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« Transformations in french ports spaces »

Ports are historically fluid and shifting spatial objects. The operational requirements of vessel accommodation, cargo handling, logistics, and industrial processing systematically reshape port territories over time. The city, which was frequently born from and prospered because of its gateway, must concurrently cope with its own urban spatial dynamics. Today, ports are embedded within greenfield challenges surrounding their spatial footprints, particularly regarding their relationship with the city, the public sphere, and the urban population. Redefining, transferring, integrating, and protecting: these are the defining actions framing the contemporary territoriality of our ports. The urbanity of port cities must manage these spaces, which retain immense value—symbolic value for local identity and heritage, and macroeconomic value as critical employment basins. Let us review the current landscape of port territoriality.

From the historical city-port to the modern gateway

Like all major European nations, France boasts an abundance of ports. From Dunkirk to Nice, including Corsica and the Overseas Territories, numerous cities host a maritime gateway. A fraction of them traces its historical origins back to Antiquity and the initial Greek or Roman trading outposts. However, the majority of port cities emerged during the Middle Ages. The most recent ones were born from royal decrees—such as Le Havre, Sète, and Lorient—and subsequently from modern industrial commerce, as seen in Saint-Nazaire, Port-La Nouvelle, Fos-sur-Mer, and Roscoff. It is undeniable that from the dawn of the 19th century onward, infrastructure assets expanded and transformed first the port cities themselves, and then their coastal peripheries, driven by macroeconomic requirements and public policies.

From a historical perspective, specific chronological phases must be unpacked within port development. Inherited from historical cycles or born from public mandates for the most recent ones, the city is a port by its very essence. The port city exists because of the quality of its shelter—whether geographical or defensive—along the coastline or by virtue of its strategic location within estuaries. Vessels historically sat at the very heart of the city, which derived its prosperity from its maritime activity. The port basins, shipowners' headquarters, shipyards, and small-scale manufacturing units occupied an urban space that was still highly restricted. Compounding this footprint was frequently the presence of naval arsenals, which were themselves heavy consumers of spatial territory.

The core challenge of 19th-century port history consisted of granting more space to vessels. Maritime commerce was powerfully driven by transoceanic trades and colonization. Without abandoning short-sea coastal shipping, the deployment of larger vessels established the prerequisites for contemporary maritime transport. The task for local authorities and the State was to deliver greenfield spaces in the form of wet docks (bassins) and piers (môles). Starting in the 1840s, quantitative, qualitative, and structural shifts in maritime transport compelled ports to execute constant spatial modernization.

In Le Havre, the 1787 Lamandé Plan initiated the first infrastructure developments for two docks completed by 1820 (the Bassin du Commerce and the Bassin de la Barre). In Marseille, public authorities decided to construct a modern port complex outside the historical, congested Vieux Lacydon starting in 1844. The strategic idea of engineering a port facility at the mouth of the Loire in Saint-Nazaire dates back to 1808, with construction work officially commencing in 1847. Dunkirk, which had been eclipsed by Antwerp under the First Empire, had to wait until the Second Empire to expand, unlocking its Bassin du Commerce in 1880. Concurrently, the inland estuary ports of Rouen, Nantes, and Bordeaux modernized their quays and planned new dock basins. Beyond infrastructure works, the rear areas of the quays were rapidly occupied by large warehouse-docks modeled on the British architectural archetype, as illustrated by the magasins généraux of Le Havre (1844) and Rouen (1857), alongside

the Docks Talabot in Marseille (1859). Paralleling these maritime works, the railway network reached every single port city in France between 1845 and 1855.

With the advent of the 20th century, these maritime territories were fitted with large, strictly functional transit sheds (hangars) that came to define the visual characteristics of contemporary urban port spaces. The initial phase of urban sprawl was thus driven by this space allocated to vessels—on a modest scale for secondary ports, but already reaching massive dimensions in the coastal gateways of Le Havre and Marseille.

The two World Wars exerted sweeping consequences on French ports. During the First World War, the British military presence in Rouen and the American deployment in Bordeaux, Brest, and Saint-Nazaire enabled rapid infrastructure upgrades. The Second World War was marked by catastrophic, widespread structural destruction from all belligerent sides. The post-war era required prolonged, capital-intensive efforts to return ports to active service, coupled with monumental reconstruction programs for the heavily bombed or besieged cities. The urban identities of Dunkirk, Le Havre, Brest, Lorient, Saint-Nazaire, and Toulon had to thoroughly reinvent themselves. While the urban port remained physically present, the historical legacy heritage vanished, making way for a clean-slate architectural modernity. The port city was forced to reinvent itself at the exact moment the port industry initiated a brand-new structural mutation, shifting its core operations far away from the historical city center.

The era of heavy industries and mega-gateways

The second structural layer of port spatial history is deeply intertwined with industrialization. The most organic manifestation of this trend was shipbuilding. Throughout the 19th century, numerous port cities were fitted with world-class shipyards; these construction facilities expanded relentlessly and consumed vast spatial footprints. In Saint-Nazaire and La Ciotat, the shipbuilding sector dominated local activity and explicitly forged the social and cultural identity of the city. While shipbuilding operates within the organic functions of a port, the broader industrialization that captured maritime spaces was driven by the processing of raw commodities right at the quayside (*bord à quai*). The port evolved beyond mere cargo transshipment and the supply of small-scale local manufacturing inherited from Mediterranean or colonial trade. Greenland and newly engineered industries consumed massive spatial territory for themselves and to accommodate increasingly larger vessels.

Crude oil initiated this new era of port history through refineries. Propelled by the availability of Iraqi crude and structured by protectionist public policies, oil refineries were constructed across the coastal or estuarine peripheries of several French ports. In the immediate term, these greenfield sites were physically removed from the historical port layout, but they successfully pioneered the concept of the Industrial-Port Zone (ZIP — *Zone Industriale-Portuaire*).

During the 1950s, the global availability of high-grade coal and iron ore represented a monumental opportunity for a Europe undergoing rapid post-war reconstruction and expansion. While small-scale steelworks already existed across many ports, the new coastal steel mills were engineered on a massive scale. Industrial-port zones officially became core instruments of national spatial planning (*aménagement du territoire*). Throughout the 1960s and 1970s, the DATAR (*Délégation à l'Aménagement du Territoire et à l'Action Régionale*) piloted the largest infrastructure macro-projects: namely, the industrial reclamation of the Gulf of Fos for the Port of Marseille, the development of the alluvial plain in Le Havre, and the structural expansion of the western coastline in Dunkirk. This momentum was nationwide: the Loire Estuary was systematically developed at Montoir-de-Bretagne, while the ports of Rouen, Bordeaux, and Nantes expanded into downstream municipalities. Even within secondary ports, these infrastructure adjustments finalized the contemporary visual layout of maritime spaces, characterized by heavy quays and localized ZIPs.

French ports witnessed a second wave of refinery installations, but maritime territories were concurrently populated by metallurgical and aluminum smelting units, cement plants, chemical fertilizer factories, and agribusiness grain silos. Ports expanded to match the scale of the industrial economy and modern maritime transport; spatial footprints were dedicated as much to industrial processing as to vessel operations. These industries clustered within port boundaries because of the economic opportunity to process seaborne cargo. Today, however, there is no long-term certainty regarding their permanence. Several territories have already lost their refineries, metallurgical plants, or fertilizer factories. A identical contraction impacted the shipbuilding sector, which retrenched sharply during the 1980s.

Consequently, port deindustrialization is synonymous with industrial brownfields (*friches*) and urban rezoning. Yet, ports are simultaneously identifying brand-new industrial opportunities, and territories can

reclaim active operations through Marine Renewable Energies (MRE). These will be followed by manufacturing plants dedicated to innovative hydrogen-pathway fuels and anaerobic digestion methanation facilities.

Furthermore, a third spatial mutation must be accounted for, consisting of granting massive new spaces for cargo logistics. Throughout the 1970s and 1980s, gas storage networks, containerization, finished vehicle logistics, and ferry services demanded vast, unprecedented spaces. Since the year 2000, landmark port infrastructure developments have proliferated: Port 2000 in Le Havre for container shipping, brand-new LNG import terminals in Dunkirk and Fos-sur-Mer, the mega-expansion of the Ro-Ro ferry port in Calais, and the spatial repurposing of part of the port layout in Saint-Nazaire and Cherbourg to accommodate MRE manufacturing. To this matrix must be added the spatial gains achieved in Brest (the Polder project), La Rochelle-La Pallice (Anse Saint-Marc), Sète (the Zifmar zone), and Port-La Nouvelle. Space is mandatory for cargo before or after stevedoring operations, but it is equally vital for contract logistics and intermodal connectivity.

At Fos-sur-Mer, the commercial success of containerization relied heavily on developing the Fos Distriport logistics platform. In Le Havre, logistics parks line the immediate hinterland of the port infrastructure, complemented by a dedicated intermodal rail yard. Dunkirk, much like Montoir, continually expands its spatial footprint for cargo. While these modern developments rarely encroach upon the historical urban fabric, it is the economic power of this integrated industrial-port basin that guarantees the prosperity of the wider territory and sustains the high-level administrative and commercial functions of the central city.

The spatial scales of port territoriality

The primary territorial dimension remains the very heart of the city, regardless of whether the port was constructed before or after the urban settlement. The historical urban port—with its open quays, tidal basins, locks, and legacy buildings—frequently sits in close proximity to the city center. It occasionally represents the exact foundational urban surface of port cities. This city center is at times historically preserved, at times fully reconstructed, at times functionally focused on the port layout, or entirely reoriented.

Over time, the urban relationship to the water can become diluted, and the residual scars of past port activities can degrade into brownfields and under-zoned grey areas (such as aging warehouses, fragmented commercial operations, or transport depots). It is precisely the acute awareness of this urban grey zone that has fueled the widespread momentum of "City-Port" waterfront redevelopment (requalification ville-port). As their historical urban ports underwent structural devitalization—handling fewer vessels and diminishing cargo volumes—municipal mayors sought to reclaim the waterfront and re-integrate it into a reinvented urban fabric.

During the late 19th century and throughout the 20th century, ports aggressively acquired territory. The initial phase of this expansion naturally consisted of expanding into the immediate vicinity of the historical port layout.

The port can be characterized as "peri-urban." It actively searches for spatial territory along the coastline or the riverbanks of the municipality. Logically, the urban fabric follows the port layout, notably through working-class neighborhoods providing the battalions of dockers and shipyard employees. In the post-war era, ports continued their spatial expansions. These greenfield sites were henceforth extra-urban, shifting outside the original municipality into neighboring territories, which were often peripheral rural villages. It was not until the 1960s that urban agglomerations partially caught up with these peripheral gateways. Petit-Quevilly and Saint-Gervais in Rouen, Roche-Maurice and Cheviré in Nantes, alongside Balguerie and Bassens in Bordeaux, mark this downstream migration of port assets. The major coastal gateways expanded extensively through the wet docks of Dunkirk, the southern basins of Le Havre, and the northern docks of Marseille. Elsewhere, this trend manifested as the polders of the Anse Saint-Marc in Brest, the Keroman and Kergroise complexes in Lorient, and the La Pallice district in La Rochelle. In these various cases, the city did not necessarily reabsorb these maritime spaces, as urban planning routed its expressways, new factories, and large-scale retail zones through them.

The final spatial phase of French port history is the "outport" or "deported port" (port déporté). This paradigm means that brand-new port facilities are constructed far beyond urban boundaries, engineering isolated terminals and heavy Industrial-Port Zones (ZIP). The most extreme illustration of this model is the Antifer oil terminal located north of Le Havre. Genuine deported ports encompass the Fos-sur-Mer complex, the Grand Canal Maritime running beyond the François 1er lock in Le Havre, the

Western Port of Dunkirk, the Loire industrial front at Montoir-de-Bretagne, and the isolated sites of Radcatel on the Seine and Le Verdon on the Gironde Estuary. For all these deepwater sites, the central core city is physically distant; the urban dimension now expresses itself exclusively through industrial safety perimeters (PPRT — Plan de Prévention des Risques Technologiques) and a catalog of local nuisances, including heavy truck transits, odors, and atmospheric pollution. The deported port concentrates the bulk of port and industrial employment, but at times projects a negative public image for local populations.

The functions of the historical city-port core

The urban space impacted by port spatial mutations faces numerous complex challenges. In terms of actual operational activity, what functions remain within these historical spaces? The urban port surrounding the historical core has frequently been emptied of cargo-related logistics. Passenger traffic can persist in selected cases, spanning cruise calls, ferry liners, excursion boats, and water shuttles. The historical tidal basins can also serve as mooring sites for state administrative fleets, pleasure crafts, or maritime heritage vessels, as illustrated by the New Maritime Museum in La Rochelle.

Above all, this territory represents the primary playground for "City-Port" waterfront redevelopment strategies (*stratégies ville-port*) aimed at reclaiming industrial brownfields. The spaces clawed back from traditional port functions are dedicated to a diverse matrix of urban uses: retail commerce, recreational and tourism zones, and residential housing. The municipality has immense interest in highlighting its maritime identity heritage, driven by the challenge of securing public access to the waterfront (basins and coastlines).

The legacy port layout thus constitutes an exceptional arena for municipal authorities and their urban planning agencies. Urban waterfront projects are proliferating across all scales, without necessarily involving the direct jurisdiction of the port authority: the Marina in Dunkirk, Dieppe Sud, the Grand Quai in Le Havre, the 105 project in Rouen, the redevelopment of the Port of Saint-Malo, the Premier Éperon in Brest, and the Petit Maroc district in Saint-Nazaire. The port spaces undergoing urban rezoning can at times reach XXL dimensions, as observed around the inner basins of Le Havre, the Île de Nantes master plan, and the Euroméditerranée urban renewal project in Marseille.

In specific configurations, the projects are smaller in scale but highly strategic for the port city's future. In Saint-Nazaire, the objective focuses on engineering the spatial hinge (*charnière*) linking three newly renovated urban realms: the inner basins still fully active and dedicated to the blue economy, the waterfront zone (*zone ville-port*) largely reshaped inside the historical submarine pen, and the urban seafront beach boulevard. The Petit Maroc urban islet concentrates high ambitions, blending residential housing developments, recreational public spaces, and the strict preservation of maritime identity by embedding institutional and commercial entities directly linked to the sea.

For the port authorities holding these spatial assets, two primary stakes are at play. The first is directly economic, centered on converting port lands into long-term commercial revenues. The second is symbolic, revolving around heritage preservation and regional influence. The "Port Center" concept has been heavily promoted by the International Association of Cities and Ports (AIVP — *Association Internationale Ville-Port*) as a strategic mediation tool between the industrial port fabric and local populations. It is not that citizens do not know their port, but rather that they lack the most up-to-date understanding of its contemporary functions and globalized development.

The Port Center does not function as a traditional maritime museum; it operates instead as an active interpretation center dedicated to fostering public comprehension and open exchange surrounding port life. France features very few of these structures: Le Havre has operated its own since 2013, Dunkirk since 2018, and Marseille is currently working on its deployment (while La Rochelle's public outreach strategy did not utilize a dedicated physical site).

Another factor driving territorial identification can be the engineering of a specific, iconic reference landmark. The installation of the *Catène de Conteneurs* artwork, erected in 2017 to commemorate the 500th anniversary of Le Havre, has now become a permanent fixture, granting a remarkable and instantly recognizable visual identity to the Norman gateway.

Port spaces lend themselves exceptionally well to modern museography. Saint-Malo is still working on its new maritime museum, though the Finistère department ultimately renounced its planned Lighthouse and Beacon Museum in Brest. For its part, Saint-Nazaire possesses two world-class interpretation centers housed within two of its historic German concrete structures: *EOL Centre éolien* (dedicated to offshore wind energy) and *Escal'Atlantic* (dedicated to the golden age of ocean liners). Lorient operates

its *Cité de la Voile* *Éric Tabarly*, while Cherbourg features its *Cité de la Mer*. La Rochelle commands both a traditional maritime museum and a world-renowned aquarium—an interactive educational and scientific attraction identically duplicated across Boulogne-sur-Mer, Saint-Malo, and Brest. Nevertheless, anchoring a cultural site to a strict port identity is by no means a mandatory requirement for success, as demonstrated by Marseille's *Mucem*, Bordeaux's *Cité du Vin*, or the famous *Machines de l'Île* in Nantes.

The challenges of peri-urban and extra-urban interfaces

The port territories constructed at the city's periphery have been partially caught up by urban sprawl. Although residential and commercial real estate press closely against them, active economic operations persist. Unlike historical city centers, maritime activity has not vanished, yet it lacks the massive, heavy industrial concentration characteristic of isolated deported outports. For Major Sea Ports, these spaces accommodate specific operational segments (dry/breakbulk cargo, short-sea ferries, cruise liners), alongside high-value naval and shipbuilding clusters, led by the world-class construction shipyard in Saint-Nazaire and specialized ship repair facilities in Dunkirk and Marseille. Within secondary ports, a diverse matrix of activities coexists, featuring local commerce centered around a handful of traditional bulk flows, commercial fisheries, and small-scale civil or military shipyards. Highly specific processing plants operate there, including fertilizer facilities, cement factories, biofuels manufacturing, and Marine Renewable Energies (MRE) hubs.

These peripheral territories will stand at the absolute center of future urban-maritime debates. For port authorities, the strategic keywords are now rezoning (requalification), land densification, environmental remediation (dépollution), structural diversification, and capital investment. Conversely, from the perspective of urban planners, these port areas are scrutinized with deep attention because selected parcels must be placed under land release (déprise foncière)—meaning divested by the port to allow for urban development. This pressure is severely exacerbated by the 2022 French Climate and Resilience Act (Loi Climat et Résilience), which locks in a binding statutory mandate of "Net Zero Artificialization" (ZAN — Zéro Artificialisation Nette) by 2050, transforming aging port layouts into prime targets for urban regeneration.

The dilemma for port executives is clear: should they cede the less commercially utilized margins of their public domain? Hydrocarbon storage tank farms, for instance, will consume excessive space face to the programmed realities of global decarbonization. The equation remains straightforward: must the port infrastructure retreat to accommodate greater urbanity? This question extends beyond real estate, as environmental access to the waterfront or the riverfront remains paramount. What land should the port surrender, and how should the city utilize it?

Building a joint governance framework

The port does not function as a single, isolated entity; it aggregates public supervisory authorities (the State and regional collectivities), the port authority or managing body, and the wider maritime business community (communauté économique). The urban sphere is equally multifaceted, blending municipal authorities, urban planning agencies, local businesses, and residential populations. These two dense sets of stakeholders must establish an institutional dialogue and construct a shared, common territorial project. Both sides are compelled to understand the operational dynamics of the other to pacify neighborhood conflicts (relations de voisinage).

The management of co-existence is henceforth viewed strictly through the lens of environmental preservation, with municipalities deeply engaged in large-scale pollution mitigation campaigns and the protection of vulnerable ecosystems. For the time being, the newly deployed Low Emission Zones (FEZ / ZFE — Zones à Faible Émission) do not encompass maritime port operations situated within urban areas. Consequently, port authorities are actively participating in the design of comprehensive environmental charters—as pioneered by Bordeaux, La Rochelle, and Marseille—to commit the port cluster and, where possible, ocean carriers to strict green baselines.

To this public regulatory action is now added the growing pressure of local populations, manifested through public petitions targeting cruise liner emissions in Marseille and Ajaccio, alongside severe community friction in Rouen, Nice, and Toulon. The absolute foundation of this dialogue relies on executing rigorous emission inventory measurements and deploying the Onshore Power Supply (OPS) electrification solutions currently being rolled out across the majority of European passenger ports.

The port and the city operate in a continuous spatial interaction. To guide this relationship, the AIVP published a benchmark international best-practices document entitled "Faire la ville avec le port" (Building the City with the Port). It is the responsibility of each specific territory to invent its own operational formula, actively involving economic stakeholders and local populations. In Le Havre, the regional urban planning agency and Le Havre Port Center conducted comprehensive surveys of users operating at the city-port interface. This interaction can also yield powerful, positive results through port-bound industrial ecology and closed-loop circular economy initiatives.

Navigating these spatial challenges demands a balanced recognition of both urban and port requirements. The port possesses its own commercial dynamics that it must share and lock in with the wider territory. For the historical urban port core, remaining fragments of maritime activity must be seamlessly integrated into the central city, ideally supported by a dedicated public mediation node (port center). For the peri-urban port layout, authorities must adapt to intense real estate pressure by ceding under-utilized spaces when necessary while optimizing public access to the water. The extra-urban port represents a critical employment basin for the wider metropolitan agglomeration, but must systematically optimize its industrial zones and land corridors while preparing for the emerging challenges of the energy transition, notably green hydrogen networks. The history of port cities is, more than any other territorial configuration, defined by profound, sweeping spatial mutations. The city and its port are condemned to evolve together.

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