Analysis of the Utilisation Policy of Wrocław Yacht Harbours, Marinas, and River Ports

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Quote as: Adamiczka, H. (2023). Analysis of the Utilisation Policy of Wrocław Yacht Harbours, Marinas, and River Ports. *Biblioteka Regionalisty. Regional Journal*, (23), 1-10.

DOI: 10.15611/br.2023.1.01

JEL Classification: R140

Abstract: The development of yacht harbours in Wrocław is a significant element of European transport policy, linked to maintaining mobility with minimal environmental impact. The increasing popularity of recreational navigation and the development of a port infrastructure reflect societal awareness and new expectations related to leisure. The Oder, the second longest river in Poland, serves as a navigable route, and the Wrocław Water Node constitutes a unique 45 km-long system. The research aimed to present Wrocław's spatial policy regarding yacht ports and marinas. The analysis of the major ports highlights the diversity of their condition while maintaining their port functions within local plans. Planned investments include new moorings, marinas, parking spaces, restaurants, green areas, and tourist infrastructure. These ports were also analysed based on Wrocław's ownership structure. The study employed various methods, including literature analysis, primary documents, legal acts, cartographic materials, field research, and in-depth interviews.

Keywords: yacht harbour, marina, river, Wrocław, spatial planning

1. Introduction

The European transport policy aims to maintain mobility while protecting the natural environment (GUS and US in Szczecin, 2022). There is a need to support modes of transport that are more environmentally friendly than road transport – this includes navigation on inland waters, due to its low energy consumption, low air pollution emissions, the possibility of significantly reducing road congestion by taking precedence over road transport, and lower external costs (Główny Urząd Statystyczny..., 2022). The need to care for the ecology and reduce climate change has also been

observed among Generation Y – the current 30-40-year-olds (The Deloitte Global..., 2020). At the same time, public awareness of the impact of active recreation, especially when combined with being close to nature, on health and well-being is increasing. This is one of the reasons why recreational sailing is becoming more and more popular, and its potential is constantly growing; this trend is reflected in the construction of new and reconstruction of existing marinas and harbours. In recent years, such works have been carried out or planned in Sztynort, Gorki Zachodnie (Gdansk), Wislinka and Puck (Magazyn Wiatr, 2023), and New Orleans (Jay, 2019), Pula (Sailing in Croatia, 2022b), Rijeka (Interparus, 2022) and Trget (Sailing in Croatia, 2022a), whilst expectations related to recreation, cruises, and technological possibilities have changed over the last few decades. As a result, modern boats are characterised by comfortable, often luxurious interiors, a change in the geometry of the forecastle and, therefore, the bow deck, and an increased external dimension of the boat (Spurr, 2020).

The Oder can be navigated by units with a motor engine, which distinguishes it from other water routes (Oder Trail, n.d.). It is the second-longest river in Poland and is part of the European network of inland water routes (UNECE, 2018). It crosses Wroclaw from the southeast and leaves the city in its northwestern part. Within Wroclaw, the length of the river along the city center (including its arm of the South Oder) is approximately 26-27 km, while its total length with side arms and water channels is around 80 km (Adamiczka, 2022). The Wroclaw Water Junction covers several sailing routes with a total length of approximately 45 km, and the Center Water Junction is unique on a European scale (OnWater.pl Foundation, 2016). The outbreak of World War II and the political changes that followed caused the river's transport importance to decline, and the hydro-technical infrastructure was neglected and destroyed; only after the flood in 1997 were modernisation and maintenance works intensified (Adamiczka, 2022), while its remaining and existing facilities constitute the basis for the development of berthing spaces for sailing boats. The aim of the study was to present the spatial policy of Wroclaw concerning marinas and harbours. To achieve the research goal, the following questions were asked: in what direction are harbours and marinas in Wroclaw being developed? What are the planned functions in Wroclaw's harbour areas? The methods used to conduct the study were analysis of literature, source documents, legal acts, and cartographic materials, field research, and an in-depth interview (IDI) with the coordinator for river policy in Wroclaw, dated 13 November 2023.

2. Study Area

Wroclaw is the capital of Lower Silesia; its area is 292.8 m², and the population of 674.3 thousand (US in Wroclaw, 2023). The city is located in the Central Oder basin. The Oder and its tributaries (Widawa, Olawa, Sleza, and Bystrzyca) create a hydrographic network over 100 km long; the river is divided into several branches. The main ones are the South Oder and the North Oder, which join before the University Bridge and flow into the Flood Canal, while in the city centre there are even smaller branches (Lemitor Environmental Protection, 2014). The course of the Oder in Wroclaw is illustrated in Figure 1.

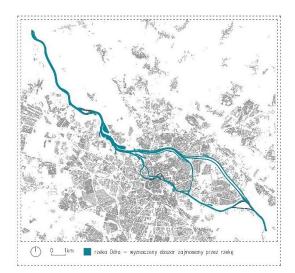


Figure 1. The course of the Oder in Wroclaw Source: own study.

According to the guide "Environment of Wroclaw" (2014), the Oder is canalised along the entire urban section, and thanks to hydro-technical structures, it creates a regulated water route. The Wroclaw Water Junction (WWJ) is a system of rivers, canals, and hydro-technical devices related to navigation and flood protection – stretching from 241.5 to 266.9 kilometers of the river. The WWJ consists of the Opatowice Canal with the Opatowice lock, the Opatowice weir, the Old Oder of Wroclaw with the Szczytniki weir, the Upper Oder with the Szczytniki lock, the Central Water Junction with the Mieszczanska and Piaskowa locks, the Lower Oder of Wroclaw with the City Harbour, the City Canal with the City Lock and the Reloading House of the Wroclaw Heat and Power Plant, the new Flood Canal with the Bartoszowice and Zacisze weirs, the Sailing Canal with the Bartoszowice and Zacisze locks, the Rozanka Canal with the Rozanka lock, the Popowice harbour and the Osobowice 1 and Osobowice 2 winter quarters, and the Redzin barrage (Study of Conditions and Directions..., 2018). According to the map of the Wroclaw Water Junction prepared by the OnWater.pl Foundation (2015), there are six current or former harbours and mooring places for water vessels in Wroclaw: Olawa Estuary Harbour, Gondola Bay, City Harbour, Popowice Harbour, and two barge winter quarters (Osobowice 1 and Osobowice 2), while the guidebook to Open Museum of Technology Foundation (2007) additionally detailed the harbour next to the railway bridge, the transshipment quay on the Shipping Canal (the northern border of the Wroclaw branch of Chemical Plants "Police" SA) and the transshipment quay on the left bank of the City Canal. This article analyses the most important locations indicated by the OnWater.pl Foundation (2015).

3. Results

3.1. Olawa Estuary Harbour – Coal Harbour

The harbour was built in the period 1842-1844 and used as wintering quarters for steam passenger ships. It was then transformed into a harbour supplying the city waterworks construction site with construction materials, a coal harbour, and until 2014, it was a harbour for construction aggregates (OnWater.pl Foundation, 2015).

The local spatial development plan has been in force since 2020 in the harbour area, which shows that both the harbour (with an area of 0.53 ha, marked with the symbol 3WS) and the peri-harbor area (1.15 ha, marked with the symbol 1US) are intended for public purposes (Law No. XXV/689/20 of the Wroclaw City Council, 2020). According to § 22, the area marked with the symbol 3WS is designated as marinas, pedestrian and bicycle routes, and technical infrastructure facilities. According to § 18, the area marked with the symbol 1US is designated as passenger harbours, surface waters, park greenery, outdoor sports facilities, road infrastructure, and technical infrastructure facilities. Currently, work is underway on the implementation of the marina project with a marina with Y-boats, a petrol station, a yacht marina, a kayak rental, and camper pitches (The Official Harbor of Wroclaw, 2023). According to the official Wroclaw website, a 30-metre floating pier and a beach bar have now been built, with a beach, a pirate ship for children, swings, and a community garden, and in the summer season there are events such as Zumba classes, silent disco, dances for seniors and yoga classes.

3.2. Gondola Bay

Built in the 17th century, Gongola Bay was used to divert flood waters from the estuary of the Olawa, and later was moved to Olawski Bridge (19th century), where until 1945 it was used for mooring tourist boats. This function was restored in 2007 (OnWater.pl Foundation, 2015).

The bay is included in the 2018 local development plan, in which an area of 0.52 ha, marked with the symbol 1WS, is intended for public purposes, and detailed provisions for the area include surface waters, park greenery, passenger harbours, minor services (facilities for renting and renting movable items), gastronomy (canteens and facilities for catering activities are not allowed), squares, pedestrian

and bicycle routes, technical infrastructure facilities (Law No. LXII/1453/18 of the Wroclaw City Council, 2018). Currently, there is a rental facility for gondolas, kayaks, motorboats, and pedal boats; one can go on a tourist cruise and take advantage of the gastronomic services (Gondola Bay, n.d.).

3.3. City Harbour

A single-basin harbour from the turn of the 19th and 20th centuries, with richly equipped quays, storage yards, warehouses, and a network of railway sidings. For many years the municipal power plant, transformed into a combined heat and power plant, was supplied with coal from there (OnWater.pl Foundation, 2015).

Nowadays, the area is in a state of neglect, and the local development plan is being prepared, but under the applicable Study of Conditions and Directions of Spatial Development (2018), this area is intended for special infrastructure, general services, metropolitan and public services, science, industry, infrastructure, and greenery. Nevertheless, in 2022 a plan was presented to create a housing estate with a marina, park, restaurants, boulevards, school, and kindergarten (Ratajczak, 2022). Work is underway on the reconstruction (for office and service functions) of one of the warehouses and the harbour elevator, while the modernisation of the second warehouse has been suspended due to the investor's lawsuit with the Provincial Conservator of Monuments regarding the scope of possible interference with the building (investmap, 2023).

3.4. Popowice Harbour

A single-basin harbour, built in 1887-1888, connected to the railway, with three wagon tippers on the quay and numerous levers, and served as a transshipment harbour for goods – mainly aggregates and cement – until the 1980s. (OnWater.pl Foundation, 2015).

The harbour area is included in the local development plan, according to which the harbour itself is marked with the symbols 3WS/1 (1.70 ha), 3WS/2 (0.18 ha) and 4WS/1 (16.67 ha), and the areas surrounding the harbour 1MW-U/1 (10.51 ha), 1MW-U/2 (2.76 ha) and 5ZP (0.68 ha) (Law No. XXXIII/1131/09 of the Wroclaw City Council, 2009). According to the provisions of the local development plan, the harbour basin is under conservation protection and requires transformation or recultivation, and areas 3WS/1, 3WS/2 and 4WS/1 are intended for surface waters, walking boulevards, multi-family housing, services, small-format retail, care health and social, telecommunications, technical infrastructure facilities, parking facilities, marina, river harbours, railway lines, thermal energy generation, fuel stations for floating facilities, parking facilities, internal roads, walking boulevards, sport, leisure, and parks, excluding park greenery. For the areas around the harbour marked with the symbols 1MW-U/1 and 1MW-U/2, the following purposes were determined: services, small-scale retail, multi-family housing, culture, health and social care, education, additional education facilities, science and higher education, accompanying apartments, police and security services, telecommunications, road infrastructure, technical infrastructure devices, thermal energy production, walking boulevards, surface waters, flood protection structures, marina. Note that these areas are partly located in the area of immediate flood risk. The housing estate in the harbour area is 52% complete (Vantage Development SA, n.d.), while the development of the harbour itself has not yet been completed.

3.5. The Barge Winter Quarters Osobowice 1 and Osobowice 2

The barge winter quarters were established in the first half of the 20th century as places where vessels can winter, i.e. stay during the closed period of the shipping season (OnWater.pl Foundation, 2015).

In the area of the Osobowice 1 barge winter quarters, a local spatial development plan is being prepared, but currently the same plan is in force as in Popowice Harbour, and the area of the barge

winter quarters is marked with the symbol 4WS/2 (12.09 ha). The established intended uses are surface waters, river harbours, railway lines, telecommunications, heat energy generation, fuel stations for floating objects, parking facilities, internal roads, walking boulevards, marina, services, sports, recreation, and parks, excluding park greenery. Currently, there is a marina for sailors with a harbour-related infrastructure: quays with Y-booms, small sanitary facilities, a place for parking campers, catering facilities, a refueling station, water equipment rental, and schools offering sailing and motorboat courses. Despite the rich variety of services on offer, access to the facility is difficult, and the reception and boatswain buildings require renovation.

The Osobowice 2 barge winter quarters area is included in the local spatial development plan, in which the water area itself is marked with symbols PP3 (9.42 ha) and PJ2 (6.85 ha), and the areas surrounding the harbour are marked N4, N5, ZU6, ZU7, ZU8, PU1 as areas constituting roads, squares and parking lots (Law No. XIII/374/03 of the Wroclaw City Council, 2003). According to § 2 of Law No. XIII/374/03 of the Wroclaw City Council of 16 October 2003) regarding the adoption of a local spatial development plan for North Osobowice Harbour in Wroclaw, "the plan aims to designate a harbour for passenger ships and a water tram, and a marina for yachts and motorboats, as well as to determine the method of developing the areas necessary for their proper functioning, taking into account the requirements of flood protection". For the harbour area, the land use category is established – a passenger marina with maneuvering, training, and a harbour basin. The following development rules apply to the mooring of passenger ships and water trams as well as vessels such as yachts, rowing boats, pedal boats, moorings in the form of movable floating piers connected to 'dolphins', two berths for passenger ships, one berth for ships waiting to enter the harbour, the location of a facility for transporting boats, permanently connecting the areas PU1 and PJ2, and enabling free vehicular and pedestrian traffic along the access road inside. For coastal areas, the following were established: services, quay with the location of access to floating piers, slips and the location of the crane, greenery with paths and the possibility of creating a viewing area, a boulevard, an official harbour square, and entrances to flood embankments. The area is located in the cultural landscape protection zone of the Oder River Valley, where the following are protected: the river, all greenery elements, and relics of technical culture, including canals and water facilities. At present, in the area of the former barge wintering quarters, there are the remains of the hydro-technical infrastructure and green areas constituting a place of leisure for the inhabitants of Wroclaw.

3.6. Summary

Of the six main harbour locations in Wroclaw, five have a local development plan (including one that is being updated). Regardless of the function they currently perform and the condition in which they remain, all of them have plans to maintain or introduce berthing spaces for vessels. To complement the research, an ownership analysis of harbour areas was carried out – a summary is presented in Table 1.

Object/ Legal status	Local plan	Destiny	Current development
Olawa Estuary Harbour (Coal Harbour)	Law No. XXV/689/20 of the Wroclaw City Council of July 23, 2020, regarding the adoption of the local spatial development plan in the area of the Juliusz Słowacki coast and Na Grobli Street in Wroclaw	 pedestrian routes, pedestrian and bicycle routes, technical infrastructure facilities, marinas, passenger harbours, surface waters, park greenery, sport equipment, road infrastructure. 	During the construction of the marina, a floating pier and a beach bar with a cultural and recreational offer have been completed.

Table 1. Summary of information about the main harbors and marinas in Wroclaw

Gondola Bay	Law No. LXII/1453/18 of the Wroclaw City Council of September 13, 2018, regarding the adoption of the local development plan between Aleja Juliusza Słowackiego and Boulevard Xawery Dunikowski in Wroclaw	 surface waters, park greenery, passenger harbours, minor services, gastronomy, squares, pedestrian routes, pedestrian and bicycle routes, technical infrastructure facilities. 	A developed area with a gondola, kayak, motorboat, and pedal boat rental, a marina for tourist cruises, and a gastronomic services.
City Harbour	Under development	 special infrastructure, universal services, metropolitan services, public services, science, industry, infrastructure, greenery. 	Degraded area, under the construction process.
Popowice Harbour	Law No. XXXIII/1131/09 of the Wroclaw City Council of April 23, 2009, regarding the adoption of the local spatial development plan for Osobowice 1 Harbour	 surface waters, walking boulevards, multi-family housing development, services, small format retail, health and social care, telecommunication, technical infrastructure devices, parking facilities, marina, river harbours, railway lines, heat energy production, fuel stations for floating vessels, parking facilities, internal roads, walking boulevards, sport, leisure, and parks. 	There is no development of the harbour, a housing estate is being built in the area surrounding the harbour.
Osobowice 1	Law No. XXXIII/1131/09 of the Wroclaw City Council of April 23, 2009, regarding the adoption of the local spatial development plan for Osobowice 1 Harbour New plan for development	 surface waters, river harbours, railway lines, telecommunication, heat energy production, fuel stations for floating vessels, parking facilities, internal roads, walking boulevards, marina, services, sport, leisure, and parks. 	Marina with harbour and harbour-related equipment, partially in need of renovation.
Osobowice 2	Law No. XIII/374/03 of the Wroclaw City Council of October 16, 2003, regarding the adoption of the local spatial development plan for North Osobowice 2 Harbour in Wroclaw	 mooring of passenger ships and water trams, as well as vessels such as yachts, rowing boats, pedal boats, mooring places in the form of movable floating piers 2 berths for passenger ships, 1 berth for ships waiting to enter the harbor, 	Remains of hydro-technical infrastructure and green areas.

 boulevard, the official Harbour Square, entrances to flood embankments.

property of the commune
property of the commune under administration and in use
property of the commune in perpetual usufruct
property of the state under administration and in use
state property in perpetual usufruct
property of legal entities
others

Source: own study.

Analysing the ownership structure (cf. Table 1), only Coal Harbour is wholly owned by the City of Wroclaw, without limited property rights, so only in this place can the area be developed in a manner fully consistent with the intentions of the city authorities, with the participation of the local community. An in-depth interview with the coordinator for river policy in Wroclaw revealed that residents are involved in the future of the harbour in question – during the development of the plan, residents' comments led to the plan being removed from the session. As a result, the local community largely influenced the final shape of the local spatial development plan. Additional public consultations are being planned regarding the development of Coal Harbour.

4. Discussion

The rivers in Wroclaw are an important element of the urban structure. Their multifunctional use can constitute the basis for the socio-economic development of the city, and, at the same time, a draw for residents and visitors. The development of inland navigation is a regularly discussed topic in public discussion, and is analysed by city managers. "The Study of Conditions and Directions of Spatial Development in Wroclaw" has a separate section devoted to river policy, and one of its goals is the development of shipping in the economic, tourist, and recreational context. In addition, issues related to inland navigation are also discussed in other sections, e.g. regarding greenery: "The Oder must be made available to navigation to the widest possible extent, both for transport purposes, as well as for sport, recreation, and tourism. The development of the city is planned in such a way that it can serve as an important river harbour. It is important to ensure the possibility of moving along the entire length of the quays and to create convenient access routes and access from adjacent areas" (Study of Conditions and Directions..., 2018).

At the same time, despite the developed hydro-technical infrastructure, research conducted in 2022 shows that the water tourism infrastructure in Wroclaw has been only partially implemented (the survey scored 3 on a scale of 1-5). There is no city marina, and the existing marinas are private and belong to land-leasing investors (Adamiczka, 2022), which was confirmed by the analysis of real estate ownership. The Study noted that the main challenges related to the multifunctionality of the Oder include:

- insufficient technical infrastructure for the development of tourism and the economy, including those related to water transport,
- deficiencies in the development of riverside areas,
- poor shore accessibility in some sections.

The objectives related to the development of rivers and waterfronts also include:

- organizing space for active recreation for residents and tourists,
- development of shipping in the economic, tourist, and recreational context,
- making bays and water areas available for sport and recreation purposes.

Activities related to harbours and marinas, which are intended to revitalise transport on the Oder, improve the quality of the river current, and support the development of new tourist infrastructure are as follows:

- protection and development of the harbour function on the Oder by maintaining the existing harbour in the area of Kleczkowska Street in Wroclaw, and reserving the new location of the river harbour on the Oder in the Redzin area, ensuring appropriate communication services for these areas,
- development of a multimodal harbour on the Oder in the Redzin area,
- supporting the organization of a passenger river harbor on the Oder in the center of Wroclaw, supporting the organization of as many marinas, mooring points, and points of small services on and near the rivers as possible, taking into consideration the local environmental, functional, and compositional conditions,
- organization of new sport and recreational bases and reactivation of former bathing areas on the rivers in Wroclaw, along with improving the accessibility of these areas,
- creation of marinas to increase the number of mooring places for various sizes of vessels, along with the necessary technical infrastructure,
- creation of accommodation and catering facilities, camping sites and campsites by the water, construction of fuel stations, repair facilities, water equipment rental facilities, barge wintering quarters and areas for rescue and cleaning units,
- introducing sport and recreational facilities on the water and shores through:
 - the creation of multifunctional sports and recreation bases,
 - the modernisation and development of the sports and recreation complexes Niskie Laki on the Olawa, and Rozanka on the Oder.

These goals and activities were defined in 2018, but in 2022, sport on the river was still dominated by private initiatives, occasionally supported by the city, and there were no city initiatives per se (Adamiczka, 2022). One of the problems related to the implementation of activities may be the limited impact of the city on coastal areas due to the ownership structure.

5. Conclusions

The development of inland navigation observed in recent years requires adapting urban areas to the changing needs of the users. It is important to introduce additional berthing spaces for vessels, with appropriate sailing infrastructure. Research has shown that the river policy in Wroclaw assumes the modernisation and revitalisation of former and current harbour facilities. This is reflected in both the river policy included in the Study of Conditions and Directions of Spatial Development in Wroclaw,

as well as the detailed provisions of local spatial development plans regarding specific harbour areas. The biggest problem in conducting harbour policy is the ownership structure, which limits the city's ability to carry out investment projects.

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Analiza polityki wykorzystania wrocławskich przystani jachtowych, marin i portów rzecznych

Streszczenie: Zagospodarowanie portów jachtowych we Wrocławiu stanowi istotny element europejskiej polityki transportowej związanej z utrzymaniem mobilności przy minimalnym wpływie na środowisko. Trend rosnącej popularności żeglugi rekreacyjnej i rozwijania infrastruktury portowej odzwierciedla świadomość społeczną oraz nowe oczekiwania związane z wypoczynkiem. Odra, będąca drugą co do długości rzeką w Polsce, pełni funkcję żeglownego szlaku, a Wrocławski Węzeł Wodny stanowi unikalny system o długości 45 km. Celem badania jest przedstawienie polityki przestrzennej Wrocławia w odniesieniu do portów jachtowych i marin. Analiza głównych portów uwydatniła różnorodność ich stanu przy jednoczesnym utrzymaniu funkcji portowej w ramach planów miejscowych. Planowane inwestycje obejmują m.in. nowe przystanie, mariny, miejsca postojowe, restauracje, obszary zielone oraz infrastrukturę turystyczną. Porty te są także poddawane analizie ze względu na strukturę własnościową Wrocławia. W badaniu wykorzystano różnorodne metody, w tym analizę literatury, dokumentów źródłowych, aktów prawnych, materiałów kartograficznych, badania terenowe oraz wywiad pogłębiony.

Słowa kluczowe: port jachtowy, marina, rzeka, Wrocław, planowanie przestrzenne