

# INTERREG IV B NWE Project

## Rotterdam and Genoa ports: performances and hinterland connections

ROTTERDAM

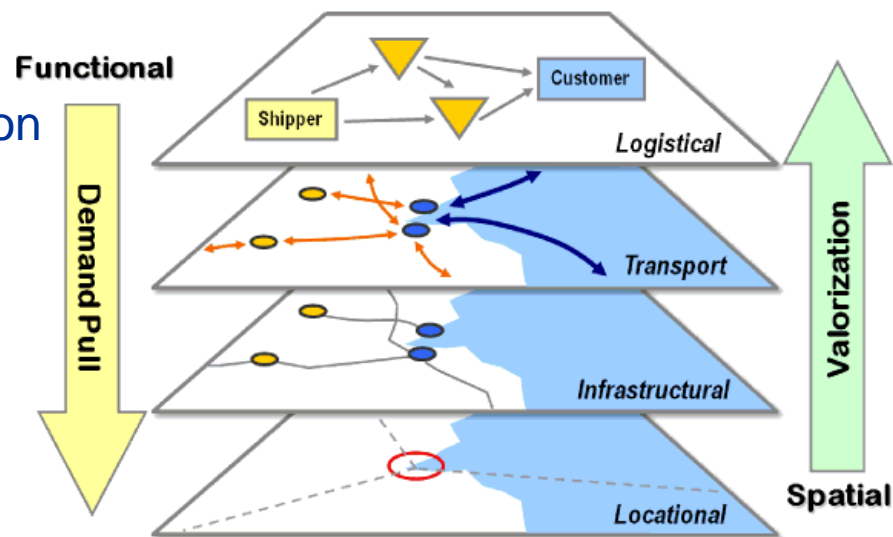
**CODE24**  
CORRIDOR  
DEVELOPMENT

GENOA



### Main steps

- ❖ Literature screening: finding a proper methodology to apply
- ❖ Data mining: focus of the data collection on ongoing transport systems and related traffic operations in 2010/2011
- ❖ Catchment area definition and socio-economic dimension
- ❖ Stakeholders involvement (interviews / workshops)
- ❖ Assessing ports 'value' in their catchment area
  - Port Performance Indicator



Source: Notteboom & Rodrigue (2008)



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## RELEVANT LITERATURE EXAMINED

- PORTS' PERFORMANCE INDICES (de Langen et al., 2007)
  - Variation of GDP
  - Employment
  - Firms' profitability and investments

→ Shortcomings: they do not represent the spatial economic impact.
  
- EXISTING MEASURES OF INTERACTION WITH THE HINTERLAND
  - Centrality Index (based on gravitation model approach, OECD Round Table, 2001)
  - Iso-distances (share of representative variables, Notteboom 2008)

→ Shortcomings: they are not based onto a quantitative theoretical framework.

**VARIABLE THAT WORTH BEING EXPLOITED TO  
CATCH THE PORTS' ECONOMIC DIMENSION**

**Generalised Cost of transport (GC)**

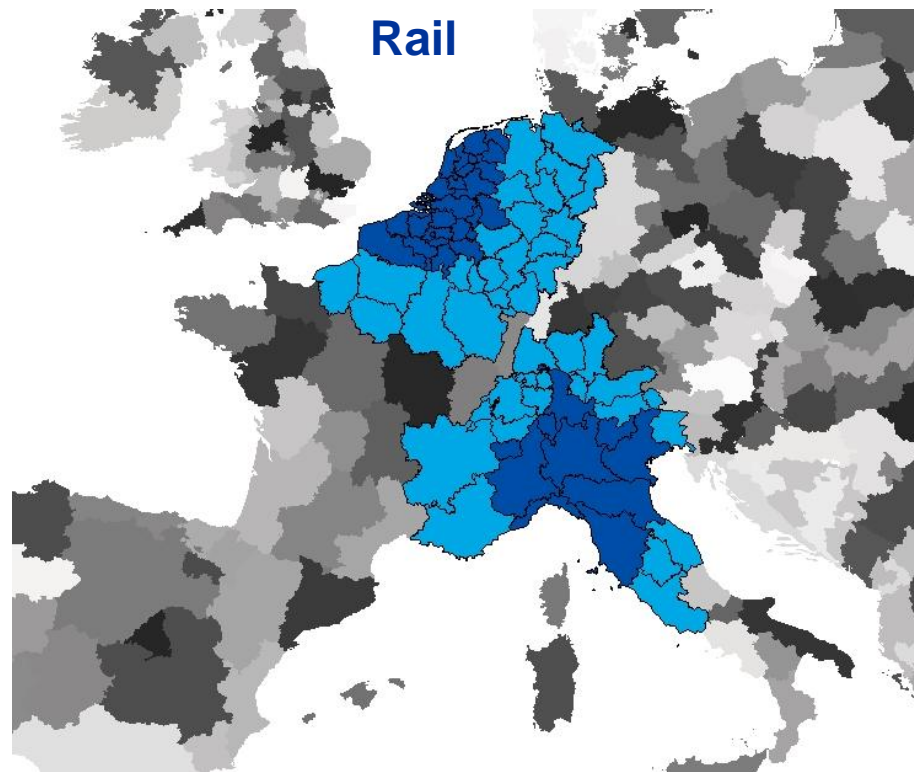
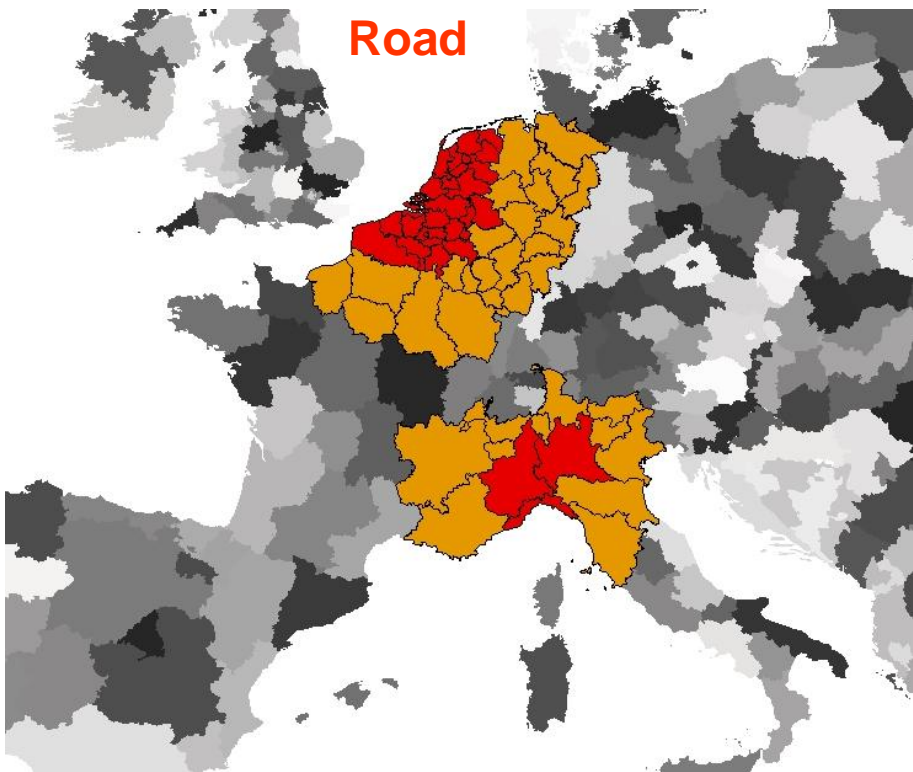


# PORTS HINTERLAND ANALYSIS

## What do we intend for hinterland ?



Road	Distance [km] *		Rail	Distance [km] *	
Thresholds * [Euro/ton]	Genoa	Rotterdam	Thresholds [Euro/ton]	Genoa	Rotterdam
0 – 60	0 – 260	0 – 310	0 – 30	0 – 320	0 – 290
60 – 100	260 – 440	310 – 490	30 – 50	320 – 520	290 – 510
100 – 150	440 – 670	490 – 785	50 – 100	520 – 1.060	510 – 1.080
> 150	> 670	> 785	> 100	> 1.060	> 1.080



\* Suitable ranges have been selected arbitrarily. Estimation of travel times, fares, VOCs (Vehicle Operating Costs), through **TRANS-TOOLS** simulation model (within **NUTS 2** partition)

The proposed analysis follows a **multi-criteria approach**, a methodology more flexible and adaptable to the objectives of this project.

## METHODOLOGICAL STEPS

1. Identification of **clusters and elements**
2. Definition of a system of **weights** for each cluster and element
3. **Input** definition and element estimation
4. **Score attribution** to each element on the basis of a **value scale**
5. Final calculation
6. Sensitivity analysis

# PORT PERFORMANCE INDICATOR

## Clusters and elements



**Five macro sectors** have been considered for taking a quali-quantitative measure of the two ports performances:

1. the **port size** (6 elements)
2. the efficiency of the **container terminals** (7 elements)
3. the use of **modern technologies** facilities (4 elements)
4. the **port hinterland** power (7 elements)
5. the development of **planning strategies** (6 elements)

→ **30 elements** totally

# PORT PERFORMANCE INDICATOR

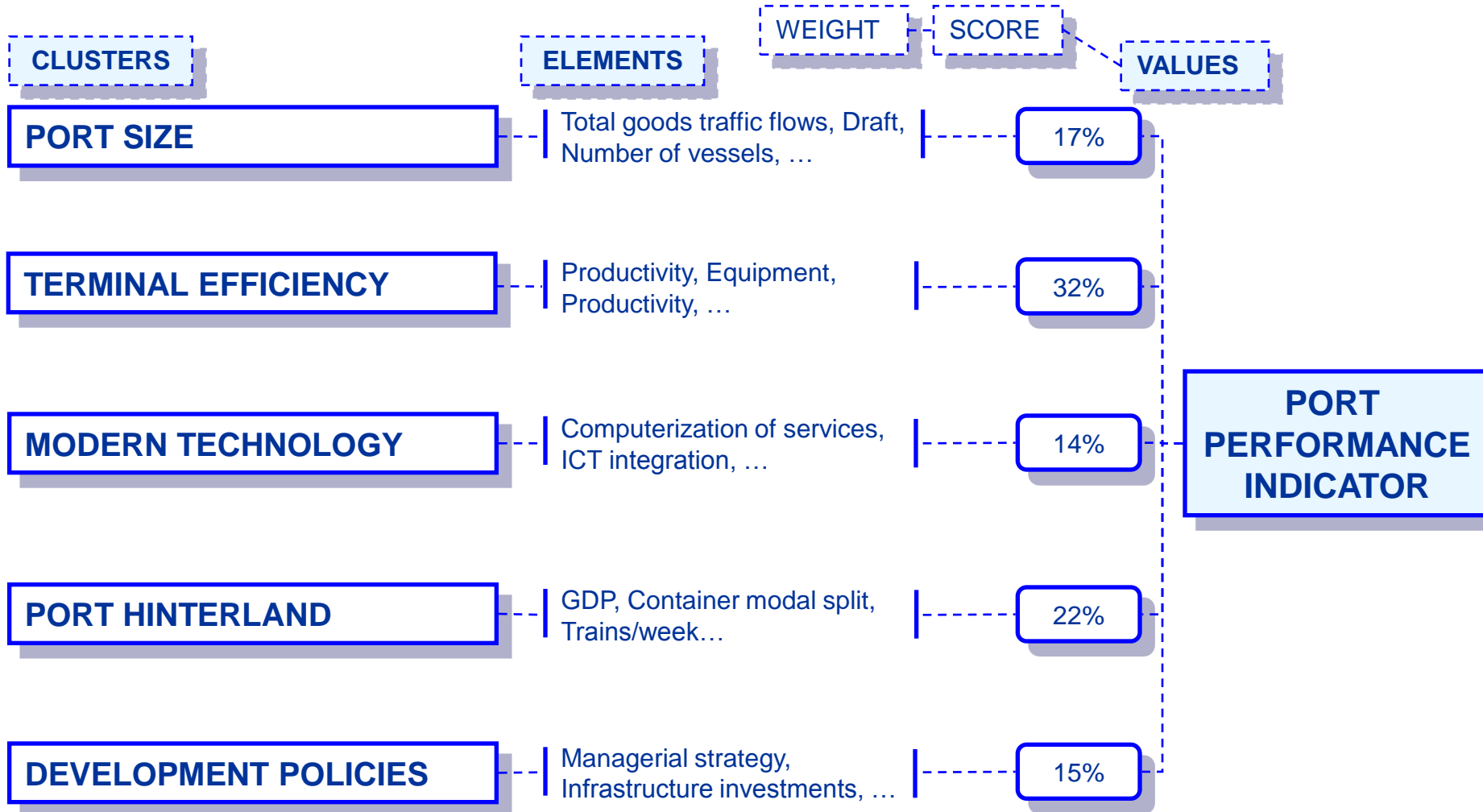
## PPI Architecture



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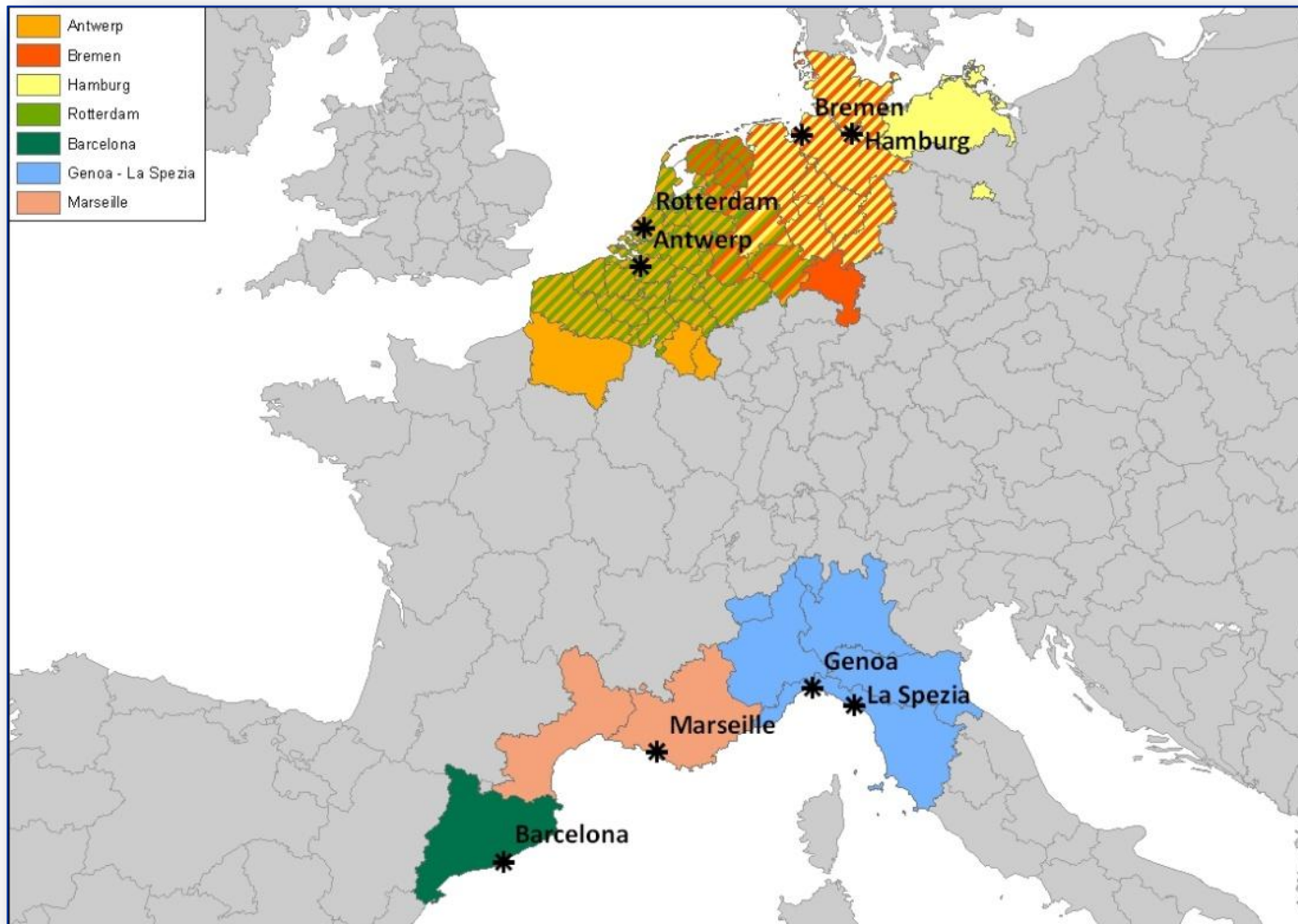
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# PORT PERFORMANCE INDICATOR

## Sample of analysis

The analysis is developed for two different port areas, the **Northern range** with respect to Rotterdam, and the **West Mediterranean range** with respect to Genoa.

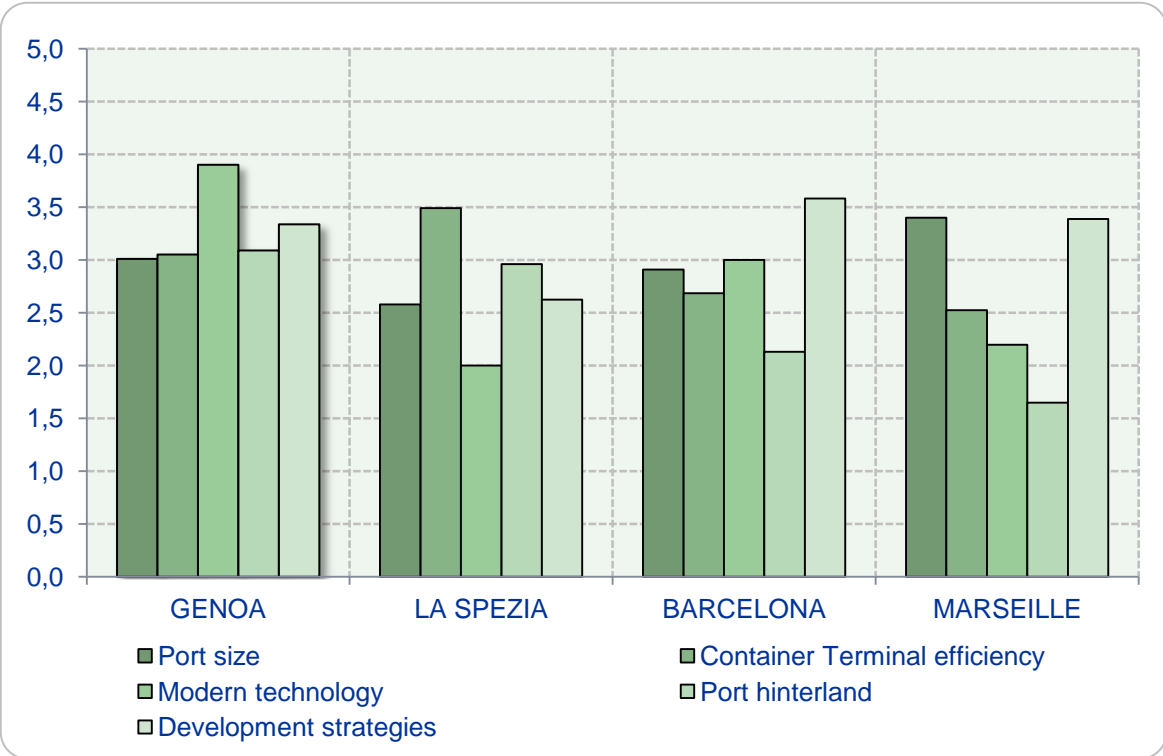






# PORT PERFORMANCE INDICATOR

## Genoa in the Mediterranean Range



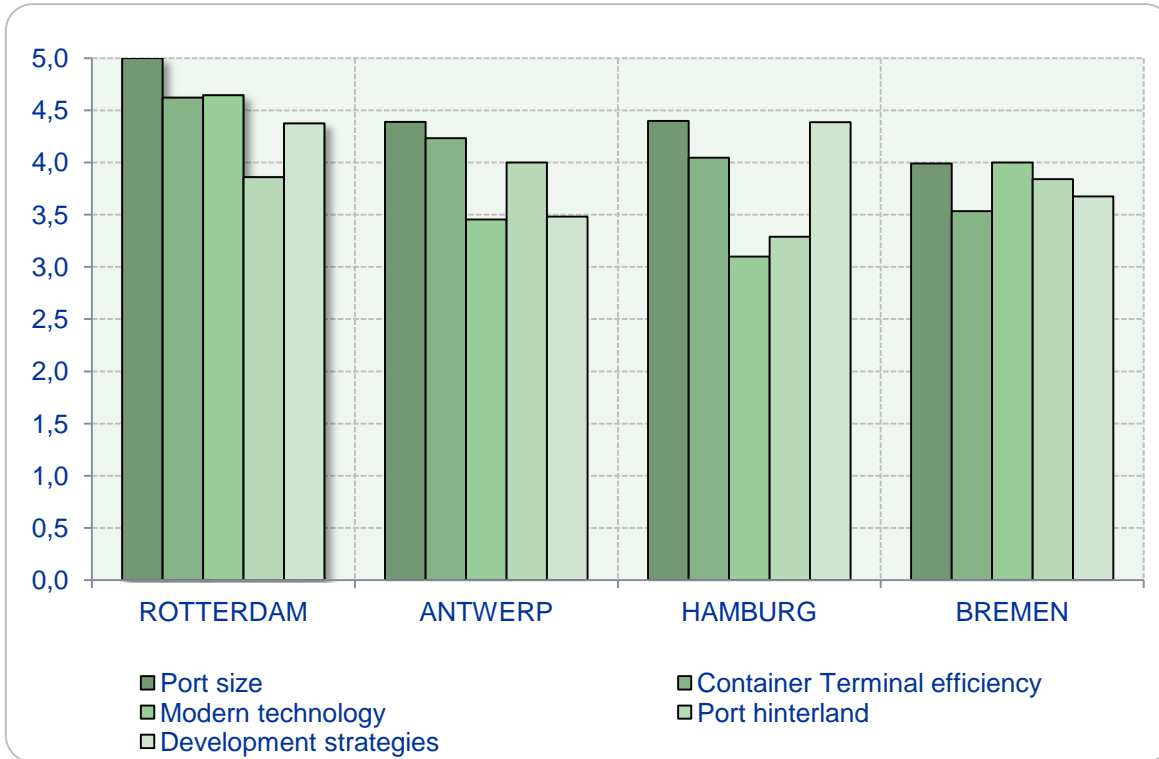
**Genoa** is the first one in respect to the synthetic indicator, with excellent performances in **Modern technology** and good results in **Development strategy** and **Port hinterland**.

Port size and CT efficiency are the less performing cluster, even if these are the second results just after Barcelona and La Spezia respectively.

	GENOA	LA SPEZIA	BARCELONA	MARSEILLE
BEST CLUSTER	Modern technology	CT efficiency	Development strategy	Port size
IMPROVABLE CLUSTER	CT efficiency	Modern technology	Port hinterland	Port hinterland

# PORT PERFORMANCE INDICATOR

## Rotterdam in the Northern Range



**Rotterdam**, the first port in respect to the synthetic indicator, has **excellent performances in all the clusters**.

The main improvement area is represented by the Port hinterland cluster (the second one in the ranking, after Antwerp).

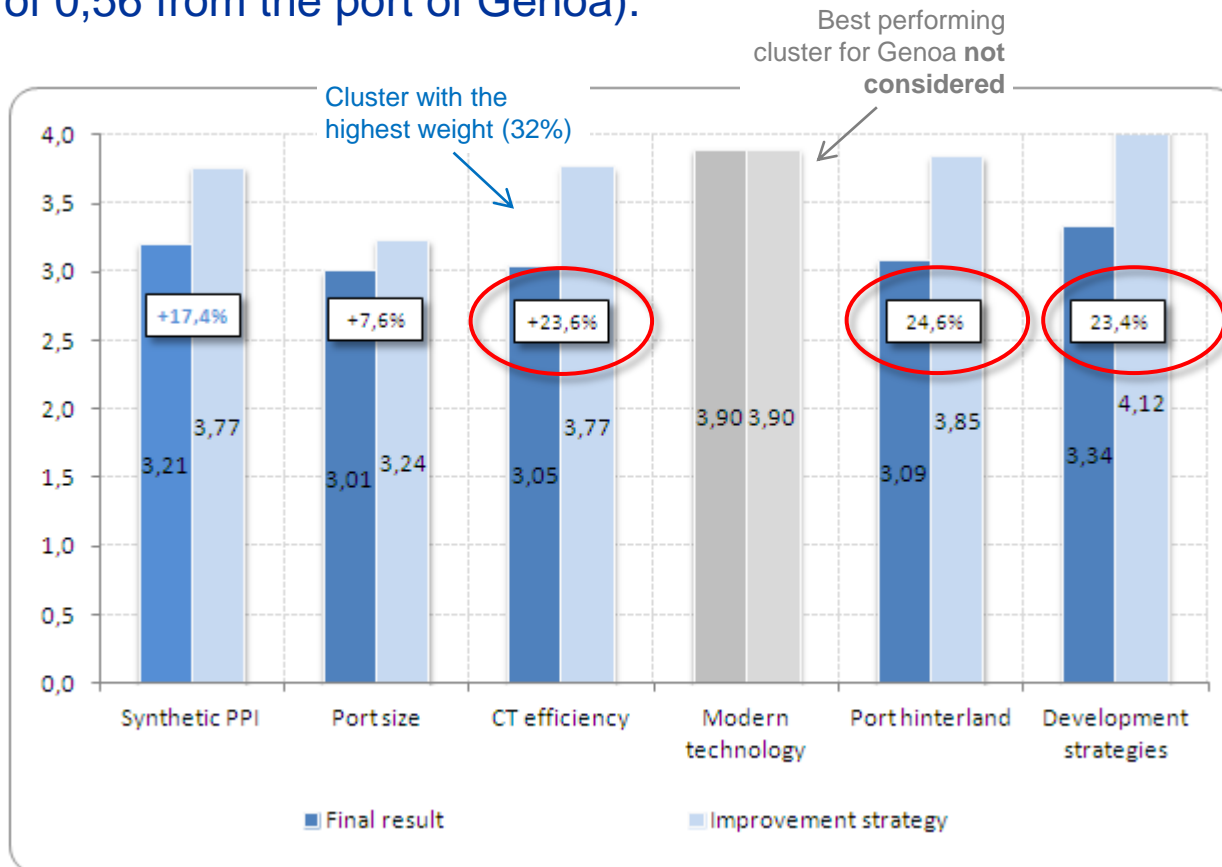
	ROTTERDAM	ANTWERP	HAMBURG	BREMEN
BEST CLUSTER	Port size	Port size	Port size	Modern technology
IMPROVABLE CLUSTER	Port hinterland	Development strategies	Modern technology	CT efficiency

# PORT PERFORMANCE INDICATOR

## Sensitivity analysis – Example of application

### WHAT IF GENOA ASPIRES TO BREMEN PERFORMANCES?

Northern Europe range ports reach higher PPI values than Mediterranean ones. The lowest, in that range, is the port of **Bremen** who reaches the **score 3,77** (with a gap up of 0,56 from the port of Genoa).



Combining the effects deriving from various improvements: an **overall increase of +17,4%** improving every single cluster result and related items.

A more dynamic **development strategy** together combine with a further growth of **CT efficiency** and improvement of the connections with the **hinterland** might, in the short-medium term, favour this type of performance improvement.

# PORTS ASSESSMENT TOOL

## Main conclusions



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- The choice to adopt a model based analysis has allowed an approach at the same time consistent, replicable and adaptable to different scopes;
- The analysis carried out demonstrates how the rail and the road transport mode, combined, may extend the hinterland potential;
- The strength of the hinterlands of both Genoa and Rotterdam is a dimension of their intense industrial and commercial activity and of a dense infrastructural network;
- It emerges how strength, dimension and efficiency of a port are strictly related to its hinterland on one side and how they rely on its capability to strategically answer to the demand and the evolution of the market;
- Both Genoa and Rotterdam play a leading role within their respective port ranges, thus reflecting a high capacity of innovating and dialoguing with their hinterlands;
- The methodology aims at proving that the competitiveness of a port and its performance are the outcome of a combined strategic management of the port potential.



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# *Thank you!*



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**Further information on main results:**

[www.code-24.eu/activities/linking-the-terminal-ports](http://www.code-24.eu/activities/linking-the-terminal-ports)

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