

The Smart Port model at the Port of Barcelona

Jordi Torrent
Strategy Director
Barcelona Port Authority

2019



Port de Barcelona



The Port of Barcelona's mission

“ To contribute to the competitiveness of the customers of the Port by providing efficient services responding to their needs for maritime transport, land transport and logistics services ”

- Competitiveness of shippers, industries, logistics operators & shipping lines
- Attraction of new industries & distribution centers





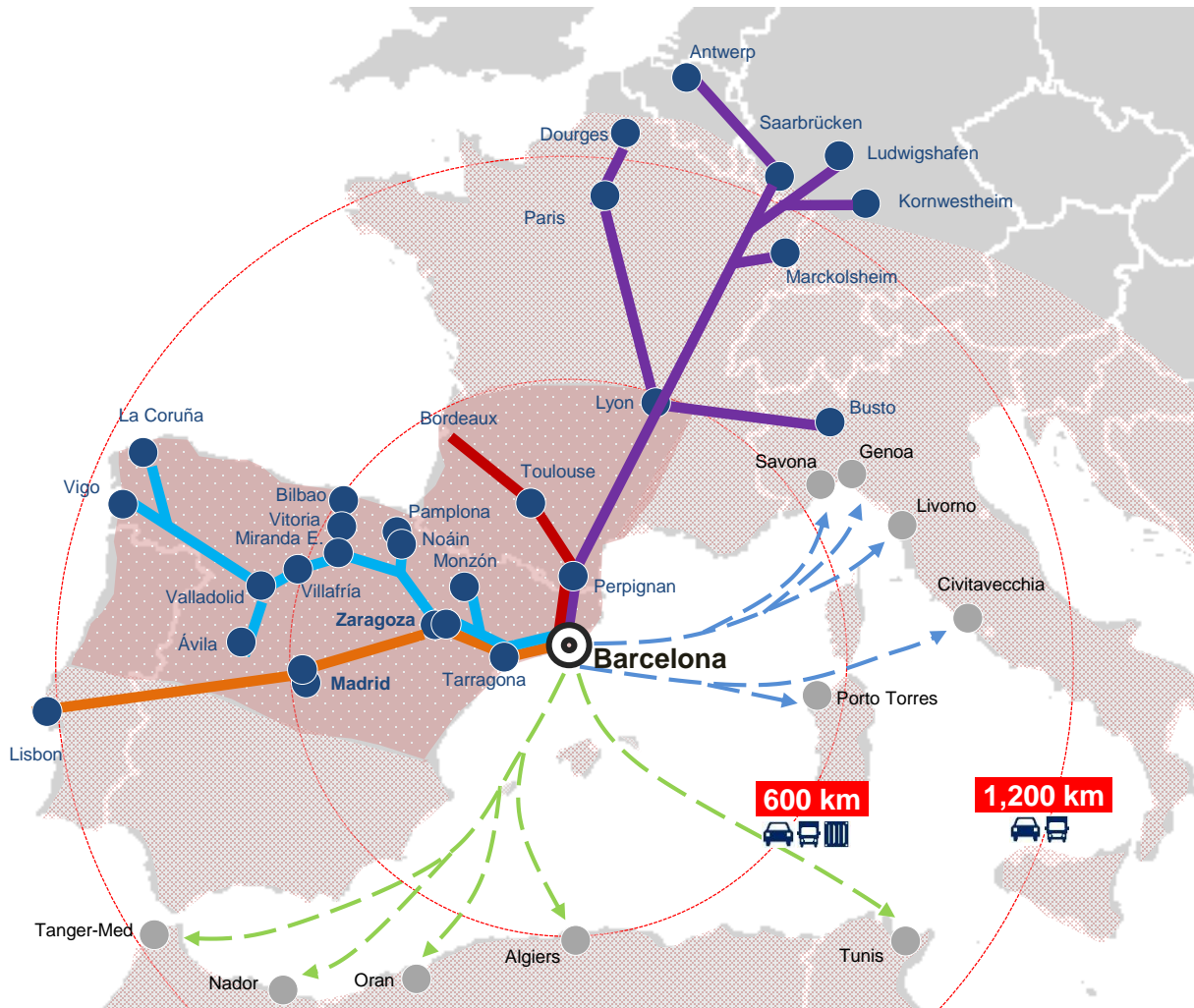
Who are our clients?







- Shippers
- Logistics Operators
- Shipping Lines
- Citizens of Barcelona





Location of Port of Barcelona customers and hinterland



-  **Port of Barcelona**
-  **Hinterland**
-  **Containers, finished vehicles and trailers**
-  **Finished vehicles and trailers**
-  **Intermodal terminals connected to the port by rail (containers and vehicles)**
-  **Ports currently connected to the port by Motorways of the Sea**

Strategic corridors

-  Iberian North Western
-  Iberian Central
-  Southern France
-  Central European
-  Motorways of the Sea with Maghreb
-  Motorways of the Sea with Italy



Leading international brands have their distribution centers in Barcelona

National	<h3>IKEA</h3> <p>Ikea located its Southern European logistics centre in Valls (Tarragona).</p>	<h3>Carrefour</h3> <p>In ZAL Barcelona they have 2 logistics warehouses: a dry one of 44.000 m2 and a cold one of 17.000 m2.</p>	<h3>LIDL</h3> <p>Logistics platform for the Iberian Peninsula in Moncada i Reixac (Barcelona) and a warehouse of 36.000 m2 in ZAL Barcelona.</p>		
Regional	<h3>AMAZON</h3> <p>New logistics center of 63.000 m2 in El Prat de Llobregat (Barcelona). The center will be part of its European network and is scheduled to open in autumn 2017.</p>	<h3>Schneider Electric</h3> <p>Integrated logistics centre in Sant Boi del Llobregat (greater area of Barcelona).</p>	<h3>HONDA Logistics</h3> <p>Factory & logistics center in Santa Perpetua de la Mogoda (Barcelona) for distributing Spain & Portugal & Morocco</p>	<h3>MAZDA</h3> <p>Car imports from Japan through the Port of Barcelona to be distributed to other Mediterranean countries.</p>	<h3>Decathlon</h3> <p>In ZAL Barcelona they have their logistics center of 50.000 m2 for stock management & for sport materials delivery to their warehouses and shops in Europe.</p>
Worldwide	<h3>INDITEX</h3> <p>From its logistics center in Tordera (Barcelona) distributes some of its brands worldwide and from ZAL Barcelona only its shops in Barcelona.</p>	<h3>SEAT Nissan</h3> <p>Their factories are in Barcelona from where they distribute their cars by road, rail and sea, all over the world.</p>	<h3>MANGO</h3> <p>New logistics centre in Barcelona with 70.000 m2 of warehouses handling most of the company's international flows. "The proximity to the port was a decisive factor in choosing the location of our new logistics park".</p>		



What do they request from a port?

CUSTOMERS

- Resilience
- Reliability
- Speed
- Transparency
- Cheap

CITIZENS

- Employment
- Sustainable development



Competitive logistics chain through the Port of Barcelona

China



Barcelona



Madrid



World

Saturday

08:00

Container ship arrives at the Port of Barcelona. Containers are unloaded and transferred to the train (Sunday 01:00)

Sunday

06:00

Cargo train leaves the Port destination Madrid

Sunday

16:00

Cargo train arrives to Azuqueca intermodal terminal (Guadalajara, Madrid)

18:00

Trucks pick up containers and transport them from the terminal to the nearby distribution centre In Madrid

Monday

10:00

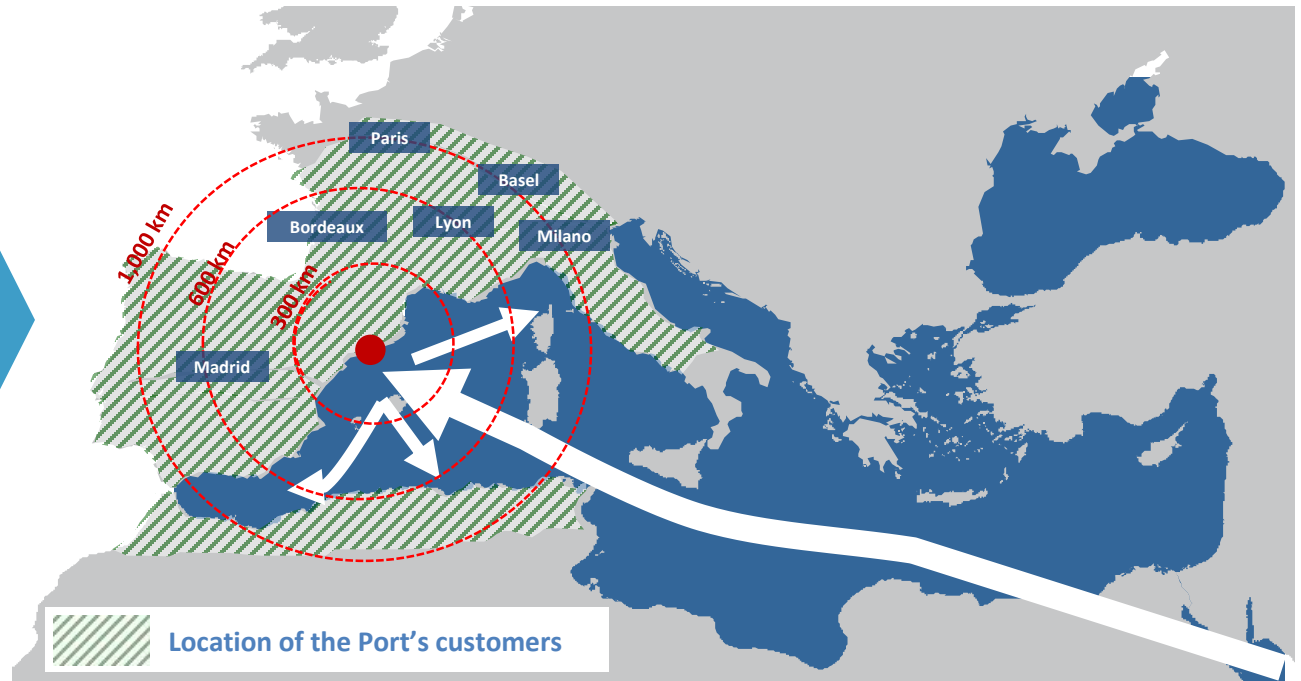
From the distribution center the pieces of clothing are shipped throughout the world





Port of Barcelona strategy

European & Mediterranean logistics hub in order to serve our clients located in Spain, France, Italy, Portugal and North Africa



Expansion of the Port and Logistics areas

Largest part completed

New investments: Hutchison & Carnival, Grimaldi, Salamanca group...

Improved connectivity with hinterland and foreland

Hinterland strategy

Direct services with Far East with excellent transit time

Efficiency in the provision of services

Port services

3rd most productive port in Europe JOC's Port Productivity Report 2014



- Real-time information
- Traceability
- Automation and robotisation
- Physical and technological integration infrastructure
- Efficiency and predictability
- Seamless freight transport
- Smart maintenance
- Non-intrusive inspection



LOGISTICS



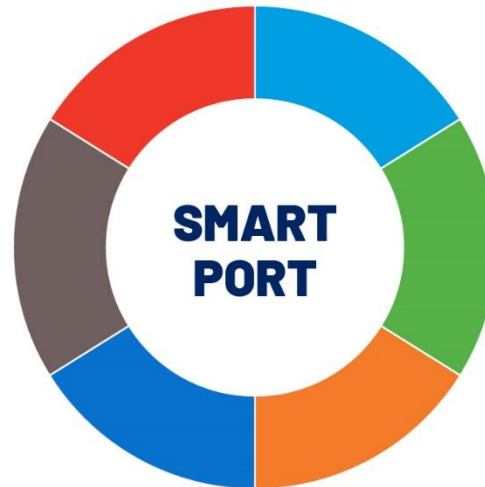
MOBILITY

- Connected vehicle
- Sustainable transport
- Autonomous transport
- Intermodality and syncromodality
- Smart traffic management
- Mobility management
- Connected infrastructure roads and rails
- Advanced parking

- Transparency
- e-Administration
- Security
- Cybersecurity
- Business models
- Digital platform
- Enabling tech
- Strategy and management



GOVERNANCE



ENVIRONMENT

- Circular economy
- Pollution reduction
- Waste management
- Energy efficiency
- Energy production
- Water management
- Alternative fuels
- Biodiversity

- Port city
- Passengers
- Port heritage
- Diversity
- Social cohesion
- Nautical cluster
- Training and knowledge



PEOPLE



ECONOMY

- Economic impact
- Competitiveness
- Employment
- Routes and connections
- Open innovation
- Cost reduction
- Financing





SMART PORT - Technological vision



PERIMETER
INTRUSION
SENSORS



SMART
TRAFFIC
MANAGEMENT



MARINE
ENVIRONMENT
SENSORS



CONNECTED
EMERGENCY
SERVICES



DIGITAL
INFORMATION



TELECOMMUNICATIONS
INFRASTRUCTURE



VIDEO
ANALYTICS



PASSENGER
GUIDANCE



AUTOMATION



BIG DATA



CYBERSECURITY



SMART
PARKING



CLIMATE
AND POLLUTION
SENSORS



WORKPLACE
MOBILITY



SMART
BUILDINGS



SMART
MAINTENANCE

Adequate legislation

Established processes and procedures

Digital training



Thinking Digital
Thinking SMART

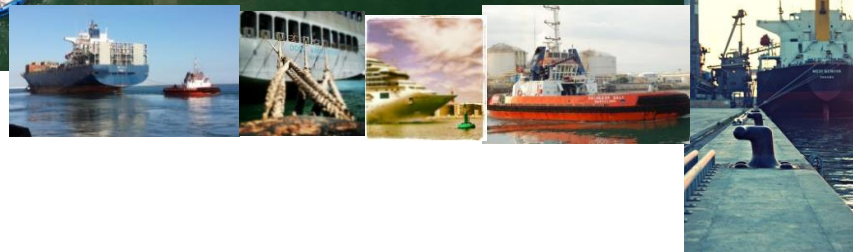
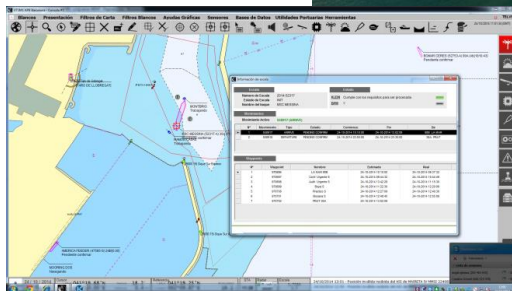


SMART PORT - Some examples

Smart traffic management



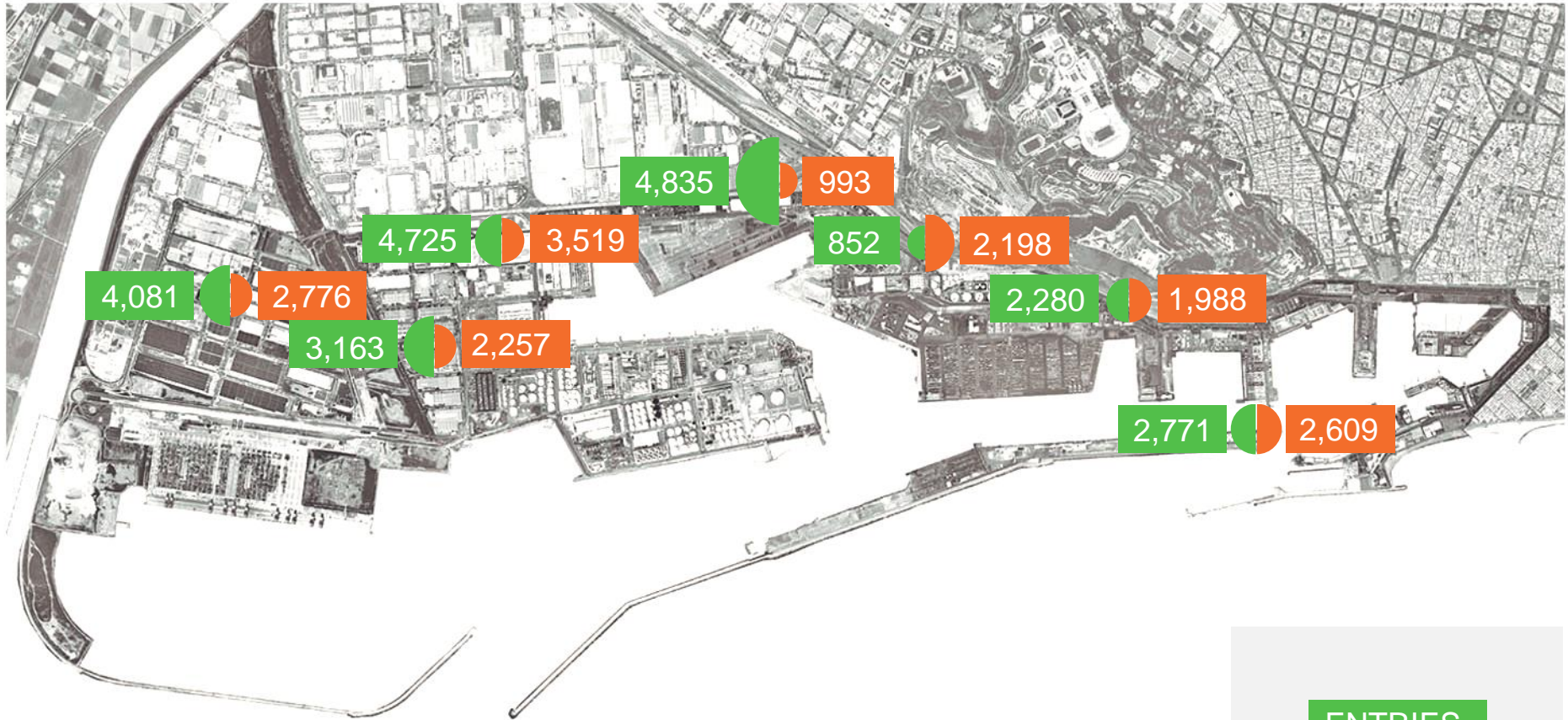
PMS (PORT MANAGEMENT SYSTEM): related to the Maritime Control Tower, it manages maritime traffic and calling operations





SMART PORT: Some examples

Smart port access



25,000 Vehicles per day

ENTRIES

EXITS



SMART PORT: Some examples

Smart port access



ACCESS TO PORT TERMINALS: Information about waiting time for entering to terminals and operation time inside port terminals

Terminals				Info	Temps Cua.	Welcome grinaic
Resum Terminals				Informació de les 09:00-09:20 del dia 2016-12-02		
BEST						
8	19	19 / 263				
Time (in minutes) to access the terminal	Time of operations (in minutes) inside the terminal	Number of trucks visiting the terminal in the last 20'	Number of trucks visiting the terminal accumulated			
PM (TCB)						
11	33	21 / 294				
Time (in minutes) to access the terminal	Time of operations (in minutes) inside the terminal	Number of trucks visiting the terminal in the last 20'	Number of trucks visiting the terminal accumulated			



SMART PORT: Some examples

Smart port access



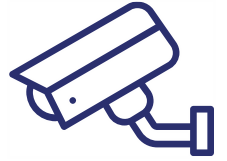
BCN PORT BOOKING SYSTEM: reservation of a time slot to drop off or pick up a container in port terminals (in operation since September 2018)





SMART PORT: Some examples

Smart security



+180 Cameras






Cameras



SMART PORT: Some examples

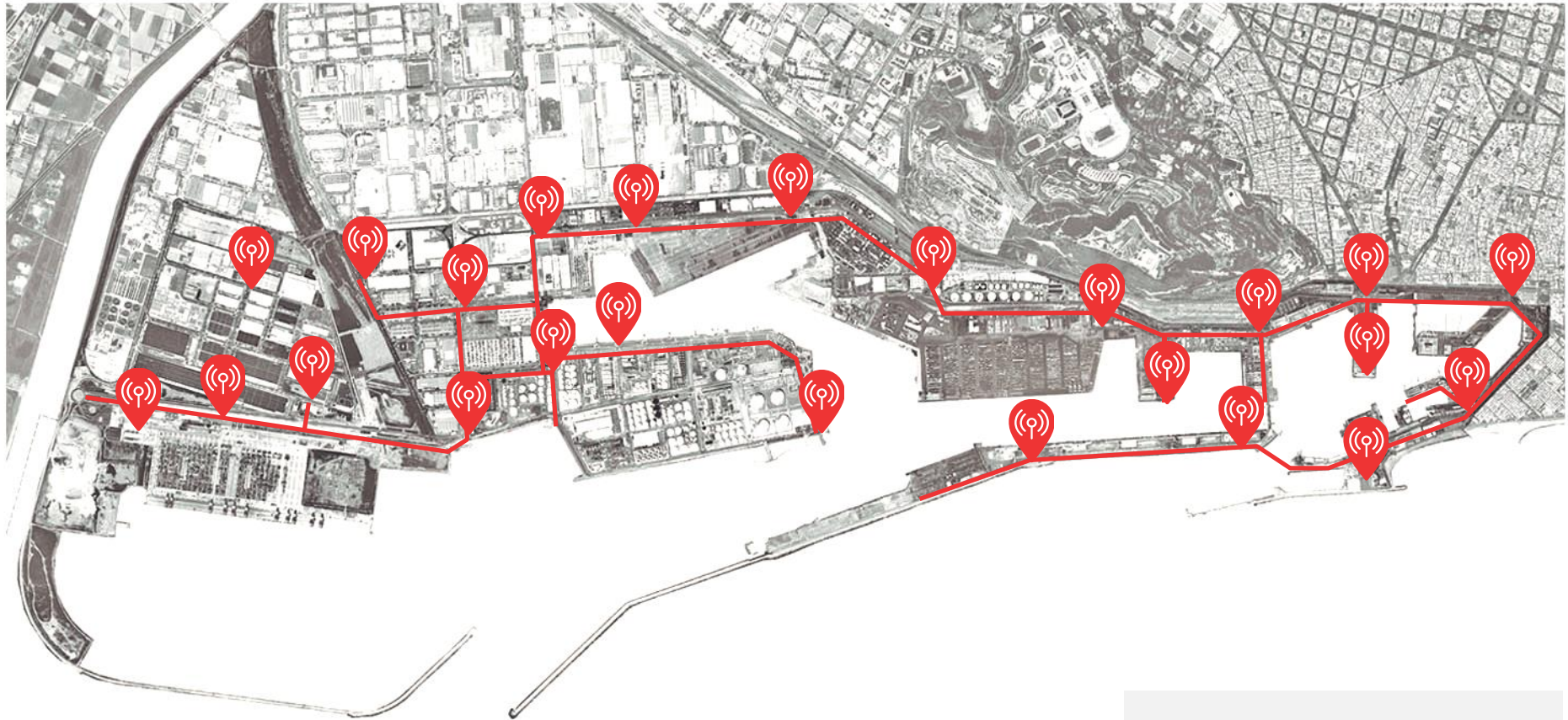


Meteorology, sea & NOx surveillance


-  Sea stations
-  Weather stations
-  Navigation radars



SMART PORT: Some examples



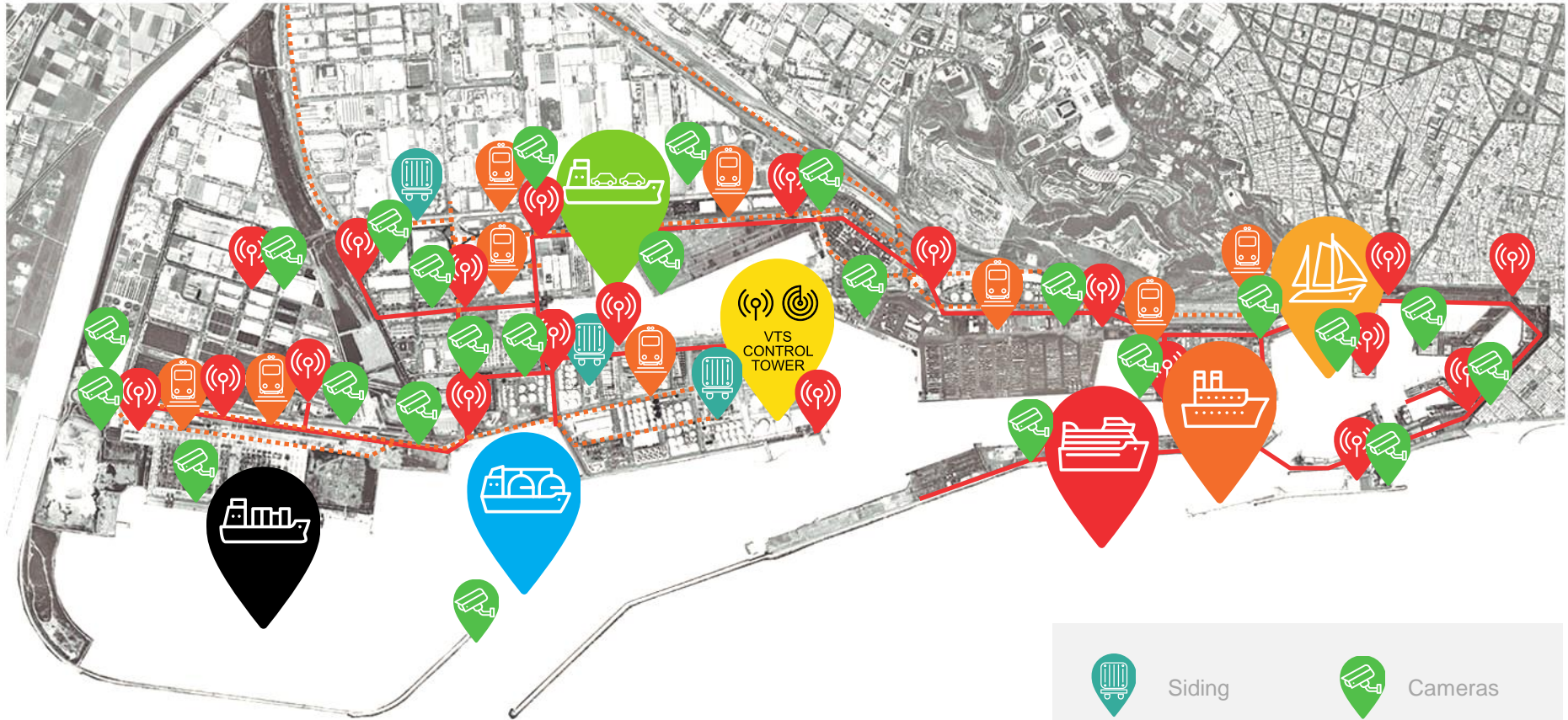
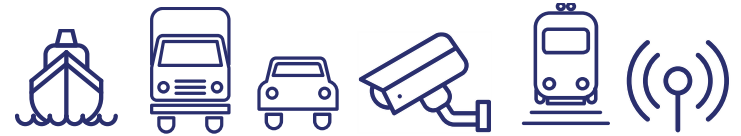
— Fibre optics network

 Links to the network

Fibre optics



SMART PORT: Some examples



9 Railway stations	+180 Surveillance cameras	Telecommunications services
90 Trains per week	25,000 Vehicles per day	9,000 Port calls per year

	Siding		Cameras
	Railway Infrastructure		Fibre optics network
	Railway terminals		Links to the network



Port Links

Build on-line your container transport chain through the Port of Barcelona
With all updated information about maritime and land transport services

Select ▼

Type of container
20', 40' or 45'

Hinterland location
Bergerac (France)

Foreland port
Yantian (China)

Import or export?
Import

Inland mode: truck or rail
Rail

Rail service
TP Nova Barcelona-Bordeaux
121 km road haulage
Bergerac-Bordeaux terminal

Maritime service
JADE/AE-11

Port de Barcelona **Port Links** CA | ES | EN | FR

Container 20' Bergerac Bordeaux Hourcade Barcelona Yantian

Transport chain

Inland section			
797	200	€	0,77
Km	kgCO ₂ eq	€	days

Port passage			
2	24	€	1,5
Km	kgCO ₂ eq	€	days

Maritime section			
16.049	1.220	€	21
Km	kgCO ₂ eq	€	days

Total path			
16.847	1.444	€	23,27
Km	kgCO ₂ eq	€	days

Build chain

Origin terminal	Destination Termi	Service Descripti	Departures	Arrivals
Moll Sud (TCB) / Moll Prat (BEST)	Bordeaux Hourcade	TPNova	DmDcDv-18:00	DvDsDI-11:00
Moll Sud (TCB) / Moll Prat (BEST)	Toulouse Fenouillet	TPNova	DiDmDcDjDv-18:00	DcDjDvDsDg-07:00
Moll Prat (BEST)	Noáin	Hutchison Logistics	DiDmDc-22:00	DmDcDj-11:25
Moll Sud (TCB) / Moll Prat (BEST)	Perpignan	TP Nova	DiDmDcDjDv-18:00	DmDcDjDvDs-08:30
Morrot	Bilbao Mercancías	Transfesa / Continen	DiDcDjDv-00:00	DmDjDvDs-00:00
Moll Sud (TCB)	Selgua	TCB Railway	DiDc-12:40	DmDj-17:28
Moll Sud (TCB)	Zaragoza tmZ	TCB Railway	DiDmDcDjDv-19:08	DmDcDjDvDs-01:19

Page 1 of 1 60+ View 1 - 30 of 30

The chosen rail service requires the following trucking: 120,98 km between Bergerac and Bordeaux Hourcade

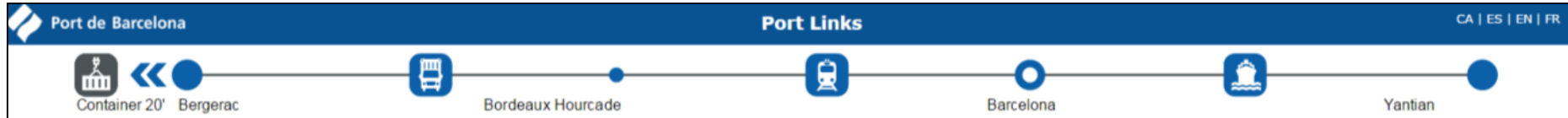
Name	TT	Tvde	Shipowner	Consianee	Docker
JADE / AE-11	21	D	MAERSK LINE/A.P.MOLLER	MARITIMA DEL MEDITERRANEO	STERCAT-BEST
JADE / AE-11	21	D	MEDITERRANEAN SHIPPING CO	MEDITERRANEAN SHIPPING	TERCAT-BEST
MEX 1 / AMX 9 / AMC25	D	D	CHINA SHIPPING CONTAINER LINICHINA SHIPPING SPAIN AGENCY	TERMINAL CONTENIDORS DE B	
MEX 1 / AMX 9 / AMC25	D	D	CMA CGM	CMA CGM IBERICA S.A.U.	TERMINAL CONTENIDORS DE B
MEX 1 / AMX 9 / AMC25	D	D	COSCO CONTAINER LINES (COSCCOSCO IBERIA S.A.		TERMINAL CONTENIDORS DE B
MEX 1 / AMX 9 / AMC25	D	D	UNITED ARAB SHIPPING, CO.	UASAC IBERIA S.L.	TERMINAL CONTENIDORS DE B
MD2 / AMX3	26	D	CHINA SHIPPING CONTAINER LINICHINA SHIPPING SPAIN AGENCY	TERCAT-BEST	
MD2 / AMX3	26	D	COSCO CONTAINER LINES (COSCCOSCO IBERIA S.A.		TERCAT-BEST
MD2 / AMX3	26	D	EVERGREEN MARINE CORPORATI	EVERGREEN SHIPPING SPAIN S.L	TERCAT-BEST

Page 1 of 1 40+ View 1 - 22 of



Port Links

Results



Aggregated results

Transport chain

Inland section

797	200	€	0,77
Km	kgCO ₂ eq	€	days

Port passage

2	24	€	1,5
Km	kgCO ₂ eq	€	days

Maritime section

16.049	1.220	€	21
Km	kgCO ₂ eq	€	days

Total path

16.847	1.444	€	23,27
Km	kgCO ₂ eq	€	days

Path info

	O-D	Service name	Dist.(km)	Time (d)
Maritime service	Yantian - Barcelona	JADE / AE-11	16.049	21
Port passage	Barcelona			1,5
Rail service	Moll Sud (TCB) / Moll Prat (B)	TPNova	677,08	0,71
Road section	Bordeaux Hourcade - Bergerac		120,98	0,06
Total path			16.847,06	23,27

CO2 emissions and other pollutants

	Kilograms (Kg)	CO ₂ eq	NOx	PM2.5	CO	NMVOc	SOx
Maritime service	1.219,97	30,52	2,16	2,85	1,04	7,7	
Port passage	23,98	0,32				0,01	
Rail service	68,39						
Road section	132	0	0	0			
Total path	1.444,34	30,84	2,16	2,85	1,04	7,71	

Externalities (€)

	Euros (€)	Cong	Accid	Polut	Noise	Clim. Cl	AvaPosi	Infras	Total
Maritime service				0,01		0,06	0,02		0,09
Port passage									
Rail service		1,35	2,71	5,42	6,09	2,81	24,51	6,09	48,98
Road section		13,67	0,73	1,51	33,87	5,02	2,18	2,9	59,88
Total path		15,02	3,44	6,94	39,96	7,89	26,71	8,99	108,95

+ Information about port passage through Barcelona: transit time, Efficiency Network, taxes and tariffs
 + Possibility of enter your transport costs



Where are we going?

From a technological perspective....

