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DIGA FORANEA
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PORTS of GENOA
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FACTSHEET ON THE WORK: THE NEW BREAKWATER IN GENOA

CURRENT STATE OF THE PORT OF GENOA AND REASONS FOR THE WORK

The current port scenario places a limit on the size of ships able to safely access the Sampierdarena basin from the main east entrance. This limit corresponds to a **maximum ship length of 300 m**. The western access has dimensional characteristics that allow the transit of ships of less than 200 meters in length.

The data are definitely binding if we consider that it is now consolidated **on a global scale the trend towards the use of container ships longer than 300 m**, belonging to the classes called New Panamax and ULCV (Ultra Large Container Vessel). The latter are characterized today (and for the next decade) by lengths up to 400 m, to reach 450 m in the future. Furthermore, the analysis of the maritime transport market conducted as part of the Technical and Economic Feasibility Project of the work highlighted how **the share of world maritime traffic transported on ships, which today cannot be accepted in the port of Genoa, is destined to increase in the coming years and decades**.

In this evolutionary context and with the problems of maritime accessibility linked to the constraints of the current breakwater, the **Sampierdarena area of the port of Genoa risks losing competitiveness with respect to the main competing ports** - Valencia, Barcelona, Marseille - which are or will soon be equipped to accommodate the New Panamax and ULCV classes.

Concerning the transit in the Lanterna and Sampierdarena basins that is not allowed to large ships, **the criticality dictated by the position of the breakwater will be further accentuated by the next entry into operation of the Calata Bettolo terminal, whose development is connected to the need to operate with large container ships**.

A lack of infrastructural adaptation of the port could therefore determine not only the impossibility of attracting new traffic but also, in the most pessimistic or "minimum traffic" hypothesis, the loss of current traffic shares destined to be transferred in the future to non-compatible ships with the current infrastructural capacity. In this hypothesis, **the "non-intervention" (or "inertial") scenario would involve a constant decline in traffic outside the Mediterranean which would be destined to run out in the span of a decade, if the project of the new breakwater is not realized, according to estimates**.

Invitalia, on the initiative and on behalf of the Western Ligurian Sea Port Authority, published in November 2018 a call for tenders on the Technical and Economic Feasibility Project of the new Genoa breakwater, to identify a company with specific skills in the field of port and maritime works and with experience in the use of sophisticated tools for carrying out studies on the physical model, for navigation tests in real time. Experience in the field of technologies for the exploitation of renewable energy was required.

Invitalia received 7 offers submitted by project groupings, made up of companies of primary importance at national and international level. Following the final award communication in April 2019, **the winning grouping of the tender with Technital as group leader consists of 8 companies** able to offer the contracting authority a multidisciplinary working group with proven technical and organizational capacity.

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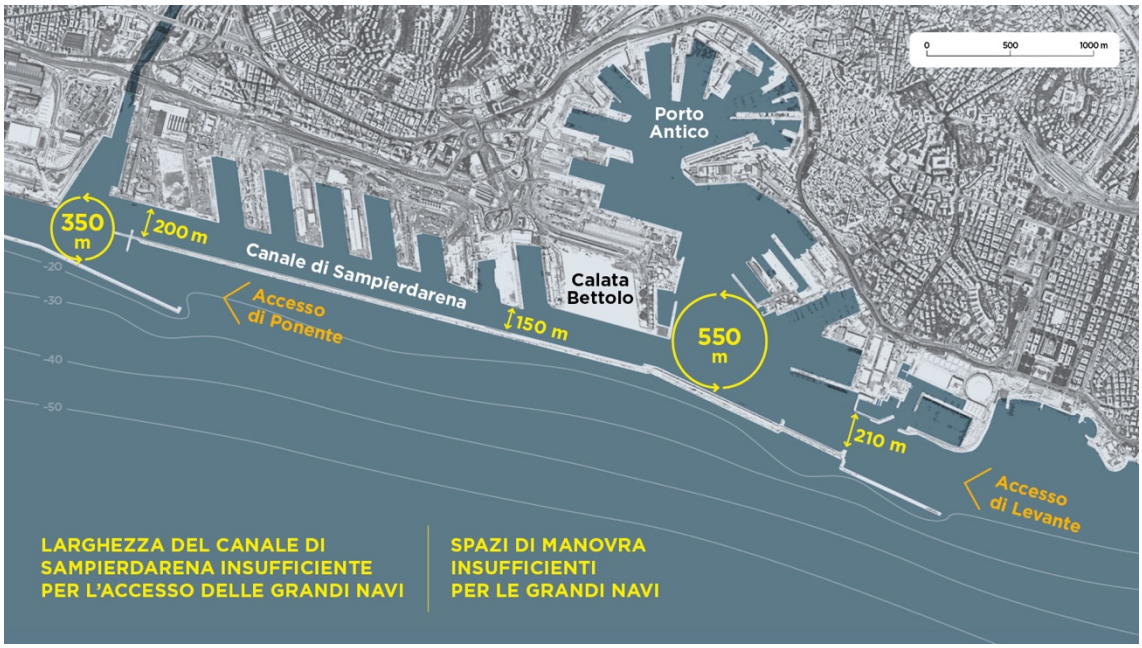

Access and maneuvering spaces in the current configuration of the port

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THE NEW BREAKWATER IN THE PORT OF GENOA:

OBJECTIVES AND PHASES OF THE INTERVENTION

The goal of the construction of the new breakwater is to allow port operations of the terminals of the Sampierdarena basin in safe conditions in relation to the access of large container ships. To solve the critical issues, the new breakwater will be built **to enlarge the current Sampierdarena channel,** increasing the internal port areas and manoeuvring areas, with the creation of **a new outer harbour with a diameter of 800 meters, of a new access channel about 300 m wide.**

With these changes, the port will once again be able to adapt to the needs of today's market and will be able to make fully operational the new terminal of Calata Bettolo, under construction, intended to accommodate container ships of large capacity and a length of 400 meters (which otherwise could not pass safely). The Port Authority has provided that the construction process of the new breakwater is organized in two functional phases, in relation to a foreseeable progressive funding:

- **Phase A**: The first phase of construction will ensure the operation of the Calata Bettolo terminal in safe conditions, guaranteeing access to the largest project vessels in the short term, maintaining and improving the operation of the other terminals that overlook the Sampierdarena channel.

- **Phase B**: The completion of the construction will ensure the operation of all Sampierdarena terminals, even those further west, in safe conditions, guaranteeing access to the project ships.

In accordance with the current Code of Contracts, the Technical and Economic Feasibility Project of the new Genoa breakwater provides **a first phase of processing in which possible alternative solutions for the construction of the work** are identified, analysed and conceived on the basis of specific functional, performance and safety criteria. **Through a process of technical and economic comparison, it is necessary to identify the possible solutions that present the best relationship between costs and benefits for the community**, in relation to the specific needs to be met and the services to be provided.

The outcome of the first phase of the Technical and Economic Feasibility Project, or the study of the project alternatives, is the topic of the Public Consultation on the new breakwater of the port of Genoa.

Following the Public Debate, in the second phase of elaboration of the Technical and Economic Feasibility Project, the project solution chosen for the new breakwater will be developed and sized at the Feasibility Project level in compliance with current legislation.

The urgent nature of the intervention for the construction of the new breakwater requires a schedule to optimize the project and construction of the work, according to the procedures provided for by the 'Extraordinary Infrastructure Relaunch Program' drafted by the Port Authority. In this context, **it is possible to foresee that the intervention will be completed in 8 years**, through a complex integrated contract for the project and construction of the work with criteria and methods of implementation such as to respect the schedule.

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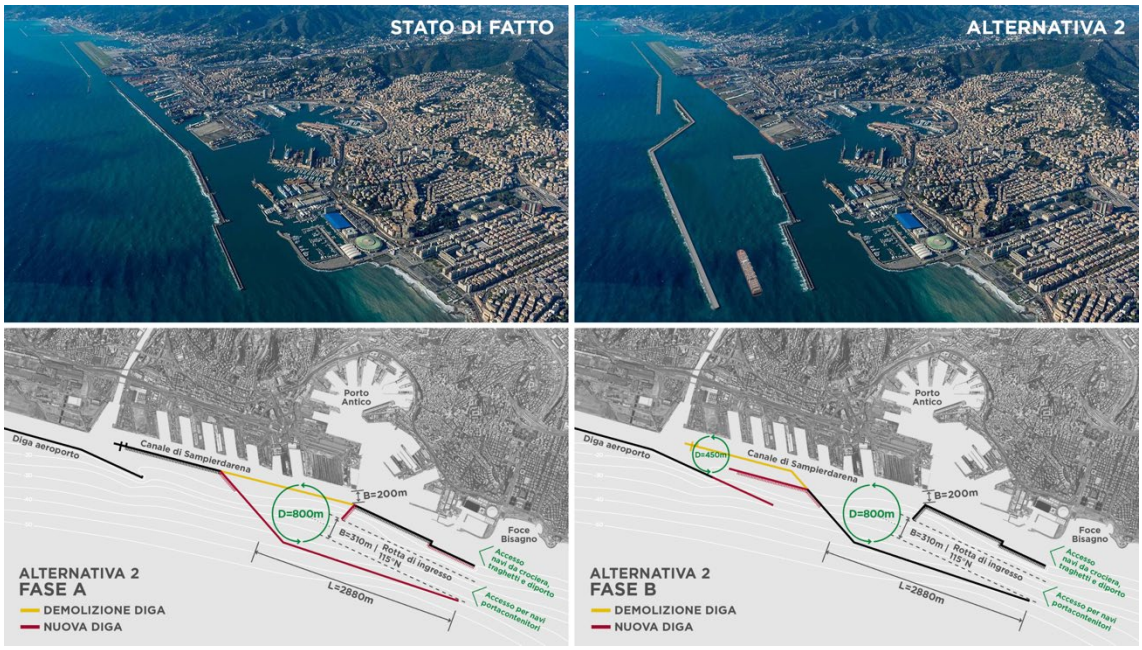
PROJECT ALTERNATIVES

Three out of five possible alternatives were selected as the most advantageous in terms of fewer developments of new works and smaller portion of existing breakwater to be demolished and therefore of lower costs: **solution 2** and **solution 3**, which provide for access to the port from the east; **solution 4** which instead provides access from the west. The three solutions selected were also evaluated and compared in relation to the effects on environmental, landscape, historical-archaeological factors, on pleasure boating activities to the east, on the procedures for boarding the pilot on ships and on the access manoeuvres of ships to the port.

ALTERNATIVE SOLUTION 2: ACCESS FROM THE EAST

The project envisages that to enter Calata Bettolo and Sampierdarena a new entrance from the East is used, allowing cruise ships and ferries to continue to reach the Porto Antico through the current entrance from the East. In the initial phase (**Phase a**), the first section of the new breakwater is built for about 3,100 meters at depths greater than 30 meters, and for about 1,000 meters at depths between 20 and 30 meters. At the same time it is planned to demolish the existing breakwater for about 1900 meters, in front of the terminals of Calata Bettolo and Calata Massaua, without touching the historic Duca di Galliera pier.

In the completion phase (**Phase b**), a new section of the breakwater is built, about 400 meters away from the edge of the docks, in addition to an extension of the existing breakwater of the airport. The demolition of the existing breakwater is then completed, facing Sampierdarena in the western section, for a total of about 1,500 meters. Between the two sections of the new breakwater an opening of 150 meters is maintained, near the mouth of the Polcevera stream, to facilitate flood outflows and limit the deposit of sediments in the port area. The Western access can also be used for small coastal navigation and service boats.



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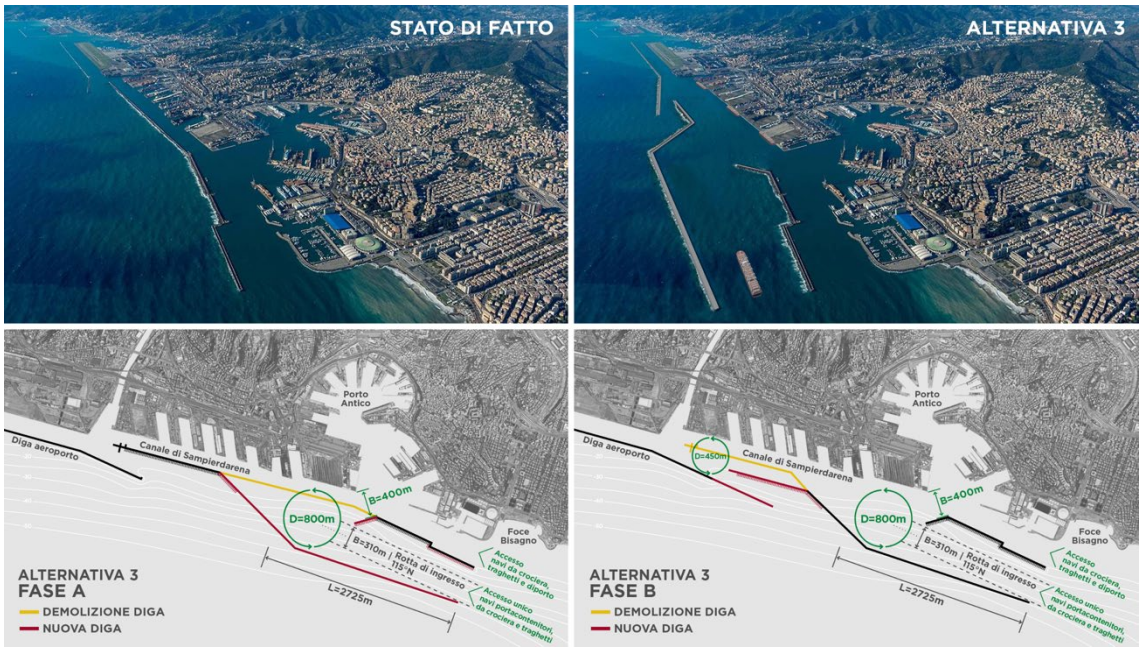
ALTERNATIVE SOLUTION 3: ACCESS FROM THE EAST

Compared to solution 2, **the project envisages a new entrance from the East for all ships bound for the various terminals, both for container ships bound for** Calata Bettolo and the Sampierdarena docks, and for cruise ships bound for the Old Port. The latter, therefore, will be able to reach the Porto Antico, through a 400-meter gap between Calata Bettolo and the existing breakwater. In this way, the entrances for the different types of traffic are distinguished, allocating the new one to traffic for commercial terminals and the existing one to traffic relating to ship repairs and pleasure boating. To achieve this solution, the demolition of a section of the Molo di Galliera towards the west is foreseen, and a new configuration of this portion of the breakwater to allow access to the Old Port. Overall, the demolition of 2,150 meters of the current breakwater is planned, in the section from Calata Massaua and the Duca di Galliera pier (about 300 meters). In the completion phase (Phase b), similarly to alternative 2, a new section of the breakwater is built, about 400 meters away from the edge of the docks, in addition to an extension of the existing breakwater of the airport. Even in this case, an opening near the mouth of the Polcevera stream of about 150 meters is maintained between the two sections. Also in this phase, the demolition of the existing breakwater facing the quays of Sampierdarena in the western section is planned, for a total development of about 1,950 meters.



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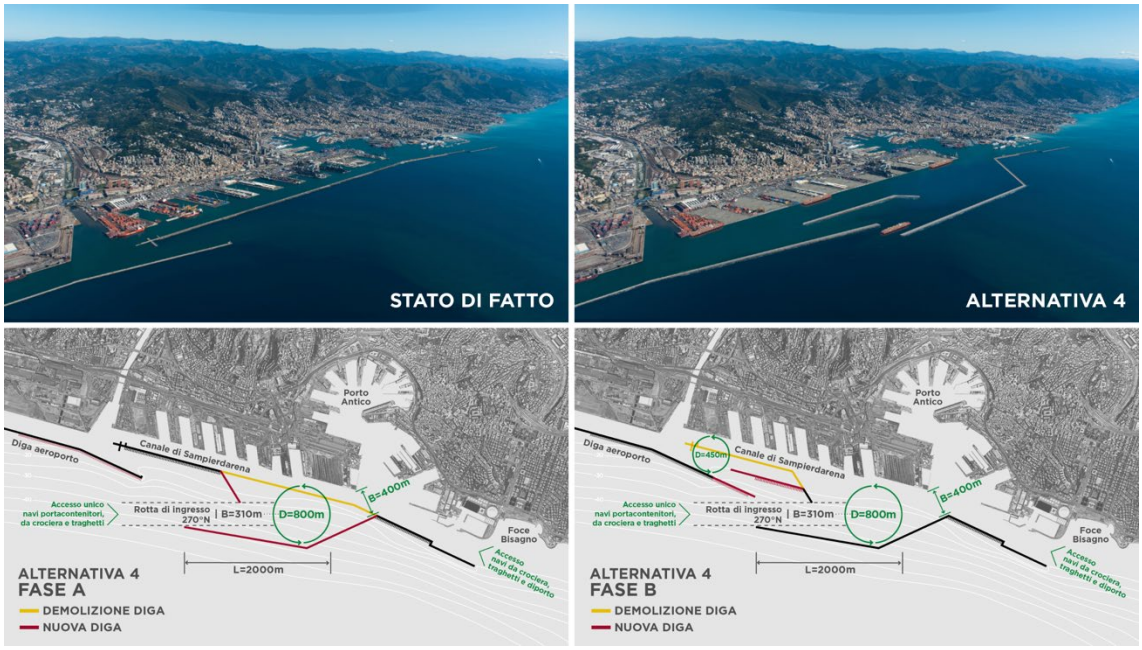
ALTERNATIVE SOLUTION 4: ACCESS FROM THE WEST

The project provides a new entrance from the west for ships bound for the various terminals: Calata Bettolo, the docks of Sampierdarena, the basin of the Porto Antico. Cruise ships and ferries, as for alternative 2, can also access the port, through a 400-meter wide passage between Calata Bettolo and the existing breakwater. In the initial phase (**Phase a**) the new breakwater is built, which extends for about 2,350 meters on depths between 30 and 50 meters and for about 850 meters on depths varying between 20 and 30. In this phase, the access to the Porto Antico, through the demolition of 2,150 meters of the current breakwater, in the section from Calata Massaua and the Duca di Galliera pier (for 300 meters).

In the completion phase (**Phase b**), as in the other solutions, a new section of breakwater is built 400 meters from the edge of the docks and another in extension of the existing breakwater of the airport. Between the two sections an opening is maintained near the mouth of the Polcevera stream of about 150 meters. In this phase, the demolition of the existing breakwater facing the quays of Sampierdarena in the western section is also planned, for a total length of 1,850 meters.



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THE EXPECTED SOCIO-ECONOMIC IMPACT

The project of the new breakwater, the new port entrance and the new manoeuvring space for ships will allow the port and terminal operators to accommodate large ships, adapting to the needs of the major shipping companies. This will make it possible to maintain **the dominant position of the port of Genoa on a national and international level, with inalienable economic and employment consequences**.

The port will continue to play a role of regional port without the new infrastructure and will record a profound contraction in traffic compared to today and handling local goods or traffic from transhipment ports, in the hypothesis of an inertial scenario.

The realization of the new breakwater project will allow the port of Genoa to have no limits to the development of port traffic, which will therefore depend on the capacity of the terminal operators and other driving and development support components.

After a first phase of predictable and slight transitory contraction in traffic during construction, a few **years will follow in which traffic will increase significantly with important annual growth rates and then settle on a trend of economic growth**.

The results of the Cost-Benefit Analysis are significantly positive for all intervention solutions, as evidenced **by the ratio between benefits and costs which is always higher than 1.5 for all solutions and in all scenarios**. On the basis of this result, the guidelines for the evaluation of investments in public works of the Ministry of Infrastructure and Transport assign a "**high priority**" level to the intervention.