

# Not Only Waterfront. The Port-City Relations Between Peripheries and Inner Harbors

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**Abstract.** The paper tackles the issue related to the sea-rail intermodal transport Important but often conflictual relations have for long times related cities and their ports. In particular, the mutual evolutions of cities and ports drew very often the attention on waterfronts and on the older port areas and facilities that are abandoned or converted to urban uses and functions. There is little attention, on the contrary, towards the new areas becoming important for ports, as the inner harbors, that host increasingly important operations that are vital for linking ports and their hinterlands in order to free quays for freight handling on the seaside. These operations include, among others, warehousing, modal shift, block-train assembly. Similarly, cities are living a complex relation among their centres, the focus of policies and attention by policymakers, and their where, on the contrary there is a general lack of services and communities suffering for deprivation and little access. These areas, furthermore, become more and more the ideal location for transport and port-related activities and facilities, among them, ideally, disused commercial and industrial sites. Such transport and logistic-related activities, however, not always are inserted into urban and transport plans, but also very often being carried on by privately-owned companies. The paper is focused on the definition of a method for highlighting the inner relations between peripheries, semi-peripheries and inner harbors, proposing a methodological analytical framework for spatially-locating the spatial pressures and potential for development. The research started from the local cases of Cagliari, Catania and Trieste as starting points for the observation of these phenomena, to extract analytical and research points for further evolutions on national and international cases.

**Keywords:** Port-City relation · Peripheries · Inner harbors

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# 1 Introduction

## 1.1 The Port City Relation

The problems and stresses that characterised the contemporary cities are mainly caused by natural and health factors - similarly to what happened in the past - linked to climate change and the recent COVID-19 pandemic crisis.

A number of studies have described the urban shocks that have affected cities in the last decade and they have defined strategies, actions and tools useful for the realization of a post-pandemic, climate-proof city [1, 2]. In several areas of many Mediterranean cities, as those object of the present paper, like, particularly, Catania, but also, in different and less evident ways, like Cagliari and Trieste, changes are taking place, involving in particular the former port areas as waterfronts, as well as other old industrialized areas.

The waterfront, in particular, generally identifies the area of a city close to the sea - or a lake - in particular the area bordered by a port, dockyard, arsenal or other commercial or industrial maritime activities. It does not therefore correspond to the waterfront, which may instead be a road or other scenic route running along the seashore [3]. These urban spaces are the object of a series of interventions aimed at increasing accessibility and public use, but also of urban-port reconversion processes and transformation projects on the waterfronts.

The port-city relationship, in its complexity, lays at the heart of a set of contradictions and problems in contemporary planning, starting from its scalar dimension, to funding and the most suitable planning tools. Several studies have conducted research on the transformation of port cities and urban waterfronts in Italy, to demonstrate that the relationship between the city and the port cannot be conceived as a problem of homogeneity, but rather of diversity.

This derives from the fact that political choices, projects and resources are often not defined with the same degree of interest and importance [4, 5]. On the basis of these concepts, this paper therefore describes the most recent evolution in particular of three Italian ports (Trieste, Cagliari and Catania). The work highlights the evolution of the inner port areas and at the same time underlines the criticalities that local administrators will have to solve to make them more usable and to improve the port-city relationship.

## 1.2 The Development of Inner Harbors

In Italy, the policy related to the development of waterfront areas focuses on the redevelopment of the port-city and the urban area immediately behind it that has non-merchant functions. It is particularly important and aims at improving the landscape, trying to reduce the environmental impact and increasing the economic resources, attracting tourist activities and flows (museums, refreshment and conference centres, etc.).

In general, the term “inner harbor” refers to an intermodal terminal for goods, which is generally located in a place that is close to a seaport. In this area there is also an intermodal area including both road and rail modes, and often other areas with sorting and distribution functions [6, 7]. The main function is the decongestion of port areas by storing goods a few - or even hundreds - of kilometers away from the port itself.

The hinterland is connected to the port through a series of rail services that are as regular and frequent as possible - dedicated services. This ensures efficient management of the entire transport cycle, including handling, storage and warehousing, and intermodal break of bulk. The port project is a dynamic infrastructural, transport and production project that produces impacts in terms of landscape/environment [8].

In order to mitigate the negative impacts new opportunities for tourism development and new challenges have to be taken into account to produce more and more energy from renewable sources - i.e. Rotterdam.

In addition, the port and the surrounding areas should become the privileged interface of land transport networks, improving intermodal connections and becoming a place of commercial exchange with a strong potential for growth and tourist attraction. [9]. In Europe, medium-sized and medium-small port cities are characterized by a particularly complex situation caused by the fragmentation of development choices but also by the presence of different authorities that are not always cohesive, by the reduced availability of resources.

Crisis conditions can also slow down, or make unfavorable, regeneration proposals based on integrated port-city development models [10]. Medium-sized port cities have great potential for urban regeneration in the interface areas between port and urban entities.

## 2 Port - City Relations Among Peripheries and Inner Harbors

### 2.1 The Case of Cagliari

In Italy the port-city system has specific features that do not emerge in other cases. Specifically, they are part of urban systems and have developed operational relationships with logistics hubs and the environment and the urban layout. However, despite the centrality and functionality, especially in southern Italy, ports are experiencing roles resulting from the multitude of entities that have a decisive role in functional reorganization (Region, Municipalities, Port System Authorities, etc.). This is what is happening in the port system of Cagliari (freight and passengers). The port system of Cagliari consists of two main areas: the historic or old port, which extends over 5,800 m of quay and has a vocation for commercial traffic, Ro-Ro, passenger and cruise ships (with a dedicated terminal), and the canal port, which extends over 1,600 m and offers five berths for transshipment and Ro-Ro traffic. To the west of Porto Canale, in the locality of Sarroch - Porto Foxi, there are petrochemical - oil docks with moorings for seventeen ships, a service of one of the most important national refineries (Fig. 1).

The recovery and revitalization of the land-sea interface constitutes the most ambitious objective for Cagliari in the context of an urban planning aimed at defining structures that ensure a renewed and solid link between the city and its sea. The completion of the Porto Canale outpost (2022), the redevelopment project of the Via Roma (2022), the drafting of a new Municipal Urban Plan (2022) constitute some of the significant events for the city: the possibility of using the new port In fact, while it opens up numerous perspectives for the reorganization of port functions, it also offers a unique opportunity aimed at the reuse and redevelopment of the city-port up to graft into the main historic districts.

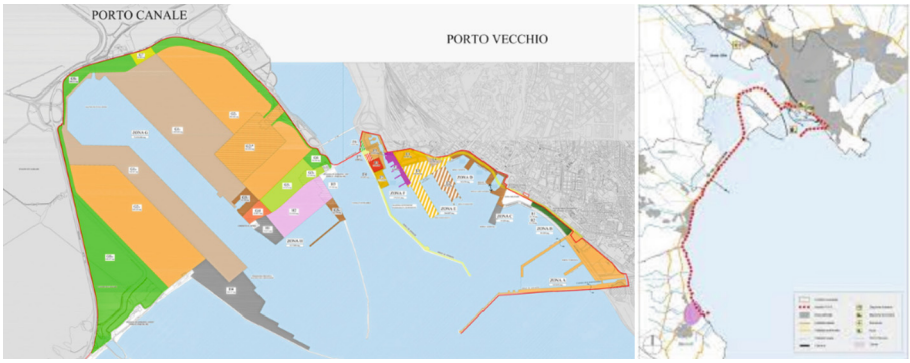


**Fig. 1.** Cagliari Old Port and Channel Port. Source: author's elaboration from [11].

The entire seafront of Cagliari extends for about 12 km from the Santa Gilla pond in Sant'Elia with the new marina under construction (2022). The seafront, with singular places of historical and environmental value that alternate with abandoned spaces or spaces intended for port or industrial activities, is involved overall in the transformation and redevelopment process, animated by multiple public actors. The design theme of the city-port interface can be summarized as a redefinition of the relationship between the "historical" city and the seafront, with the aim of integrating the sea-city. The goal that everyone agrees is given by the connections of long and short, fast and slow networks.

The complex network of relationships between the parts and elements of the waterfront and the city offers a progressive redevelopment of empty spaces and abandoned sites, responding to the needs of the metropolitan city.

The interface is thus configured to give rise to the different types of relationship between the urban and port systems. Furthermore, in December 2021 the ZES (Special Economic Zones) of Sardinia (7 + 7 years) were approved with the aim of promoting economic production opportunities facilitated by a more advantageous tax and customs system (Fig. 2).

However, the port system of Cagliari, goods in particular, is affected by the lack of railway infrastructures that oblige any movement of goods and passengers by road in road infrastructures, including those of urban relevance.

### 2.2 The Case of Catania

The port of Catania is currently defined by many activities, ship-related and otherwise. The port and its back harbor are part of the special economic zones (ZES) of Eastern Sicily [12]. The Port of Catania is defined as a first generation port through the UNCTAD classification [13] as are the ports of Taranto and Ravenna; these ports have a strong interaction with their cities [14]. Currently, the port of Catania covers an area of approximately 470,000 square metres.

It is located in the centre of the Mediterranean Sea; to the east, a breakwater encloses it, 1860 m long, with an end section of approximately 40 m.

To the south it is bordered by another quay about 420 m long. There is also a new port (to the northeast), polygonal in shape, delimited by two small piers to the east and

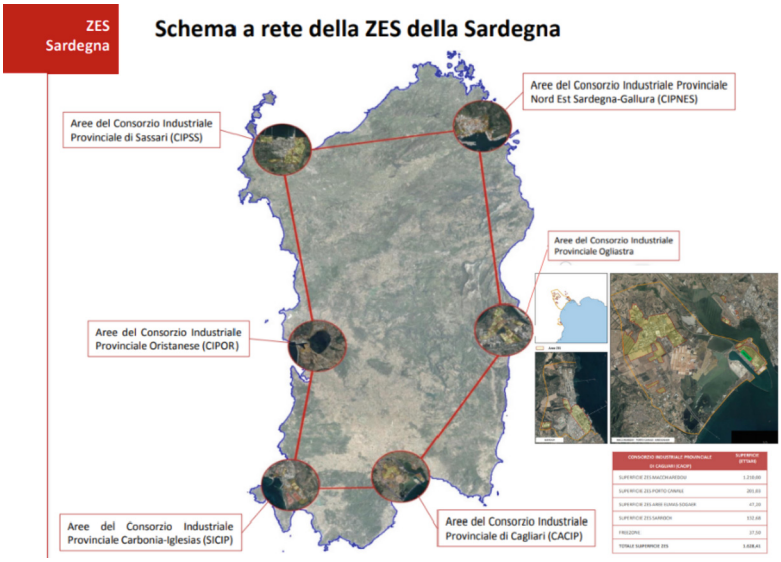


**Fig. 2.** Special Economic Zones (SEZ). Focus on Cagliari [11].

west. The old port is located to the west of the new one. It serves as a quay for fishing and motor fishing boats. The location and connections to the road and motorway network as well as to the regional airport and airport network have made the port a key player in the regional economy (Fig. 3).

In particular, in 2018, the port recorded the presence of approximately 99,157 ferry passengers and 123,985 cruise passengers; these results have made the port of Catania one of the main passenger ports in Sicily [15, 16]. Cargo traffic is located in the southern area of the port, in the Nuova Darsena commercial dock.

The Northern area of the port is instead characterised by a mixed use of areas and infrastructures, due to the significant and continuous commercial growth registered recently.

Unfortunately, in the areas surrounding the port there is a negative interference of vehicular flows (i.e. private and goods) with pedestrian flows and there is also a lack of dedicated spaces and reserved paths for pedestrian and bicycle mobility.

In order to minimise interference with congested urban traffic, the access and exit of heavy vehicles is allowed through the gate called Faro Biscari, located to the south and connected to a motorway structure. The Dusmet gate is dedicated to pedestrians and private vehicles.

Although several redevelopment proposals have been planned, the conditions of marginality and degradation that characterise the portion between the Faro Porta Biscari and Porta Dusmet gates remain [17].

The Port Committee, contrary to art. 4, paragraph 4, letter c of Law 84/94, did not consider it opportune to deepen the problem of promiscuity by strengthening the road system and trying to solve the problem of congestion with a view to a future modification of transport and communication modes. This action, while solving the problem, also




**Fig. 3.** The Port and city of Catania (author's elaboration over Google Earth).

increases the conflict between the city and the port. In 2016, a project was signed by the competent authorities for the construction of a very long cycle-pedestrian promenade of about two kilometres with lighting and benches, the creation of a sports area and also a saltwater swimming pool. To date, this project has not yet started, with only the beginning of some of the work to reunite the "Civita" district with the port of Catania.

### 2.3 The Case of Trieste

The port of Trieste is located near the northeastern border of Italy with Slovenia, and at the crossroads of the main international routes between the Mediterranean and central Europe. It occupies about 2.3 million square meters, around 1.8 million square meters of free zones. The quays cover a total length of 12 km with 58 operational moorings, and maximum depths of up to 18 m (container terminal - Pier VII in particular), and served by a total length of 70 km of railway tracks (Fig. 4).

The Port of Trieste presents itself as a unique case on the national scene, especially for the international Free Port regime, sanctioned after the end of the Second World War, and after the long definition of the northeastern border of Italy. This regime, recently regulated in order to adapt to the transformation of national ports within the Port System Authorities, provides in particular for customs relief, and port development as a transit hub and for the development of local economic activity. In particular, the free points of the port of Trieste are considered as a duty-free territory, with consequences, in particular, linked to simplifications in terms of introduction of goods, storage, processing, deferred

payments, as well as relative to the possibility of on-site processing while maintaining the origin, or, on the contrary, according to certain conditions, acquiring the 'made in'. The facilitation of transit functions is also guaranteed by free rail access, with the opening of access for all rail carriers to free points, and the exemption of fixed rights on the movement of vehicles, with the liberalization of the transport of goods in transit. The strong development of the Port of Trieste as the first Italian railway port, as well as the most connected to an international hinterland, and the strong presence of traffic, especially Ro-Ro, are elements that can certainly be connected to this regulatory situation which, in perspective, can orient the port and local economic development towards the definition of free zones [18, 19].




**Fig. 4.** The Port and city of Trieste (author's elaboration over Google Earth).

The evolution that has taken place in recent years, starting from January 2016, has led to a potential changing and changed relationship between the port and neighboring areas or areas linked to the urban context. From that moment, in fact, the free zone regime, up to that moment unchangeable in its locations, was able to be 'moved' and assigned to areas where it could more readily and fully be exploited: in particular, from the Punto Franco Vecchio, a large part, in fact, of port structures dating back to the Austro-Hungarian period, the area of which is now destined for a 'traditional' redevelopment as an urban waterfront, towards other locations, such as the new FreeEste logistics center, part of Interporto Trieste (Fig. 5).

Precisely the logistic nodes external to the port, albeit at its service, such as the Fernetti dry port and its free zone FreeEste are the testimony of a process of organization of a port region in a broader perspective than the traditional relationship 'city-port' , in which new spaces are involved in operations connected to handling, and in which new

relationships arise with portions of territory once touched in a different way by transport operations.

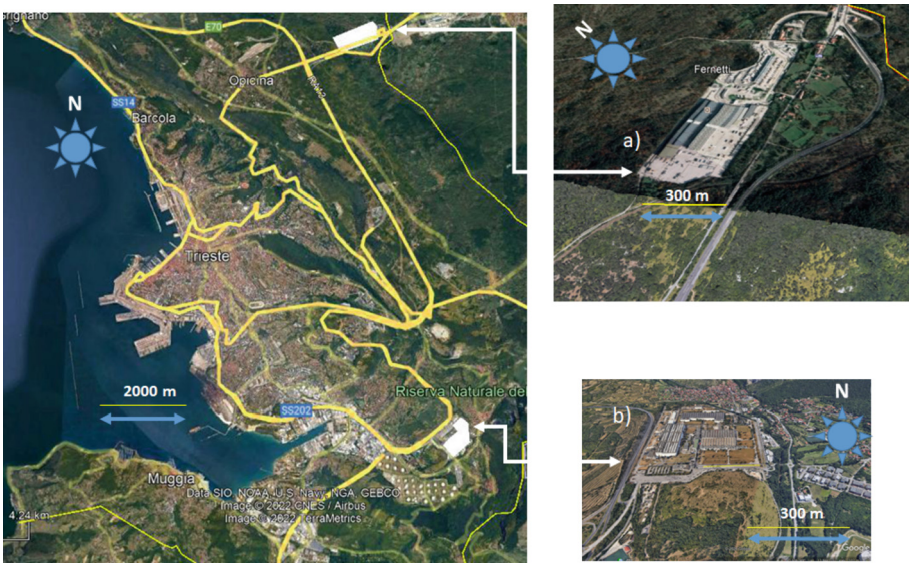


**Fig. 5.** Trieste and its main inland logistic nodes (North: Interporto Trieste - Fernetti; South: Interporto Trieste - FreeEste/Free zone)

## 3 Not Only Waterfront - A Methodological Proposal

### 3.1 Not Only Waterfront

It is necessary to integrate these spaces into urban systems (physical, economical, social and cultural) and at the same time to attract inhabitants by proposing that they use these spaces for socialising.

While the waterfront concept represents a boundary at different levels (e.g. between land and sea), it is also possible to define an environment with a multi-layered historical, economic, social and cultural characterisation. Considering the increasing separation between port and city, it is necessary to maintain this link and to reassure that the presence of the port is still an asset for the city and not the other way around.

Ports are complex systems but some portions of them could be more easily integrated into the context by technology, for example. A balance must be found between the positive and negative effects that port activities generate, as this balance is often the key to the tension between port and city. It is necessary to experiment with new projects and organisations that support hybrid spaces between ports and cities.

Another important issue is the reconstruction and re-functionalisation of the imaginary port-city area, based on citizen participation processes, where people can talk about and recover a sense of belonging to the port as 'their' own port.

There are no universal solutions. Although ports are very often similar, each one presents different problems in the port-city relationship. At a general level, it is possible to emphasise certain strategies in terms of urban planning:

1. It is essential to open up planning processes to the public, particularly those relating to the port-city interface;
2. Improve the management of these areas;
3. It is necessary to identify negative port externalities affecting local inhabit-ants, which vary from case to case (e.g. smoke reduction in some cases, traffic or noise pollution in others);
4. Reuse resources generated by the port, which would otherwise be wasted, such as heat or energy.

The overview of the different ports involved in the present paper represents the starting point for trying to propose a methodological framework for a more punctual and thorough analysis of the complex set of relations among the urban areas, in their articulated framework of centres, semi peripheries and peripheries, and the port and port-related activities.

### 3.2 A Methodological Proposal

The overview of the different ports involved in the present paper represents the starting point for trying to propose a methodological framework for a more punctual and thorough analysis of the complex set of relations among the urban areas, in their articulated framework of centres, semi peripheries and peripheries, and the port and port-related activities.

The descriptive overview so far briefly introduced, should be integrated by a different set of analysis, that implies the organization of the different planning tools, together with the de-facto, spontaneous organization of the industrial and logistic players, in space. On one side there is the need to organize and analyse the approved, adopted or in progress planning tools in terms of their capacity to tackle together the aspects related to the different land uses at urban and peri-urban levels, therefore observing the effects on urban and port centres. If we can observe that strictly urban and port planning tools are generally coordinated and interrelated, this is not always true when we consider transport and industrial planning tools, as well as when we consider the ‘spontaneous’ behavior of de-facto logistic operators, whose location in space can be non-structured and referred to traditional standard industrial and retail locations, but with logistic-like impacts in space. This, in particular, needs to be appropriately surveyed and investigated.

The proposed matrix, that can provide in perspective a useful tool for evaluating the urban-port performances [20, 21], as well as a planning instrument for an overall harmonization of the set of the planning tools.

Different sets of procedures need therefore to be put in action in order to fill the matrix as proposed.

1. Desk research on the approved (AP), adopted (AD) or in progress (IP) planning tools;

2. Desk/cartographic/field research on the major urban/industrial/transport areas involved
3. Field survey on the existing logistic and logistic-related activities on the territory;
4. Overlay of the different levels of information (Table 1).

**Table 1.** A matrix for estimating the city-port relations' impact over different areas and according to structured and non-structured tools (Source: Authors' elaboration).

| Urban & port areas/Planning tools (AP-AD-IP) | Urban planning | Port planning | Transport planning | Industrial planning | De facto planning |
|---|---|---|---|---|---|
| Central area | | | | | |
| Semi-periphery | | | | | |
| Periphery | | | | | |
| Port area | | | | | |

Such a framework should be useful for 'filling the gap' among the different sets of knowledge over the logistic needs and characters of city-port regions, in order to propose tools for better exploiting their evolution towards a smart port region concept.

## 4 Discussion

The port - city relation holds historical origins and is related, with particular reference to the oldest urban areas, to the same birth, development and evolution of cities itself, with a very tight and strong link [22–28]. The transformations occurred in time modified the relations among the two subjects: ports on one side changed their roles - so as cities - servicing not only the cities they were located in, but more and more oriented towards a wider hinterland, regional and often national or international, with changed links, often weaker, with the cities themselves and their neighboring territories.

The port-city relation passed through several evolutions and in the post-industrial - or trans-industrial - stage it faced a particular attention towards waterfronts and a renewed interest towards their conversion to urban uses. In such sense, the typical case studies involved Genoa with its Old Port and its urban redevelopment in the Nineties of the past century and, almost potentially and only partially, Trieste, where, currently, the urban redevelopment has been only partial so far, considering also the gigantic dimension of the buildings' volumes and surfaces involved, whose conversion and redevelopment is challenging and still to be defined and properly ignited.

In such a situation, cities and ports today coexist in their differentiated functions, often in the waterfront where such a mix is more evident. As a matter of example, we can recall the pedestrian function coupled with mobility and free time, together with the port one, related mainly to passengers' traffic, as the urban public transport and transit systems, ferry - Pax and/or Ro-Pax -, cruise ships.

The changed - and changing - functions and relations as played by ports, as nodes of a wider set of links with the hinterland and other maritime destinations, as well as areas for handling, managing, storing and warehousing freights, other than as break of bulk and transshipment to other transport means, and of local and regional distributions, produce, as a consequence, a shift of the spaces connected to port functions and activities, towards the inner areas of the port region, actually connecting and competing with urban uses and functions for land use.

In such a sense, new "geographies of marginality" are being drawn, with a city - port relation that does not deal any more with traditional places, that can be defined as central within the different urban areas, but with those in peripheral or marginal areas, often localized also in different municipalities to those strictly urban and hosting the port itself.

## 5 Conclusions

The coordination among the different planning levels - urban plan and port plan - is foreseen in the Italian planning framework, and, particularly for the areas having concurrent and mixed use, different is the case of the other new planned logistic areas and their interaction with urban activities.

Important changes are ongoing, both related to urban logistics and to the locations becoming necessary from the widespread diffusion and importance of the last mile in the door-to-door urban distribution, and with reference to the new inner harbor spaces, where logistic functions supporting port activities are mixed and confused with the urban ones, often without a proper coordination. Inner-harbor industrial and logistic zones often coordinate with ports themselves - and this is, as a matter of example, what the Port of Trieste is doing, via the coordination of the Industrial Zone Board and inland terminals, while a lower attention is for private activities related to logistic and distribution, often related, or referable to greyfields conversion from industrial and/or commercial uses to logistic ones, with an impact non always foreseen or foreseeable on activities and urban functions.

In conclusion and in perspective, therefore, in addition to greater coordination between the plan initiatives already in place at the urban and logistical-port level, it becomes possible and necessary to map the logistical and distribution nodes, whether linked to the already existing and planned dedicated infrastructures, both those managed by private operators, also for micro-distribution and storage functions, in order to be able to evaluate the development areas of these activities more precisely and highlight possible interactions and criticalities in urban interactions, including periphery and margin.

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