

# Design concept of a modular stage-stop-over terminal for inland waterways passenger transport on East-West routes

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## ABSTRACT

*Key position of the Vistula in the ecological system of Poland potentially makes it possible to form an “ecological corridor” of this country, connected with the natural macro-system of Europe. The possible use of the Middle Vistula and its meridional connection with Kaliningrad region as well as Belarus and Ukraine territories concerns the rivers : Warthe, Notec Vistula, Narew and Bug Realization of functional connections between neighbouring territories will stimulate development of their economy and culture and make it possible to demonstrate their natural merits. Ecological and economical aspects of transport based on inland waterways make it necessary to formulate criteria for architectural objects to be created on waterfront areas (with taking into consideration of social, historical and location contexts, local conditions and architectural traditions).*

**Keywords :** waterfront, riverfront, inland waterways, stage-stop-over passenger terminal, Vistula, Notec, Warthe, Toruń, Elbląg, Wintering Harbour, Bazaar Island

## INTRODUCTION

Key position of the Vistula in the ecological system of Poland potentially makes it possible to form an “ecological corridor” of this country, connected with the natural macro-system of Europe. It results not only from the environmental state of the Vistula and a prevailing part of its basin but also from ecological priorities of European policy. Ecologization of the Vistula by fundamental improvement of its environment state will also valorize its cultural merits formed by the towns and historical objects located along the axis of the river and being a part of European cultural heritage [1].

The unique natural and cultural merits can form a permanent basis for developing domestic and international tourism and possibility of creating one of the more attractive tourist routes of Europe [1], that results from the fact that the above presented functions of the Vistula form a non-conflict - generating, complementary and mutually supporting complex of nature, society and economy.

And, even at the turn of 18<sup>th</sup> and 19<sup>th</sup> century the role of the Vistula weakened due to a lack of continuity in investing and modernizing technical state of its transport potential (partitions of Poland and division of the river into three parts subjected to foreign powers) it is still an European territory having waterway problems.

Its attractiveness consists in the possibility of being a meridional connection between the Vistula and Danube and a waterborne connection between the Baltic Sea and Black Sea, as well as in parallel use of the Middle Vistula for connecting the West-European waterways system with East-European one (the Pripet, the Dnieper) (Fig.1.)



Fig. 1. Schematic diagram of the proposed East-West waterway shown on the background of the principal waterways of Europe .

Use of the potential waterways network depends on appearance of demands for passenger traffic and goods shipping, as well as on relation of investment cost of such undertaking, including cost of opening the passage through the run-wild waterways especially those along the Bug and through the Vistula Bay. The enumerated factors are not so effective as to justify that huge investment undertaking. However it does not exclude to use the connections for tourist passenger traffic based on exceptional attractiveness of the rivers and their surroundings, as well as on elaboration of a new generation of inland waterways and coastal ships well adjusted to real conditions of the route and friendly to the environment, which is the subject of investigations carried out within the frame of the Eureka Incowatrans E!3065 project. The presented design concept of

stage-stop-over terminal (Research project W.A.1/2004 and 2/2005) is one of the links of multi-directional research and design activity realized within that frame.

## MAJOR PREMISES FOR SELECTION OF STOP-OVER SITES

The possible use of the Middle Vistula and its meridional connection with Kaliningrad region as well as Belarus and Ukraine territories concerns the rivers : Warthe, Notec Vistula, Narew and Bug.

Realization of functional connections between neighbouring territories will stimulate development of their economy and culture (Bydgoszcz, Toruń, Włocławek, Warszawa, as well as Kwidzyn, Malbork and Elbląg) and make it possible to demonstrate natural merits of such areas as : the National Park of Warthe Estuary, Notec and Bydgoszcz primeval forests, Kampinos National Park, Bug-valley Landscape Park, White Primeval Forests as well as historical attractions of Biskupin, Licheń and Ciechocinek, sites of ancient fortifications etc.

Ecological and economical aspects of transport based on inland waterways make it necessary to formulate criteria for architectural objects to be created on waterfront areas (with taking into consideration of social, historical and location contexts, local conditions and architectural traditions). Such approach requires also all “for and contra” arguments resulting from the new approach to problems of forming the waterfront space, to be analyzed. As water-courses are linear objects many aspects should be analyzed by analogy to land transport systems.

Waterfronts of the urbanized areas develop usually as derivatives of development of port and transport infrastructure having origins in the times of industrial revolution.

Appearance of a new architectural quality on the riverfront areas, in the form of back-up facilities supporting water transport makes it possible to create a link between river and land, and nature and man.

A partial target of the Eureka Incowatrans project in the area of architectural tasks has been to present a concept of a hotel & recreation complex of modular structure, which would be an important element of tourist traffic infrastructure both in antropogenic space of a high degree of transformation and the environment's space.

The object in question should have such structural arrangement as to make it possible to obtain an arbitrary configuration of elements, depending on functional demands and ground conditions, as well as to ensure its high architectural standard. The functioning of the complex should be realized with the use of environment-friendly technical solutions such as renewable energy sources, usage of rain water for the “grey-water” system etc. The so-designed architectural object would fulfill the role of a back-up facility for a floating unit having passenger shipping function, designed within the design & construction part of the project, e.g. in the form of segment passenger ship.

Trips of passenger ships consist of a few stages with stop-over in some points of the route, selected with taking into consideration the following criteria :

- ★ stop-over frequency required by technological factors : to take fuel, discharge various operational substances for their utilization outside the terminal, as well as to carry out minor overhauls and repairs of floating units
- ★ degree of attractiveness of a given location for potential tourists
- ★ possible use of existing or planned port infrastructure
- ★ interest and engagement of local authorities in building such stop-over terminals and their back-up facilities with a view of creating new workplaces for local population.

Hence in the project's scope have appeared the following design items [2] :

- ✱ technological solutions for ensuring possibility of ship mooring and also supplying it with operational materials, as well as mooring a local transportation ship (passenger river boat)
- ✱ a hotel part which, apart from lodging services, should provide : boarding, organizing common entertainment events etc
- ✱ sport & recreation program – realized both in the terminal's accommodations and the open air (including a swimming pool with appropriate infrastructure)
- ✱ tourist attractions such as one-hour coach excursions for sightseeing a given region; trips by a river boat or pusher of the designed ship (lasting 10 hours in total at the most, directed to places of interest of a given region, available by water transport means).

## DESIGN CONCEPT OF A MODEL MODULAR STAGE-STOP-OVER TERMINAL

In choosing a place for location of the stage-stop-over terminal has been taken into account possible use of existing port infrastructure and attractiveness of the terrains surrounding the considered inland waterways system from the point of view of their use for purposes of inland water tourism not only in the scale of this country.

Hence, preliminary investigations in that area took into account two locations : in the surrounding of Toruń and that of Elbląg.

The choice of Toruń has been told by its location in the north part of Polish inland waterways which, going from Berlin through the Oder, Warthe, Notec and Vistula, leads northward to Gdansk, and further via Vistula Bay and Elbląg, to Kaliningrad.

Its suitable railway and road connections in north-south and east-west direction as well as the existing port basin (Timber Port) provide a chance for shipped cargo to be reloaded onto multi-modal transport means in the surrounding of Toruń and to be sent in the direction of Belarus and Ukraine.

Moreover, in this town there is a suitable post-industrial basin which temporarily serves as a wintering harbour for river vessels.

The choice of Toruń as a model of using inland waterways for domestic and foreign water tourism purposes and the place of about 340 cultural heritage monuments is consistent with the intentions of its local authorities.

According to the description of development projects of the Vistula's embankments, possible modernization and erection of new tourist infrastructure objects to increase tourist attractiveness of the town and neighbouring waterfront terrains would make it possible to create an additional area which could constitute a “green heart” of the town whose *“attractiveness will systematically grow by developing there functions resulting from monitoring the increasing needs of its inhabitants...the idea of creation of such open recreation centre in which cycle tracks, walking paths, resting places adjusted to handicapped person needs, water tourism harbours, water sport areas etc, will be located.”*

Basing on the local study on directions of the site planning of the town of Toruń, as well as on development its pro-ecological transport systems, the authors have selected the site for location of the stage- stop-over terminal, placed in the terrain neighbouring the so-called Wintering Harbour (Fig.2).



Fig. 2. Functional ideograph of site planning for the area of Wintering Harbour in Toruń.

It is the site having suitable connections with main directions of road transport, not very far distant from the Old Town - the main attraction of Toruń, located in the direct neighbourhood of the existing port infrastructure used for wintering the barges, which may be used for mooring the segment hotel ship to overhaul it and for receipt of any operational substances to utilize them outside the terminal.

The choice of the site would make the designed ships possible :

- ❖ to moor along the existing quay of the Vistula bank, to disembark a part of passengers for a short stop-over and lodge them at the designed terminal
- ❖ to depart with the remaining passengers onboard, making use of their cabins during the stop-over, and to arrive at the Wintering Harbour, to moor in the direct vicinity of the recreation & hotel terminal taking over boarding functions for 2-3 days necessary for developing a tourist program.

Owing to the selected location both groups of tourists : that lodged on land and that onboard the ship would have opportunity to make use of the back-up facilities of the terminal, being apart by only a short walk from the Old Town and the hotel currently under modernization, based on the former Navy High School's buildings, which could be an alternative land-based lodging place for passengers.

The choice of such location was told, apart from the fact of favourable location of the Wintering Harbour and a short distance from the Old Town area, also by an attractive view on the reserve Kepa Bazarowa (Bazaar Island) as well as on the remnants of the 15<sup>th</sup> century King's Castle (Zamek Dybowski).

If at the Little Vistula estuary on the Bazaar Island to erect a small harbour is provided it will be possible to extend the tourist offer by sightseeing this place.

To this end, a project of refurbishment and activation of the Castle remnants (agreed with Municipal Conservator of historical objects) has been provided for, with a view to locate there a museum with a boarding back-up and exclusive hotel apartments as well as with a viewpoint toward the Old Town, an interesting old residential area and relic fishery houses.

Maintaining the natural character of the Bazaar Island one has provided for to mark out walking paths along the island side, which would lead - beginning from the Dybowski Zamek

through a footbridge over the Little Vistula - to an existing viewpoint.

Modernization of the viewpoint by giving a new structural form to it, would make it possible to demonstrate wide panoramic view of the Old Town, and the planned erection of the river harbour would provide a waterborne connection with the left-hand side part of the town with the Philadelphia Boulevard, simultaneously being an alternative to the bridge connection, and the connection of the Podgórze area with the City (an extension of the road along the view axis up to the railway sites).

In Fig. 3 and 4 are presented the elaborated model modular hotel objects of the stage-stop-over terminal, having light-



Fig. 3, 4. Visualization of the model option of the modular terminal located in the area of the Wintering Harbour in Toruń (authors : Felski B., Ptasiński M.).

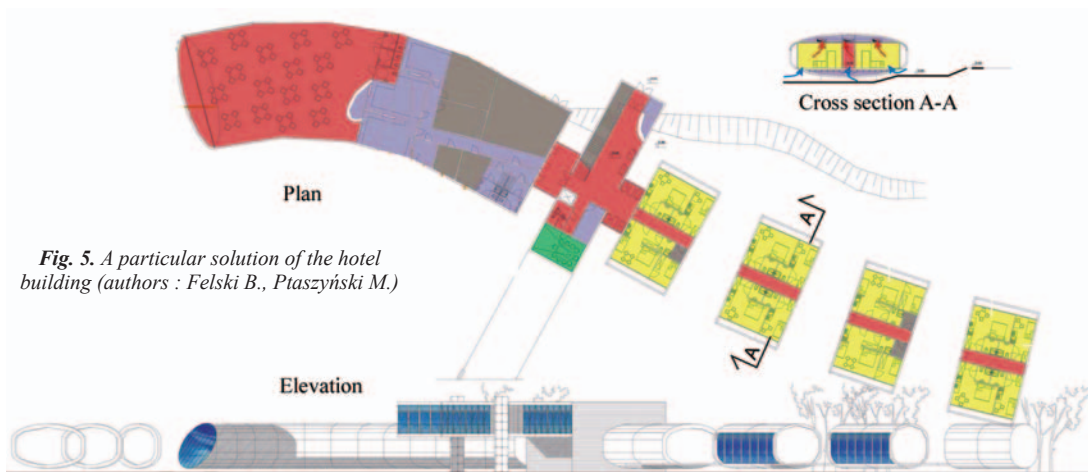


Fig. 5. A particular solution of the hotel building (authors : Felski B., Ptaszyński M.)

-weight structure and ensuring possibility to be composed in many variants, arbitrary situations and spatial forms and to be located at arbitrary sites; they are so designed as to be independent of local ground conditions hence it is possible to place them over the ground level (Fig.6), this way risk of failure at a high river stage would be excluded.

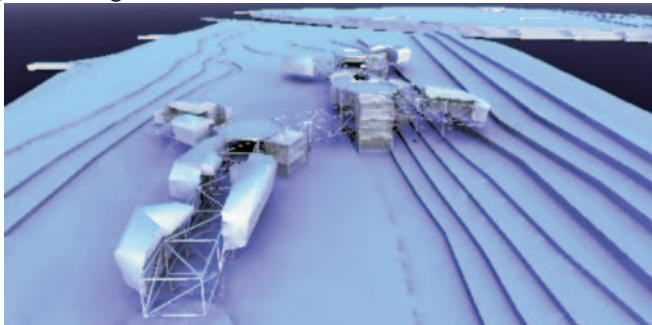


Fig. 6, 7. A variant solution of the modular stage-step-over terminal (concept draft by Szumilas A.)

Elaboration of the identical analysis of possible location of a stage-step-over terminal for the designed inland waterways ship, with regard to the Vistula Bay area, made it possible to select the town of Elbląg as a successive centre which - like Toruń – fulfils requirements for possible use of the existing port infrastructure (Fig.7) as well as attractiveness of the town itself in the aspect of being a tourist product (Fig.8).



Fig. 8. The historical architecture substance of the Elbląg city, considered as a potential tourist product

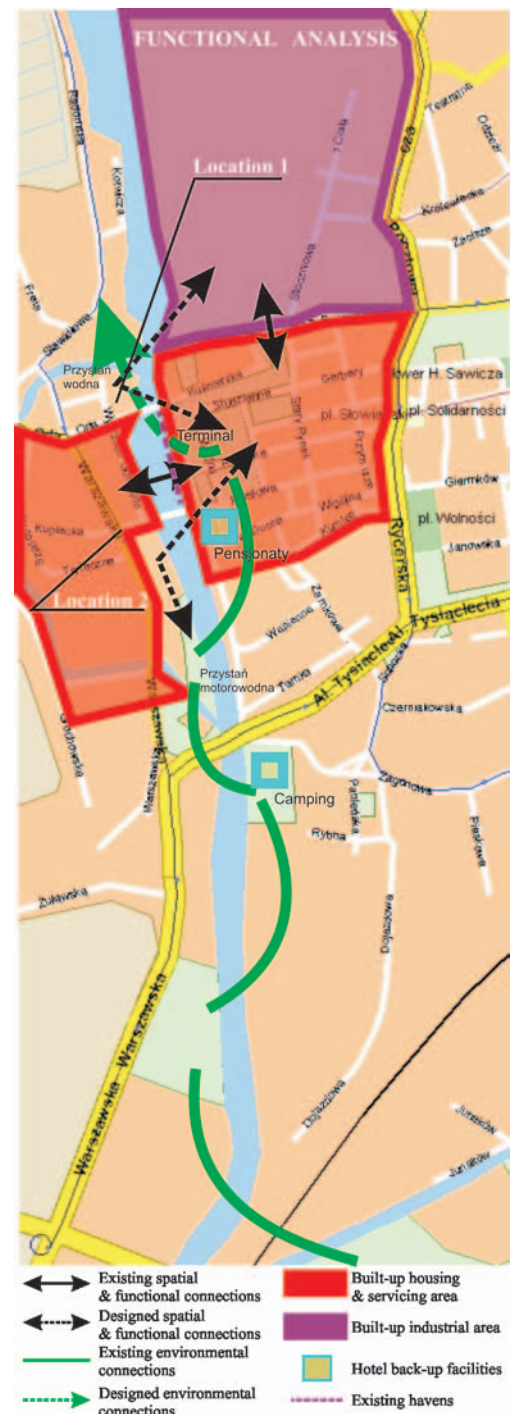


Fig. 7. The areas selected as potential locations of the stage step-over terminal in Elbląg

In the area of the town developed on the basis of the river Elbląg two potential locations have been chosen in direct vicinity of the town centre, on the left-hand side of the water-course. Because of the specificity of the Elbląg tourism centre both the locations have been analyzed on the basis of a less extended set of additional functions as compared with that for Toruń. Such decision is justified by the following factors :

- intermediate or final character of the terminal;
- lack of crossing the water-course corridor by other inland runs;
- a relatively small area for potential use;
- partly existing infrastructure : inland harbour, hotel back-up in the town.

## FINAL CONCLUSIONS

The above described locations, in spite of different contexts of local architecture and specific conditions resulting from the proposed set of functions, are associated with the common priorities such as :

- The need of activation of the areas which – after economical transformation – became degraded (the chaotically developed areas of low-standard buildings, neighbouring with port & industrial terrains). Low esthetic merits lowering the municipal space quality, detrimentally influence local development of the areas in question.
- Use of the potential of the areas in question resulting from their short distance from the city considered as a centre-creating and culture-creating factor, as well as of the river as an element which makes tourist development to

be a possible way for local population activation. An additional advantage of the discussed locations is accessibility to their underground infrastructure, that makes investment cost lowering possible and this way their attractiveness increasing - from the point of view of potential investors.

- Creation of the modern architecture of high esthetic merits, with the extensive use of the technical solutions which enable to design the objects to function on the basis of renewable energy sources, biodegradable materials and a low energy outlay during their production. The proposed foundation of the buildings over ground level makes it possible to prevent biologically active areas from degradation and to make the buildings independent of specific ground conditions which result from the vicinity of water environment.

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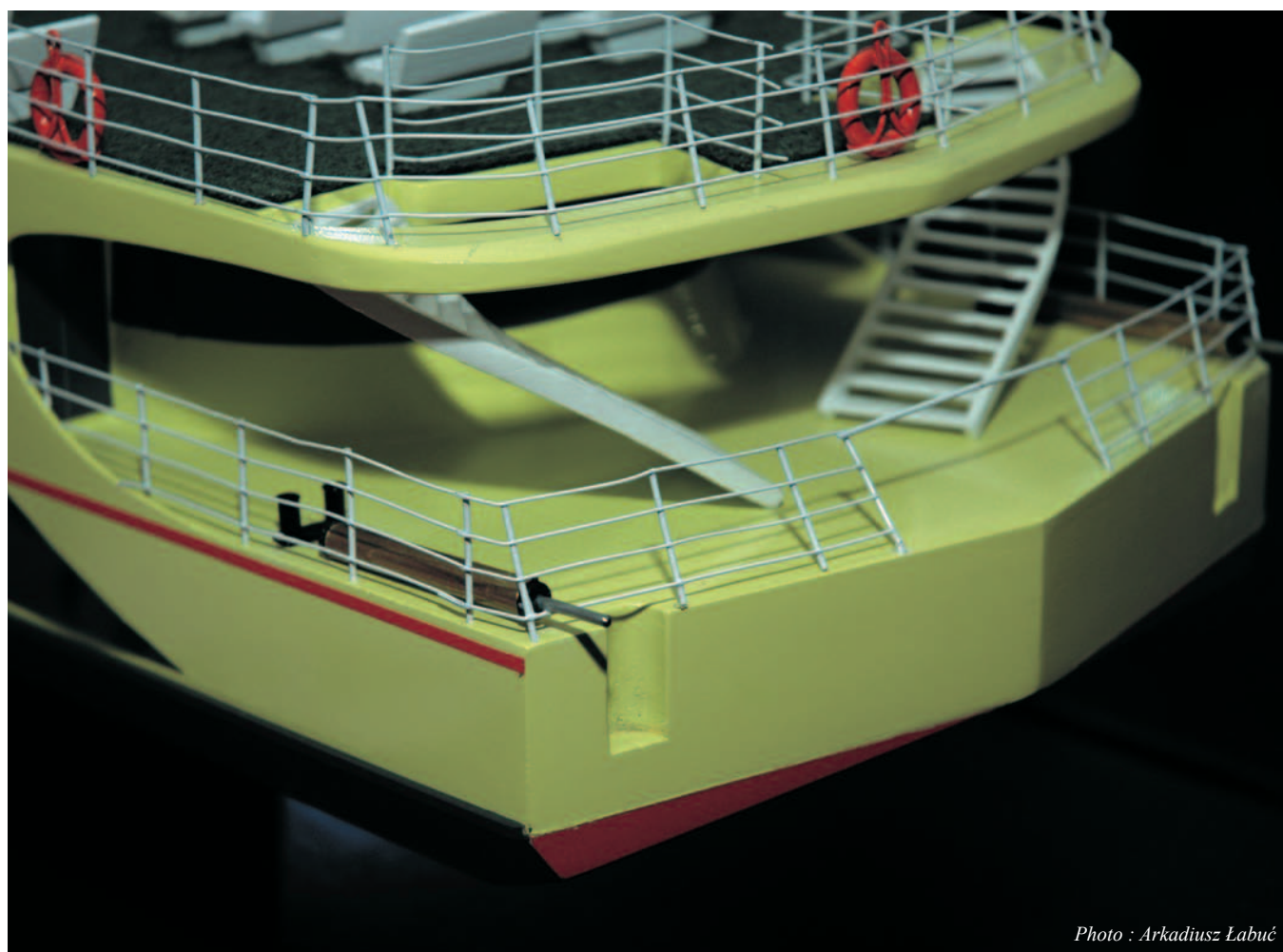


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