Sustainable Development of CRUISE TERMINALS

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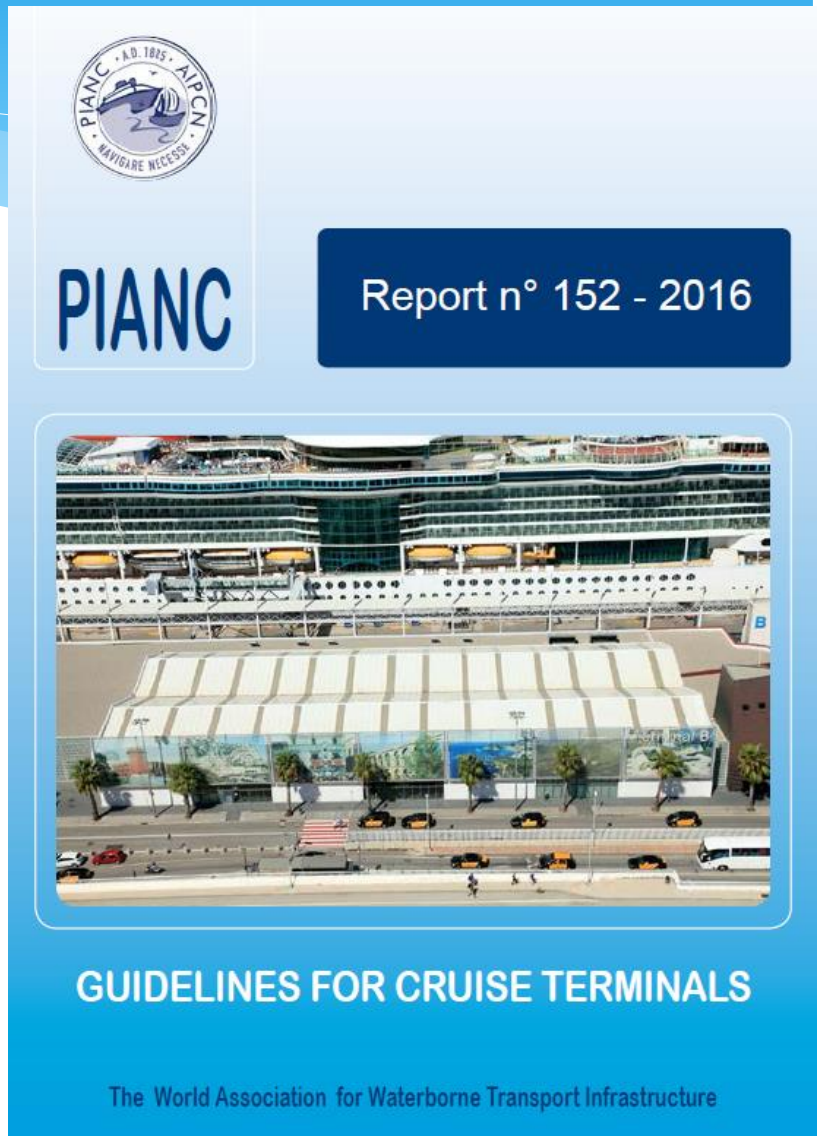
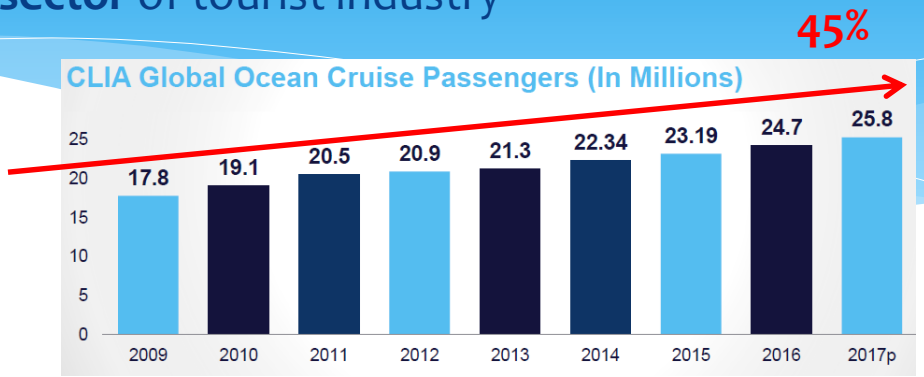
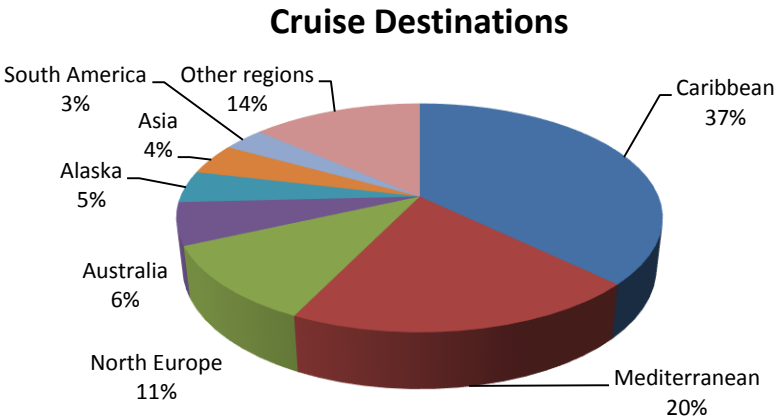


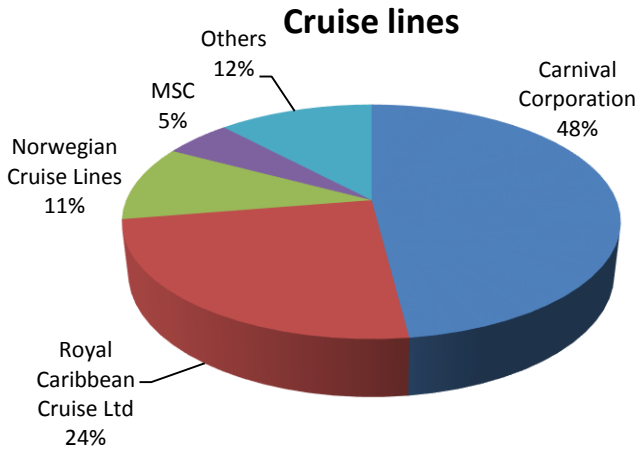
Cruise Industry Outlook

- Cruise tourism – **fastest growing sector** of tourist industry



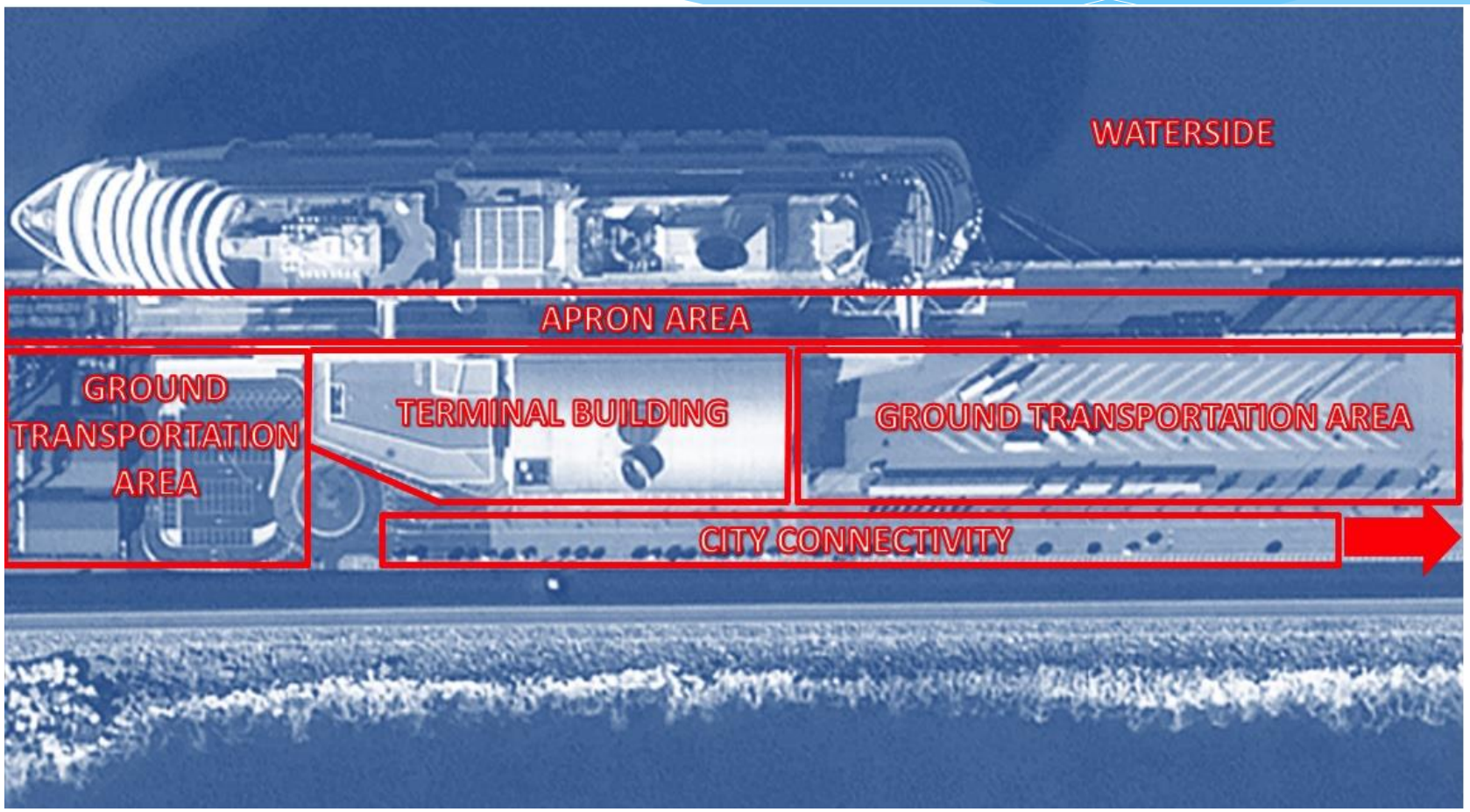
- **Economic impact** of $119.19 billion + 940.000 jobs (CLIA, 2016)
- **Main Cruise destinations:** Caribbean (37%), Mediterranean (20%), North Europe (11%), Australia (6%)
- **Main Cruise companies:** Carnival (48%), RC (24%), NCL(11%), MSC (5%)





Planning a cruise terminal

- Terminal spaces inside a cruise terminal

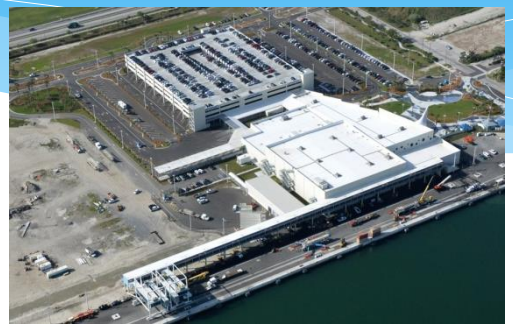


Planning a Cruise Terminal

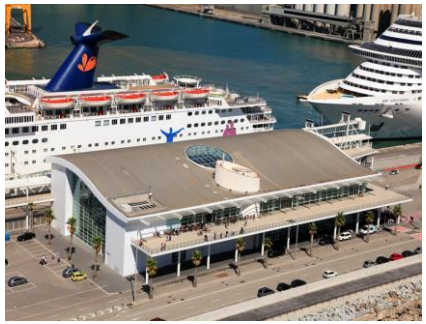
- Type of operations

  - **Turn around**
    - ✓ Luggage
    - ✓ Check inn
    - ✓ Services: Provisions
    - ✓ GTA

  - **Transit**
  - **Inter-porting**



- Business Plan. Marketing approach



Trends and challenges for the Ports

1. Giant Vessels
2. Diversified Portfolio
3. Environmental Impacts (dredging, air quality, water)
   - CLIA Leadership .
4. Social effects. Mobility, local effects.

Trends and challenges for the Ports

- The cruise industry has experienced **incredible growth** over the past decade. MMM (More vessels, More Ports, More destinations)
- Trend for **mega - cruises** (+5,000 pax)
- There has been an **increase in the number of cruise shipping lines and in their fleets** (the number and size of the ships).
- In this evolving market context Ports have developed an interest in advancing their cruise activities

Trends and challenges for the Ports

Cruise ships gigantism

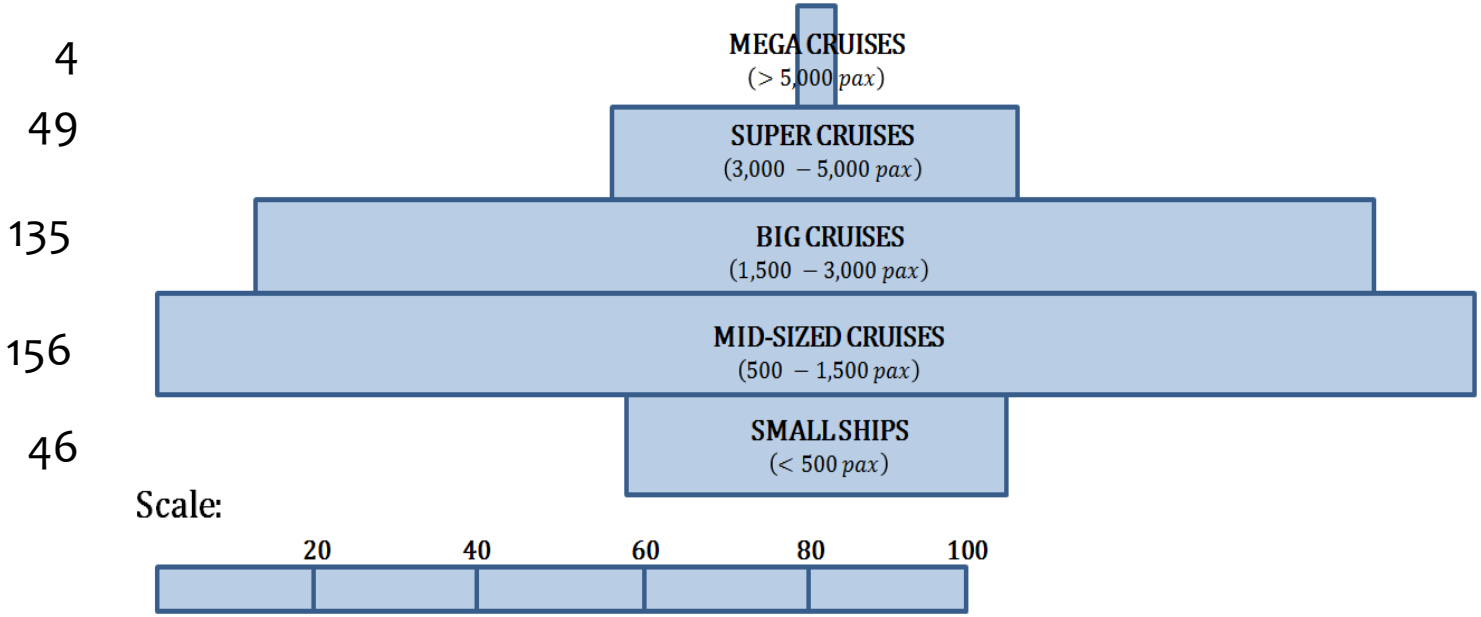
- Barcelona – Allure of the seas (362 m)

Ránking de los cruceros más grandes del mundo
(SEGÚN EL TONELAJE DE ARQUEO)

1. **Harmony of the Seas** 226.963 toneladas
2. **Allure of the Seas** 225.282
3. **Oasis of the Seas** 225.282
4. **Quantum of the Seas** 168.666
5. **Anthem of the Seas** 168.666
6. **Ovation of the Seas** 168.666
7. **Norwegian Escape** 165.157
8. **Liberty of the Seas** 155.889
9. **Norwegian Epic** 155.873
10. **Freedom of the Seas** 154.407

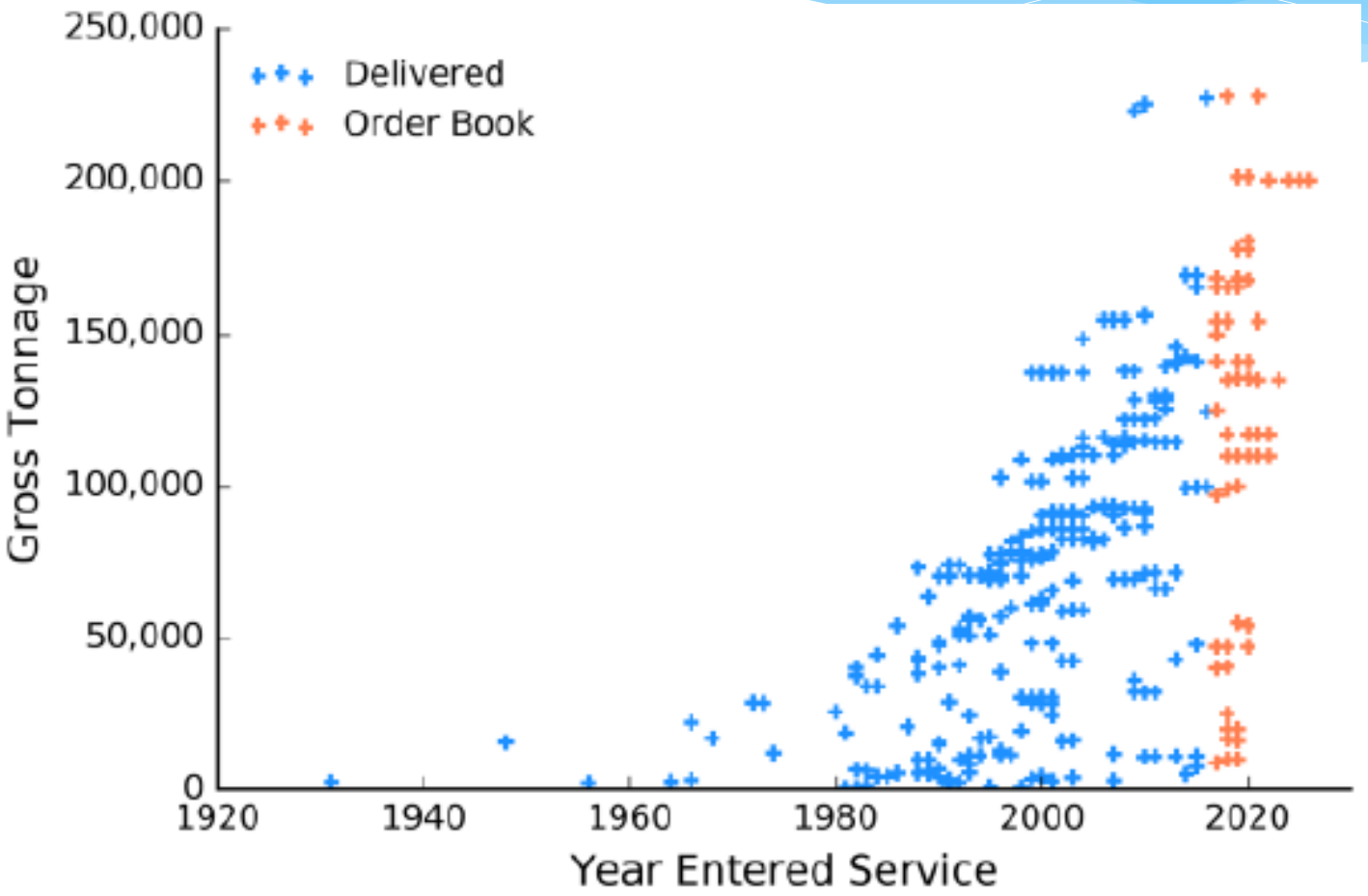
Trends and challenges for the Ports

- Fleet of **more than 300 cruise** vessels and plus 41 being ordered



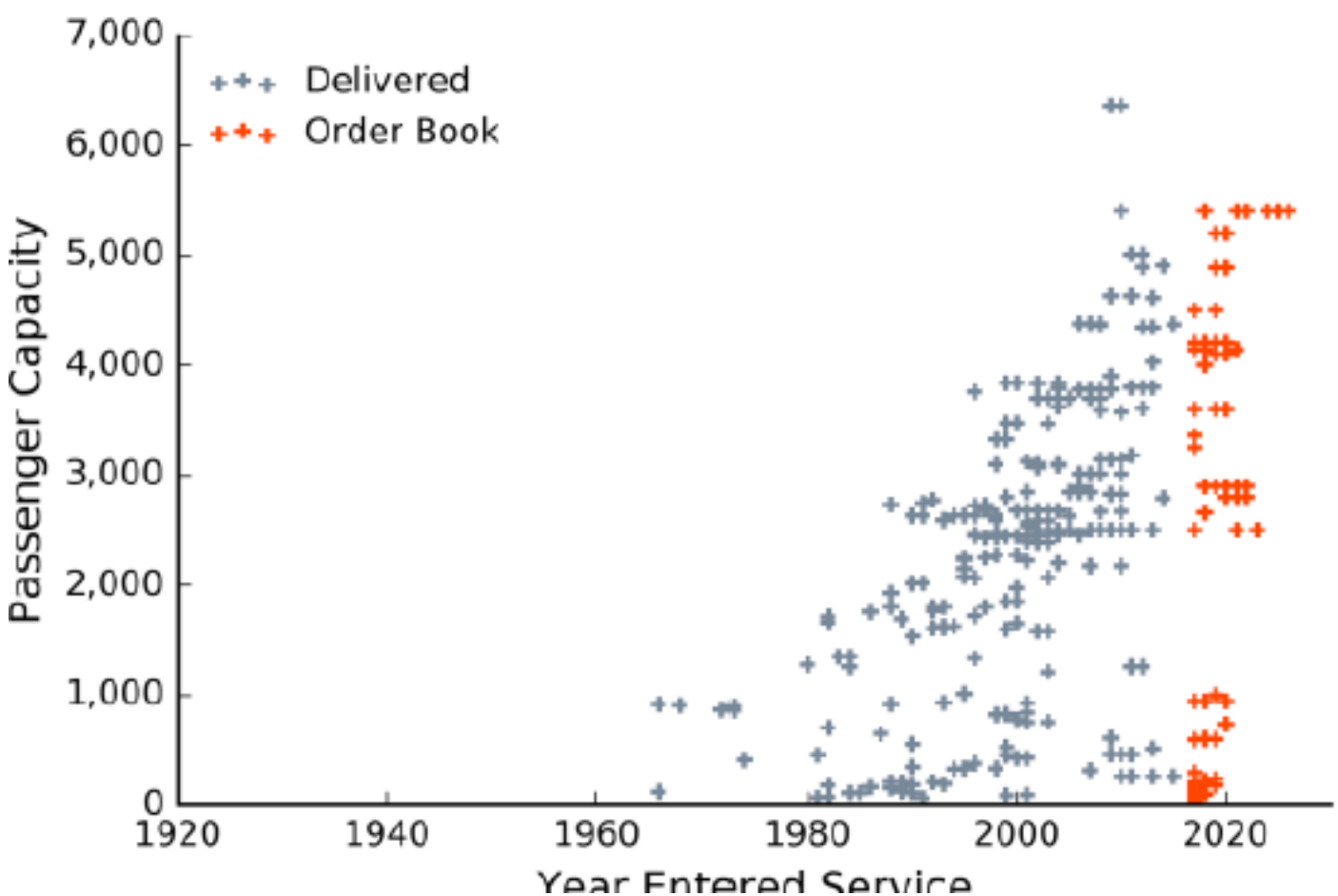
Trends and challenges for the Ports

Orderbook



Trends and challenges for the Ports

Orderbook



Trends and challenges for the Ports

Impact on public opinion

The Telegraph

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Giant cruise ships 'crushing the life out of Venice'

Warning comes at opening of controversial exhibition of photographs showing how Venice is dwarfed by huge cruise liners

MENÚ BUSCAR elPeriódico

Ecologistas y vecinos de Barcelona se manifestarán el domingo contra el crucero más grande del mundo

Denuncian el impacto negativo de las emisiones de los gigantescos motores de gasoil en la salud y el clima

Viernes, 03/06/2016 | Actualizado el 07/06/2016 a las 17:50 CEST

The Telegraph

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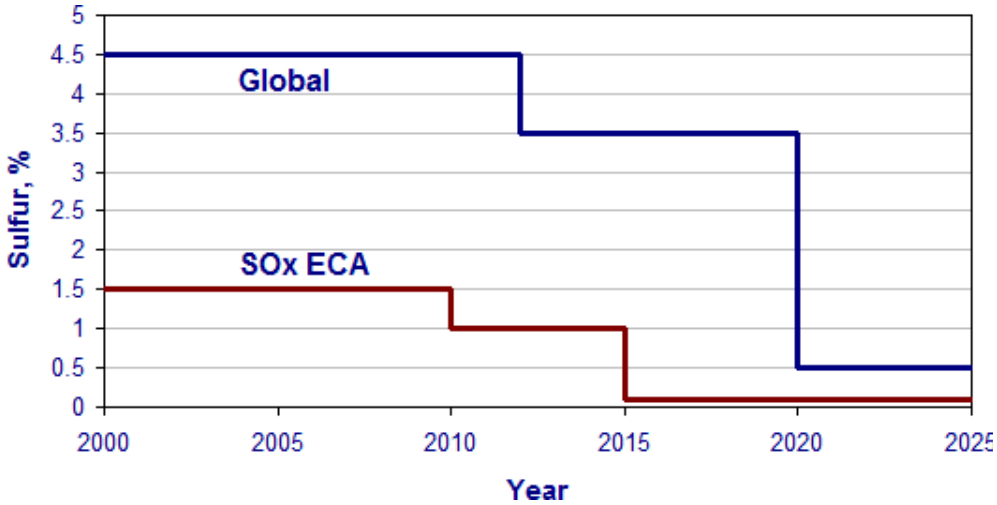
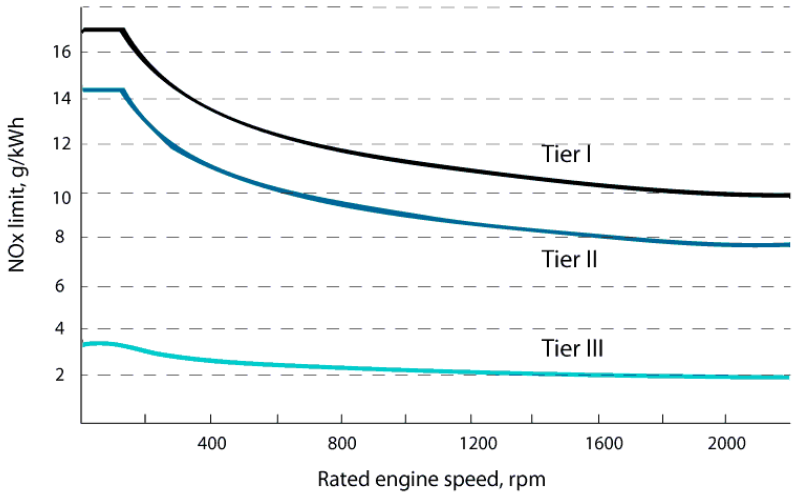
Too many tourists? Amsterdam to move cruise terminal

Business November 3, 2016

Environmental issues

Increasing environmental demands and regulations -> gas emissions from HFO/MDO have to be reduced





- CLIA: Cleaner fuels
  - 86 vessels Tier III 1.01.2016 + LNG (14 vessels ordered)

  ECGS IN 38% of the fleet

  Shore power in 25 vessels

Waterside Design Drivers

Aspects defined are:

- **Vessel characteristics** (dimensions, tonnage, overhanging decks, etc.)

NO standardization , Cruise lines define the vessel.

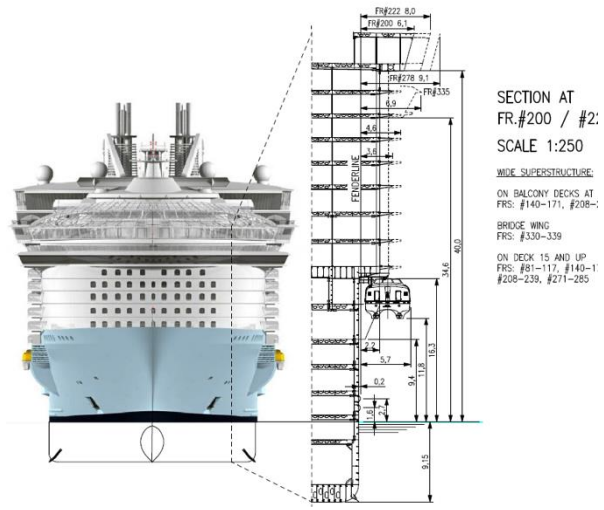
Example of cruise line: Royal Caribbean

ROYAL CARIBBEAN	GRT	LOA (m) (ft)	Draught (m) (ft)	Beam (m) (ft)
Sovereign class	73,192	268.32 m (880 ft)	7.85 m (25.75 ft)	32.20 m (106 ft)
Vision class	78,340	279.00 m (915 ft)	7.90 m (25.92 ft)	32.20 m (106 ft)
Radiance class	90,090	293.20 m (962 ft)	8.50 m (27.89 ft)	32.20 m (106 ft)
Voyager class	137,276	311.12 m (1,020 ft)	9.10 m (29.86 ft)	38.60 m (127 ft)
Freedom class	154,407	338.04 m (1,112 ft)	8.80 m (28.87 ft)	38.60 m (127 ft)
Quantum class	168,666	347.17 m (1,139 ft)	8.82 m (28.94 ft)	41.40 m (136 ft)
Oasis class	225,282	360.00 m (1,181 ft)	9.32 m (30.57 ft)	47.00 m (154 ft)

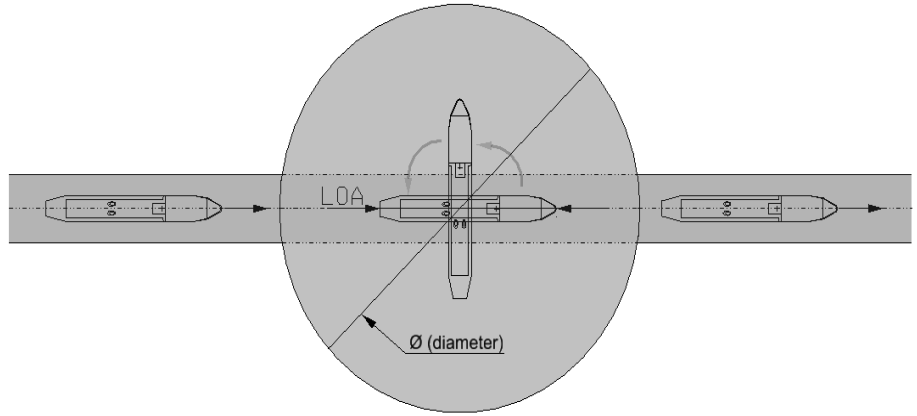
Waterside Design Drivers

Aspects defined are:

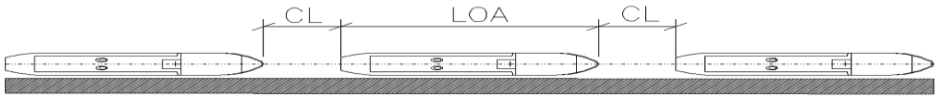
- **Navigation and berthing** (channels, turning basins, berth length, etc.) reducing dredging works, optimizing channels, spaces and berthing.



Overhanging decks – Oasis class



Turning basins

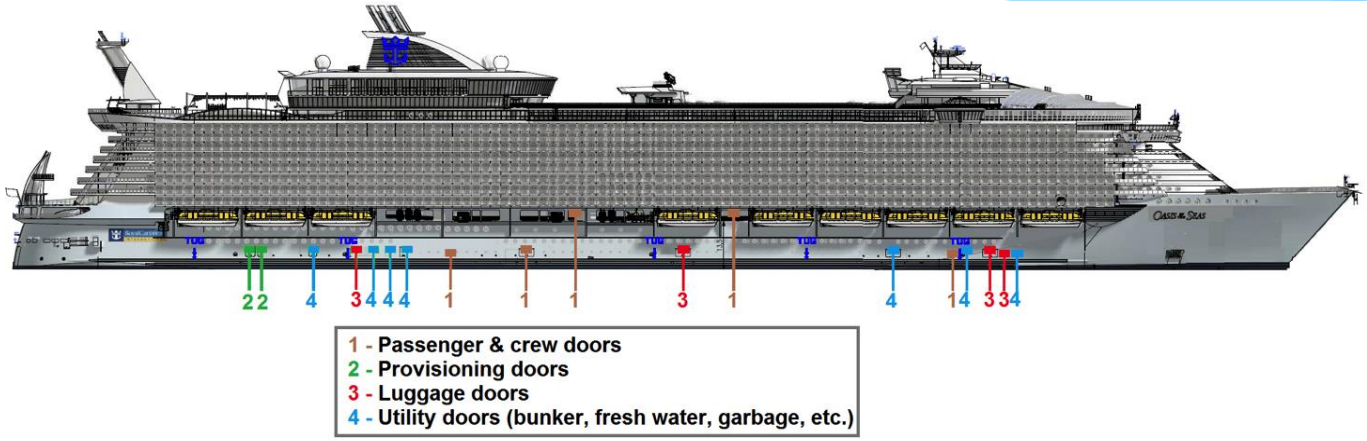


CL = 10% LOA
max: 30 m
min: 15 m

Berth length

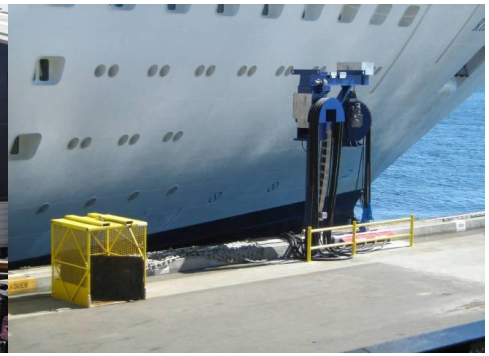
Apron Area –

- Operations in the apron area



Provisioning

Luggage door



Utility door

Apron Area – Vessel utilities

Demand for utility services at cruise vessel:

- **Potable water**
- **Communications**
- **Bunkering**
- **Sewage & biosolids**
- **Garbage**
- **Ballast water**
- **Power – cold ironing**
- **LNG.**

Shore power connection

LNG barge

Cruise terminal building

Cruise terminals can be divided into **four categories** based on their use, longevity, adaptability and relationship within a context of adjacent development:

Temporary terminal

Convertible building

Purpose-built terminal

Mixed-use terminal

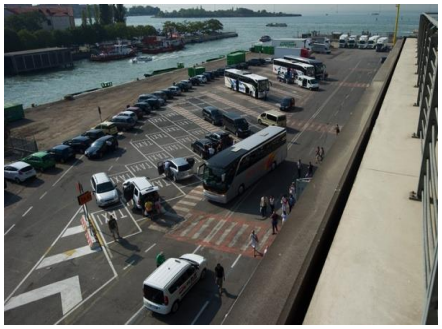
Cruise terminal building

- **Water use:** **Recycling, rain water,**
- **Energy :** **Solar pannels, Geotermic, Leds lighting,**
- **Materials:** **Recycling materials, local materials, isolated materials**
- **Construction:** **Land occupation, environmental construction**

Single storey

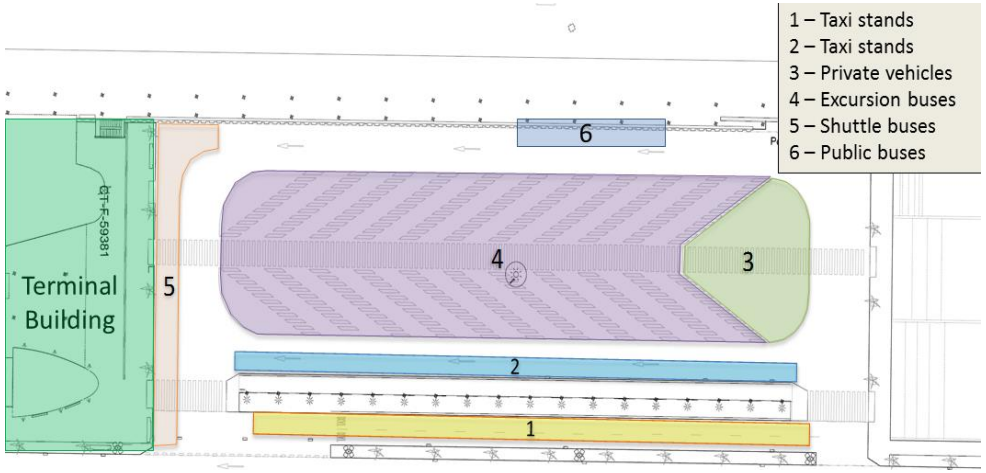
Multi-storey

Ground transportation area (GTA)



Following spaces are required:

- **Coaches Park**
- **Taxi ranks**
- **Kiss and ride**
- **Parking**



Ground transportation area – City conectivity

A **mobility study** will be necessary, in order to:

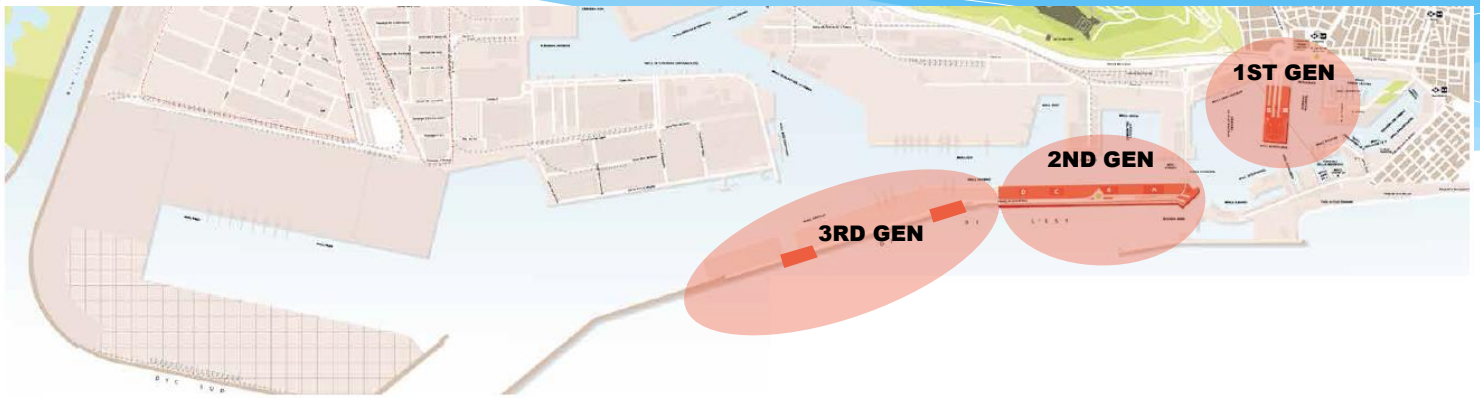
- Improve and organize mobility to optimize flows and reduce contamination
- Work together the cruise line, local authorities and port to reduce impact in the local area.

For the spaces required in the GTA area, the following issues should be considered:

- Type of cruise vessel operations
- Port-city distance
- Transport systems available
- Other factors – local, regional and environmental considerations

Port of Barcelona experiences

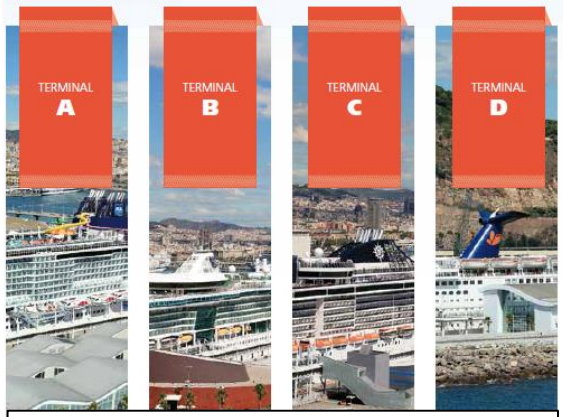
Location



1ST GENERATION

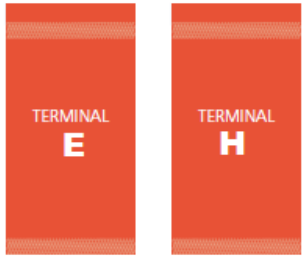
$S_{maritime\ station}$: < 500 m²
S_{gtal}: < 2.000m²
Berth length: <250 m

2ND GENERATION



$S_{maritime\ station}$: 3.000 – 5.000 m²
$S_{terminal}$: 6.000 – 10.000 m²
Berth length: 250 – 330 m

3RD GENERATION



$S_{maritime\ station}$: 8.000 – 12.000 m²
$S_{terminal}$: 10.000 – 30.000 m²
Berth length: 330 – 400 m

Port of Barcelona experiences

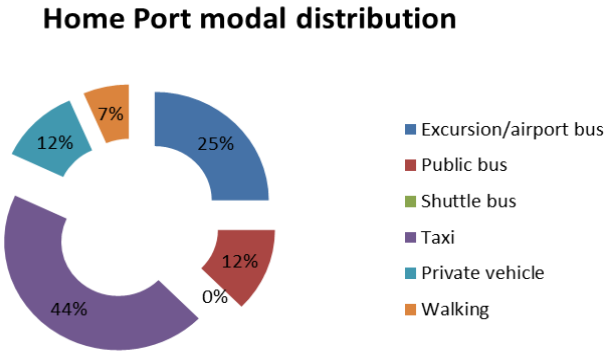
Evolution. Location of the Terminals

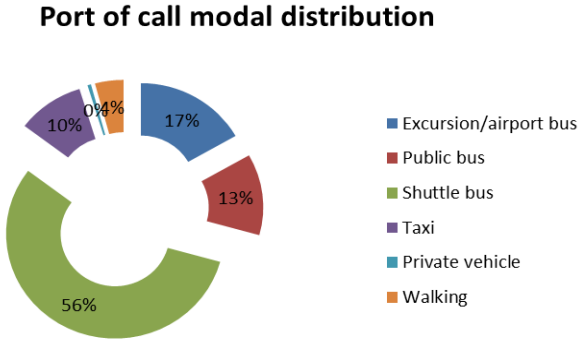
- **More closer to the entrance of the Commercial Port**
- **Recovery not usable spaces for commercial uses**
- **More distance from city for reduce environmental impact**
- **Buffer distance for manage mobility. Free spaces for queuing**
- **Social effects. Mobility, local impact. Moll Barcelona**

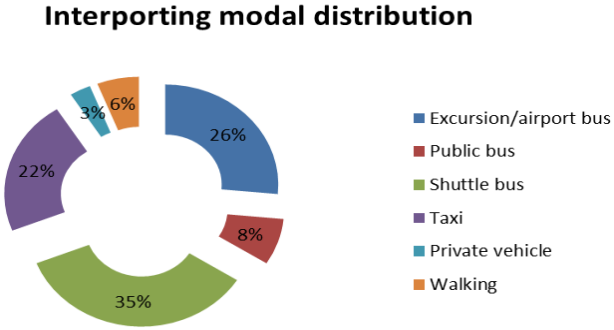
Mobility

- Measuring MOBILITY. The **flow of pax** depends on the **cruise operation** (turnaround, transit, interporting) and the **arrival time** of the cruise.

- Home ports - taxis (44%) vs. Transit ports – shuttle buses (56%)







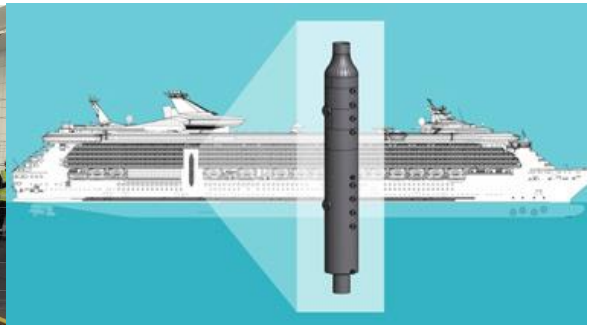
- Studying and implement new solutions for manage the mobilty

- Collaboration Cruise line, Port and city to organize excursions to different monuments

Environmental issues

Air Quality Plan

- **Promoting Barcelona as LNG Port provision**
- **Studying different cold iron solutions. Barge, grid etc**
- **Reducing Port taxes to greener vessels**
  - **Combination of cleaner fuels, engine modifications, scrubbers and other measures to reduce exhaust gases emissions**



Conclusions

- Ports and Cruise terminals **must adapt to the new requirements**: larger surfaces, better maritime infrastructures, more accesses, etc. but must be thinking in minimizing environmental impact (dredging, recoverying of spaces, etc)

- Environmental requirements are a "must" for the Ports, specially in air quality.

- Mobility impacts must be worked together Cruise line, Port and local authorities.

- Sustainable requirements must be implemented in all different areas: **waterside design areas, apron area, cruise terminal building, ground transportation area.**

- Finally, it is important to note that **each cruise port is different** and has an **unique conditions**, so global solutions are difficult, but collaboration in green between Ports must be in the agenda.

THANK YOU
FOR YOUR ATTENTION