport closely follows with little more than twenty eight million international passengers. However, concerning the domestic/national passengers, Leonardo da Vinci Airport leads the Barcelona El Prat and the rest follow them. It’s interesting to note that, the Larnaca International Airport from Cyprus didn’t register any national passengers.

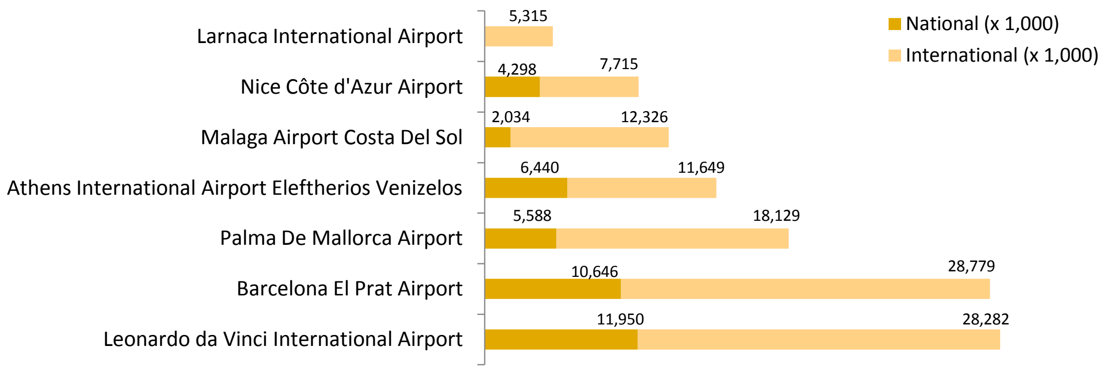

Figure 42: Main Airports with Total Number of National and International Passengers in 2015
Source: Elaborated from EUROSTAT data

Considering the higher numbers, an intra EU-28 and extra EU-28 analysis has been carried out on the recorded international passengers. Results suggest the intra EU-28 passenger movements are far higher than the recorded extra EU-28 movements. Concerning the international passenger movements within the EU, Barcelona El Prat airport tops the chart by subsequently closely followed by the Leonardo da Vinci and Palma de Mallorca airports. Concerning the passenger movements outside of the EU, Leonardo da Vinci airport tops the bars with more than ten and half million passengers, followed by the Barcelona El Prat with more than six million passengers.

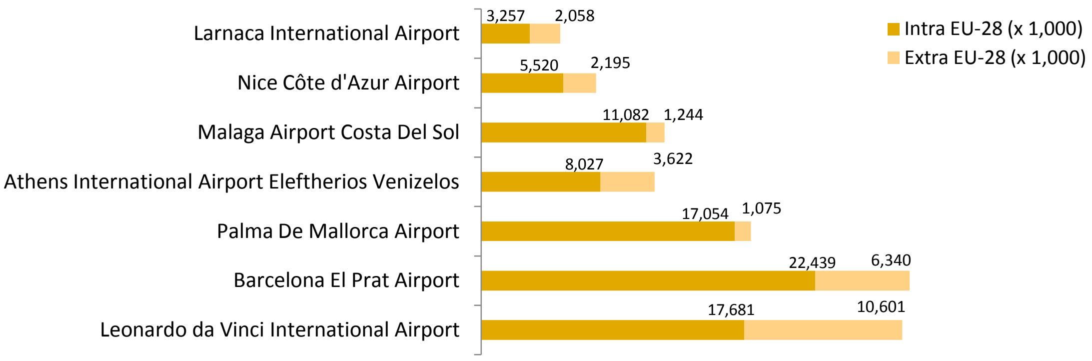

Figure 43: Main Airports with Total Number of Intra-EU and Extra-EU International Passengers in 2015

Source: Elaborated from EUROSTAT data

The numbers of the total flights analyzed in these major airports also suggest the Leonardo da Vinci airport (311,000) spearheading the list in 2015, followed by the Barcelona El Prat (275,000). Except the Larnaca International Airport (-0.20%), all other main airports have experienced a positive annual growth in managing the number of flights with the Athens International airport recording the highest percentage (15.50%).

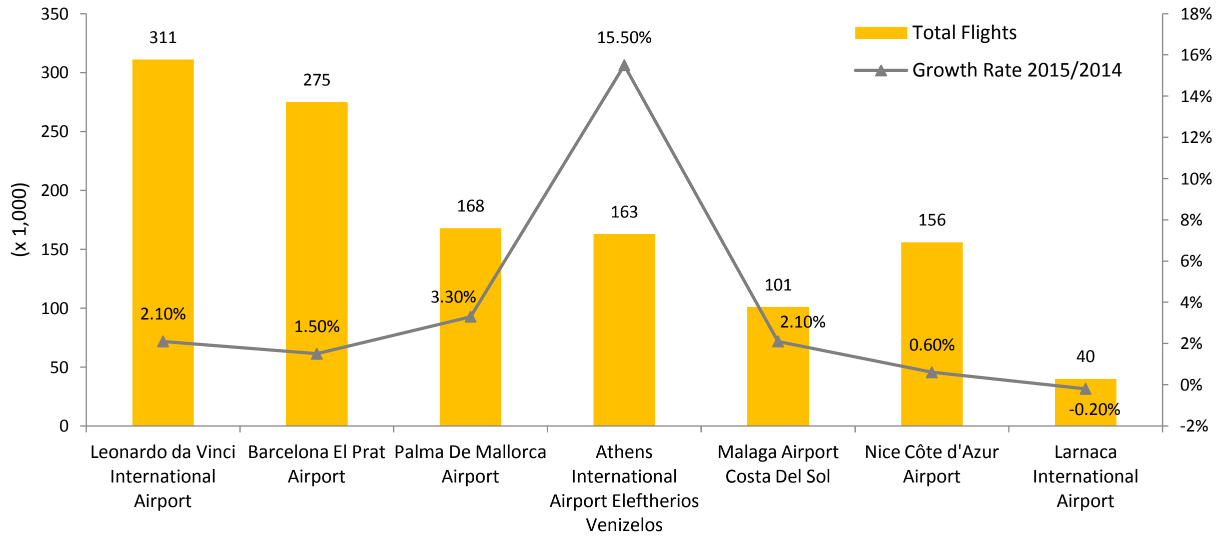

Figure 44: Main Airports with Total Number of Flights and Annual Growth in 2015

Source: Elaborated from EUROSTAT data

8.5.1 Hinterland Accessibility

Distances between the nearest intercity bus terminals and train stations to/from the identified airports has been analyzed in order to assess the enabling factors for passengers' hinterland accessibility. Results suggest most of the intercity bus and train stations are located within 1-10 kilometers distance from the airports. Whereas total sixteen of the identified airports provide access to the bus terminals in less than 500 meters and seven airports does the same for the intercity train stations. However, study suggests total nineteen of the identified airports do not provide any railway transport accessibility.

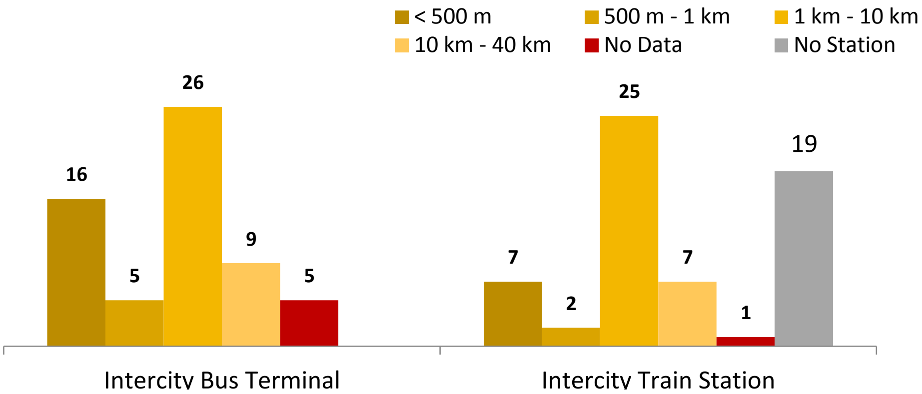

Figure 45: Number of Identified Airports and their Distance from other Transport Nodes

Source: Elaborated through extracted data from MedCruise (2017), Global Ports Holding and Google Maps

Similar to the cruise ports, the passenger intermodality offered by these airports includes a variety of choices from taxi service and car rentals to public transport bus. While all the identified airports (61) provide taxi services and parking area for private vehicles, 60 airports offer car rental options. Shuttle service and public bus can be accessed respectively in 43 and 44 of the identified airports. Whereas metro and train services can be availed by respectively six and nine of the identified airports, none of the airports offer the tram service. Again Venice Marco Polo Airport has been confirmed as the only airport offering water bus as a public transport mode. The red bars in the figure indicate the higher data unavailability rate when it comes to identify the city public transport services.

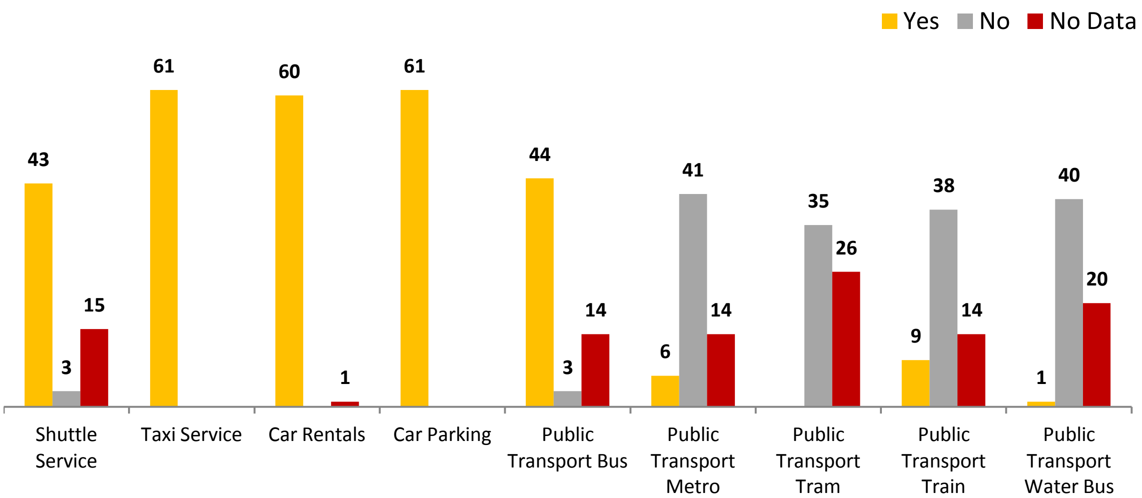

Figure 46: Numbers of Identified Airports with their Passenger Intermodality Options

Source: Elaborated from Google Maps Data

Passenger cars accounted for 83.2% of inland passenger transport in the EU in 2013 (EUROSTAT). While the study findings also suggest a higher presence of passenger cars, public transport vehicles such as the shuttle and city bus services also constitute a principal mean of hinterland accessibility.

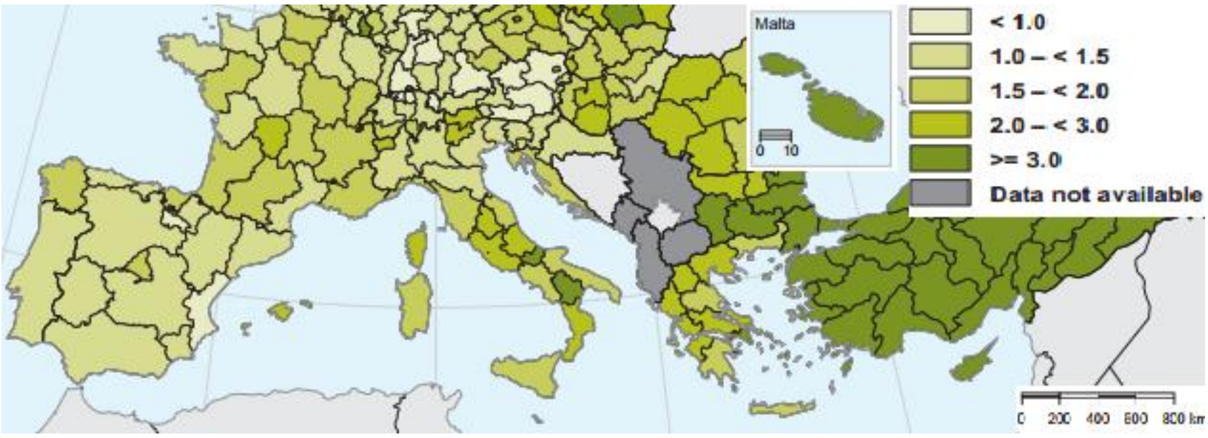

Figure 47: Equipment Rate[2] for Public Transport Vehicles by NUTS 2 Regions in 2014 (Estimates for Spain)

[2] *Number of public transport vehicles (motor coach, bus & trolley-bus) per 1,000 inhabitants*

Source: EUROSTAT

8.6 Marinas

Adriatic region hosts 331 marina structures with 78,238 berths (Adriatic Sea Tourism Report, 2017). However, Bosnia Herzegovina remains the only country with access to the Adriatic Sea with no marinas dedicated to nautical tourism (Adriatic Sea Tourism Report, 2017).

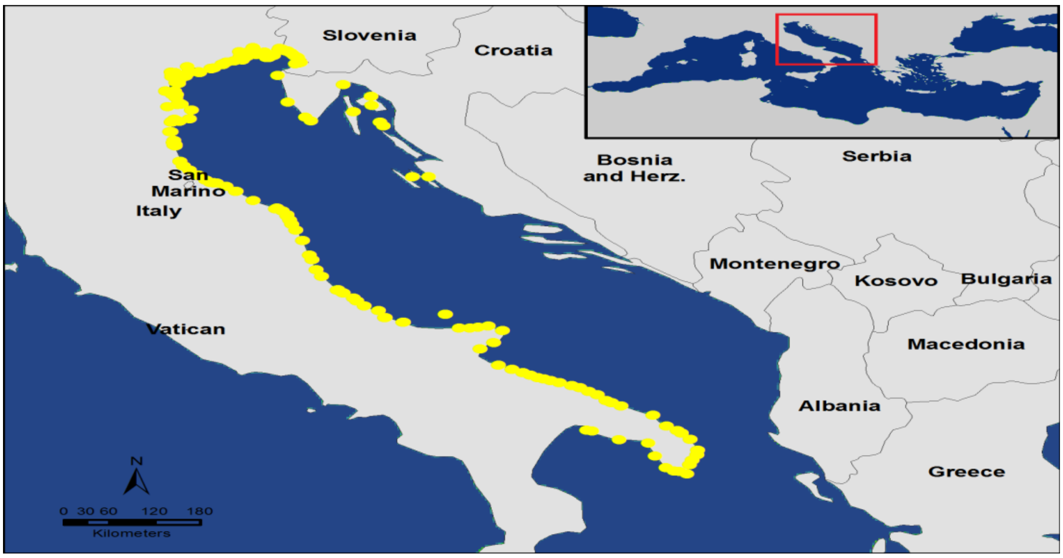

Figure 48: Locations of 218 (out of 331) Identified Marinas

Source: Elaborated from ADRIPLAN Project Data Portal

Italy leads the ranking in terms of both berths (62.2% of total) and marina structures (56.8%). While the number of structures in Slovenia (8), Montenegro (8) and Greece (4) is lower than in Italy (188) and Croatia (122), the average numbers of berths per structure are almost double (Adriatic Sea Tourism Report, 2017).

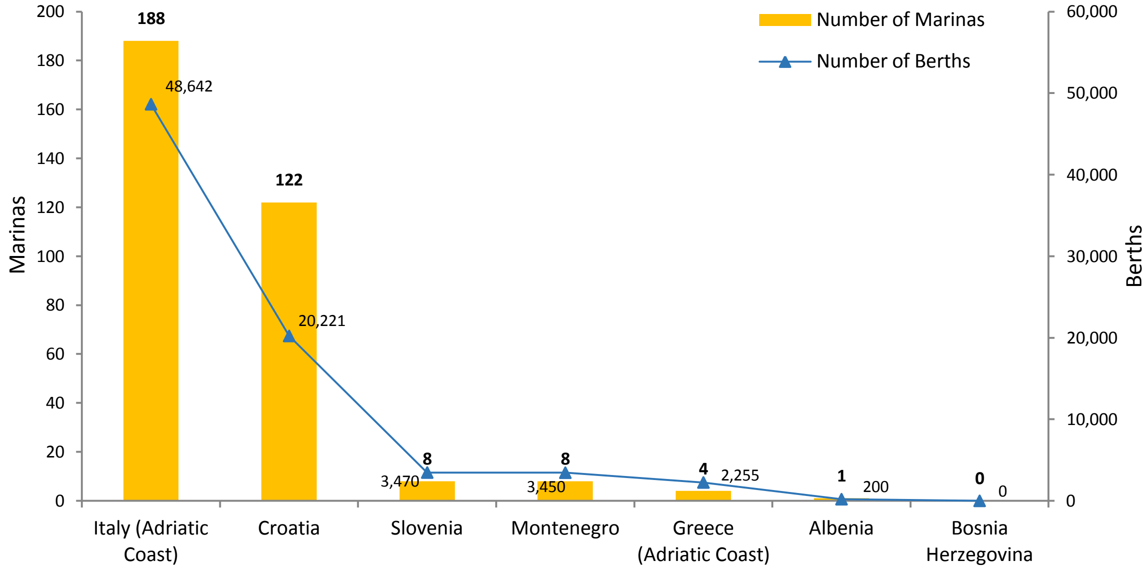

Figure 49: Adriatic Country-wide Marinas and their number of Berths in 2017

Source: Elaborated from Adriatic Sea Tourism Report (2017)

An Adriatic Country-wide Coastal Regional density analysis suggests, Italian Regions offer relatively more berthing places per kilometer along their coastline together with the numbers of available Marinas. While the Italian Friuli Venezia Giulia Region registers the highest number of berths per kilometer, it also offers one marina structure in every three kilometers. For the Croatian Dubrovnik Neretva Region as one of the lowest provider of berths (1 per each kilometer), one marina structure can be found in every 542 kilometers.

Table 4: Density of Marinas and Berths in the Adriatic Region in 2017

COUNTRY	REGION	COASTLINE (KM)	BERTH/KM*	KM PER STRUCTURE*
ITALY	Puglia (Adriatic coast)	560	20	10
ITALY	Molise	35	21	18
ITALY	Abruzzo	133	17	22
ITALY	Marche	180	33	13
ITALY	Emilia Romagna	130	53	5
ITALY	Veneto	170	64	4
ITALY	Friuli Venezia Giulia	130	82	3
SLOVENIA	Karst	47	74	6
CROATIA	Istarska	539	9	36
CROATIA	Primorsko-goranska	1,065	2	107
CROATIA	Zadarska	1,082	4	22
CROATIA	Šibensko-kninska	806	6	38
CROATIA	Splitsko-dalmatinska	1,064	3	46
CROATIA	Dubrovačko-neretvanska	1,025	1	542
MONTENEGRO	Montenegro	294	12	37
ALBANIA	Vlorë	244	1	244
GREECE	Corfu	200	6	200
GREECE	Lefkada	117	5,3	117
GREECE	Epirus	200	2	100

* The values have been rounded either up or down to whole numbers

Note: The table excludes the Regions without structures, as in Croatia Ličko-senjska county coastline (200km), Bosnia and Herzegovina coastline (23.5km) and in Albania Lezhë (38km) and Durrës coastline (62km).

Source: Adriatic Sea Tourism Report (2017, p.31)

An Adriatic Area-wide analysis suggests, most berths (55.9%) and marina structures (58.6%) are located in the Northern part of the Adriatic Sea, which is one third of the whole Adriatic Region. While the center Adriatic hosts the least of the shares.

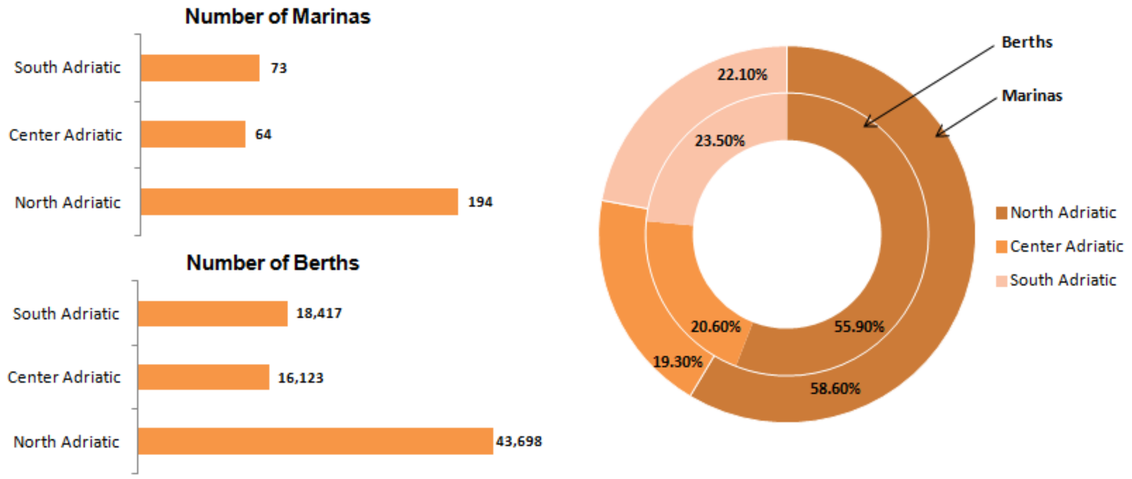

Figure 50: Adriatic Area-wide Shares of Marinas and Berths in 2017
Source: Elaborated through extracted data from Adriatic Sea Tourism Report (2017)

8.6.1 Future Developments

Considering the on-going and the planned works for the next two years (2018 and 2019), the Adriatic Region is expected to increase its offer with 2,700 berths in 9 marinas (Adriatic Sea Tourism Report, 2017). While Italy and Croatia is enlarging their offered berthing capacities for the recreational boats, Slovenia is not expected to do so in the near future (Adriatic Sea Tourism Report, 2017).

9. Pilot Area Scale Value Added Analysis

T&A analysis has been carried out including areas under all the seven PAs in the basis of the nearest transport nodes providing access to the individual PAs. This includes airports, passenger ports, intercity train stations and intercity/international bus terminals. Each of these transport nodes has been individually studied to assess the accessibility to/from the individual PAs. These include the distance to the PA town centers and to other major transport nodes enabling the PA accessibility. Additionally, the intermodality provided by each of these transport nodes has been analyzed focusing on the public transports, taxi and shuttle service, car rentals and provisions for private vehicle parking.

Study suggests, all the identified airports are located out of the individual PAs, except the Valencia and Split airports. All of these airports also provide taxi services, car rentals and car parking facilities. However, data gaps have been identified concerning the shuttle service (only for Kavala International Airport) and public transport bus.

Table 5: Nearest Airports from the PAs with Available Passenger Intermodality

PA	City	Airport	Located_within_PA	Ferry	Bus	Tram	Metro	Train	Shuttle_Service	Taxi_Service	Car_Rentals	Car_Parking
Keramoti (el)	Keramoti	Kavala International Airport	N	N	Y	N	N	N	Y	Y	Y	Y
Neretva Delta (hr)	Metkovic	Dubrovnik Airport	N	N	Y	N	N	N	Y	Y	Y	Y
Polesine Camerini (it)	Polesine Camerini	Venice Marco Polo Airport	N	Y	Y	N	N	N	Y	Y	Y	Y
Rosolina (it)	Rosolina	Venice Marco Polo Airport	N	Y	Y	N	N	N	Y	Y	Y	Y
Herault (fr)	Sete	Béziers Cap d'Agde Airport	N	N	Y	N	N	N	Y	Y	Y	Y
Port of Valencia (es)	Valencia	Valencia Airport	Y	N	Y		Y	N	Y	Y	Y	Y
Kastela Bay (hr)	Kastel Luksic	Split Airport	Y	N		N	N	N	Y	Y	Y	Y
Cattolica (it)	Cattolica	Federico Fellini International Airport	N	N	Y	N	N		Y	Y	Y	Y
Lido di Spina (it)	Lido di Spina	Federico Fellini International Airport	N	N	Y	N	N		Y	Y	Y	Y
Alexandroupolis (el)	Alexandroupolis	Kavala International Airport	N	N		N	N	N		Y	Y	Y

Source: Data Request Survey Feedback from PA Coordinators and Google Maps

Interconnectivity of the T&A enabling factors in the individual PAs have been analyzed by identifying the mutual distances of other transport nodes from the identified airports, including the distance to the PA town centers. Study suggests, Neretva Delta, Polesine Camerini and Alexandroupolis PAs are located more than 100 kilometers from the nearest accessible international airports. While all the airports are also located within a 30 kilometers distance from an intercity train station, no train service is available linking the Dubrovnik and Kavala international airports.

Table 6: Hinterland Connectivity Distances from the Airports

PA	City	Airport	PA Town Center_km	Intercity Bus Terminal_km	Intercity Train Station_km
Keramoti (el)	Keramoti	Kavala International Airport	10	15	30
Neretva Delta (hr)	Metkovic	Dubrovnik Airport	113	113	
Polesine Camerini (it)	Polesine Camerini	Venice Marco Polo Airport	107	11	11
Rosolina (it)	Rosolina	Venice Marco Polo Airport	70	11	11
Herault (fr)	Sete	Béziers Cap d'Agde Airport	10	10	10
Port of Valencia (es)	Valencia	Valencia Airport	5	10	5
Kastela Bay (hr)	Kastel Luksic	Split Airport	3.5	0	4.5
Cattolica (it)	Cattolica	Federico Fellini International Airport	12	0.8	0.6
Lido di Spina (it)	Lido di Spina	Federico Fellini International Airport	70	0.8	0.6
Alexandroupolis (el)	Alexandroupolis	Kavala International Airport	138	17	

Source: Data Request Survey Feedback from PA Coordinators and Google Maps

The nearest passenger ferry/cruise ports have been also identified providing access to the PAs. Among them, ferry ports related to the Alexandroupolis, Keramoti, Neretva Delta and Port of Valencia PAs are located within the individual PAs. All of the passenger ports also provide public buses together with taxi, car rentals and car parking facilities. Additionally, only the Port of Valencia passenger port provides access to public transport metro.

Table 7: Nearest Passenger Ports from the PAs with Available Passenger Intermodality

PA	City	Passenger_Port	Located Within PA	Ferry	Bus	Tram	Metro	Train	Shuttle_Service	Taxi_Service	Car_Rentals	Car_Parking
Alexandroupolis (el)	Alexandroupolis	Alexandroupolis	Y	Y	Y	N	N	N	N	Y	Y	Y
Keramoti (el)	Keramoti	Keramoti	Y	Y	Y	N	N	N	N	Y	Y	Y
Neretva Delta (hr)	Ploče	Ploče	Y	N	Y	N	N	N	Y	Y	Y	Y
	Metković	Metković	Y	N	Y	N	N	N	Y	Y	Y	Y
Polesine Camerini (it)	Polesine Camerini	Venice	N	Y	Y	N	N	Y	Y	Y	Y	Y
Rosolina (it)	Rosolina	Venice	N	Y	Y	N	N	Y	Y	Y	Y	Y
Herault (fr)	Sete	Sete	N		Y	N	N	Y	Y	Y	Y	Y
Port of Valencia (es)	Valencia	Valencia	Y		Y		Y		Y	Y	Y	Y
Kastela Bay (hr)	Kastel Luksic	Split	N		Y	N	N		Y	Y	Y	Y
Cattolica (it)	Cattolica	Ancona	N		Y		N			Y	Y	Y
Lido di Spina (it)	Lido di Spina	Venice	N	Y	Y	Y	N	Y	Y	Y	Y	Y

Source: Data Request Survey Feedback from PA Coordinators and Google Maps

While majority of the PA town centers are located within ten kilometers distance from the passenger ports, Polesine Camerini (93 km) and Lido di Spina (85 km) town centers register the longest distances.

Table 8: Hinterland Connectivity Distances from the Passenger Ports

PA	City	Passenger_Port	PA Town Center_km	Intercity Bus Terminal_km	Intercity Train Station_km
Alexandroupolis (el)	Alexandroupolis	Alexandroupolis	0.75	0.5	0.3
Keramoti (el)	Keramoti	Keramoti	0	0	
Neretva Delta (hr)	Ploče	Ploče	0.4	0.2	
	Metković	Metković	2	1.3	
Polesine Camerini (it)	Polesine Camerini	Venice	93	1	1
Rosolina (it)	Rosolina	Venice	66	1	1
Herault (fr)	Sete	Sete	60	40	10
Port of Valencia (es)	Valencia	Valencia	4	10	5
Kastela Bay (hr)	Kastel Luksic	Split	10	0.1	0.1
Cattolica (it)	Cattolica	Ancona	50	1	1
Lido di Spina (it)	Lido di Spina	Venice	85	0.3	1

Source: Data Request Survey Feedback from PA Coordinators and Google Maps

The intermodality offered by the nearest intercity train stations providing access to the PAs have been identified as well. Study suggests, Neretva Delta, Cattolica and Alexandroupolis host intercity train stations within the PAs. While all of them provide taxi services, most of the train stations also provide car rentals, car parking, shuttle and public bus facilities. Valencia station additionally provides metro and tram services.

Table 9: Nearest Train Stations from the PAs with Available Passenger Intermodality

PA	City	Intercity_Train_Station	Located_within_PA	Bus	Tram	Metro	Train	Shuttle_Service	Taxi_Service	Car_Rentals	Car_Parking
Keramoti (el)	Keramoti	Xanthi	N	N	N	N	N	N	Y	N	Y
Neretva Delta (hr)	Ploče	Ploče	Y	Y	N	N	N	Y	Y	Y	Y
	Metković	Metković	Y	Y	N	N	N	Y	Y	Y	Y
	Opuzen	Opuzen	Y		N	n	N	N	Y	N	
Polesine Camerini (it)	Polesine Camerini	Rovigo	N	Y	N	N	Y	Y	Y	Y	Y
	Polesine Camerini	Padova	N	Y	Y	N	Y	Y	Y	Y	Y
	Polesine Camerini	Venezia Santa Lucia	N	Y	Y	N	Y	Y	Y	Y	Y
Rosolina (it)	Rosolina	Rovigo	N	Y	N	N	Y	Y	Y	Y	Y
	Rosolina	Padova	N	Y	Y	N	Y	Y	Y	Y	Y
	Rosolina	Venezia Santa Lucia	N	Y	Y	N	Y	Y	Y	Y	Y
Herault (it)	Sete	Beziers	N	Y	N	N	Y	Y	Y	Y	Y
Port of Valencia (es)	Valencia	Valencia	N	Y	Y	Y			Y	Y	Y
Kastela Bay (hr)	Kastel Luksic	Split	N	Y	N	N	N	Y	Y	Y	Y
Cattolica (it)	Cattolica	Cattolica	Y	Y	N	N	Y		Y	Y	Y
Lido di Spina (it)	Lido di Spina	Ravenna	N	Y		N			Y	Y	Y
Alexandroupolis (el)	Alexandroupolis	Alexandroupolis	Y	Y	N	N	N	N	Y	Y	Y

Source: Data Request Survey Feedback from PA Coordinators and Google Maps

The PA town center distance analysis suggests Port of Valencia, Cattolica and Alexandroupolis PAs are located within one kilometer distance from the identified intercity train stations. While for the Neretva Delta PA, as the town centers can be distributed among three cities, only Ploce is accessible within a kilometer (0.6 km), while Metkovic and Opuzen are respectively 1.5 and 19 kilometers away. The locations of the nearest intercity bus terminals are within ten kilometers except from the Xanthi (35 km) and Opuzen (10.7 km) train stations linking to the Neretva Delta and Keramoti PAs respectively.

Table 10: Hinterland Connectivity Distances from the Train Stations

PA	City	Intercity Train Station	PA Town Center_km	Bus Terminal_km	Ferry Port_km
Keramoti (el)	Keramoti	Xanthi	35	35	35
Neretva Delta (hr)	Ploče	Ploče	0.6	0.15	0.22
	Metković	Metković	1.5	2.1	1.2
	Opuzen	Opuzen	19	10.7	9
Polesine Camerini (it)	Polesine Camerini	Rovigo	76	0.7	80
	Polesine Camerini	Padova	96	0	39
	Polesine Camerini	Venezia Santa Lucia	102	1	1
Rosolina (it)	Rosolina	Rovigo	39	0.7	80
	Rosolina	Padova	59	0.5	39
	Rosolina	Venezia Santa Lucia	65	1	1
Herault (it)	Sete	Beziers	10	10	60
Port of Valencia (es)	Valencia	Valencia	1	2	5
Kastela Bay (hr)	Kastel Luksic	Split	10	0.1	0.1
Cattolica (it)	Cattolica	Cattolica	0.1	1.4	50
Lido di Spina (it)	Lido di Spina	Ravenna	25	0	11
Alexandroupolis (el)	Alexandroupolis	Alexandroupolis	0.6	0.2	0.3

Source: Data Request Survey Feedback from PA Coordinators and Google Maps

Similar analysis has been carried out for the nearest international/intercity bus terminals providing access to the individual PAs. Only Neretva Delta, Cattolica and Alexandroupolis host such bus terminals within the PAs. All of the identified bus terminals provide public bus service in parallel with taxi service, car rentals and car parking facilities.

Table 11: Nearest Intercity Bus Terminals from the PAs with Available Passenger Intermodality

PA	City	Intercity/International Bus Station	Located Within PA	Bus	Tram	Metro	Train	Shuttle_Service	Taxi_Service	Car_Rentals	Car_Parking
Neretva Delta (hr)	Ploče	Ploče	Y	Y	N	N	N	Y	Y	Y	Y
	Metković	Metković	Y	Y	N	N	N	Y	Y	Y	Y
Polesine Camerini (it)	Polesine Camerini	Padova	N	Y	Y	N	Y	Y	Y	Y	Y
	Polesine Camerini	Venezia Mestre	N	Y	Y	N	Y	Y	Y	Y	Y
Rosolina (it)	Rosolina	Padova	N	Y	Y	N	Y	Y	Y	Y	Y
	Rosolina	Venezia Mestre	N	Y	Y	N	Y	Y	Y	Y	Y
Herault (it)	Sete	Beziers	N	Y	N	N	Y	Y	Y	Y	Y
Cattolica (it)	Cattolica	Cattolica	Y	Y	N	N	Y		Y	Y	Y
Lido di Spina (it)	Lido di Spina	Ravenna	N	Y		N			Y	Y	Y
Alexandroupolis (el)	Alexandroupolis	Alexandroupolis	Y	Y	N	N	N		Y	Y	Y
Port of Valencia (es)	Valencia	Valencia	N	Y	Y	Y		Y	Y	Y	Y
Kastela Bay (hr)	Kastel Luksic	Split	N	Y	N	N	N	Y	Y	Y	Y
Keramoti (el)	Keramoti	Kavala	N	Y		N	N		Y	Y	Y

Source: Data Request Survey Feedback from PA Coordinators and Google Maps

The hinterland distances towards the PAs suggest less than 100 kilometers proximity from the identified bus terminals. However, five of the PA town centers are located within ten kilometers distance. While the train stations are conveniently located within a kilometer distance for most of the identified bus terminals, only Kavala station (35 km) linking to the Keramoti PA is more than ten kilometers away.

Table 12: Hinterland Connectivity Distances from the Bus Terminals

PA	City	Intercity/International Bus Station	PA Town Center_km	Train Station_km	Ferry Port_km
Neretva Delta (hr)	Ploče	Ploče	0.6	0.15	0.2
	Metković	Metković	0.2	2.1	1.3
Polesine Camerini (it)	Polesine Camerini	Padova	95	0	38
	Polesine Camerini	Venezia Mestre	96	0.05	10
Rosolina (it)	Rosolina	Padova	58	0.5	38
	Rosolina	Venezia Mestre	59	1	10
Herault (it)	Sete	Beziers	10	10	60
Cattolica (it)	Cattolica	Cattolica	0.1	1.4	50
Lido di Spina (it)	Lido di Spina	Ravenna	25	0	11
Alexandroupolis (el)	Alexandroupolis	Alexandroupolis	0.6	0.2	0.5
Port of Valencia (es)	Valencia	Valencia	1.5	2	10
Kastela Bay (hr)	Kastel Luksic	Split	10	0.1	0.05
Keramoti (el)	Keramoti	Kavala	22	35	22

Source: Data Request Survey Feedback from PA Coordinators and Google Maps

Additionally, some marina structures had been identified within the PAs, providing access to the yachts and recreational boats. The hinterland accessibility within the PAs from these identified marinas has been also investigated and results suggest, except the Makri PA, all other PAs with identified marina structures offer accessibility to public transport service/services, while no data can support such accessibility for Rosolina PA. The marina structures within the Valencia Port PA offers the highest number of berths or mooring places (898), while Alexandroupoli and Makri PAs each provides fifty places, the least on the list.

Table 13: Numbers of Identified PA Marinas and Berthing Capacity with Hinterland Accessibility

PA	Number of Marinas	Number of Berths	Access to Public Transport
Rosolina (it)		150	
Alexandroupoli (el)		50	Y
Makri (el)		50	N
Valencia Port Area (es)	1	898	Y
Herault (fr)	3	650	Y

Source: Data Request Survey Feedback from Respective PA Coordinators

10. Data Synergies with Relevant Sustainability Indicators

Data collected during the study phase may feed some of the T&A relevant indicators which had been adapted by the 3.16 Task Group in order to develop the Tourism Sustainability Toolkit (Deliverable 3.16.2). The consolidated "Database" has been developed as part of the Deliverable 3.11.2. For "Destination Indicators on Cruising", the scale of the data synergies can be expected in a Mediterranean scale, while in some particular cases this may support some of the individual ports as well. Concerning the "Destination Indicators on Recreational Boating", the data synergy scale is limited within the Adriatic Region only.

Table 14: T&A Data Synergies with the Destination Indicators on Cruising and Recreational Boating

Section	Indicator reference	Destination Indicators: Cruising	Measure	Reference
Diii.A.Socio-economic	Diii.A4.	Number of ship visits per year (by month)	Number	WTO (2004)
	Diii.A5.	Annual ship visits arriving in peak month/ season	Percentage	
	Diii.A8.	Average spending per cruise ship visitor	€	
Diii.C.Management and optimization of key assets to destination type	Diii.C1.	Maximum capacity of docking facilities (number)	Number	Plan Bleu (2011), WTO (2004), WTO and APTEC (2016)
	Diii.C2.	Functional passenger terminals	Percentage	
	Diii.C3.	Access to transportation networks (railway and airports) (YES/NO)	YES/NO	
	Diii.C4.	Access to public transportation systems(YES/NO)	YES/NO	
Section	**Indicator reference**	**Destination Indicators: Recreational boating (Yachting/Marinas)**	**Measure**	**Reference**
Div.C.Management and optimization of key assets to destination type	Div.C1.	Number of berths and moorings for recreational boating	Number	European Union (2016), European Commission (2007), MITOMED (2015)
	Div.C2.	Access to public transportation systems (YES/NO)	YES/NO	Plan Bleu (2011), WTO (2004)

Source: Elaborated from Deliverable 3.16.2 on Tourism Sustainability Toolkit

The value added PA scale T&A analysis may support some of the "PA Specific Indicators", based on the data request survey feedback from the individual PA Coordinators responsible for the Polesine Camerini, Rosolina, Herault coast and Alexandroupolos PAs. The independent research conducted by the 3.11 Task Group can additionally support only the "Modes of Transport Used by Tourists to Reach Destination" (indicator reference P.B4.2) indicator for all the seven PAs.

Table 15: T&A Data Synergies with the PA Specific Indicators

Section	Key issues addressed	Indicator reference	Pilot Area Specific Indicators	Measure	Reference
P.B. Enabling Factors	*P.B4.Transport and accessibility*	P.B4.1.	Density of public transport (route kms per km2)	Number	WTO (2004)
		P.B4.2.	Modes of transport used by tourists to reach destination (airplane, car, rail, bicycle, walking, other)	Description	
		P.B4.3.	Number of passengers transported by local public transport for tourism / leisure purposes (compared to number of tourists using individual transport)	Ratio	
		P.B4.4.	% of accommodations, tourism facilities and other tourist attractions accessible by public transport	Percentage	
		P.B4.5.	Ratio of travel expenses by public versus private transport inside the destination	Ratio	

Source: Elaborated from Deliverable 3.16.2 on Tourism Sustainability Toolkit

11. Policy domain

Accessibility is a key factor in regional development policy and this is well documented (Brookfield, 1980; Biehl et al., 1986; Rutz and Coull, 1996; Hoyle, 1999). However, it is often not the determining factor for promoting a region since development also depends on a large range of parameters including physical conditioning factors, population size and characteristics together with state investment policy (Luis, 2002). A destination's remoteness only seeks to amplify its dependence on transport connections elevating the preservation of access as a key government objective (Currie and Falconer, 2013). The distances between islands and the modes and schedules of transportation linking the islands are a vital part of the archipelago’s tourism policies (Bardolet and Sheldon, 2008). Within the geographical context of insularity, transport plays a key role in terms of territorial cohesion and economic development, as defined in Article 170 of the Trans-European Networks of the Treaty on the Functioning of the EU.

Optimization of intermodal transport and market integration has been set as one of the goals of 2011 White paper (COM 144 2011), promoting collective transport and intermodal journeys as an easy and reliable alternative to the private transport, through insurance of uniform access conditions for passengers, insurance of service quality at a basic level and through better mobility planning. Furthermore, new rules on passenger rights, one of the objectives of White Paper 2001 (COM 370 2001) is based on the following three keystones, which have been adopted as a first step in the EU passenger transport policy moving from a mono-modal approach towards a more multimodal vision:

a) Non-discrimination
b) Accurate, Timely and Accessible Information
c) Immediate and Proportionate Assistance

This comprehensive strategy also contains a roadmap of forty specific initiatives to build a competitive transport system over a ten year period that aims to increase mobility, remove major barriers in key areas and fuel growth and employment. Additionally, in order to provide a seamless journey, the following core elements and issues had been identified in the project Towards Passenger Intermodality in the EU (2004):

a) Networks and interchanges – Availability of infrastructure of a certain quality and interoperability
b) Integration of the different transport services – Integrated timetables
c) Intermodal services – Integrated ticketing and tariffs, handling of baggage, pre- trip and on-trip information
d) Promoting intermodality – At an individual, on-site and general public level

Concerning the maritime transport, the appearance of new ship owners as a result of the complete liberalization of short sea transport in the EU waters since the beginning of 1999 (as a result of CEE Ruling number 3577/92 of the Council 07/12/92, article 6, point 2) has led to the implementation of cabotage for intra-EU shipping services (Luis, 2002). This has resulted in an increase in daily trips, an improvement in timetables and reduced fares (Luis, 2002). Additionally, the development of the Motorways of the Seas (MoS) has been highly supported by the EU policies (Casaca and Marlow, 2001) to promote an integral, and efficient intermodal transport system exploiting the European sea basins. MoS are short sea shipping services with particular characteristics which must be viable, regular, frequent, high-quality, reliable and integrated (Lupi et al., 2017). The MoS concept has suggested by the European Commission's (EC) White Paper (EC, 2001) and it has become one of the priority projects for the Trans-European Transport Network (TEN-T) program (European Parliament, 2004). Improving accessibility and connectivity for all EU regions as well as taking into account the specific case of island, sparsely populated, remote and peripheral regions are among the main priorities set out in the TEN-T guidelines.

MoS are aimed at constituting a valid alternative to all-road transport and integrating inland transport, specially when there are geographical constraints (Lupi et al., 2017). The EC's White Paper (European Commission, 2001) considers intermodal transport based on MoS, a viable and competitive alternative to all road transport. One of the main drawbacks of road transport, pointed out in the White Paper, is the saturation of traffic in some parts of the EU. However, the modal split is still in favor of road transport (European Commission DG Move, 2016, p. 36) and the principal mode of passenger transport is the passenger car (EUROSTAT). The higher rate of car rentals and car parking facilities provided by the passenger ports (Figure 37) and airports (Figure 42) also support this argument. However, high reliance on the use of cars as a means of passenger transport across the EU and as well as in the Mediterranean has contributed to an increased level of congestion and pollution in many urban areas and on many major transport networks (EUROSTAT).

12. Future Developments

Future developments within the touristic T&A features may include a set of recommendations in order to provide the best of these services in a sustainable way. Although these recommendations are more of a generalized theme, these best practices may be adapted with the CO-EVOLVE strategic planning for the testing phase (WP 4) in a PA scale and for the transferring phase (WP 5) in both PA and Mediterranean scale.

12.1 Monitoring

A monitoring mechanism may be needed for either specific services or for the entire ferry system to safeguard accessibility and competition, which could benefit service providers, users and also stakeholders beyond market participants (Lekakou and Vitsounis, 2011). Such a tool can prove valuable not only for evaluating the performance of individual services but also for evaluating the effectiveness of policy measures in the context of the provision of what is deemed as essential public services for accessibility (Lekakou and Vitsounis, 2011).

Monitoring operational initiatives may be undertaken to ensure the provision of adequate transport services to all users, irrespective of their geographical location, in a specified quality and at a reasonable price (Lekakou and Vitsounis, 2011). According to Lekakou and Vitsounis (2011), the concept of an adequate service is linked with:

- **Affordability –** The ability to make a service available at a cost that is proportionate to the economic capabilities of the target population
- **Availability –** The ability to provide the service at the location and time that suits users
- **Accessibility –** The capability of easy access to the service by disadvantaged users and users with special social needs
- **Acceptability –** The provision of service that is considered appropriate for the users' needs

12.2 Simplification

In order to increase the number of people using public transport, it is important to make it more attractive by simplifying the transportation (Stupalo et al., 2013). For example, by offering passengers one ticket for the entire trip even when using several transport modes and by assuring integrated schedules of different transport modes to provide quick, qualitative, reliable and flexible transport service (Stupalo et al., 2013). However, lack of regular public transports resulting in a lack of temporal accessibility may be overcome by providing taxi and car rental options for the tourists, which may eventually lower the economic accessibility.

12.3 Information

The information about the multimodal journey can be provided by the online multimodal journey planners, such as the TransDirect (UK), 9292 (Netherlands) or Reiseauskunft (Germany) providing door-to-door travel information and ticketing services (Stupalo et al., 2013). Information provided by the multimodal journey planner provides the users with travel cost calculation and travel time comparison depending on the transport mode and the availability of maps together with the suggestions on selecting the “greener” transport mode (Stupalo et al., 2013). Information provided to the passengers should also be user friendly (Stupalo et al., 2013). Therefore announcements, signs, schedules and information on the ground level may be posted in english besides the National/local language, in order to ease the accessibility for the international tourists. While this may have been maintained by the larger international transport nodes (e.g. airports, passenger ports, international bus and train stations), promoting this practice may be encouraged throughout the smaller nodes providing access to the touristic sites of interest.

Additionally, real time information around the passenger port on traffic jams, arrivals of ferries and cruise ships may also help the local citizens to choose alternative routes and might be a way to tackle the seasonal traffic congestions in port cities (Ryckbost et al., 2016).

12.4 Adequate and Synchronized Interchanges

To reduce passenger perception of transport breakings, it may be necessary to ensure adequate interchanges and infrastructure where timetables of different transport modes will be synchronized to ensure reliable, fast, flexible and comfortable transfer (Stupalo et al., 2013).

12.5 Improvement of Transport Infrastructures

Travelling times vary significantly due to changes in ship types and improvement in ports or road networks (Luis, 2002). Therefore, temporal accessibility may be improved by minimizing sea distances and introducing fast ferries capable of carrying both passengers and vehicles at speeds of 35-38 knots to shorten overall journey times (Luis, 2002). In the cruise and ferry business, quality and performance in one port will only show themselves to best advantage if the connecting ports are making similar efforts (Ryckbost et al., 2016).

The minimum requirements for a cruise transit port infrastructure may be the depth, appropriate quays, close vicinity and a high quality connection to the local touristic attractions (Ryckbost et al., 2016). A good temporary anchorage in vicinity of the touristic attractions can be sufficient as well (Ryckbost et al., 2016). Whereas, cruise turnaround port infrastructure is more demanding and requires good connection with the arrival/departure point of passengers (airport, railway station or bus terminal) and vast parking areas (Ryckbost et al., 2016). For the gateway airports, a good amount of international connections may be needed to allow passengers from all over the world to easily access their port of departure (Ryckbost et al., 2016). In order to minimize the congestion in road transport networks and to ensure smooth connections without hindering the local traffic, relocating the passenger car parking and/or having a dedicated road connecting the passenger port with the highway by passing the city centre are examples that have been proven useful (Ryckbost et al., 2016).

Port authorities may also incentivize shipping lines to use less polluting ships by introducing reduced port dues for greener vessels (Ryckbost et al., 2016) or by providing sufficient Port Reception Facilities (PRFs) and introducing the “No Special Fee” system, as it has been implemented in the Baltic Region, where the payment is already made regardless the ships deliver their waste or not, in order to eliminate the discharges at sea. The port authorities may also be encouraged to provide shore side electricity where possible, in order to reduce the airborne emissions of cruise and ferry ships at berth (Ryckbost et al., 2016).

12.6 Short Walking Accessibility

Short distance walking may be included in the integrated intermodal system by ensuring real time walking information are provided together with adequate pedestrian routes (Stupalo et al., 2013), while maintaining the safety features and enabling the accessibility for elderly tourists or persons with reduced mobility.

12.7 Customized Policy Adaptation for Insular Regions

It may be needed to develop national transport policies that take into consideration the particular characteristics of the insular and peripheral regions (Lekakou and Vitsounis, 2011). Furthermore, interventions may take into account the structural difficulties of T&A elements to and from the islands and the prevailing market structure (Lekakou and Vitsounis, 2011).

13. Conclusion

The mean level of quality of the Adriatic passenger ports and marinas together with the impressive array of services on offer along its coastlines are satisfactory in both quantitative and qualitative terms, which represents a logistical solution favoring the combined onshore and offshore touristic experiences (Adriatic Sea Tourism Report, 2017). The accessibility features for the cruise ports together with their excellent overall port-city relationships (i.e. close proximity and accessibility) suggest an overall positive trend for the Mediterranean EU Member States. Similarly, the airports also offer a wide range of intermodal T&A features as an enabling factor, providing access to the Mediterranean coastal touristic sites. However, lack of data on public transport services suggests necessary improvements may be needed in some smaller municipalities or in rural areas with sites of touristic interests.

In terms of the cruise ports analysis, Spain and Italy are spearheading in the Mediterranean as well as in the Europe. However, the ferry passenger analysis suggests Italy and Greece are leading the Mediterranean by welcoming passengers more than any other countries. This may be directly linked to the tourist influx on the coastal regions of these countries. The analysis on the main airports also suggests a similar trend for Italy, Spain and Greece.

Based on the available data and analysis carried out by this study, future developments on cruise tourism can be foreseen as new ports are joining the cruise itineraries, specially for the case of Italy. Also Maltese Authorities are expecting a rise in the number of cruise passengers and calls in the coming years. The West Mediterranean Region ports may be predicted for an overall steady growth as well. Concerning the developments on ferry passenger ports and marinas, a rise is expected for the Adriatic Region in 2017.

Since the inception of this study, data inadequacy and harmonizing discrete data from various sources have been the main challenges encountered. However, this study neither rules out the presence nor confirms the absence concerning the data unavailability for certain T&A features, as specified during the analysis.

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