Identification and assessment of new cruise terminal locations in port areas under aspects of sustainability

03.12.2018

GREEN CRUISE PORT is an INTERREG V B project, part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument).

Identification and assessment of new cruise terminal locations in port areas under aspects of sustainability

ID Nr. RBP_2018/45_ INTERREG

FINAL REPORT

Customer:
Riga Free Port Authority
Kalpaka 12, Riga, LV-1010
Reg. No. LV90000512408

Consultant: „Grupa93" Ltd.
Reg. No.: 50103129191
Adress: Kr. Barona 3-4, Rīga, LV-1050
E-mail: info@grupa93.lv

Contact person:
Jurijs Kondratenko, +37128349594
jurijs@g93.lv

Table of Contents

1 Introduction

This report contains results of the study "Sustainable cruise terminal development opportunities in the port of Riga". The study has been made within the Baltic Sea Region "Green Cruise Port" project. The study analyses market and industry trends in the cruise ship industry in the Baltic Sea Region as a whole and the port of Riga in particular and defines prerequisites for sustainable cruise terminal infrastructure and location, based on the best international practice criteria. The study has developed multi-criteria analysis methodology for selection of the most suitable location for cruise terminal among alternative locations and applied this methodology for the port of Riga

2 Terminology and Definitions

According to CRUISE EUROPE[1] definition, a cruise is a voyage of at least 60 hours by a seagoing vessel, mainly for pleasure. No cargo/rolling stock will be transported but only passengers with tickets that should include accommodation and all meals. The Cruise voyage must include at least two visiting ports apart from the starting and ending port.

When a ship enters a port, it is a "*call*". The number of calls in a port is hence the number of ships visiting that port. A call is called a turnaround if the cruise passengers leave the ship at the port and new passengers board the ship. A partly turnaround is also possible, provided at least 25% but not all of the cruise passengers leave the ship at the port and new passengers board the ship.

A cruise tourist is a person having booked a cruise trip. A cruise includes visits to several cities/ports; each time the tourist is counted as a passenger in that city/port (a passenger visit). If the cruise tourist stays on board the ship for 7 nights and visits 5 cities/ports, he or she is counted as 1 tourist, but as a passenger 5 times with 7 bed-days (on board the cruise ship).

3 Current Situation in the Cruise Segment at the Port of Riga and the Baltic Sea Region as a Whole

In order to understand the current situation in the cruise segment in the Baltic Sea region, including the Port of Riga, it is necessary to highlight the development trends of the cruise industry over the recent years in the world and in Europe. The cruise industry has undergone a dynamic growth for almost half a century, originally formed by the demand for cruise travel in North America and in recent years by increasing demand in Europe and the rest of the world, especially in China and Australia. Over the last four years (2014-2017), the demand for cruise travel in different regions of the world has increased from 23.34 million passengers in 2014 to 26.76 million passengers in 2017 *(see* Table 1*)*.[2]

[1] CRUISE BALTIC Market Review 2018 // https://api.cruisebaltic.ovdal.dk/media/4160/cruise-baltic-market-review-2000-2018-pdf.pdf

[2] Contribution of Cruise Tourism to the Economies of Europe 2017 // https://www.cruising.org/docs/default-source/market-research/contribution-of-the-cruise-tourism-the-economies-of-europe-2017.pdf?sfvrsn=0

Table 1

International Demand for Cruises from 2014 to 2017 (million passengers)

Region	2014	2015	2016	2017
North America	12.04	12.00	12.26	12.87
Europe*	6.39	6.46	6.79	6.96
ASIA	1.69	2.06	3.37	4.06
Australasia	0.99	1.13	1.37	1.44
RoW**	2.24	1.42	1.37	1.43
TOTAL	**23.34**	**23.06**	**25.15**	**26.76**

* Including Russia and Central and Eastern European countries outside the EU+3.
** Rest of the world, includes Mexico, South/Central America, Africa, Middle East, Other.

In Europe the number of passengers has increased by 8.9% between 2014 and 2017, but at the same time, the share of total number of European cruise passengers has decreased from 27% in 2014 to 26% in 2017.

The key factors characterising the cruise industry in Europe in 2017 are mentioned below. These factors also support the fact that, as the cruise industry continues to grow and expand into new destinations, Europe retains its place in the global market, being the second most popular cruise destination in the world (second only to the Caribbean)[3]:

- During 2017 there were 40 cruise lines domiciled in Europe which operated 137 cruise ships with a capacity of 164,000 lower berths. In addition, there were 23 cruise lines domiciled outside Europe which operated 75 cruise ships with a capacity of 95,000 lower berths.
- An estimated 6.96 million Europeans cruised or to paraphrase – the demand for the cruise tourism market was shaped by 6.96 million cruise passengers from Europe, of which almost 71% were generated by 3 countries: Germany – 31.50%, the United Kingdom (with Ireland) – 28.3% and Italy 11.1% *(see Table 2)*.

Table 2

The number of Cruise Passengers (in Million People) and Market Shares (in %) in the European cruise market between 2015 and 2017[4]

	2015		2016		2017		2017/2015
	Cruise passengers	Market Share %	Cruise passengers	Market Share %	Cruise passengers	Market Share %	%
Germany	1.813	28,1	2.018	29,7	2.189	31,5	20,7
UK and Ireland	1.789	27,7	1.960	28,9	1.971	28,3	10,2
Italy	0.808	12,5	0.751	11,1	0.769	11,1	-4,8
Spain	0.466	7,2	0.480	7,1	0.510	7,3	9,5
France	0.612	9,5	0.554	8,2	0.504	7,2	-17,7
Other	0.969	15,0	1.026	15,1	1.015	14,6	4,7
TOTAL	**6.457**	**100**	**6.789**	**100**	**6.958**	**100**	**7,8**

- An estimated 6.5 million cruise passengers embarked on their cruises from European ports in 2017, which is 6.1% more than in 2015. Of these, 5.5% were European citizens.

[3] Contribution of Cruise Tourism to the Economies of Europe 2017 // https://www.cruising.org/docs/default-source/market-research/contribution-of-the-cruise-tourism-the-economies-of-europe-2017.pdf?sfvrsn=0

[4] Contribution of Cruise Tourism to the Economies of Europe 2017 // https://www.cruising.org/docs/default-source/market-research/contribution-of-the-cruise-tourism-the-economies-of-europe-2017.pdf?sfvrsn=0

- In 2017 the vast majority of the cruise ships visited ports in the Mediterranean, the Baltic Sea region, and other European regions, generating 34.10 million passenger visits at a total of around 260 European port cities, an increase of 9.4 percent from 2015.
- In 2017 an estimated 16.8 million crew arrived at European ports.
- The total economic impacts of the cruise industry included the following: €47.9 billion in total output, which is up about 17 percent over 2015; €19.7 billion in direct spending by cruise lines and their passengers and crew; 403, 621 jobs, and €12.8 billion in employee compensation.

3.1 Market Players and Competition

3.1.1 Cruise lines - companies

The countries of the Baltic Sea Region are becoming more and more popular as a cruise destination offering an attractive combination of architecture, rich culture and history. Cruise companies base their offer on the following factors[5]:

- cutting edge cuisine;
- cruise routes providing visits to several capital cities at a single weekend, including medieval old towns such as Riga and Tallinn;
- Cold War history;
- visit to Scandinavian islands;
- visit to St. Petersburg;
- "White Nights" (the long hours of daylight) in summer;
- beautiful beaches;
- Scandinavian design.

Between 2013 and 2017 there were 42 cruise companies operating in the Baltic Sea with a total fleet of approximately 80 cruise ships.

Of the approximately 80 cruise ships having arrived in the Baltic Sea 68 cruise ships arrived in the Port of Riga at least once during the last five years (from 2013 to 2017). On average, 30 unique cruise ships have arrived in the Port of Riga during the last five years *(see Table 3)*.

Table 3

The Number of Unique Cruise Ships Having Arrived in the Port of Riga from 2013 to 2017

	2013	2014	2015	2016	2017
Number of cruise ships	33	30	26	27	35

Among the 42 cruise companies operating in the Baltic Sea in the last five years, ships of 8 cruise companies have never arrived at the Port of Riga, ships of 6 cruise companies have arrived at the Port of Riga in one of the five years, ships of 5 cruise companies - in two of the five years. Ships of 10 cruise companies given below arrive at the Port of Riga regularly, i.e., every year (see Annex 1):

- COSTA (a total of 29 calls, 2 cruise ships, 87,554 passengers);
- ROYAL CARIBBEAN INTERNATIONAL (a total of 31 calls, 3 cruise ships, 69,449 passengers);
- OCEANIA CRUISES (a total of 31 calls, 3 cruise ships, 30,490 passengers);
- PHOENIX REISEN GMBH (a total of 24 calls, 4 cruise ships, 16,819 passengers);
- REGENT SEVEN SEAS CRUISES (a total of 29 calls, 3 cruise ships, 15,952 passengers);
- Silja Line (a total of 8 calls, 4 cruise ships, 12,740 passengers);
- HAPAG LLOYD CRUISES (a total of 16 calls, 3 cruise ships, 6,232 passengers);
- MAJESTIC INTERNATIONAL CRUISES (a total of 11 calls, 1 cruise ship, 4,974 passengers);
- SILVERSEA (a total of 11 calls, 2 cruise ships, 4,096 passengers);
- CRUISE&MARITIME VOYAGES (a total of 9 calls, 2 cruise ships, 3,556 passengers).

[5] https://www.mundycruising.co.uk/cruise-news/destination-review/why-book-baltic-cruise

According to the data of the Freeport of Riga Authority, between 2013 and 2016 the port of Riga received in average 60 calls per year. In 2017 this figure increased to 82 calls. Between 2013 and 2017, 426,279 passengers arrived by cruise ships at the Port of Riga (see Annex 1).

3.1.2 Ports of the Baltic Sea

According to the data on cruise calls by CRUISE BALTIC the 32 ports of the Baltic Sea Region are segmented into 4 groups: small (up to 24 calls), medium (25 – 49 calls), large (50 – 199 calls), and extra-large (200 and more calls)[6] (*see Table 4*). The characteristics of ports and their terminals has been provided in subchapter 3.4.

Table 4

Baltic Sea Cruise Port Classification after the Calls in 2017[7]

Cruise Port Groups	Port
Small (0 – 24 calls)	Mariehamn (19), Lübeck-Travemünde (14), Fredericia (8), Turku (7), Kalundborg (6), Elsinore (6), Karlskrona (6), Arendal (5), Helsingborg (5), Saaremaa (5), Kotka (4), Kalmar (1), Kemi (0), Malmö (0)
Medium (25 – 49 calls)	Gothenburg (41), Aarhus (36), Aalborg (35), Skagen (31), Rønne (26)
Large (50 – 199 calls)	Rostock (190), Kiel* (143), Oslo (101), Riga* (85), Kristiansand (52), Gdansk (64), Klaipeda (63), Visby (59)
X-Large (200+ calls)	Copenhagen (325), St. Petersburg* (319), Tallinn (311), Helsinki (266), Stockholm (264)
* St. Petersburg, Riga and Kiel is not part of Cruise Baltic network	

The outlook for 2018 forecasts the increase in terms of number of calls in all port segments. For the large ports, the estimated growth is 11.4% compared to 2017 (except, for Riga and Oslo where the decrease is expected), for medium ports – 26%, for small ports –7.4%[8].

One of the decisive factors influencing the growth of the number of calls is the availability of a variety of off-board activities in target port cities and their marketing strategy, either emphasizing wide range of offers in large ports/cities, or narrow niche offers in small ports/cities.

3.2 Dynamics in the Number of Cruise Passengers, Ships and Ship Sizes

3.2.1 Number of passengers in the Baltic Sea ports

According to the statistical data collected by the association of CRUISE BALTIC the total number of cruise guests in the Baltic Sea ports has increased 2.2 times over 14 years (between 2005 and 2017)[9] (see Annex 2).

In the segment of large ports (50 – 199 cruise calls per year), Rostock has experienced the highest growth rate in terms of cruise passengers as of 5.2 times in 2017 compared to 2005, Kiel – 3.9 times, Gdansk – 3.8 times, Klaipeda – 3.2 times, Kristiansand – 2.5 times, Riga – 1.8 times, Oslo – 1.1 times. In Visby the number of cruise passengers has decreased by 64%[10].

Tendencies of similar changes in large ports have not been observed. The number of cruise passengers would grow and decrease in different years – no regularity can be identified (see Figure 1). Compared to the previous year, Gdansk experienced the lowest drop in terms of cruise passengers (50%) in 2010, Kiel – (8%) in 2012,

[6] CRUISE BALTIC Market Review 2018 // https://api.cruisebaltic.ovdal.dk/media/4160/cruise-baltic-market-review-2000-2018-pdf.pdf

[7] CRUISE BALTIC Market Review 2018 // https://api.cruisebaltic.ovdal.dk/media/4160/cruise-baltic-market-review-2000-2018-pdf.pdf

[8] https://api.cruisebaltic.ovdal.dk/media/4160/cruise-baltic-market-review-2000-2018-pdf.pdf

[9] https://api.cruisebaltic.ovdal.dk/media/4161/cruise-passengers-calls-turnarounds-2018-overview.pdf

[10] https://api.cruisebaltic.ovdal.dk/media/4161/cruise-passengers-calls-turnarounds-2018-overview.pdf

Klaipeda – (39%) in 2011, Kristiansand – (58%) in 2008, Oslo – (22%) in 2014, Riga – (23%) in 2008, Rostock – (23%) in 2007, Visby – (49%) in 2009.

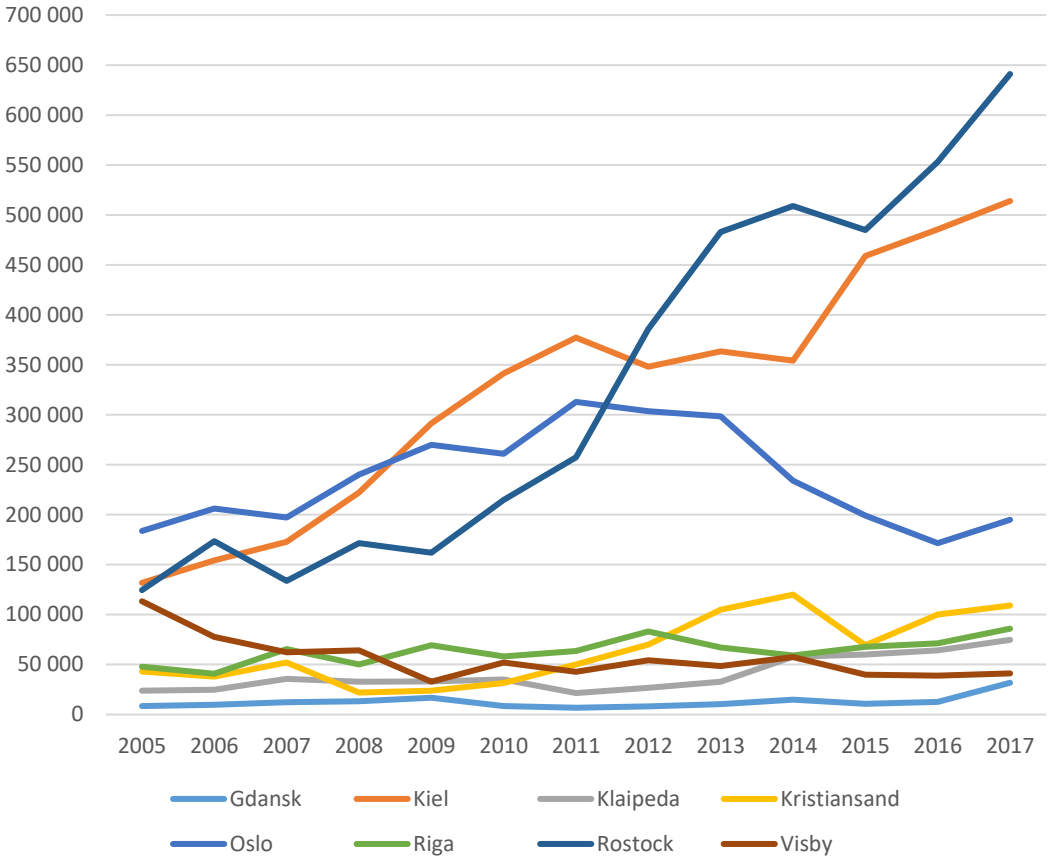

Figure 1. Number of Cruise Passengers in the Large Ports from 2005 to 2017

Over the last three years, the number of passengers at the Port of Riga has increased 1.3 times, or has grown from 67,687 passengers in 2015 to 85,923 passengers in 2017. The number of calls at the Port of Riga has also increased 1.3 times from 64 calls in 2015 to 85 calls in 2017[11] (Figure 2).

[11] https://api.cruisebaltic.ovdal.dk/media/4161/cruise-passengers-calls-turnarounds-2018-overview.pdf

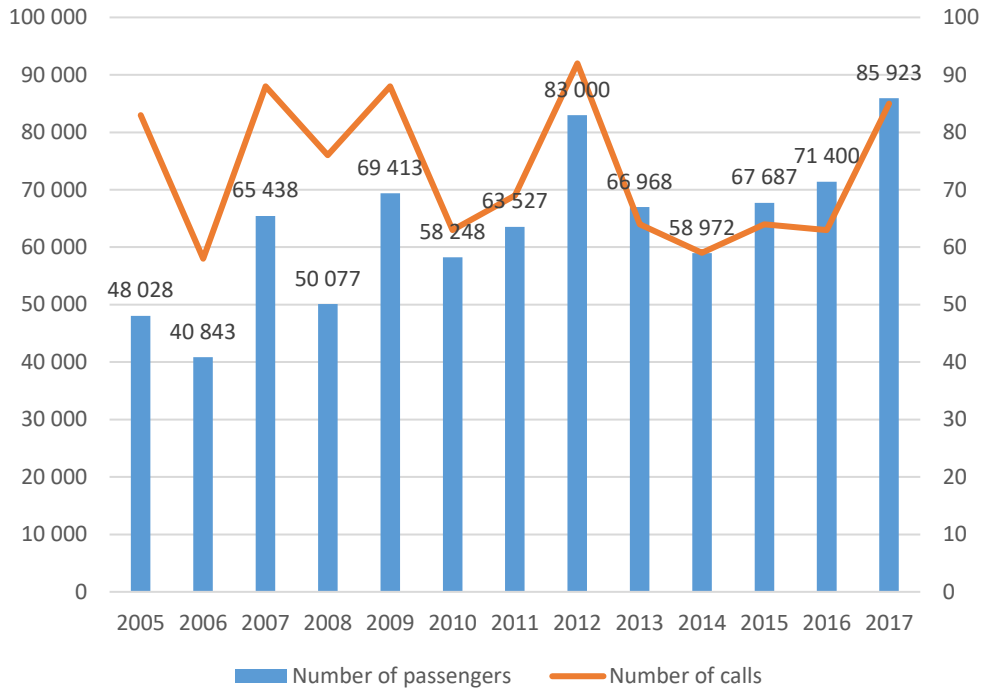

Figure 2. The Number of Cruise Passengers and Cruise Calls in the Port of Riga from 2005 to 2017

3.2.2 Number and size of cruise ship calls in the Baltic Sea Ports

Examining the dynamics of cruise calls at the Baltic Sea ports it may be concluded that the growth rate of this indicator is lower. In large ports the number of calls over the last 14 years has increased as follows: in Rostock – twice (number of calls in 2017/ number of calls in 2005=190/97), in Kiel – 1.5 times, in Gdansk – twice, in Klaipeda – 1.1 times, in Kristiansand – 1.6 times, in Riga – 1.02 times, in Oslo and Visby – decreased (*see Table 5*).

Table 5

Dynamics of Cruise Calls in the Baltic Sea Ports from 2005 to 2017[12]

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Arendal	4	2	1	1	6	1	-	3	6	4	8	4	5
Copenhagen	282	280	289	301	334	307	368	372	347	313	283	306	325
Elsinore	7	7	3	-	2	1	5	2	2	2	2	2	6
Fredericia	-	-	-	-	-	-	-	-	-	1	5	4	8
Gdansk	32	29	39	36	40	26	21	29	30	38	25	32	64
Yearly Growth (%)		*-9%*	*34%*	*-8%*	*11%*	*-35%*	*-19%*	*38%*	*3%*	*27%*	*-33%*	*28%*	*100%*
Gothenburg	20	18	23	18	34	41	52	69	39	73	50	34	41
Helsingborg	5	6	3	4	13	6	9	5	7	6	5	8	5
Helsinki	247	259	238	269	263	247	258	265	282	261	254	240	266
Kalmar	4	6	3	4	2	2	-	3	4	3	1	4	1
Kalundborg	4	1	11	8	3	8	-	13	12	5	-	1	6
Karlskrona	2	3	4	9	3	2	1	2	10	6	2	2	6
Kemi	3	4	3	3	4	3	4	3	3	1	3	1	-
Kiel	93	93	116	125	117	136	120	137	128	127	133	147	143
Yearly growth (%)		*0%*	*25%*	*8%*	*-6%*	*16%*	*-12%*	*14%*	*-7%*	*-1%*	*5%*	*11%*	*-3%*
Klaipeda	59	48	65	46	50	45	36	43	40	63	51	52	63
Yearly Growth (%)		*-9%*	*35%*	*-29%*	*9%*	*-10%*	*-20%*	*19%*	*-7%*	*58%*	*-19%*	*2%*	*21%*
Kotka	-	-	-	-	1	1	-	1	-	-	-	-	4
Kristiansand	33	23	27	17	16	20	32	51	58	78	40	66	52
Yearly Growth (%)		*-30%*	*17%*	*-37%*	*-6%*	*25%*	*60%*	*59%*	*14%*	*34%*	*-49%*	*65%*	*-21%*

[12] https://api.cruisebaltic.ovdal.dk/media/4161/cruise-passengers-calls-turnarounds-2018-overview.pdf

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Luebeck-Travemunde		-	-	-		-	-	-	-	-		14	14
Malmö	2	4	2	2	2	2	2	-	10	12	17	2	-
Marienhamn	28	12	19	9	10	19	18	20	22	15	7	9	19
Oslo	144	156	138	148	149	150	173	166	159	129	104	82	101
Yearly Growth (%)		*8%*	*-12%*	*7%*	*1%*	*1%*	*15%*	*-4%*	*-4%*	*-19%*	*-19%*	*-21%*	*23%*
Riga	83	58	88	76	88	63	69	92	64	59	64	63	85
Yearly Growth (%)		*-30%*	*52%*	*-14%*	*16%*	*-28%*	*10%*	*33%*	*-30%*	*-8%*	*8%*	*-2%*	*35%*
Rostock	97	138	92	116	114	114	158	181	198	182	175	181	190
Yearly Growth (%)		*42%*	*-33%*	*26%*	*-2%*	*0%*	*39%*	*15%*	*9%*	*-8%*	*-4%*	*3%*	*5%*
Rønne	33	34	29	31	36	24	25	44	29	32	18	20	26
Saaremaa	-	7	6	6	5	2	8	3	14	10	5	2	5
Skagen	5	9	6	4	5	6	7	7	9	10	14	13	31
St. Petersburg	364	302	292	311	321	304	309	307	335	315	285	272	319
Stockholm	259	260	255	265	293	261	263	274	278	263	249	230	264
Tallinn	324	289	268	298	305	279	293	294	330	297	280	271	311
Turku	17	6	9	9	8	6	7	4	4	-	8	8	7
Visby	150	104	80	72	53	66	53	62	62	54	50	43	59
Yearly Growth (%)		*-31%*	*-23%*	*-10%*	*-26%*	*25%*	*-20%*	*17%*	*0%*	*-13%*	*-7%*	*-14%*	*37%*
Aalsborg	2	3	-	3	3	2	4	7	10	1	14	21	35
Aarhus	20	23	16	21	14	3	18	20	13	11	11	29	36
TOTAL	**2323**	**2184**	**2125**	**2212**	**2294**	**2147**	**2313**	**2479**	**2505**	**2371**	**2163**	**2163**	**2497**
Yearly Growth (%)	16,6	-6,0	-2,7	4,1	3,7	-6,4	7,7	7,2	1,0	-5,3	-8,8	0	15,4

Statistics prove that the growth rate of passenger number is faster than that of the number of cruise ships. Consequently, it may be concluded that the passenger capacity of cruise ships used on cruise routes has increased (*see Table 6*).

Table 6

Average Number of Passengers in the Large Baltic Sea Ports from 2005 to 2017

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Gdansk	261	335	313	369	419	322	323	286	350	394	433	393	497
Kiel	1,417	1,659	1,491	1,777	2,490	2,510	3,143	2,541	2,840	2,788	3,449	3,303	3,594
Klaipeda	402	519	549	713	666	782	597	623	819	917	1,180	1,236	1,186
Kristiansand	1,303	1,652	1,926	1,294	1,500	1,585	1,563	1,373	1,810	1,538	1,731	1,515	2,096
Oslo	1,276	1,322	1,429	1,622	1,810	1,740	1,808	1,828	1,877	1,814	1,913	2,091	1,931
Riga	579	704	744	659	789	925	921	902	1,046	1,000	1,058	1,133	1,011
Rostock	1,284	1,257	1,453	1,478	1,419	1,884	1,628	2,131	2,439	2,797	2,771	3,055	3,374
Visby	756	746	778	893	620	789	808	874	784	1,067	800	908	697

The growth difference between the number of passengers and calls in the Port of Riga (data for 2017/ data for 2005) is relatively small (1.8 and 1.02 respectively), compared to the situation in other large ports, e.g., in Rostock (5.2 and 2), or in Kiel (3.9 and 1.5), or in Gdansk (3.8 and 2). It allows to draw the conclusion that the passenger capacity of ships arriving at the Port of Riga has changed less compared to other large ports. The above conclusion is confirmed by the data of Freeport of Riga Authority on the ships having arrived at the Port of Riga between 2013 and 2017. As it is seen in Table 7, the average length, width and draught of cruise ships having arrived at Riga port has little changed. However, it should be noted that in 2018 smaller cruise vessels arrived at Riga port (see Table 7 and Table 8).

Table 7

Average Technical Parameters of Cruise Ships Having Arrived in the Port of Riga from 2013 to 2018 and Scheduled for 2019[13]

	2013	2014	2015	2016	2017	2018	2019
Length	196.55	204.45	200.65	200.64	192.43	175.38	181
Breadth	26.41	26.92	26.77	26.54	25.38	23.88	26.88
Draft	6.65	7.00	6.76	6.64	6.36	5.95	6

Table 8

Characteristics of Cruise Ships Having Arrived in the Port of Riga from 2013 to 2018 and Scheduled for 2019 [14]

	2013	2014	2015	2016	2017	2018	2019
To 29,999 GT							
Calls	28	25	27	23	38	45	35
Number of arriving passengers	9,556	9,713	9,130	6,548	8,832	9,598	No data
Number of vessels	15	17	12	11	15	15	12
30,000-59,999 GT							
Calls	20	17	20	20	24	22	23
Number of arriving passengers	21,738	14,740	17,578	18,649	25,179	22,896	No data
Number of vessels	14	10	10	11	13	12	10
60,000-89,999 GT							
Calls	10	9	3	8	7	7	7
Number of arriving passengers	17,748	15,170	3,685	13,321	11,123	10,324	No data
Number of vessels	3	2	1	3	3	3	4
Over 90,000 GT							
Calls	6	7	14	12	17	12	8
Number of arriving passengers	17,926	21,217	38,771	32,902	42,250	32,067	No data
Number of vessels	1	1	3	3	4	5	5

The average length of a ship having arrived at Riga port between 2013 and 2018 is 195 meters, the average width – 26 meters, the average draught – 6.56 meters *(see Table 7)*. The biggest cruise ship having arrived at the Port of Riga between 2013 and 2016 was COSTA PACIFICA – 114,425 GT, length 289.59 meters, width – 35.50 meters, draft – 8.32 meters. In 2017 next to COSTA PACIFICA, CELEBRITY SILHOUETTE arrived at Riga – a bigger cruise ship – 122,210 GT, length – 319.02 meters, width – 36.80 meters, draft – 8.6 meters.

[13] Data of Riga Freeport Authority

[14] Data of Riga Freeport Authority

Examining the indicators of ships having entered the Baltic Sea in 2018 – their length, tonnage and the number of on-board passengers (see Annex 3), it may be concluded that the Port of Riga is incapable of accommodating only the biggest ships with the length more than 300 meters.

Assessing the large ship group, the exchange of the cruise passengers takes place only at individual ports – in Rostock (111 in 2017), in Kiel (129 in 2017), in Oslo (4 in 2017), and Gdansk (1 in 2017) (see Table 9).

Table 9

Turnaround in the Baltic Sea Ports from 2005 to 2017[15]

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Arendal	-	-	-	-	-	-	-	-	-	-	-	-	-
Copenhagen	93	104	120	147	156	135	171	173	160	129	125	139	151
Elsinore	-	-	-	-	-	-	-	-	-	-	-	-	-
Fredericia	-	-	-	-	-	-	-	-	-	-	-	-	-
Gdansk	-	-	-	-	-	-	-	-	-	2	-	-	1
Gothenburg	5	1	5	5	6	7	7	13	3	9	-	-	1
Helsingborg	1	-	-	-	-	-	-	-	-	-	-	-	-
Helsinki	-	13	15	18	16	21	18	9	7	2	-	3	5
Kalmar	-	-	-	-	-	-	-	-	-	-	-	-	-
Kalundborg	-	-	-	-	-	-	-	-	-	-	-	-	-
Karlskrona	-	-	-	-	-	-	-	-	-	-	-	-	-
Kemi	-	-	-	-	-	-	-	-	-	-	-	-	-
Kiel	n/a	89	114	119	105	125	115	125	113	109	118	136	129
Klaipeda	-	-	-	-	-	-	-	-	-	-	-	-	-
Kotka	-	-	-	-	-	-	-	-	-	-	-	-	-
Kristiansand	-	-	-	-	-	-	-	-	-	-	-	-	-
Luebeck-Travemunde	14	17	3	2	6	5	8	3	9	4	-	4	2
Malmö	-	-	-	-	-	-	-	-	10	10	7	-	-
Marienhamn	-	-	-	-	-	-	-	-	-	-	-	-	-
Oslo	-	2	4	6	8	9	6	9	4	8	2	-	4
Riga	-	-	-	-	-	-	-	-	-	-	-	-	-
Rostock	24	48	16	22	15	28	35	53	60	99	95	107	111
Rønne	-	-	-	-	-	-	-	-	-	-	-	-	-
Saaremaa	-	-	-	-	-	-	-	-	-	-	-	-	-
Skagen	-	-	-	-	-	-	-	-	-	-	-	-	-
St. Petersburg	-	-	-	-	-	-	-	-	-	1	-	2	1
Stockholm	29	28	27	28	38	31	39	50	47	42	53	55	73
Tallinn	-	1	-	-	-	-	5	5	5	5	3	-	-
Turku	-	-	-	-	-	-	-	-	-	-	-	-	-
Visby	-	-	-	-	-	-	-	-	-	-	-	-	-
Aalborg	-	-	-	-	-	-	-	-	-	-	-	-	-
Aarhus	-	-	-	-	-	-	-	-	-	-	-	14	-
TOTAL	166	303	304	347	350	361	404	440	418	420	403	460	478
Yearly Growth %	**36,1**	**28,9**	**0,3**	**14,1**	**0,9**	**3,1**	**11,9**	**8,9**	**-5,0**	**0,5**	**-4,0**	**14,1**	**3,9**

3.3 Cruise Passengers Demographics

3.3.1 Cruise Passengers Demographics in the Baltic Sea region ports

Between 2005 – 2017, the total number of cruise passengers in the Baltic Sea region ports has increased 2.2 times: from 2,285,093 passengers in 2005 to 5,054,849 passengers in 2017 (see Table 5).

[15] https://api.cruisebaltic.ovdal.dk/media/4161/cruise-passengers-calls-turnarounds-2018-overview.pdf

The main European cruise generating countries (in 2016 & 2017) were Germany, Great Britain and Ireland, Italy, Spain and France (see Table 2), which allows to draw the conclusion of the same trend in the Baltic Sea region ports.

Statistic data on the cruise passengers` age, gender and other variables is not available. Neither Eurostat gives such socio-demographic characteristics of cruise passengers. The analysis of the structure of cruise passengers in the common world market has been done.

According to the data by www.cruisemarketwatch.com from April 2015 the average age of cruise passengers is between 40 - 49 years (26%) and above 60 years (26%), followed by passengers aged 50- 59 years (22%), and passengers aged 30- 39 (18%) *(see Figure 3)*. The smaller part - only 7% - are aged 25 - 29 years. Thus, it is possible to conclude that 74% of cruise passengers are older than 40 years, and the average age of cruise passengers is 49 years (Sciozzi et al, 2015).

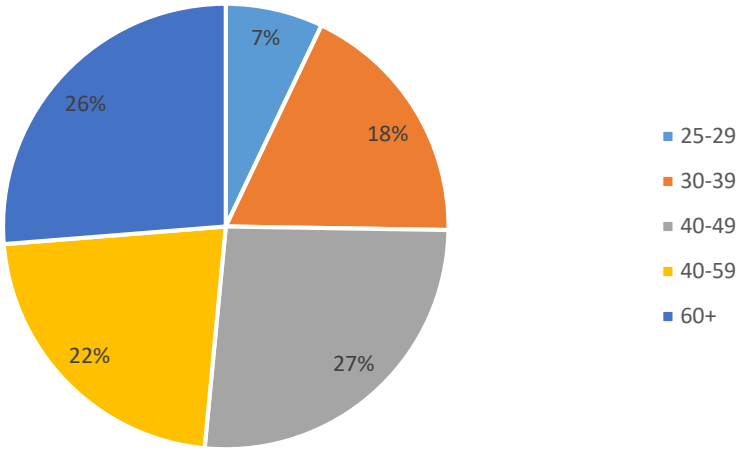

Figure 3. Cruise Ship Passenger Structure by Age in the Global Market

According to the study by *Cruise Lines International Association – CLIA* on the cruise passengers` profile in 2014 the majority of cruise passengers were working population (71%), the minority were senior population (21%) and population with higher education (69%). The average cruise duration was 7.3 days. Passengers were mostly travelling in pairs (53%) or in groups of five or more people (Sciozzi et al, 2015). Based on the 2017 study *Cruise Travel Report* on cruise passengers and cruise as the reason for travelling the following conclusions may be drawn[16]:

- cruisers are loyal to cruise travelling – 92% of cruise passengers confirm that they may go on a cruise next vacation, and 65% evaluate cruise as the best way of spending their vacation; even if they prefer a non-cruise vacation, the average adult cruise passenger has already gone on at least five cruises;
- families with children choose cruises as their priority way of travelling, especially those with children below 18;
- younger generation, including Y generation (Millennials, born in late 80-ies – 2000) and X generation (born in mid-sixties – early-eighties) enjoy going on a cruise; two thirds of Y generation mention cruise as their favourite way of spending vacation, the same preference is even more pronounced among X generation (71%);
- cruisers have different priorities:
    - *Baby boomers* are more influenced by cruise itself, ports and destinations, as well as the chosen route and tourist attractions;

[16] http://cruising.org/docs/default-source/research/clia_cruisetravelreport_2017.pdf

- traditional passengers are interested in programmes for children and families;
- X and Y generations are more interested in cruise costs, comfort and entertainment on board the ship;

- majority of cruisers assess cruise as a good opportunity for choosing the destination for their later travels.

3.3.2 Cruise Passengers Demographics at the Port of Riga

Every year cruise tourists from all over the world arrive in Riga, and in 2017 representatives of 120 different countries visited the city. 55% of all the cruise passengers represented European countries, 34% were from the American continents, 3% represented Australia and New Zealand, but 3% Asia and Middle East, tourists from 10 different African countries also arrived at the port.
Table 10 shows the breakdown of visiting cruise tourists at Riga port between 2013 and 2017 according to their country of origin in percentage and number[17].

Table 10

The Breakdown of Visiting Cruise Tourists at Riga Port Between 2013 and 2017 According to their Country of Origin in Percentage and Number

Country	2013		2014		2015		2016		2017		Average 2013-2017	
	%	No	%	No	%	No	%	No	%	No	%	No
Australia	2%	1044	2%	1071	2%	1209	4%	2710	3%	2163	**3%**	**1639**
Austria	2%	1125	2%	1131	2%	1552	3%	1890	2%	986	**2%**	**1337**
Brazil	1%	619	1%	687	1%	643	1%	735	1%	590	**1%**	**655**
Canada	3%	1742	3%	1868	2%	1509	2%	1617	4%	2528	**3%**	**1853**
Finland	3%	1945	2%	1322	5%	2939	2%	1438	6%	3770	**4%**	**2283**
France	4%	2837	4%	2620	4%	2738	2%	1526	3%	2040	**4%**	**2352**
Germany	29%	19198	26%	17257	44%	28879	42%	27166	31%	20185	**35%**	**22537**
UK	6%	3798	8%	5476	8%	5415	6%	4156	14%	9068	**9%**	**5583**
Israel	1%	573	1%	833	2%	1183	3%	2069	3%	1859	**2%**	**1303**
Italy	3%	2017	5%	3199	3%	2280	3%	2219	3%	1860	**4%**	**2315**
Japan	2%	1032	0,4%	236	0.4%	263	0.4%	254	2%	1219	**1%**	**601**
Mexico	1%	594	1%	732	2%	1043	2%	1125	2%	1201	**1%**	**939**
Nether-lands	1%	380	1%	782	1%	341	1%	348	0.4 %	258	**1%**	**422**
Norway	1%	858	1%	553	1%	581	1%	497	1%	585	**1%**	**615**
Portugal	1%	499	0,4%	289	1%	331	1%	357	0.5 %	314	**1%**	**358**
Russia	5%	3333	5%	3112	0.1%	72	2%	1597	3%	1854	**3%**	**1994**
Spain	3%	1932	3%	1815	3%	1920	3%	1716	4%	2723	**3%**	**2021**
Sweden	10%	6321	1%	903	1%	399	0.3%	215	1%	354	**3%**	**1638**
Switzer-land	2%	1474	3%	1651	2%	1365	3%	1708	2%	1540	**2%**	**1548**
US	17%	11023	17%	10877	16%	10257	20%	13347	38%	24478	**21%**	**13996**
Other	4%	2876	7%	4426	7%	4246	7%	4730	12%	7809	**7%**	**4817**
Total	**100%**	**65220**	**100%**	60840	**100%**	69165	**100%**	71420	**100 %**	87384	**100%**	**70806**

Over the last five years, the biggest number of cruise tourists at Riga port were from the following countries: Germany (35% on average), the USA (21%), and Great Britain (9%), followed by France (4%), Finland (4%), and Italy (4%)[18].

[17] Data of Riga Freeport Authority
[18] Data of Riga Freeport Authority

3.4 Cruise Terminals and Their Infrastructure, Including Recent Infrastructure Development Projects

When assessing cruise terminals and their infrastructure, it is important to pay attention to both their physical and other characteristics, which both meet the requirements for cruise terminals and determine the attractiveness of cruise terminals in the eyes of cruise lines - companies and cruise passengers. Here we can mention the cruise terminal functional design guidelines and the factors that determine the cruise line's decision to visit the destination (port).

In the study *Common Standards in the Assessment of Economic Effects by Cruise* Tourism[19] carried out in 2017 by the Maritime Institute in Gdansk, the following factors determining the decision of the cruise lines to visit the destination (port), have been mentioned: the main natural and cultural objects and sights of the port which can be visited while the vessel is in the port, its location in relation to other destinations and departure ports, port facilities, port security, infrastructure, port costs, water and food supply, marketing.
As the largest number of cruise passengers in the Baltic Sea region is created by large and extra-large ports and the Port of Riga belongs to the group of large ports, this section of the study further provides characteristics of cruise terminals and their infrastructure, including infrastructure development projects over the last 5 years of large (Rostock, Kiel, Oslo, Riga, Kristiansand, Gdansk, Klaipeda, Visby) and extra-large ports (Copenhagen, St. Petersburg, Tallinn, Helsinki, Stockholm). The port characteristics include the available information on ports on the CRUISE BALTIC page (https://www.cruisebaltic.com/destinations), the information available on the websites of the ports concerned, and the study *Common Standards for the Assessment of the Economic Impact of Cruise Tourism* by the Gdansk Maritime Institute.

3.4.1 Copenhagen port terminals and their infrastructure

- There are three cruise terminals in the Port of Copenhagen: Langelinie, Ocean Quay and Nordre Toldbod.
- The distance from the terminals to the city centre ranges from 3 to 8 kilometres, the closest to the city centre is the Nordre Toldbod terminal (3 km), and the farthest – Ocean Quay terminal (8 km).
- The total length of the berths is 2, 035 meters (Langelinie – 710 m, Ocean Quay – 1, 100 m and Nordre Toldbod – 225 m).
- The maximum draft of vessels is from 7.4 meters to 10.5 meters (Langelinie – 9.1 m, Ocean Quay – 10.5 m and Nordre Toldbod – 7.4 m).

For further information see Annex 4.
Information on cruise passengers' services is given in Annex 17.
Description of infrastructure development projects implemented in recent years and planned for the future
In 2010, a new quay construction for turnaround cruise ships was commenced in Copenhagen. The total investment amounted to approximately SEK 500 million (EUR 48,292,848). It was planned that about 60% of annual cruise passengers, or around 420, 000 cruise passengers a year would be served by the new quay. The quay was opened in 2014[20].
At the beginning of October 2017, the Copenhagen Malmö Port Board supported the construction of a new terminal in Copenhagen. It will be located behind the current Ocean Quay terminal and will be able to handle more than 5,000 passengers in one call. The cruise terminal is scheduled to open in 2020[21].

19 http://www.greencruiseport.eu/files/public/download/studies/Common%20Standards%20in%20the%20measurement%20of%20economic%20effects%20by%20cruise%20tourism_30.06.2017_Gdansk.pdf

20 http://www.cmport.com/corporate/investments/new-cruise-ship-quay

21 http://www.cmport.com/news-and-media/pressreleases/2017/2017-10-04

3.4.2 St. Petersburg port terminals and their infrastructure

- The Port of St. Petersburg has 3 cruise terminals and 7 quays, allowing to accommodate up to 7 cruise ships at the same time.
- The distance from the cruise terminals to the city centre is approximately 11 kilometres.
- The total length of the quays is 2, 171 meters (quay No. 1 – 375 m, quay No. 2 – 288 m, quay No. 3 – 304 m, quay No. 4 – 271 m, quay No. 5 – 270 m, quay No. 6 – 288 m, quay No. 7 – 375 m).
- The maximum draft of ships is up to 11 meters.

For further information see Annex 5.
Information on cruise passengers' services is given in Annex 17.
Description of infrastructure development projects implemented in recent years and planned for the future
In view of the tendency to increase the size and capacity of cruise ships, it is planned to reconstruct quay No.7 in the port of St. Petersburg, extending it by 108.6 meters (quay length will be 483.6 m)[22]. In the third quarter of 2018 a positive evaluation of this project has been received[23].

3.4.3 Tallinn port terminals and their infrastructure

- In the Port of Tallinn there are four quays for cruise ships - No. 1, 17, 24 and 25.
- The distance from the quays to the city centre is approximately one kilometer.
- The maximum draft of ships is up to 10.7 meters.

For further information see Annex 6.
Information on cruise passengers' services is given in Annex 17.
Description of infrastructure development projects implemented in recent years and planned for the future
Currently, (in the last quarter of 2018), Tallinn is implementing the EU project Twin-Port 2, which also plans to reconstruct the Tallinn Old City Harbour passenger terminal D, create a mobile passenger gangway between Terminal A and Terminal D, and change the traffic solution around terminal A. Within the framework of the project a new passenger terminal has been constructed at Helsinki Port – West Terminal 2[24].
Further development projects for the period from 2018 to 2023 are planned for the Port of Tallinn, Old City Harbour – both the creation of a new cruise terminal, the reconstruction of Terminal D, and the implementation of new IT solutions[25].

3.4.4 Helsinki port terminals and their infrastructure

- There are eight quays in the port of Helsinki for cruise ships – LHC, LHB, LV7, LMA & LMB, ERA & ERB, EKL, EPL, EO1[26].
- The distance from the quays to the city centre is 1.5 to 4 kilometres, the South Harbour quays being the closest to the city centre, the West Harbour quays and Hernesaari being the furthest to the city centre.
- The total length of the quays is 2, 185 meters (LHC + LHB – 675 m, LV7 – 220 m, LMA & LMB – 400 m, ERA & ERB – 400 m, EKL – 180 m, EPL – 130 m, EO1 – 180 m).
- The maximum draft of ships is from 6 meters to 12.5 meters (LHC – 9.8 m, LHB – 9 m, LV7 – 11 m, LMA & LMB – 12.5 m, ERA & ERB – 10.3 m, EKL – 8.8 m, EPL – 6 m, EO1 – 8.3 m).

For further information see Annex 7.
Information on cruise passengers' services is given in Annex 17.

[22] https://www.portspb.ru/en/about/info_about_port/investments
[23] http://en.portnews.ru/news/263301/
[24] http://www.portoftallinn.com/eu-ongoing-projects
[25] http://www.portoftallinn.com/old-city-harbour-development-plans
[26] https://www.portofhelsinki.fi/sites/default/files/attachments/homeport.pdf

Description of infrastructure development projects implemented in recent years and planned for the future
In the Port of Helsinki, several infrastructure development projects have been implemented over the recent years and are still ongoing.
In the southernmost part of *Hernesaari* near the West Harbour, the construction of a new quay was launched in the spring of 2017. It is planned to be completed before the start of the cruise season in 2019. The new quay is planned for ships up to 360 meters[27].

3.4.5 Stockholm port terminals and their infrastructure

- There are twelve quays at the Port of Stockholm for cruise ships – *Nybroviken 5, Nynäshamn Seawalk, Buoy at Strömmen, Stadsgården 160, Stadsgården 167, Värtahamnen 523, Värtahamnen 511, Skeppsbron 105, Värtahamnen 515, Frihamnen 638, Frihamnen 634, Frihamnen 650*.
- The distance from the quays to the city centre is approximately 4 kilometres.
- The maximum draft of ships is from 5 meters to 25 meters.

For further information see Annex 8.
Information on cruise passengers' services is given in Annex 17.
Description of infrastructure development projects implemented in recent years and planned for the future
Between 2013 and 2016, the entire port of *Värtahamnen* was rebuilt, with five new quays with smart and environmentally friendly solutions and a modern passenger terminal[28].

3.4.6 Rostock port terminals and their infrastructure

- There are five quays at the Port of Rostock for cruise ships – *P 1-4, P7, P8, LP31* and *LP41*.
- The distance from the *Warnemünde* Port to the city centre is approximately 1 kilometre.
- The maximum draft of ships is from 7.3 meters to 9.3 meters (*P 1-4* – 7.3 m, *P7* – 9 m, *P8*– 9 m, *LP31* – 9.3 m and *LP41* – 9.3 m).

For further information see Annex 9.
Information on cruise passengers' services is given in Annex 17.
Description of infrastructure development projects implemented in recent years and planned for the future
No information was available on either the implemented development projects of cruise terminals over the last few years or any planned for the next few years.

3.4.7 Kiel port terminals and their infrastructure

- There are three quays at the Port of Kiel for cruise ships – *Ostseekai*, *Ostuferhafen* and *Norwegenkai*.
- The distance from the terminals to the city centre ranges from 300 meters (from *Ostseekai* and from *Norwegenkai*) up to 8 kilometres (*Ostuferhafen*).
- The total length of quays is approximately 925 meters (*Ostseekai* – 355/285 m, *Ostuferhafen* – 395 m and *Norwegenkai* – 175 m).
- The maximum draft of ships is from 9 meters to 9.5 meters (*Ostseekai* – 9.5 m, *Ostuferhafen* – 9.5 m and *Norwegenkai* – 9 m).

For further information see Annex 10.
Information on cruise passengers' services is given in Annex 17.
Description of infrastructure development projects implemented in recent years and planned for the future
No information was available on either the development of cruise terminals in the last few years or that it is planned for the next few years.

[27] https://www.ssab.com/company/newsroom/media-archive/2018/03/20/12/44/building-a-new-cruise-quay-in-hernesaari
[28] http://www.portsofstockholm.com/stockholm/port-areas/vartahamnen/development-2013-2016/

3.4.8 Oslo port terminals and their infrastructure

- There are four quays at the Port of Oslo for cruise ships – *Sondre Akershus, Vippetangen*, *Revier* and *Filipstad.*
- The distance from the quays to the city centre is approximately 3 kilometers.
- The total length of the quays is 1, 197 meters (*Sondre Akershus* – 295 m, *Vippetangen* – 200 m, *Revier* – 302 m and *Filipstad* – 400 m).
- The maximum draft of ships ranges from 8 meters to 10.3 meters (*Sondre Akershus* – 10.3 m, *Vippetangen* – 8 m, *Revier* – 8.4 m and *Filipstad* – 10.3 m).

For further information see Annex 11.
Information on cruise passengers' services is given in Annex 17.
Description of infrastructure development projects implemented in recent years and planned for the future
No information was available on either the development of cruise terminals in the last few years or that it is planned for the next few years.

3.4.9 Riga port terminals and their infrastructure

- There are four quays at the Port of Riga for cruise ships – MK-3 and MK-4 (the nearest possible location in the Old Town), JPS-1 and JPS-2 (for ferries, but it can also be used for cruise ships), in some cases cruise ships are also moored at quays at freight terminals.
- The distance from the passenger terminal to the city centre is approximately 2 kilometres.
- The total length of the quays is 811 meters (MK-3 – 240 m, MK-4 – 222 m, JPS-1 – 132 m and JPS-2 – 217 m).
- The maximum draft of ships is from 7.6 meters to 8.2 meters (MK-3 and MK-4 – 8.2 m, JPS-1 – 7.6 m and JPS-2 – 7.6 m).

For further information see Annex 12.
Information on cruise passengers' services is given in Annex 17.
Description of infrastructure development projects implemented in recent years and planned for the future
In 2018, Riga Passenger Terminal, in cooperation with the Freeport of Riga Authority, has carried out the works on the deepening of the ship channel of the Daugava river bed, which will allow deep-sea cruise ships to enter the Port of Riga and moor at the passenger terminal quays.
In the future, it is planned to continue the work on attracting investors, to increase the capacity of port services provision – by completely modernizing the Riga Passenger Port, including the construction of a new terminal building, as well the construction of a hotel and office building on the land owned and managed by the Riga Passenger Terminal.
The Freeport of Riga Authority has started the design of the port development plan for the next decade. It will be comprehensive and will highlight the trends in the development of Riga port in the next ten years, starting with the development of the infrastructure, the development of new logistics routes, and followed by a sustainable environmental policy. Not only national experts are involved in the preparation of the new development plan of the Freeport of Riga, but also internationally acclaimed specialists from Rotterdam.

3.4.10 Kristiansand port terminals and their infrastructure

- There are three quays at the Port of Kristiansand for cruise ships – No. 10, 16 and 20.
- Distance from quay No. 10 and No. 20 to the city centre is about 500 meters.
- The total length of the quays is 695 meters (No. 10 – 361 m, No.16 – 64 m and No.20 – 270 m).
- The maximum draft of ships is from 9 meters to 18 meters (No. 10 – 11 m, No.16 – 12 – 18 m and No.20 – 9 m).

For further information see Annex 13.
Information on cruise passengers' services is given in Annex 17.

Description of infrastructure development projects implemented in recent years and planned for the future

In June 2017 a new cruise quay was opened at the port of Kristiansand, thus allowing Oasis class ships to moor[29].

The port of Kristiansand in cooperation with the Danish company PowerCon (www.powercon.dk) and the local energy company Agder Energi Net (www.aenett.no), has set up Europe's largest port-shore power plant. The project was co-financed by the European Union and the Horizon 2020 program for research and innovation for SMEs. The project's total investment is about 4 million euros, co-funded by the EU and the Horizon 2020 program for small and medium-size enterprises. The shore power system is so powerful that even the world's largest cruise ships can connect and shut off their engines at the quay. It was planned that the system will be installed and tested during the 2018 cruise season and will be fully operational at the end of summer 2018[30]. This project can be referred to as a sustainable infrastructure development project.

3.4.11 Gdansk port terminals and their infrastructure

- The Port of Gdansk offers several quays that can be used by cruise ships, including quays *Westerplatte*, *Cpt. Ziolkowski* and *WOC II*.
- The distance from the quays to the city centre is about 10 kilometres.
- *Westerplatte* can accommodate ships up to 225 meters, *WOC II* quay – up to 170 meters, no information available on *Cpt. Ziolkowski.*
- The maximum draft of ships is from 8.3 meters to 9.3 meters (Westerplatte: from 8.3 to 9.3 meters, Cpt Ziolkowski – no information and WOC II – 8.6 meters).

For further information see Annex 14.

Information on cruise passengers' services is given in Annex 17.

Description of infrastructure development projects implemented in recent years and planned for the future

In recent years the Port of Gdansk has been focusing on developing port infrastructure to meet market requirements and enable all users of this infrastructure to expand their businesses, thus improving the competitiveness of the port complex. Among the investments is the construction of the tunnel below *Martwa Wisla* (finished in 2016, total investment – EUR 210 million), modernization of railway line No. 226 and construction of a new railway bridge (total investment – EUR 123 million), the completion of the first stage of the construction of the PERN SA Group oil terminal (finished in 2015, total investment – EUR 98 million), construction of the second deep water berth at the DCT container terminal (finished in 2016, total investment – EUR 195 million), etc[31]. No information was available on the development of cruise terminals in the last few years or that it is planned for the next few years.

3.4.12 Klaipeda port terminals and their infrastructure

- The port of Klaipeda has one terminal with three quays for cruise ships.
- The cruise ship terminal is located 100 meters from the centre of Klaipeda.
- The total length of the quays is 686 meters (No. 80 – 297 m, No. 80a – 177 m, and No. 81a – 125 m).
- The maximum draft of ships ranges from 10 meters to 12.5 meters (No. 80 – 10 m, No. 80a – 11.5 m, and No. 81a – 12.5 m).

For further information see Annex 15.

Information on cruise passengers' services is given in Annex 17.

Description of infrastructure development projects implemented in recent years and planned for the future

In order to increase Klaipeda's competitiveness in cruise shipping and to further develop maritime tourism, Klaipeda Central Terminal was built in 2014. The terminal, located near the city centre, can accommodate up

[29] http://www.portofkristiansand.no/en/en-historisk-dag-i-kristiansand-havn/

[30] https://sustainableworldports.org/project/port-of-kristiansand-shore-power-supply-for-cruise-ships/

[31] https://www.portgdansk.pl/about-port/investments-carried-out-in-recent-years

to 3 ships: cruise ships, passenger and ro-pax ferries. Klaipeda guarantees the highest quality of services for all passengers[32].

Over the next three years (2019-2021), the Klaipeda port plans to invest 407 million euros in its infrastructure, including 94 million euros from the EU Structural Funds. About 293 million euros are planned to be invested in the construction and improvement of quays. Since 2013, nearly 173 million euros have been invested in the port infrastructure[33].

3.4.13 Visby port terminals and their infrastructure

- The distance to the city centre ranges from 200 to 500 meters.
- Two large cruise ships can be moored at the same time at the new cruise terminal. The pier is 360 meters long.

For further information see Annex 16.

Information on cruise passengers' services is given in Annex 17.

Description of infrastructure development projects implemented in recent years and planned for the future[34] [35]

In April 2018 a new cruise quay was revealed at Visby port, as a result of cooperation between the Gotland region and the Port of Malmo Copenhagen (CMP), where the Gotland region was responsible for the construction, while CMP assumes responsibility for its operation.

The construction of the cruise quay was commenced in early 2016. It included dredging works, landfill, the construction of a new land area of approximately 12,000 square meters, construction of foundations, and other works. Sustainability issues were central to the project. Ships arriving at the Port of Visby can drain their waste water into an underground pool from where it is pumped into the sewage treatment plant. The sludge can then be used for the production of biogas in Gotland.

It is planned that the new quay will be visited by 90,000 passengers in 2018 and in a few years the number of passengers will increase to 150,000 passengers per year.

Assessing the aspects of the large and extra-large cruise ports of the Baltic Sea Region, it can be concluded that:

- the quays at ports are mostly located in the city centre or close to the centre where large cruise ships can enter and passengers can easily get to the city / board land transport;
- the average length of quays is 306 meters (10,705 m/35 quays - no data is available for all quays for cruise ships of large and extra-large ports of the Baltic Sea Region due to the lack of data for several quays), which allows to accommodate cruise ships with an average length of up to 300 meters;
- the range of services offered to cruise passengers is very wide.

[32] http://www.portofklaipeda.lt/passenger-terminals

[33] http://www.baltic-course.com/eng/good_for_business/?doc=143173

[34]http://www.seatrade-cruise.com/news/news-headlines/visby-celebrates-as-new-cruise-berth-officially-opens.html

[35] http://www.cmport.com/business/cruise-ships/visby-cruise-terminal

4 Cruise Segment Outlook in the Baltic Sea Region

4.1 Cruise Shipping Market Forecasts

According to *2018-19 Cruise Industry News Annual Report* the capacity of European cruise lines will grow by 70% from approx. 7.4 million in 2018 to 12.5 in the nearest decade. In the Report, the growth has been anticipated next year, i.e., in 2019 – by 14.8%, and in 2023 – by 7.3%, but the growth rate will slow down after 2024[36] (see Figure 4).

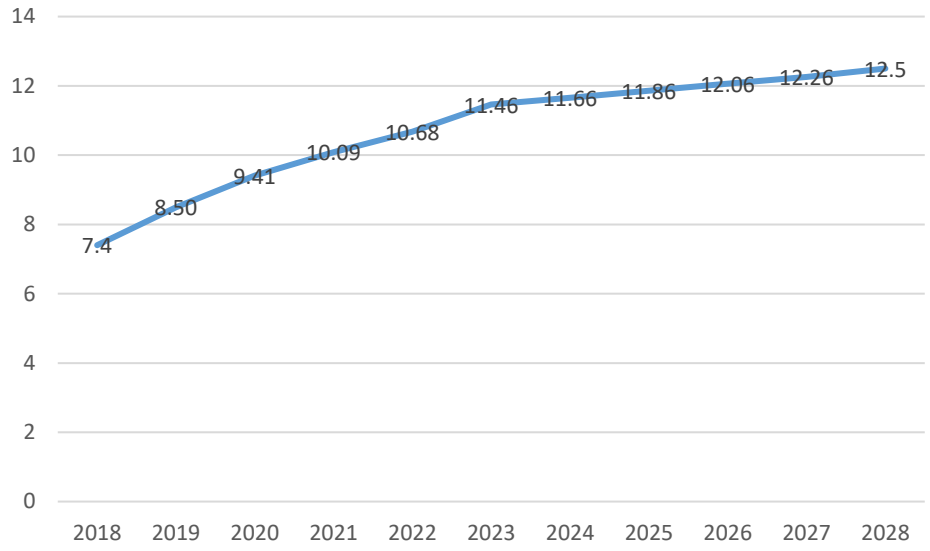

Figure 4. Forecasts of the Number of Cruise Passengers (in millions) in Europe from 2018 to 2028

The assessment of offer shows that the capacity of active cruise fleet will also grow in the coming years. Till October 23rd, 2018, 115 ships have been ordered with the total passenger capacity of 513,414: 25 cruise ships have been ordered for 2019, 20 cruise ships – for 2020, 20 cruise ships – for 2021 (Annex 18), of which 8 ships with total passenger capacity as of 29,376 passengers planned for European cruises. The tonnage of the smallest ship ordered for European cruises equals to 58,250 GT and her passenger capacity being 1,000 passengers, whereas that of the biggest ship – 183,900 GT and her passenger capacity – 5,200 passengers[37].
Various studies have been carried out on the forecasts of passenger and call numbers – for various geographical units, for various time frames, or by using different growth rates. Within the scope of the present study, considering prospective annual growth rates, the following studies were examined: the 2015 study by Petter Dybedal et al Cruise passenger traffic to Norway – history and forecasts until 2060[38] (summary available in English), the 2018 study by Maritime Institute in Gdansk Exploring the future of shipping in the Baltic Sea[39] , and the 2014 study by UniConsult Assessment of the cruise market in the Baltic Sea Region (BSR) and the neighbouring North Sea area in the light of SECA/NECA regulations (2015) – cruise line strategies and needs to improve sustainable port facilities[40].
When forecasting the development of cruise segment in the Baltic Sea region three development scenarios are considered – slow growth, base growth, and fast growth. The annual growth rates for each of the scenarios are shown in Table 11. It should be underlined that it is complicated to forecast further development of cruise

[36] https://standbynordic.com/europe-cruise-capacity-to-rise-70-in-ten-years/
[37] https://www.cruiseindustrynews.com/cruise-news/cruise-ship-orderbook.html
[38]https://www.toi.no/getfile.php/1339880/Publikasjoner/T%C3%98I%20rapporter/2015/1388-2015/1388-summary.pdf
[39] https://vasab.org/wp-content/uploads/2018/08/20180730_FutureShippingQuoVadis.pdf
[40]http://www.greencruiseport.eu/files/public/download/studies/The%20cruise%20market%20in%20Baltic%20S

segment taking into account considerably variable annual growth rates of both the number of cruise passengers and cruise calls between 2005 and 2017. (Annex 2 and Table 5)

Table 11

Annual Growth Rates for Slow Growth, Base and Fast Growth Scenarios

	Slow growth scenario	Base scenario	Fast growth scenario
Increase in the number of passengers	3.3%	4.8%	6.3%
Increase in the number of calls	2%	3.5%	5%

For the base scenario rates (4.8% annual growth rate of the number of cruise passengers and 3.5% annual growth rate of cruise calls) in the present study the growth rates given in the 2014 study by UniConsult Assessment of the cruise market in the Baltic Sea Region (BSR) and the neighbouring North Sea area in the light of SECA/NECA regulations (2015) – cruise line strategies and needs to improve sustainable port facilities have been used, which in the slow and fast development scenarios have been adjusted by 1.5% based on the differences in rates in the cases of various scenarios used in the 2015 study by Petter Dybedal et al Cruise passenger traffic to Norway – history and forecasts until 2060.

When forecasting the number of cruise passengers and cruise calls in the Baltic Sea region ports for 2030 with the year of 2017 as the base year, in the slow growth scenario the number of cruise passengers may increase up to 7.71 million passengers and 3,230 cruise calls, in the case of the base scenario – up to 9.3 million passengers and 3,904 cruise calls, in the case of fast growth scenario – up to 11.18 million cruise passengers and 4,710 cruise calls.

In the study Assessment of the cruise market in the Baltic Sea Region (BSR) and the neighbouring North Sea area in the light of SECA/NECA regulations (2015) – cruise line strategies and needs to improve sustainable port facilities it has been forecasted that the growth of cruise segment in the Baltic Sea region will be reached by the growth of shipping volume in large and extra- large ports. It is anticipated that medium and small ports will experience slower growth, stagnation, or in some cases – decrease[41].

4.2 Outlook of Cruise Segment Development in Riga

The assessment of the outlook of cruise segment development in Riga has been carried out based on the existing studies and in-depth interviews with the experts of cruise industry.

When forecasting the number of cruise passengers and cruise calls at Riga port, the same growth rates as for the Baltic Sea region (*see Table 11*) have been used. The year of 2017 has been chosen as the base year. In the case of slow growth scenario, it has been forecasted that the number of cruise passengers will increase to 131. 07 thousand passengers and the number of cruise calls – to 111 in 2030; in the case of base scenario – 158. 06 thousand passengers and 132 cruise calls; in the fast growth scenario – 190.13 thousand passengers and 160 calls (*see Figure 5 and Figure 6*).

[41] Uniconsult. 2014. Pre-Feasibility Study "Assessment of the cruise market in the Baltic Sea Region (BSR) and the neighboring North Sea area in the light of SECA/NECA regulations (2015) – cruise line strategies and needs to improve sustainable port facilities"

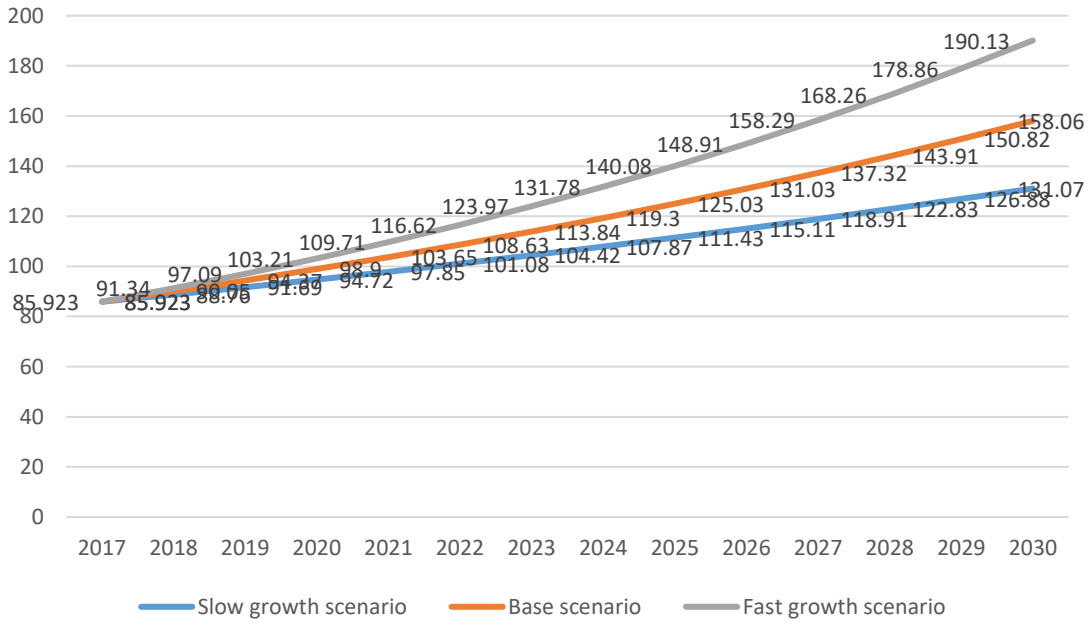

Figure 5. Forecasts of the Number of Cruise Passengers at Riga Port from 2018 to 2030

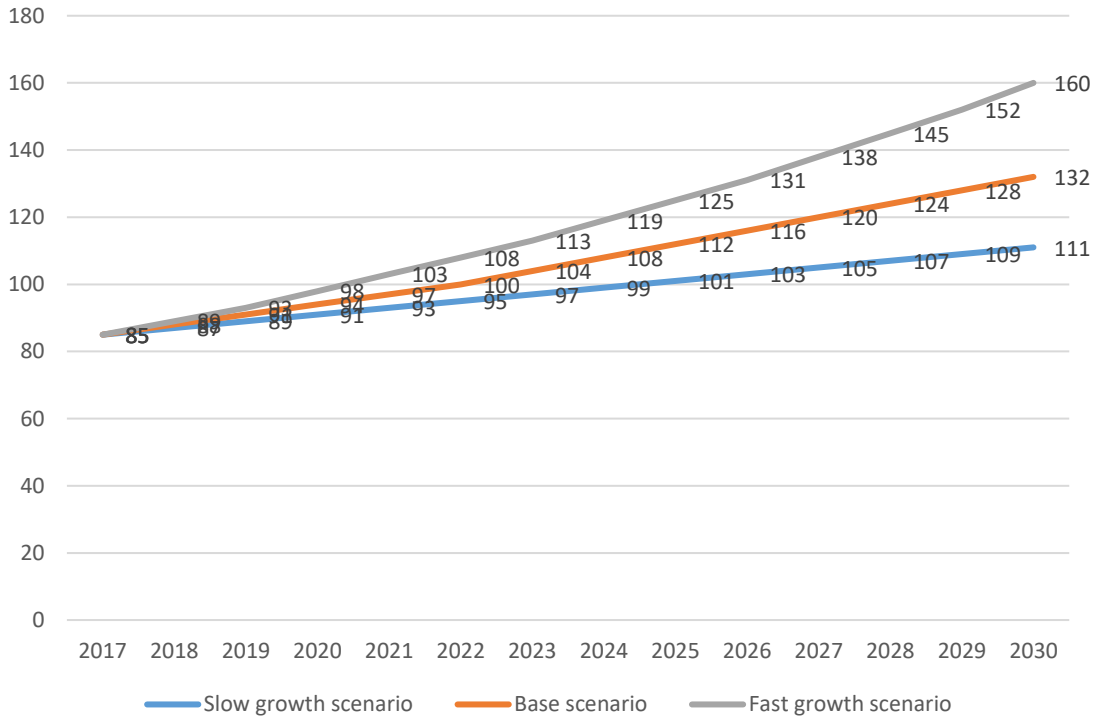

Figure 6. Forecasts of the Number of Cruise Calls at Riga Port from 2018 to 2030

By including the opinion of experts from various organizations and companies the present study ensures multi-sided view of involved parties on the aspects of cruise segment development in Riga. The choice of experts to be interviewed was based on their professionalism and expertise in the field of cruise shipping and/or tourism. Interviews were conducted with the representatives from:

- SIA “Riga Cruiseship agency”;
- SIA “Noord Natie Ventspils Termināls” (NNVT);

- Riga Freeport Authority – several interviews;
- Meet Riga (the official convention bureau of Riga city and a department of Riga Tourism Development Bureau whose main task is to promote and establish Riga & Latvia as a perfect meetings and events destination in Northern Europe);
- Con-ex Latvia Tours group (the company providing incoming tourism services in the Baltics).

The experts were asked to rate the present situation in cruise tourism development in Riga within the scale of 1 – 10 points. The experts` assessments indicate that so far the potential of cruise tourism in Riga has not been fully taken advantage of. Thus, there are potentialities for future development.
The following essential factors to be developed/ improved at Riga port in order to increase the number of cruise ships and passengers were mentioned by experts:

- terminal location;
- terminal accessibility by car, on foot, by bicycle, by public transport;
- berth length, draught and load;
- ship channel limits;
- services available at the terminal for passengers;
- location of main tourism attractions/ sights;
- sufficient tourism information;
- participation of port authority at exhibitions/ associations related to promoting cruise tourism;
- work quality of shipping agents;
- price policy at Riga port.

All the experts – interviewees were of the opinion that the main factor preventing the development of cruise tourism at Riga port is the lack of development strategy and the lack of a single responsible institution. Among other impeding factors the following were mentioned:

- location in Riga Gulf, requiring higher costs and time consumption;
- insufficient width and depth of ship channel;
- poor condition of Riga Passenger Terminal;
- insufficient urban infrastructure related to cruise passengers, incl., insufficient number of parking areas for tourist coaches;
- lack of regular marketing activities, incl., insufficient participation at international tourism fairs;
- activities by competitors (Tallinn, Klaipeda, Visby) in both developing port infrastructure and marketing;
- insufficient involvement of the city, e.g., meeting cruise ships with addressing speeches;

According to the experts, the decisive parties to be involved in the development of cruise tourism are Freeport of Riga and Riga Municipality. The cooperation and communication with the above partners until now was evaluated as good.

The following strong sides of cruise tourism in Riga were mentioned – history, culture, wide choice of offers.
In terms of achievable ship calls till 2030 the experts mentioned 130- 150 calls per year, which correlates with the forecasts made by the present study (*see Figure 6*).
Recommendations by the experts include:

- to attract big cruise ships and companies (Carnival etc.);
- to become turnaround port (by developing necessary infrastructure, it would be possible to reach about 6 turnaround ship calls).

When planning the necessary activities and costs for the development of cruise tourism in Riga, it should be taken into account that the minimum requirements for transit harbours and cruise turnaround ports differ.
Minimum requirements for the infrastructure of transit harbour include the following:

- depth;

- adequate berth length;
- wide apron for servicing cruise passengers;
- *International Ship and Port Facility Security Code – ISPS Code* is observed;
- proximity to or high quality connection to local tourism attractions and sights.

The requirements for turnaround cruise ports are higher – good connection with the passenger arrival/ departure place – airport, railway station, bus station (airports particularly require wide range and number of international connections). In case of turnaround cruise, large parking areas by the cruise terminals become essential[42].

4.3 Market outlook conclusions

The main conclusions on the current situation and outlook of cruise segment at the Port of Riga and the Baltic Sea region as a whole are as follows:

- The world cruise market in the last decade has continuously been growing and will continue to grow in the future.
- Europe is the world` s second most important market after North America. The main cruise offer generating European countries in the last three years (2015 – 2017) are: Germany, Great Britain (together with Ireland), and Italy.
- Between 2013 and 2017, 42 cruise companies were operating in the Baltic Sea with the total fleet of about 80 cruise ships.
- In 2017 2, 497 cruise calls and 5. 05 million passengers were registered in the Baltic Sea region. The biggest numbers of cruise passengers visited ports of Copenhagen (850, 000), Rostock (641, 000) and Stockholm (600, 000), the number of cruise calls in the ports – Copenhagen (325), St. Petersburg (319) and Tallinn (311). 85, 923 cruise passengers and 85 cruise calls were registered in the Port of Riga in 2017.
- Over the last years, the majority of European sea region ports have made considerable investments in port infrastructures with the aim of fulfilling the requirements of normative acts, as well as in order to facilitate the development of cruise tourism.
- The demand for cruise tourism across the globe will continue to grow in the future. Respectively, the offer will also grow, thus, increasing the available capacities of cruise fleet. By October 23, 2018, 115 ships with total capacity of 513, 414 passengers have been registered in Cruise Ship Orderbook. For 2019, 25 cruise ships have been ordered, for 2020 – 20 cruise ships, for 2021 – 20 cruise ships, of which, as it is known, 8 ships with the capacity of 29, 376 passengers are designated for European cruises.
- Forecasting the number of cruise passengers and cruise calls in the ports of the Baltic Sea region, where the year of 2017 was taken for the base year, in the case of slow growth scenario the estimated numbers of cruise passengers may reach 7. 71 million passengers and 3, 230 cruise calls in 2030, in the case of base scenario – 9.3 million cruise passengers and 3, 904 cruise calls, in the case of fast growth scenario –11. 18 million passengers and 4, 710 cruise calls.
- The forecasts for Riga port for 2030 include: in the case of slow growth scenario the estimated number of passengers – 131. 07 thousand and the estimated number of calls – 111, in the case of base scenario – 158. 06 thousand passengers and 132 cruise calls, in the case of fast growth scenario – 190. 13 thousand passengers and 160 cruise calls.

The development of cruise tourism in the Port of Riga is possible provided the development strategy for the sector is drawn up and a single head organization is established to undertake the responsibility for the implementation of the above strategy.

[42]http://www.greencruiseport.eu/files/public/download/studies/Common%20Standards%20in%20the%20measurement%20of%20economic%20effects%20by%20cruise%20tourism_30.06.2017_Gdansk.pdf

5 Prerequisites for the development of sustainable cruise terminals operation in the ports of the region

5.1 Legislation setting requirements for the operation of sustainable cruise terminals

The cruise sector is subject to both international and European Union and national regulations that provide for certain requirements and limitations for environmentally-polluting activities, thus contributing to the sustainable development of terminals.

Since the 1st March 1993 the Republic of Latvia is a member of the International Maritime Organization (IMO). The territorial waters of Latvia are the international shipping area and the rules deriving from the IMO Conventions apply to its use. The Convention on the Prevention of Pollution from Ships of 1973, as amended by the Protocol of 1978 (MARPOL 73/78), is a determining international convention which works to prevent marine pollution which is likely to occur in the event of ship activity or accidents.

5.1.1 Legislation regulating the sulphur content of fuels

The International Maritime Organization (IMO) regulates the amount of emissions caused by international vessels in accordance with *Annex VI of the 1973 International Convention for the Prevention of Pollution from Ships*, as amended by its Annex VI to the 1978 Protocol (MARPOL), "Regulations for the Prevention of Air Pollution by Ships".

The IMO has established ECAs (Emission Control Areas), where one of their controlled areas is the Baltic Region. ECAs or Emission-Controlled Areas are special sea areas that meet environmental policy requirements and limitations directly related to the pollutions such as sulphur oxides (SOx), nitrogen oxides (NOx) and microparticle emissions, as well as waste and waste water treatment.

The emissions of sulphur oxide has been limited In the Baltic Sea region since 2006. At that time it was the first region in the world with such limitations. The initial limit was 1.5% m/m of sulphur in fuel until the 1st July 2010, later it was 1,00% m/m from 2010 to 2015 and after the 1st January 2015 it is 0.10% m/m. This limit applies to all vessels moored at the quay for more than two hours.

One of the objectives of the European Union's environmental policy set out in the Environmental Action Programs is to improve air quality. EU Directive 2012/33/EU of the European Parliament and the Council of 21 November 2012 amending Council Directive 1999/32 / EC as regards the sulfur content of marine fuels provides the reduction for the maximum sulphur content for fleet fuel from 3.5% to 0.5% by the January 2020.

To comply with restrictions the vessel operators move to the use of scrubbers and the cleaner fuels:

- Distilled fuel (MDO or MGO);
- Methanol;
- Liquefied Natural Gas (LNG).

Ports should ensure the bunkering capacity of these fuels, as well as the possibility of disposing of flue gas purification waste. For more information on the impact on port infrastructure, see section “5.2. The requirements for port and terminal infrastructure, including environmental protection requirements”

5.1.2 Legislation regulating emissions of nitrogen oxides

Annex VI to MARPOL provides that nitrogen dioxide emission reductions are regulated by the Technical Code for the control of marine diesel nitrogen oxide emissions (NOx Technical Code). The amendments to Annex VI

to MARPOL provides that in the case of engine modifications, the NOx emissions resulting from the modifications must be documented in accordance with the NOx Technical Code.
In accordance with the Annex VI to MARPOL the operation of diesel engines is permitted when nitrogen oxides (calculated as total NO_2 emissions) from the engine are within the following limits:

(i) 17,0 g/kWh if n is less than 130 rpm/min;
(ii) 45.0 X n (-0.2) g/kWh if n is 130 or more, but less than 2000 rpm/min;
(iii) 9,8 g/kWh if n is 2000 rpm/min or more

n = nominal engine spin speed (crankshaft revolutions per minute).

This provision applies to: (i) every diesel engine with a power output of more than 130 kW installed on board of a ship whose construction started on or after the 1st January 2000; and (ii) each diesel engine with a power output of more than 130 kW which undergoes significant changes on or after the 1st January 2000.

Annex VI provides also the control of three levels (tiers) of ships based on the year of construction of the ship. Tier III restrictions apply to vessels from the Baltic Sea Region, built since 2021. The aim of the Tier III regulation is to reduce nitrogen oxide emissions (NOx) by about 70% compared to current Tier II standards. These regulations apply to vessels in North America, the United States Caribbean, **the Baltic Sea**, the North Sea and all future NOx emission control areas: all ships using these areas must comply with the requirements, which essentially means that these requirements apply to any ship practically.

The impact on port infrastructure when implementing these requirements is in line with section 5.1.1. described above, i.e. it is necessary to provide cleaner refueling and flue gas cleaning waste disposal facilities.

5.1.3 Legislation regulating GHG emissions and EU policy on the development of alternative fuels infrastructure

Regulation (EU) 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport, and amending Directive 2009/16/EC (monitoring, reporting and verification of emissions) requires the shipowners and operators to monitor and report CO^2 emissions quantity from the beginning of 2018. That applies to ships over 5000 gross tonnage for trips to, from and between the countries of the European Union. The indicators such as fuel consumption, load capacity and energy efficiency is also included in the report.

Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure provides for the establishment of a common framework of measures for the development of infrastructure for alternative fuels in the European Union and defines minimum requirements for the development of alternative fuel infrastructures as well as common technical specifications, incl. for electric vehicle charging points, for natural gas (LNG, CNG) filling stations and for hydrogen filling stations. In accordance with the requirements of the Directive 2014/94/EU for the Member States[43]:

- shore electricity supply should be assessed for inland waterway vessels and sea vessels at sea and inland ports. Such shore electricity supply must be prioritised for installation in the TEN-T core network ports and other ports by the 31st December 2025, except where there is no demand and costs disproportionate to the benefits, including environmental benefits;

[43] https://eur-lex.europa.eu/legal-content/LV/TXT/PDF/?uri=CELEX:72014L0094LVA_247268&qid=1542357569361&from=LV

- an appropriate number of LNG filling points should be established at sea ports by the 31st December 2025 in order to allow the movement of LNG inland waterway vessels or sea vessels throughout the TEN-T core network;
- an appropriate number of LNG filling points should be established at inland ports by the 31st December 2030 in order to allow the movement of LNG inland waterway vessels or sea vessels throughout the TEN-T core network;

According to the Cabinet of Ministers Order No 202 "On the Alternative Fuel Development Plan 2017-2020" (Riga, the 25th April 2017 (Protocol No 20, paragraph 25)) the information gathered in the White Paper **"Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system"** (hereinafter - White Paper) one of the objectives of sustainable transport is to reduce transport dependency on oil resources. In order to achieve this objective the White Paper provides to create a sustainable alternative fuel strategy by creating adequate infrastructure. The White Paper provides also the 60% reduction in GHG emissions in transport by 2050 compared to 1990 level, including a whole series of additional measures to achieve this objective, for example:

- Overall, by 2050 EU maritime transport's CO2 emissions should be reduced by 40% (if practically possible - by 50%) compared to 2005 level. It should be noted that the Latvia's national position on the White Paper is in force in relation to the reduction of maritime transport's GHG emissions, in which the special interests of Latvia indicate that these issues should be dealt within the framework of the International Maritime Organisation with the aim to prevent market distortion and conditions of unequal competition in the region.
- With regard to maritime transport, the decisions on GHG emission reduction instruments should be taken internationally, i.e. within the framework of the International Maritime Organization.

The impact on port infrastructure when implementing these requirements is in line with section 5.1.1. described above, i.e. it is necessary to provide cleaner refueling and flue gas cleaning waste disposal facilities. In addition, provision should be made for the power supply of ships. For more information on the impact on port infrastructure, see section "5.2 The requirements for port and terminal infrastructure, including environmental protection requirements ".

5.1.4 Legislation regulating ship waste water

The procedure for the management of ship-generated waste in Latvian ports is regulated by the Cabinet of Ministers Regulation No 455 of the 8th October 2002 **"Procedure for the Reception of Ship-generated Waste and Polluted Waters and the Procedure for the Development of Ship-generated Waste Management Plan"**. The Regulations prescribe that the Port Authorities organise the management of waste generated by ships and are responsible for "The development of a plan for the management of ship-generated waste."

The procedure for the management of waste generated by ships in the Freeport of Riga is determined by the "Ship-generated waste management plan in the Freeport of Riga" approved on the 28th June 2017.[44]

According to the definitions of MARPOL Annex IV[45] "Waste water" means:

- sewage waters and other waste from any type of toilets and urine ducts;
- sewage waters from medical facilities (dispensary, sickbay, etc.) coming from washing tanks, washing baths and drains located in these premises;
- sewage waters from the premises where the animals are located; or
- other waste water which is mixed together with the predefined sewage waters.

[44] http://rop.lv/lv/par-ostu/vide/kugu-radito-atkritumu-apsaimniekosana.html
[45] https://likumi.lv/ta/lv/starptautiskie-ligumi/id/828

The Convention MARPOL 73/78 consists of six annexes - Annex I "Regulations for the prevention of oil pollution", Annex II "Regulations on the prevention of pollution of harmful liquid substances transported as liquid cargo", Annex III "Regulations on the prevention of pollution of hazardous substances transported by Sea in the package", Annex IV "Regulations for the prevention of pollution from ship-source waste water", Annex V "Regulations for the prevention of pollution from ship-generated waste", Annex VI "Regulations for the prevention of air pollution from ships", of which the first five annexes are in force .

MARPOL Annex IV "Regulations for the prevention of pollution from ship-source wastewater" defines obligatory inspections of ships, procedures for issuing certificates, sewage systems and removal requirements (ship discharges fractionated and disinfected waste water more than 3 nautical miles from the nearest coast using a system recognized by the administration or unfractionated or disinfected waste water more than 12 nautical miles from the nearest coast, ensuring that the waste water is discharged in a moderate flow), the standard dimensions of the unloading flanges, to facilitate the connection of the reception facilities pipelines to the vessel's discharge pipeline.

The Baltic Sea is defined in Annex V to MARPOL 73/78 as "Special Territory" - "Special Territory" means a Marine Region where, for recognised technical reasons related to its oceanographic and ecological status and the specific characteristics of traffic in that region, specific compulsory methods should be introduced to prevent pollution of the sea by waste.

In the following year (2019) passenger ships will be banned from discharging untreated sewage in the Baltic Sea. The discharge of purified sewage water will require a purification equipment that is approved and comply with the standards of Resolution MEPC.227 (64)5. The alternative is a waste water tank with enough volume. All States adjacent to the "Special Territory" (Baltic Sea) have undertaken to provide the passenger ships with adequate facilities for the reception of waste water in ports without causing unnecessary delays for the ships. The Regulations for the special area of the Baltic Sea will come into force:

- For new passenger ships – the 1st June 2019;
- For the existing passenger ships – the 1st June 2021;
- For existing passenger ships travelling directly to/from a port outside the special territory and to/from a port situated east of 28°10' E within specific area borders and not calling in special territory ports - the 1st June 2023.

The members of the International Cruise Line Association (CLIA) recognise the extreme eutrophication problem in the Baltic Sea identified as a special area in accordance with the MARPOL Annex IV. The International Maritime Organization invites the shipping companies to strive to comply with the rules that will enter into force even before they enter into force. According to the MARPOL and the guidelines for the port's waste water reception facilities the CLIA members have adopted a policy allowing the vessels operating in the Baltic Sea to transfer the waste defined in the MAPROL Annex IV to the ports that have appropriate waste water reception facilities on the basis of an "indirect charge" or *"no special fee"* agreement.[46]

According to the Plan of ship-generated waste management at the Freeport of Riga (2017), the so-called "indirect charge" system operates at the Freeport of Riga, which means that the costs of reception and managing the waste generated by the ships are covered by the ships entering the port, paying a sanitary fee. All incoming in the Riga Port ships pay a sanitary fee according to the "Riga Port's Fees"[47] and it is calculated for one vessel's visit, that calculation is based on the vessel's GT[48]. Fee for the services received at the port

[46] https://cruising.org/about-the-industry/regulatory/industry-policies/environmental-protection/waste-management
[47] https://likumi.lv/doc.php?id=125787
[48] Vessel GT - Ship's Total Capacity Indicator, which determined in accordance with the IMO Convention of 1969 on the Measurement of Ships and shown on the Vessel's Measurement Certificate. For the GT tankers with the insulated ballast tanks the reduced gross tonnage indicated in the international tonnage certificate should be taken into account.

and the port's fees, including the sanitary fees, from the vessel are collected by the shipping agent in accordance with the terms of the agreement concluded with the Freeport of Riga Authority. The Authority of Freeport Riga has the right to reduce the sanitary fee according to the Cabinet of Ministers Regulation No 455 of 08.10.2002 "Procedures for the Reception of Ship-generated Waste and Polluted Water and Procedures for the Development of Ship-generated Waste Management Plan". The Authority of Freeport Riga informs the State Envirоinment Department on a quarterly basis for ships that have a reduced sanitary fee or which are exempted from the sanitary fee.

Existing in force **the Directive 2005/35/EC of the European Parliament and the Council of the 7th September 2005 on ship-source pollution and on the introduction of penalties for infringements**, which aim to incorporate international standards for ship-source pollution into The European Union legislation and to ensure that responsible for leakage persons are subject to appropriate sanctions in order to improve maritime safety and to promote the protection of the marine environment from pollution by ships.

The impact on port infrastructure when implementing these requirements is the need to ensure the possibility of transferring ship waste water to ports. For more information, see section "5.2 The requirements for port and terminal infrastructure, including environmental protection requirements".

5.1.5 Legislation regulating the management of ship waste and cargo waste

According to the definitions of the Annex V to MARPOL, "Waste" means all types of food, household and operational wastes except fresh fish and its parts, which are incurred during usual operation of the ship and are continuously or periodically destroyed, with the exception of substances identified or listed in other annexes to this Convention.

The MARPOL Annex V "Provisions on the prevention of pollution from ship-generated waste" states that it is prohibited to discard any plastic material in the sea, including, but not limited to, synthetic ropes, synthetic fishing nets, plastic bags and waste of burning stoves ash as a result of the burning of plastic products which may contain toxic or heavy metal residues. Defined waste which allowed to be discarded in the sea at a sufficient distance from the nearest land, provided that it is crushed. The waste must be shredded or grinded so that it can be passed through a sieve with a mesh size is not more than 25 millimeters.

The Directive 2000/59/EK of the European Parliament and the Council of the 27th November 2000 on port facilities intended for the reception of ship-generated waste and cargo residues aim is to limit the landing of ship-generated waste and cargo residues in the sea, in particular illegal landing from vessels using ports in the Community, by improving the availability and use of port ship-generated waste and cargo residues reception facilities in ports, thereby improving the protection of the marine environment.
The directive states that:

> (10) Appropriate waste reception facilities at ports should meet the needs of users from major commercial vessels to the smallest recreational craft, as well as the needs of environmental protection, and should not unnecessarily delay vessels using such equipment. The obligation to ensure the availability of suitable waste reception facilities in ports does not exclude high level of choice freedom for the Member States for waste reception in the most favourable way and allows them to provide stationary reception facilities or to appoint service providers, as required entering mobile units for shipment in ports. This obligation includes also the provision of all services and/or other ancillary measures, if necessary, for the correct and appropriate use of these equipment.

(Article 4, Article 1) - Without causing unnecessary delays in vessels the Member States ensure the availability of waste reception facilities at ports in accordance with the needs of ships normally using the port concerned.

It is important to mention that a new draft directive on ship recycling facilities is currently being drafted, repealing Directive 2000/59/EK and amending Directives 2009/16/EK and 2010/65/EU. Some 17 years after its entry into force, the Directive is in need of a thorough revision. The current situation is now significantly different to when the original Directive was adopted in 2000. Since then, MARPOL has been strengthened through subsequent amendments, while the scope and definitions of the current Directive are no longer in line with the international framework. As a consequence, Member States are relying increasingly on the MARPOL framework, making implementing and enforcing the Directive problematic. In addition, Member States apply different interpretations of the Directive's main concepts, creating confusion among ships, ports and operators.
The revision aims to achieve a higher level of protection of the marine environment by reducing waste discharges at sea, as well as improved efficiency of maritime operations in port by reducing the administrative burden and by updating the regulatory framework. As the proposal comes under the Regulatory Fitness Programme (REFIT), it aims to be in line with the REFIT principles of simplification and clarification.
For the sake of clarity, the proposal repeals the current Directive, replacing it with a single new Directive. It also includes ancillary changes to Directive 2009/16/EC on Port State Control[49], as well as Directive 2010/65/EU4[50].

The impact on port infrastructure when implementing these requirements is the need to ensure the reception and disposal of waste, including shared waste, in ports. For more information, see section "5.2 The requirements for port and terminal infrastructure, including environmental protection requirements".

5.2 The requirements for port and terminal infrastructure, including environmental protection requirements

The *World Association for Waterborne Transport Infrastructure – (PIANC*) has developed the cruise terminal functional design *guidelines* .[51] However, *PIANC* indicates that each cruise port is different and has unique conditions, so these guidelines provide a framework for cruise terminal planning.[52]

According to the guidelines for cruise terminals, the following fields should be analyzed and planned:[53] (see Table 12):

- Waterside elements (*Waterside design*);
- quays service area (*apron design*);
- terminal premises (*terminal building*);
- land transport area (*ground transportation area*);
- security issues (*security aspects*);
- financial issues (*financial aspects*).

[49] Directive 2009/16/EC of the European Parliament and the Council of 23 April 2009 on port state control, OJ L 131, 28.5.2009, p. 57.
[50] Directive 2010/65/EU of the European Parliament and the Council of 20 October 2010 on reporting formalities for ships arriving and/or departing from ports of the Member States, OJ L 283, 29.10.2010, p. 1.
[51] https://www.cruiseindustrynews.com/cruise-news/14077-guidelines-for-cruise-terminal-design-and-operations.html
[52] The World Association for Waterborne Transport Infrastructure (PIANC), 2016. Guidelines for Cruise terminals. PIANC report N°152, Maritime navigation commission.
[53] The World Association for Waterborne Transport Infrastructure (PIANC), 2016. Guidelines for Cruise terminals. PIANC report N°152, Maritime navigation commission.

Table 12

Contents of Cruise Terminal Guidelines[54] [55]

	Defined aspects
Waterside design	Vessel characteristics (dimensions, tonnage, overhanging decks, lifeboats, etc.) Operating conditions (storm events) Navigation and berthing (channels, turning basins, prevailing winds, sea level in port waters, weather conditions, waves and current, berth length, etc.) Number and size of vessels
Apron design	Doors and gangways (for passengers and crew members, supply, luggage) Port services - fresh water, waste water reception, electricity, bunkering, waste management, etc.).
Terminal building	Terminal building types depending on the function Size and placement of the premises in the terminal Flow schemes - boarding and disembarking routes
Ground transportation area	Required Area: for buses for taxi for parking “Kiss and Ride” zone
Security aspects	ISPS (The International Ship and Port Facility) Code European Regulations and Directives (EU Regulation No 725/2004, EU Directive 2005/65, EU Regulation 324/2008) Requirements for the cruise lines (CVSSA 2010) Assessment plan for port landscaping
Financial aspects	Business plan Infrastructure, operation and maintenance costs Revenue sources

The main aspects of the cruise terminals' infrastructure are reviewed in the following sections using the above mentioned breakdown and paying particular attention to sustainability aspects.

5.2.1 Waterside elements

5.2.1.1 Ship channel parameters

The minimum water depth shall be such that the vessel can be reached safely through the canal to the berth, taking into account the vessel's potential deviations in movement.

The design depth must correspond to the maximum draught; taking into account the angle of heeling (heel), turning (trim), and the spaces under the keel in shallow water (squat); taking into account the conditions of the waves at the time of the ship's dive; ship's operator/owner has identified desired distances below the keel. The combined effect of these conditions can increase channel depth requirements by up to 3.00 m more than the projected draught.

Modern cruise ships are well maneuvered in the variety of sea conditions thanks to azipods, stern and bow thrusters. This infrastructure provides sufficient control of ships to minimize access channel widths.

[54] file:///E:/2018_Petijums_Kruiza%20turisms%20BJR%20un%20Riga/Info/Guidelines%20for%20cruise%20terminals_presentation.pdf

[55] https://docplayer.net/63996624-Guidelines-for-cruise-terminals.html

The PIANC guidelines prescribe that the channel width must be 5 x the width of the vessel (beam) under moderate conditions, 7 x the width of the vessel under less moderate conditions (moderate). However, in practice these dimensions are reduced to 2 x the ship width from the immediate vicinity of the berth. The channel's width below the PIANC guidelines should only be considered after consultation with the local pilots and by vessel entry/exit simulations. In the channel, the width increases by its length and approach, and possible different weather conditions.

The width of the largest cruise ships travelling in the Baltic Sea is 46.5 m (for example, Norwegian Escape), while at Riga port – 42.3 m (Mein Schiff 4).

Most cruise ship owners prefer to approach the berth without towing help, which may involve the width increasing of the desired berth and channel approach. The upper water height of the ships should be taken into account when constructing the infrastructure. The cruise ship's heights vary significantly and have risen up to 70 meters in several new boats. This condition reflects the demand and must be taken into account when determining the location of the acceptable cruise ship infrastructure.

5.2.1.2 Return channel parameters

The PIANC guidelines recommend a 2 x total length diameter plus the possibility for the ship to drift according to weather conditions. This parameter may be reduced in areas where the water is protected.

The length of the largest cruise ships travelling in the Baltic Sea is 326 m (for example, Norwegian Escape or Norwegian Getaway), while in the port of Riga – 294 m (Serenade of the Seas).

5.2.1.3 Berth height and depth

The height and depth of the berth must be determined taking into account the range of vessels that could use the berth concerned. This applies to both cruise ships and service vessels.

According to the PIANC guidelines the recommended berth height for new buildings should be at least the lowest of the following levels:
2.00 m above the average lowest water level,
1.00 m above the highest tide level,
1.00 m above the average maximum water level, also taking into account the expected rise in sea level.

Recommended water depth near the berth = boat draught + 2m.

The draft of the largest cruise ships travelling in the Baltic Sea is 8.75 m (for example, MSC Meraviglia), while in the port of Riga – 8.5 m (Serenade of the Seas), the recommended depths for the new terminals are at least 10.5-11 m.

5.2.1.4 Length of berth

For safe entry/exit to the ship's length (LOA) it is necessary to calculate additionally 10% of its length in the range from 15 to 30 m. Accordingly, the distance between the ships at the berth will also be within the specified interval.

Taking into account the parameters of new cruise ships the length of the berth must be at least 360-400 m.

5.2.1.5 Fenders etc. mooring infrastructure

The cruise ships are mostly sawn off using a berth stand where the maximum berth distance is next to the boat, which offers take-off / boarding efficiency. In some cases, ships are moored at berths shorter than the ship using stationary or anchored mooring buoys (dolphins) to protect the not tied up parts of the ship's at the coast. This type of mooring is more commonly known as intake (*midpoint*) vessels, since the berth does not require so much space.

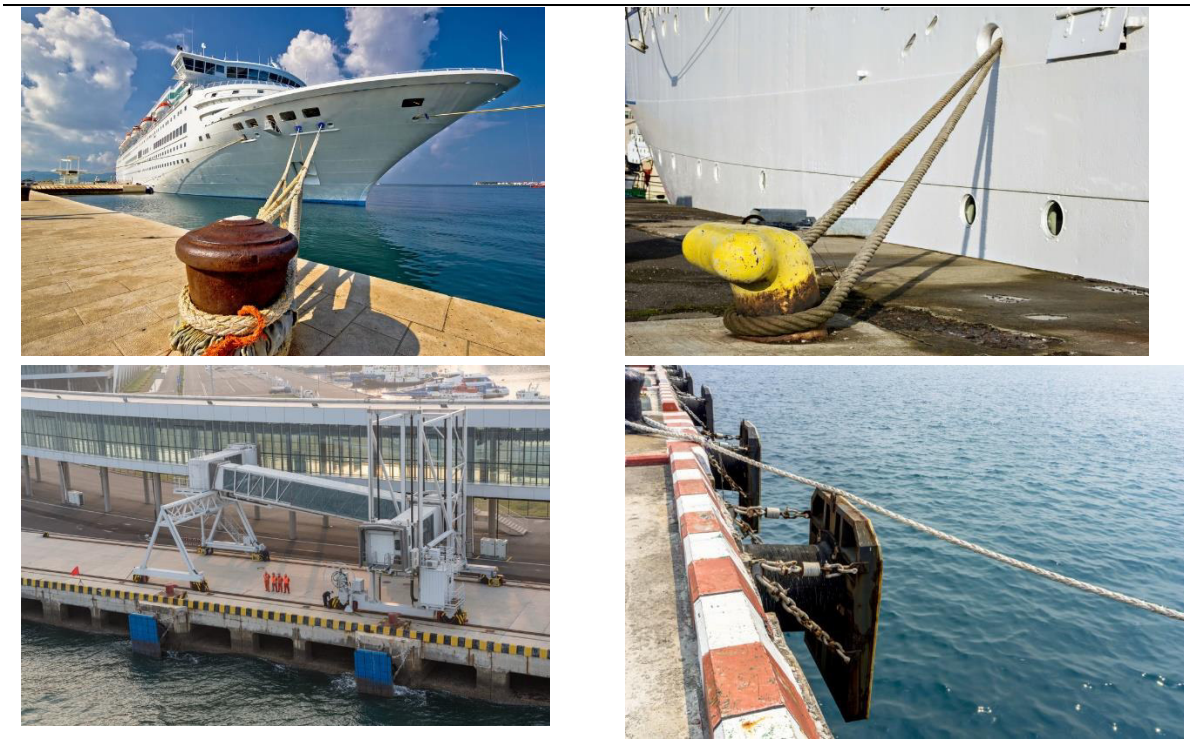

Image 1. Mooring systems[56]

Ships must have at least 30 mooring points (lines) in order to secure them. This number depends on the position of the wind and the position and capacity of the poller.

The more the ends are used, the more complex the mooring operation and the more potential impact on the berth operation are. And conversely, the less the mooring ends are used the greater load on individual poller is, what require stringent building constructions. The polar types can be different – the wide range of sizes, shapes, material and load categories are available. The choice of its type depends on the end user.

The load capacity requirements is determined using a site and a ship's mooring analysis, taking into account wind conditions, streams, tides and the impact of passing vessels. The modern cruise terminals use high-capacity mooring pollers, with a capacity from 100 up to 200 tons.

Fender system. Cruise ship berths are mainly equipped with the fender system on the entire berth edge to absorb the impact energy during the mooring of the vessel and provide a soft buffer between the berth edge and the ship during mooring.

5.2.1.6 Waves, streams, water level fluctuations

Specific studies of the water level should be carried out at least on: the average lower water level, the average water level, the average highest water level, and the highest and lowest recorded tides. The projected increase of the sea level during the berth life should be also taken in to account.
When creating the infrastructure and equipment of the berth, it is necessary to adapt the ship's mooring to all possible water levels in order to make the vessel fully operational.

5.2.2 Apron area

5.2.2.1 The berth width

The berth width should be from 6.00 to 30.00 meters. This area requires delimitation and security controls at all exit/entry points. It is important to keep easy access from the street (direct connection to the street). A

[56] www.shutterstock.com

separate connection is required for the service/emergency vehicle access and passenger flows, which would generally improve ship-related activities and services.

5.2.2.2 Doors and gangways, conveyors

All cruise ships have several doors intended for different functions and users in the berth service area:
- passenger boarding/disembarking doors;
- crew boarding/disembarking doors;
- delivery doors;
- luggage doors;
- technical door of the ship (for the supply of water, electricity, communication systems);

The gangways must be created to match the intensity of human flows, be adapted to a wide range of water levels and vessel movements and ensure safe boarding/disembarking to/from the ship in all weather conditions.

Several alternative ways are available for the gangways creating:
- fixed gangways - bridges from the berth or terminal;

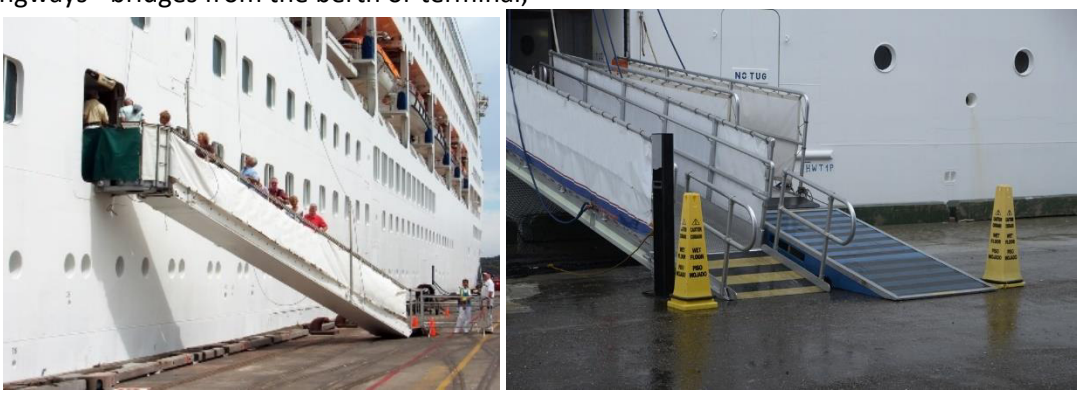

Image 2. Fixed gangways [57]

- fixed telescopic gangways which are fixed to the terminal side and movable on the vessel side (horizontally and vertically);

Image 3. Fixed telescopic gangway[58]

-mobile adjustible gangways which are not fixed on either end

[57] www.shutterstock.com
[58] http://www.nauticexpo.com

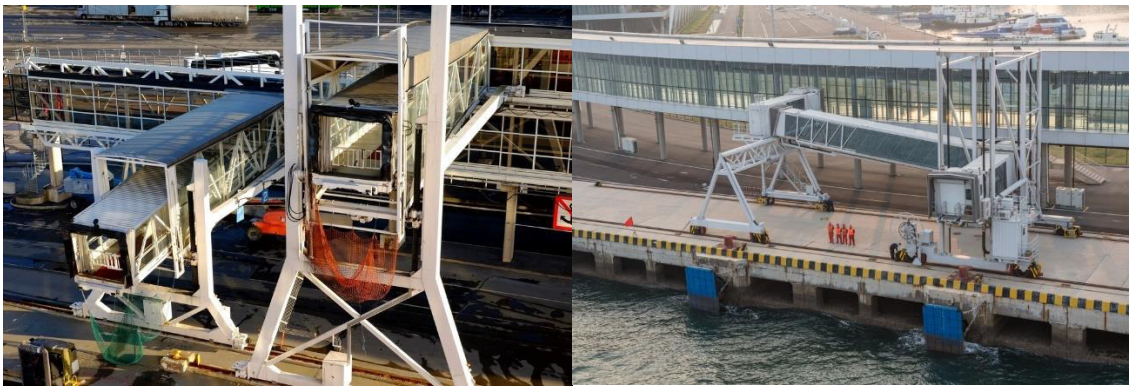

Image 4. Mobile adjustible gangways[59]

The choice of the gangways specific type depends on the terminal properties as well as the comfort level to be provided to passengers.

The recommended minimum pass through capacity of the gangways for the servicing of large ships is at least 1000 passengers per hour. Considering that in large ships such throughput should be provided for both entry and exit, in practice at least two such gangways are required at the terminal, this applies both to boarding and disembarking.

5.2.2.3 Passenger flow management at berth, tourism information

If passengers arrive in a city or land transport area straight from the berth without a terminal, the berth must to have clear indications as well as flow regulating equipment: barriers, etc. In addition, tourism information about the destination of tourist is even desirable there: a tourist map and other useful information. It is desirable to have a toilet, souvenir kiosk and free WiFi at this point too.

Image 5. Information signs[60]

5.2.2.4 Bunkering

The refuelling of the cruise ship does not take place at every port. It usually takes place in a turnaround terminal or an intake port that is in the middle of a cruise. Consequently, the bunkering infrastructure is not necessary but it is desirable, especially if the port is a turnaround terminal.

[59] www.shutterstock.com
[60] www.shutterstock.com

Fuel with lower sulphur content is used in order to respond to changes in regulatory enactments regarding sulphur content and nitrogen oxide emissions:

- Distilled fuel (MDO or MGO);
- Methanol;
- liquefied natural gas (LNG).

Marine gas oil (MGO) in contrast to heavy fuel oil, which is the oil distillation process residue, is distilled fuel, which contains more short chain hydrocarbons, fuel is light-coloured or transparent, it has lower sulphur content.

Marine diesel oil (MDO) is a mixture of heavy fuel oil (HFO) and marine gas oil (MGO) which at the same time satisfies the requirements for sulphur content and relatively economical fuel.

Methanol is low-emission fuel that meets strict environmental regulations.
It is pure for burning (reduction of SOx emissions by ~99%, reduction of NOx emissions by ~60% and reduction of particulate matter (PM) by ~95%. Methanol is relatively economical and is widely available, as it is one of the top 5 chemical substances transported by vessels. Methanol can be produced from renewable or fossil sources.
Since methanol is toxic, special precautions must be taken especially when performing bunkering and maintenance work.

MDO, MGO and methanol filling does not require in principle new infrastructure, an existing bunkering infrastructure of ports can be used for these fuels.

In turn, the providing of LNG filling requires in principle new infrastructure.

LNG (liquefied natural gas) is the purest of available fossil fuels. Using of LNG reduces emissions of SOx (-100%), NOx (-92%) and particulates (-100%). Using of LNG can also reduce CO_2 emissions. LNG vessels require sophisticated engine systems, special double insulation tanks, pipelines and a number of other special technical solutions that require high investment.

LNG filling requires a separate specific infrastructure – the terminal, provision of storage facilities.[61]

At the time of writing this report, several LNG terminals in the Baltic sea have been constructed or are at the construction stage, for example:

- Swinoujscie in Poland;
- Klaipeda in Lithuania;
- Nineshamn in Sweden;
- Pori in Finland;
- Hamin in Finland - construction;
- Visock in Russia;
- Gothenburg in Sweden;

LNG terminals are planned or analyzed in several places, for example in Tallinn (Muuga) in Estonia, Gavle (Sweden), Ventspils and Skulte (Latvia), as well as implementation of the project "Kundziņsalas South Project", which includes the construction of a LNG terminal.

[61] http://www.greencruiseport.eu/files/public/download/studies/The%20cruise%20market%20in%20Baltic%20Sea%20and%20neighboring%20North%20Sea%20-%20Pre-Feasibility%20Study_November%202014_Uniconsult.pdf

In addition, two LNG bunkering vessels operating in the Baltic Sea and one more LNG bunkering vessel is planned, which are not linked to a specific port.

Depending on a number of factors, such as the distance from a LNG terminal to a particular port, delivery frequency and volume, etc., one of the LNG bunkers' types is selected:

- One or several tank vehicles – directly or through a pump system;
- One or more tank trailers or ISO containers - through a pump equipment;
- Reservoirs for storing and filling the largest LNG volume with tank trucks, possibly in combination with tank trailers;
- Small LNG terminal;
- LNG barge (a combination with the reservoirs on land);
- LNG vessel.

The above mentioned LNG filling types are described in more detail in the report “Sustainable Energy Supply & innovative Solutions for Emission Reduction "Green bunkering of cruise vessels with sustainable fuel options”. The main conclusion from this study is that the variety of supply options allows choosing a solution for a specific case and that LNG supplies can also be provided without significant investment.

According to the EU Directive 2014/94/EU on alternative fuels by the 31st December 2025 an appropriate number of LNG filling stations should be created in seaports in order to allow LNG inland waterway vessels or sea-going vessels traveling throughout the TEN-T core network. At the same time, the location of specific terminals should be determined on the basis of cost-benefit analysis and demand analysis.

The foregoing means that the usefulness of an LNG filling infrastructure should be assessed at each specific port depending on the demand. At the moment constructed, existing under construction and planned LNG terminals in the Baltic Sea offer a wide range of filling options for cruise ships. The cruise ship fleet is gradually changing to the LNG powered fleet increasing demand for LNG filling, especially at turnaround terminals.

5.2.2.5 Shore power supply

The shore power supply allows significantly reduce SOx and NOx emissions, as vessels for electricity generation are longer use spare engines but receive electricity from the shore. The environmental friendliness of this solution depends on which energy resources electricity is produced. There may be the cases where electricity production by a ship engine powered by MDO or LNG, or if the ship has an exhaust gas cleaning system, is more environmentally friendly than a shore power supply produced from coal.

In accordance with the requirements of the Directive 2014/94/EU the Member States should evaluate the shore power supply (*cold ironing*) for sea-going vessels at sea and inland ports. Such shore electricity supply must be prioritised for installation in the TEN-T core network ports and other ports by the 31st December 2025, except where there is no demand and costs disproportionate to the benefits, including environmental benefits.

Considering the previously mentioned, the usefulness of shore electrical supply should be assessed in each specific case. The price of electricity for industrial consumers in the energy system of the concerned country plays an important role in this assessment.

Two principal ways are present for a providing of the shore power supply: by connecting to the domestic power supply network or by an LNG barge where generators are installed. A brief description of both types is below.

Connection to the domestic power supply network

In this variant the connection is provided on a high voltage or medium voltage network. The infrastructure includes transformer substations, frequency converters, necessary cables and connections.

Taking into account the diversity of vessel power systems, such systems usually offer different frequencies (50 and 60 Hz) as well as different voltages and capacities.

An example of this solution is Hamburg Alton's terminal which provides a permanent installation that supplies electricity at frequencies of 50 Hz or 60 Hz.

An interesting solution is introduced in Kristiansand port where shore power supply is provided by Powercon container modules which offers an incoming and outgoing voltage range from 400 V to 60 KV with the frequency of 50 and 60 Hz and the power from 100 kVA to 100 MVA. The system is flexible because it is not attached to a particular berth.

Due to the connection of high power electrical load an expensive modernization of electricity supply infrastructure can be required.

The total investment cost for the construction of electricity supply infrastructure related to domestic electricity supply with 2-3 connection points is 10-15 mln. EUR[62].

LNG hybrid barges

New innovative ship power supply technology is LNG barges, which include LNG tanks, regasification equipment and gas turbines that generate electricity. The barge is connected to the shore electricity distribution infrastructure, which is connected to the ships accordingly. The total electricity generation capacity of the LNG barga can range from 4 to 35 MW and it can provide electricity up to three ships simultaneously. The LNG barge can provide electricity with different frequency and voltage parameters as needed.

Image 6. LNG barge[63]

The LNG barge is a flexible and mobile solution that can deliver electricity to a cruise ship during the summer season and can operate as a source of energy and heat in the winter.

The total cost of the LNG barges and the necessary shore infrastructure can be around 16 mln. EUR.

[62] Bergen og Omland Havnevesen. 2018. Onshore Power Supply for Cruise Vessels –Assessment of opportunities and limitations for connecting cruise vessels to shore power

[63] © HPE Hybrid Port Energy

According to studies[64], in which the calculation of coastal electricity supply have been carried out, the infrastructure itself does not pay off and the state support is needed. Investments are usually carried out by the port authorities in co-operation with energy companies.

5.2.2.6 The waste management of the exhaust gas treatment systems (scrubbersystem)

The use of exhaust gas purifiers (Scrubbers) requires the disposal of waste – sludge/ash with high sulphur content. Accordingly, if a large proportion of the ships use purifiers, a disposal infrastructure is required.

Typical a collection of such waste is provided by the operators of hazardous waste.

5.2.2.7 The reception of waste water

The Baltic Sea region is designated as the "Special Waste Water Zone for Passenger Ships" by the MARPOL Convention Annex IV (the Resolution MEPC.200(62).

The coastal states of the Baltic region should to ensure:
- wast water reception facilities in the ports and terminals located in a special territory and used by the passenger ships.
- the equipment suitability to serve the passenger ships; and
- the operation of the equipment which would not prevent unjustified delays of the passenger vessels.

Wast water includes both "black" waste water (wast water and other waste from any type of toilets and urinals) and "gray" wast water (wast water from washbasins, baths and drainage pipes located in the medical treatment rooms (ambulances, lazarets, etc.)).

Shore infrastructure for the ships' waste water reception

The MARPOL Annex IV (Regulation 10) sets standards for the ships' waste water systems connections to the port reception infrastructure.

The ships transfer waste water to a reception facility by the vessel pumps. Some ports regulate the pumping speed. For example, the port of Copenhagen requires the vessels to pump black waters with a flow rate of at least 30 m3/h and grey waters with a minimum flow rate of 50 m3/h per one berth place. The typical cruise ship's pumping capacity is 200-300 m³/h. The vessels are interested in a providing of sufficient capacity to manage the waste water discharging in a short time.

The passenger ships have different needs for the waste water discharge, depending on vessel's size, number of passengers, voyage duration, drainage and purification systems. The port needs a PRF (port reception facility) that meets the needs of incoming ships (the Resolution MEPC.83(44)). The port is recommended for its users and IMO – GISIS (Global Integrated Navigation Information System) to clearly indicate the waste water reception capacity.

The cruise ship's staying in the port continues about 8-11 hours what means that the waste water should be pumped in about 6.5-9.5 hours. The suction capacity should be high in order to avoid vessel's delay as the amount of waste water can be high. The cruise ship companies have expressed their willingness to transfer from 800 to 1200 m³ of waste water per staying at a flow rate of 200-300 m³/h, as well as about 270 m³ of the highest density of sewage sludge per port's intake.

Use of barge and tank trucks

The barges and road tankers are used in the ports which do not use the stationary sewage pipelines.

[64] City & Port Development, CMP and the City of Copenhagen (2015); Bergen Port, DNV GL (2018)

The barges and tanks have limited volume and larger volumes should be transferred into several parts, so larger cruise ships may not be able to complete the discharge in time. A multiple connection and disconnection pose a safety threats – a leakage possibility, odour and other risks, what is a lack in comparison with a fixed connection, however, it is a solution to ports with a limited capacity of berths or other infrastructure constraints.

5.2.2.8 Water supply

It is estimated that 3500 passengers need about 750 m^3 of water per day or 5250 m3 for 7 days cruise. Most part of this water demand is provided by using on board water desalination systems, however, about 550 to 750 m^3 required to be delivered when the ship is at the berth. It is more expedient to supply such volume with direct connection to the urban water pipeline located in the port

5.2.2.9 Reception of household waste and sorting of waste

The ports should to provide a possibility for the reception of household waste and sorted household waste. Some ports provide the cruise companies with discounted rates on sorted waste transfer.

5.2.3 Terminal building

5.2.3.1 Terminal building types

The main objectives of the terminal building are to optimise the flow, increase passenger satisfaction, reduce the number of employees and ensure security.

The cruise terminals can be classified according to the type of buildings in four categories by their type of use, expected duration of service, flexibility and neighborhood development. The type depends on the cruise business in a specific location, as well as on the level of capital investment and property ownership.

Generally speaking, an entry terminal does not require a separate terminal building, since the purpose of such site is to ensure the movement of passengers from the ship to the tourist destination at the port and back as soon as possible. But in practice, both midpoint terminals and turnaround terminals use all types of the terminals. A specific solution can be assessed in each particular situation and depends on the number of vessels' arrivals, the flow of passengers, and the attractiveness of the tourist destination and, accordingly, the ability of the terminal to determine and the cruise operator's willingness to pay a higher terminal fee.

5.2.3.1.1 Temporary Terminal

It may be the initial stage of the terminal, the terminal function is only provided on the days when the ship is at the berth and the terminal is required at the time of boarding and disembarking. The temporary terminal can be created using mobile barriers, such traffic organisation solutions as poles, cones and tapes, etc. Baggage transfer and check-in are organized separately with the equipment introduced for the day. The service is based on employees to make it viable.

Depending on environmental conditions, tents and similar sheds can be used to provide shadow or protection from weather conditions, and non-conventional cost-effective structures can also be used, save time, increase the attractiveness of the site, which increases the interest in the respective cruise destination. At this stage utilities are provided for a limited period using generators, portable hardware/equipment, etc.

The temporary terminals are mostly used in midpoint terminals, but in some cases where they are used in turnaround terminals with small number of cruises (for example, in Tallinn).

Image 7. Temporary Cruise Terminal in Newcastle, Australia [65]

5.2.3.1.2 Convertible terminal

In many ports the cruise market starts with this type of building or it may be the second phase of the cruise terminal development. This building serves as an independent building that meets industry expectations. The primary use of this type of building is not the cruise terminal, what means that the building will be satisfactory for the needs of the cruise, but not ideal. As in the temporary terminal, baggage, passport control, etc. services are provided only on a cruise day, especially by bringing furniture, enclosures and equipment. This variant requires more staff to ensure efficient passenger service when disembarking and boarding. Passport control processes can be provided on board of the ship, baggage and checks may be carried out in the same area as the boarding, registration and waiting area. The main function of such buildings may be, for example, a warehouse that to be temporarily adapted to the needs of the terminal (for example, room heating, introduction of temporary toilets, security measures, etc.).

5.2.3.1.3 Special cruise terminal

This type of terminal is specially created to meet the needs of cruises and provide functionality for both boarding and disembarkation. These buildings may also have secondary uses, such as events, shopping place, cafes, restaurants, etc. In this case cruise servicing is the primary purpose of the building's use. Entrance and disembarkation areas, furniture, equipment, etc. in the building are created to optimize passenger satisfaction, optimize flows, reduce a number of employees and maintain safety. These buildings tend to be part of a larger port system in the waterfront context. There is no other use for the building without cruise servicing.

[65] https://www.theherald.com.au/story/5242541/cruise-terminal-needed-for-first-impressions/#slide=10

Image 8. Cruise Center in Singapore

The architectural solution of the building can be both more complex and expensive (for example, such as in Singapore), both simpler and less expensive (for example, such as in Liverpool)

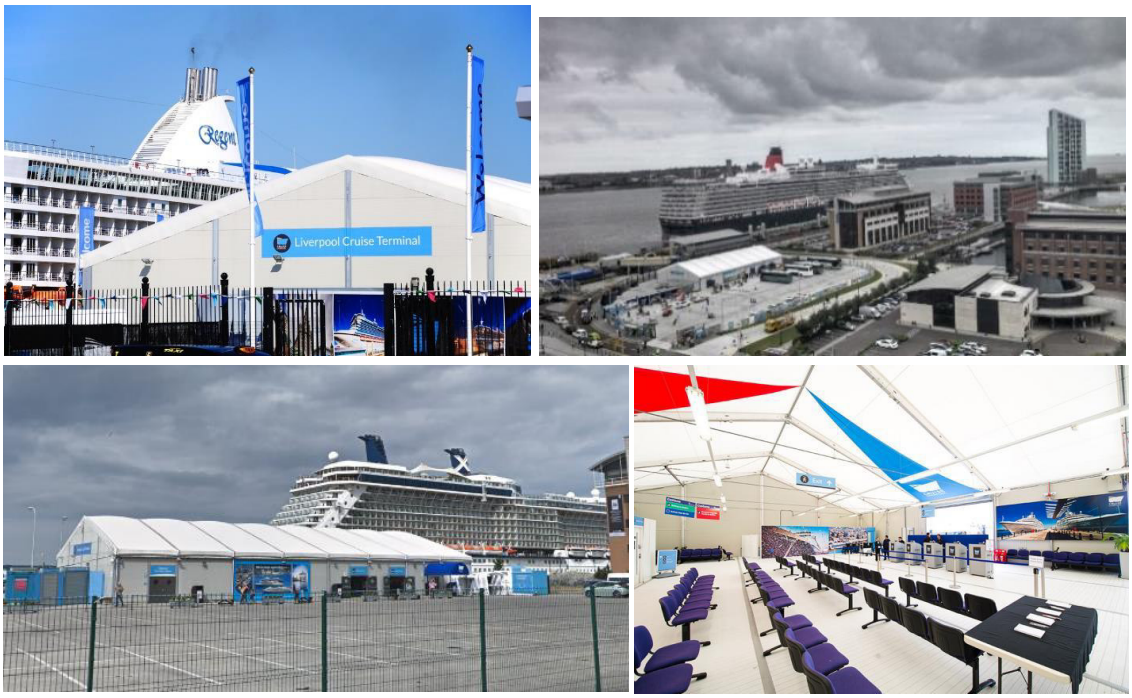

Image 9. Liverpool Cruise Terminal[66]

5.2.3.1.4 Multifunctional (mixed-use) terminal

The last type of development is a multi-functional terminal. Such a mixed-use building contains all the necessary elements of a purposefully constructed terminal and added other planned objects such as shopping areas, an aquarium, conference rooms, etc.

[66] www.shutterstock.com, http://www.cruise-liverpool.com, Google maps

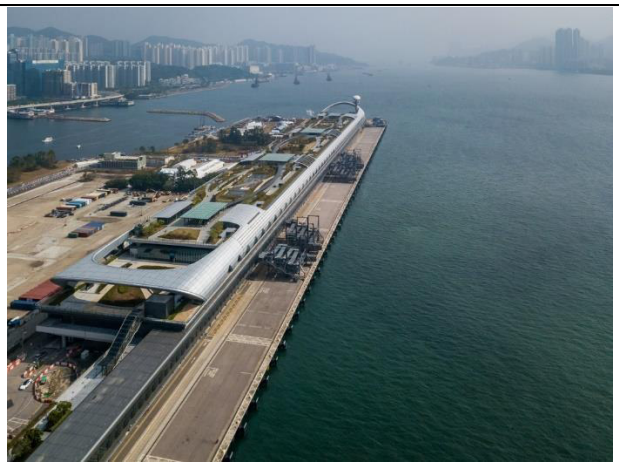

Image 10. Multifunctional Terminal in Hong Kong[67]

5.2.3.2 Necessary premises and services in the cruise terminal building

The layout of particular cruise terminal should be based on its specific and this terminal should have flexible zoning and multifunctional spaces as far as possible.

The following premises are needed at turnaround terminal terminals. At the incoming terminals the premises program will be similar, except for passenger registration and luggage handling premises.
Boarding flow premises:

- Entrance
- Baggage transfer place and baggage scanners
- Security check and space for queues before it
- Passport control
- Registration room (check - in)
- Waiting rooms
- Places for taking photos
- Employees/agents working rooms
- Employees recreation rooms
- VIP entrance
- Wedding and other groups of entrance
- Boarding zone before the trap
- Traps to the ship

Disembarking flow premises:

- Traps from the ship
- Disembarking corridor
- Passport control, customs, phyto-veterinary inspection, police
- Luggage delivery
- Waiting (meet & greet) zone

At the terminal toilets must be provided, WiFi is often provided, as well as sales and services.

[67] www.shutterstock.com

5.2.3.3 Boarding and embarkation routes, tourist information

The terminal building should have clear indications to the main terminal areas, to the city, as well as tourism information.

5.2.3.4 Use of sustainable technologies in the building structures and systems

According to the EU Directive 2010/31/EU on the energy efficiency of buildings all new buildings from 2021 and public buildings from 2019 should be near zero energy buildings, which is defined as "a building with very high energy efficiency... Almost zero or very small amount of needed energy should be covered to a very large extent by renewable energy sources, including on-site or near produced energy from renewable sources". The Member States should set their own requirements for nearly zero energy buildings.

For example, in Latvia almost zero energy building is defined as a building where

- the building's energy efficiency index for heating corresponds to the Class A (not exceeding 40 kWh per square meter per year), while ensuring that the micro climate of the premises complies with the requirements of the regulatory enactments in the field of construction, hygiene and labour protection;
- the total primary energy consumption for heating, hot water supply, mechanical ventilation, cooling, lighting shall be not more than 95 kWh per square metre per year;
- high efficiency systems are used in the building, which:
    - ensure that no less than 75% of the loss of ventilation heat is recovered during the heating period;
    - ensure at least partly the use of renewable energy;
- the building does not have installed low-performance fossil fuel heating equipment.

The following sections describe various elements of sustainable construction for the terminal buildings, which can achieve near-zero building compliance.

5.2.3.4.1 Building's shape, location and architecture

The shape and location of the building against the heavens affect the benefits and losses of heat. An important factor in the building's heat retention is the proportion of glazed surfaces: the larger it is, the lower the thermal insulation (the thermal transmittance coefficient U for the almost zero energy building wall is about 0.1, windows - around 0.7-1.0 or 7-10 times bigger).

5.2.3.4.2 Building envelope

Modern enclosure structures are used to ensure greater thermal insulation of the building, including specially created wall constructions, three-pane windows, and so on. Green roofs are also used which not only reduces rainwater drainage but also provides thermal insulation.

In the case of glass facades, double facades are sometimes used.

5.2.3.4.3 Heating, cooling and ventilation systems

The sustainable buildings use district heating as much as possible, where heat is predominantly produced in a combined cycle with electricity. Both urban co-generation plants for heat and electricity generation and smaller scale plants, which are built for example for airport, port or neighbourhood purposes, are used.

Sea-water or ground-based heat pumps are used for local sustainable heating and cooling solutions at the cruise terminals.

Heating, ventilation and cooling are divided into zones, regulating heating or cooling needs in each zone on demand in order to reduce energy consumption.

The ventilation units use heat or cold recovery, returning heat or cold from the outgoing air by the heat exchangers.

5.2.3.4.4 Lighting and electrical appliances

Already the usual practice in sustainable terminal buildings is using of energy-efficient LED lamp lighting with automatic switching on and off by the motion detectors.

5.2.3.4.5 Using of renewable energy

The renewable energy production is used in the sustainable terminal buildings:

- solar PV panels;
- solar collectors for heating and water heating;
- wind generators.

5.2.4 Ground transportation area

This section describes the preconditions/requirements for the terminal's transport infrastructure or connections to the city.

5.2.4.1 Mobility Types Combination /Trends

When planning the land transport area and determining the location for the various transport types, it is necessary to take into account the specific transport types to the site as the terminal functions (intake/home), the proximity of the tourism destination, the practices of the ships and tourism agents, the transport systems in the concerned city and by which transport types passengers reach the port.

5.2.4.2 Public transport

A public transport stop should be in close proximity to the terminal and the timetable for public transport should be consistent with the time of cruise ships' arrival. It is desirable that several routes are available connecting the port to the city centre or other tourist sites. In the case of a home terminal, there must be good connections to the airport, station and other transport units. It is desirable to provide night transport. In addition, a public transport ticket should be possible to buy at the terminal (a ticketing machine or information centre). In the case of a turnaround terminal, it should be possible to make a flight registration.

5.2.4.3 Taxi

24-hour taxi parking should be provided at the terminal.

5.2.4.4 Parking places, shared cars

In the case of the home terminal and if it is expected that a large part of the passengers will use private transport, long-term parking places should be provided near or at the terminal. In any case, the terminal should provide short-term parking places. However, the number of parking places should be not too high to encourage the sustainable use of the transport types. It is desirable to have a car sharing site reserved to the terminal. Also, it's desirable to provide real-time free parking information on the terminal homepage, the "Port App" mobile application, or in conjunction with other application developers.

The terminal should to have a sufficient number of the bus stops for the tourist buses to ensure the transportation of the required tourist number.

5.2.4.5 Kiss and Ride zone

The terminal requires an area for people dropping off or picking up passengers (kiss and ride) with sufficient space for regular human movement through it and at the same time for a short stay, if it is an outdoor space

a shelter for different weather conditions should be provided, if is an indoor room - aesthetic environment, for example, a glazed room with panoramic view, which may be combined with a waiting room.

5.2.4.6 Bicycle infrastructure, incl. shared bicycle

In particular, in the case of a incoming terminal a cycling infrastructure should be provided with a connection to the city infrastructure (bicycle tracks), a possibility to park the bicycles in the port area (parkings with shelter).

It is desirable to have a shared bicycle point where a bicycle can be rented for a specified period (using application, leaving it there or at another point at the port).

5.2.4.7 Connection to a pedestrian infrastructure

In particular, in the case of the incoming terminal, a high-quality pedestrian infrastructure and convenient connections to tourist attractions such as the city centre should be there.

5.3 The requirements for the location of terminals – Midpoint and Turnaround ports

Based on international studies, incl. research information from the Green Cruise Port project, it is possible to define the main requirements for the location of the terminals, particularly taking into account passenger amenities and sustainable mobility aspects.

5.3.1 A compliance with the spatial plan and free port border

It is very important that the location of a potential terminal is located in an area where the passenger ships' berths and the construction of the terminal are permitted in accordance with the city's spatial plan. The changes to zoning and spatial planning can take a very long time and are not guaranteed taking into account a potential public opinion.

In addition, if the status of a free port is essential for the operation of the terminal, it is important that the potential terminal is located within the territory of the Free Port.

5.3.2 Waterside and berth parameters

Both the Midpoint and Turnaround ports must meet certain parameters so that the vessel can physically moor and disembark passengers - parameters of the approach channel, parameters of the turning basins, berth parameters - depth, length and mooring infrastructure. All of the above mentioned parameters are described in detail in the Chapter 5.2.1 “Waterside elements”.

5.3.3 Proximity to the city centre / tourist attractions and pedestrian infrastructure

The proximity to the city centre / tourist attractions is particularly significant for the midpoint terminals where cruise ships stay for a certain period of time and then go to the next destination. In general, it is important not that the terminal is located geographically close to the city's central part and tourist attractions but as these areas are quickly and easily accessible. Even if the physical distance between the terminal and the city's parts of the tourists' interest is relatively high, this can be solved by providing convenient, fast and diverse connections. Optimal walking time and distance to the nearest public transport stop or tourist attractions, which people are ready to walk, is up to 10 minutes or ~ 800 m.

It is necessary to ensure a connection with high-quality and secure pedestrian infrastructure (priority in Midpoint ports) providing the opportunity to reach the nearest tourist attractions as well as strategic points like the city centre, the silent centre, the Old Town, etc. by walking, because often the cruise ship's passengers choose to go on long or short walks exploring the city directly from a pedestrian perspective.

5.3.4 A Proximity to Sustainable Mobility Types For Passenger Transport

5.3.4.1 Bicycle infrastructure, incl. shared bicycle rent

An essential requirement for the location of the Midpoint ports in relation to the city is a link to existing bicycle infrastructure networks. A convenient connection to the bicycle infrastructure is particularly important for the Midpoint ports since the ship's passengers have limited time for the city viewing - bicycle infrastructure availability near of the terminal, incl. availability of the shared bicycle points or, for example, electric scooters (rental) diversifies the possibilities for a comfortable city viewing.

5.3.4.2 Public transport infrastructure

As an essential requirement for the Midpoint ports should also be mentioned the location near to the existing city's public transport networks, what is also relevant for the ship's passengers with limited time for the city viewing. If such connection is difficult to provide at a comfortable walking distance, it is necessary to look for other solutions, for example, to provide buses that deliver the passengers to the city centre and offer a return on board at a certain time. Unlike the Midpoint ports, the Turnaround ports have a more important direct connection with transport networks to the extent that the terminal is easily accessible from both the airport and the international railway station or station. It is necessary to provide to the terminal the fast and convenient public transport network connections with the railway station and the airport (train, tram, bus, trolley bus). It is desirable that the airport be less than an hour drive from the Turnaround terminal.

5.4 Summary table with the minimum and optimal requirements for the Midpoint and Turnaround ports

The table below summarises the necessary and desired aspects of infrastructure and location at cruise terminals. Necessary aspects are determined by the legislative requirements and the feasibility of the terminal's operation, the desired aspects by the good practice of the sustainable terminals and the development trends of future infrastructure.

Table 13. Minimum and optimal requirements for the Midpoint and Turnaround ports

Infrastructure component	Midpoint terminal - required	Midpoint port - preferably	Turnaround terminal - required	Turnaround terminal - preferably
Requirements for Cruise Terminal Infrastructure				
Minimal characteristics of the berth (depth, length)	✔	✔	✔	✔
MDO, MGO bunkering	✖	✔	✖	✔
LNG filling options[68]	✖	✔	✖	✔
Shore power supply	✖	✔	✖	✔
Reception of waste water by a barge or a cistern truck	✔	✔	✔	✔
Reception of waste water by pumping into the sewerage network	✖	✔	✖	✔
Water supply by a barge or cistern truck	✖	✔	✖	✔

[68] LNG refuelling possibilities should be provided at one of the cruise ports but not at all ports, as no LNG refuelling takes place in each port

Infrastructure component	Midpoint terminal - required	Midpoint port - preferably	Turnaround terminal - required	Turnaround terminal - preferably
Water supply with a direct shore connection	✗	✔	✗	✔
Reception of household waste	✔	✔	✔	✔
Reception of divided waste	✔	✔	✔	✔
Reception of hazardous waste	✔	✔	✔	✔
Terminal building	✗	✔ May be a temporary structure	✔ May be a temporary structure	✔
Energy Efficiency Level of the Terminal Building	Nearly zero energy building			
Public transport stop in the immediate vicinity of the terminal	✗	✔	✔	✔
Private car parking areas	✔	✔	✔	✔
Bus parking areas	✔	✔	✔	✔
Kiss & ride and taxi parking areas	✔	✔	✔	✔
Shared cars / car rental station / parking areas	✗	✔	✗	✔
Shared bicycle station	✗	✔	✗	✔
The requirements for the Cruise Terminal location				
Minimal width and depth of the vessel channel	✔	✔	✔	✔
Minimal size of the turning basin	✔	✔	✔	✔
A compliance with the functional zoning of the territory and the status of the free port	✗	✔	✗	✔
Walking accessibility of the City Centre / Tourist Attractions	✗	✔	✗	✔
A sufficiently quick connection to the airport and the international train station - by private transport / taxi	✗	✗	✔	✔
A sufficiently quick connection to the airport and the international train	✗	✗	✗	✔

Infrastructure component	Midpoint terminal - required	Midpoint port - preferably	Turnaround terminal - required	Turnaround terminal - preferably
station - by public transport				

6 Examples of good practice in European ports in relation to the introduction of sustainable development aspects at cruise terminals

The study of the sustainable development aspects at cruise terminals in some of the most important ports around Europe it can be concluded that the ports do not focus on sustainability of cruise terminals specifically but rather as a broader sustainable port agenda.

Nevertheless, port sustainability aspects most relevant for the cruise ship terminals have been summarised and presented in this part.

These cruise ship terminals are in Copenhagen Malmö Port (Denmark – Sweden), Hamburg Port (Germany), Stockholm (Sweden), Kristiansand Port (Norway) and Tallin Port (Estonia).

In the following part some important background about the different ports is presented to understand better characteristics and importance of cruise terminals, and then sustainability aspects, objectives and features of each one are discussed.

6.1 Copenhagen - Malmö Port

6.1.1 General information

Copenhagen Malmö Port (CMP) operates the ports in Denmark's capital Copenhagen and in Sweden's third largest city, Malmö. The ports are located either side of Øresund, a strait between the two countries.

CMP is one of the biggest ports in Europe in terms of cargo ships and industry. Considered as an important regional hub, it's also the gateway to the entire Baltic Region with more than 100 million consumers.

Image 11. Industrial port of CMP.[69]

Furthermore, *CMP* is the **leading turnaround cruise port** in Northern Europe and among the most popular departure ports for Baltic Sea itineraries.

Copenhagen has space for 9 cruise ships and Malmo for 3, but also cargo ships and ferries are operating in each one.

CMP offers **three cruise quays in Copenhagen**: Nordre Toldbod, Langelinie Pier and Ocean Quay.

[69] Google Images

· ***Nordre Toldbod:***
The smallest one, with approximately 225m of quay (water depth is 7.4m).

· ***Langelinie:***
Approximately 710m of quay. There is space for two to four ships, depending on their length and draught. At the southern end the water depth is 9.1m, meanwhile in the northernmost 345m of quay (from bollard no. 32 and northwards) the water depth is 10m.

· ***Ocean Quay*** (*The sustainable turnaround port*):
Approximately 1.100m of quay, water depth is 10,5m, with state-of-the-art terminals.

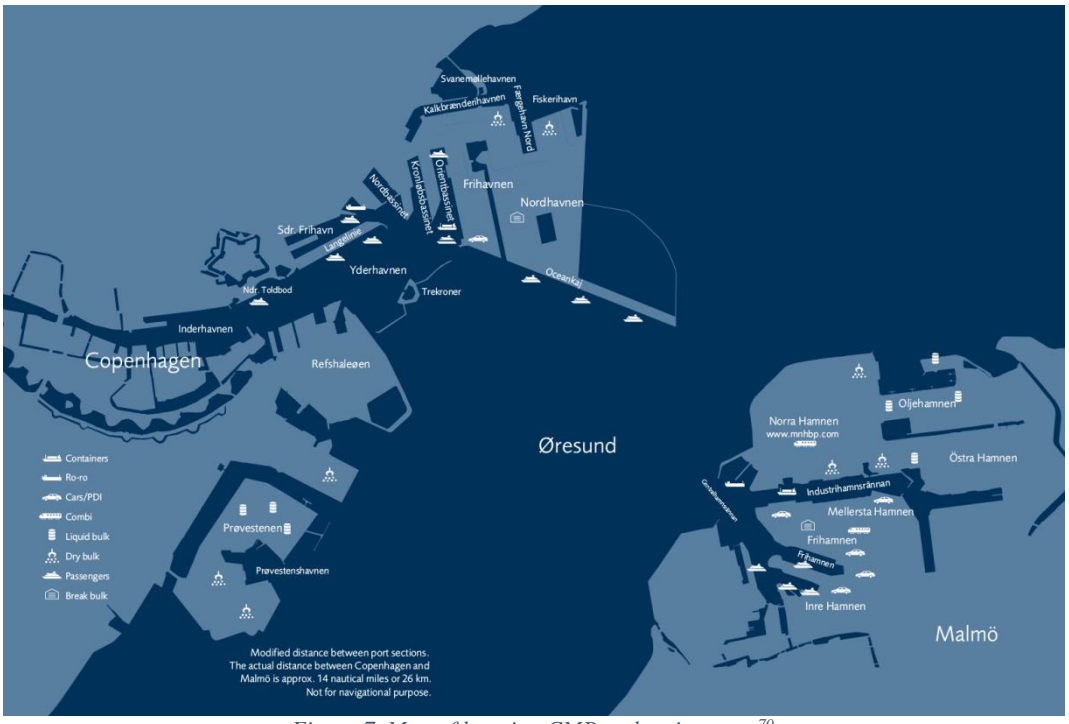

Figure 7. Map of location CMP and main areas.[70]

6.1.2 Sustainability background

CMP is one of the most environmental friendly ports around the world and a good example to take in consideration. Approximately SEK 2.5 billion has been invested in new logistics and infrastructure solutions in Copenhagen and Malmö between 2010 and 2014. The investments are in freight and passenger terminals, quay installations, machinery, cranes and other infrastructure.

These investments are part of a refurbishment plan with the objective to make the port more sustainable.

CMP made action on environmental issues an important part of its strategy. **CMP has encouraged a development of environmental and quality management systems, and is a member of the environmental organization *EcoPorts Foundation.***

The environmental policy of CMP is focused on work to create a balance between economic, social and environmental aspects. Port's environmental approach focuses on air, water, soil quality, energy and waste cycles. In the long run, the aim is to reduce the port's environmental impact both on a global and a local level, for example climate change and noise pollution.

[70] *www.CMPport.com*

The environmental policy affects the entire port and is not is specific for cruise terminals. The environmental objectives of the CMP are the following:

1. Energy

Reduce electricity consumption and heating requirements by an average of 2% per year through efficiency solutions. At the same time, increase the proportion of internally generated energy by an average of 5% per annum.

2.Air

Be CO2-neutral by 2025 through changing to fossil-free fuels and fossil-free sources of energy for electricity and heating. The indoor air will be of good quality and there must be no risk of toxic substances in connection with demolition work.

3. Water

Contribute to achieving and ensuring a good biological and chemical status in the classified bodies of water that CMP affects.

4.Land

Spillage on permeable areas will be minimised.

5.Waste

Follow the so-called waste staircase. Waste generated by CMP will be cut by an average of 4% per annum and the degree of recycling will be 50% (excluding hazardous waste) by 2020. For waste generated by ships, the combustible and unsorted waste will be reduced by an average of 2% per annum.

6. Climate

CMP will develop a clear picture of how the ports are affected by changes in the climate. The ports' role in such a situation must be clear.

Below are described the features of the environmental policy relevant for the cruise terminals.

6.1.3 Sustainability initiatives relevant for the cruise terminals

6.1.3.1 Terminal location

The location of the new cruise terminal Ocean Quay where turnarounds are served is further out towards the sea. This makes the air emissions from the cruise ships less of a problem for people who live close to the port. At the same time, the terminal is well accessible by the public transport. The cruise terminal is connected with the city by regular public transport bus route 27, in addition bus 25 is run when cruise ships dock at the Ocean Quay.

6.1.3.2 Waste water management

Permanent facilities for wastewater have been installed at Ocean Quay, which can carry the waste of three ships simultaneously (300 cbm per ship per hour). The cruise ships pump their wastewater to these facilities, which convey the water in pipes to the sewage treatment plant. Both black water that is flushed out from toilets and grey water from baths, showers, washing-up and laundry can be processed.

6.1.3.3 Shore-to-ship power connection

Docked ships can plug into the land power grid, eliminating the need to run auxiliary engines.

6.1.3.4 Terminal building constructions, energy efficiency and renewable energy

The terminal buildings of the Ocean Quay cruise terminal are built with high energy efficiency. Moreover, the three buildings at the Ocean Quay cruise terminal are furnished with 9,900m² green roofs. This roof consists of live vegetation and as a result, the plants on the roof both subdue noise pollution and purify rainwater, also reducing energy demand for the building.

The south side of the Ocean Quay terminal is equipped with solar PV panels and is filled with natural light from skylights above. If additional heating or lightning is required, energy comes from a CO neutral source (wind, solar etc.)

Motion detectors and LED lighting are installed to minimise lighting electricity consumption.

Image 12. Cruise Terminal Ocean Quay (CMP).[71]

6.1.3.5 Controlled hull cleaning service

Biological roughness or fouling increases the resistance and consequently fuel consumption of the ships. The CMP offers to clean the hull filtering organic and water waste, not using toxic antifouling.

6.1.3.6 Encouraging separation at source

Recycling points are located on the quays where the crews can separate their waste at source. In some cases economic incentives are offered to those who separate at source in the form of a discounted port charge.

6.2 Hamburg Port

6.2.1 General information

The Port of Hamburg is a sea port on the river Elbe in Hamburg, Germany, 110 kilometres from its mouth on the North Sea. It's Germany's largest port, in terms of TEU throughput, Hamburg is the second-busiest port in Europe (after Rotterdam) and 15th-largest worldwide.

Hamburg is a major cruise destination and one of Europe's largest ports of call for cruise passengers travelling the Atlantic, or the Norwegian and Baltic Seas. Due to the many touristic attractions the city has to offer, the unique inner- city location of the port and excellent waterside and landside infrastructure for cruise ships. Hamburg also offers excellent air connections and attracts international cruise ship passengers who start or end their journey in Hamburg.

Hamburg has three passenger terminals for cruise ships: Hamburg Cruise Center HafenCity, Altona and Steinwerder, all three capable of processing the world's largest cruise ships.

[71] www.CMPport.com

Hafencity

The cruise terminal HafenCity lies very near the city. Two cruise ships can be handled at the same time.

Image 13. Hafencity cruise terminal (Port of Hamburg).[72]

Altona

Hamburg Cruise Center Altona lies on the Elbe between the Fish Market and the beach at Oevelgönne. The inner city is just 15 minutes away by public transport. The berths can take cruise ships up to 300-metres-long, with the ships' power supply coming from the shore as from summer 2015.

Image 14. Altona cruise terminal (Port of Hamburg).[73]

Steinwerder

In June 2015 a third cruise terminal came into operation in Hamburg, the Cruise Center 3 (CC3) at Kronprinzkai, in Steinwerder. The terminal can serve the largest cruise ships, more than 330 metres long. The embarkation and disembarkation areas are separate, so that 8,000 visitors can be dealt with on two parallel passenger bridges. The terminal offers 1,500 car parking spaces as well as extra capacity for buses, taxis and trucks. Land-side Hamburg's inner city is less than 20 minutes away. In addition there is a public waterbus stop connected to the HADAG network. The cruise ship terminal is intended to be used initially for 15 years.

[72] www.Cruisemapper.com
[73] Google Images

Image 15. Steinwerder cruise terminal (Port of Hamburg).[74]

6.2.2 Sustainability background

The port of Hamburg, Europe's third-largest container port, is setting the bar for green, sustainable business solutions. Hamburg's maritime trade started developing eco-friendly technologies several years ago, as a consequence of pollution and degradation of Elba's river ecosystem. Today, the port of Hamburg can boast highly efficient global transport chains combined with green, sustainable port operations. Port's model "Ecological City Port" aims at pursuing environmental and climate protection aims in shipping, reducing emissions from terminals, influencing the modal split strengthening the railway and inland waterway shipping, nature conservation in the port as well as environmentally friendly energy supply in the Port.

Specific sustainability measures of the Port of Hamburg include:

1. **Use of sulphur-free fuel**. Since 2009, the *Hamburg Port Authority* (HPA) has been using this for its own fleet of ships.

2. **Spaces for barges and ferries are equipped with a land power connection**

3. **Incentives for enhancing eco-friendliness in shipping**
In collaboration with *ECOPorts,* the HPA has also created the "Environmental Ship Index" and the "Carbon Footprint" that are designed to assess the environmental impact of ocean-going vessels. Today, several European ports use these parameters for calculating port fees. Since July 2011, Hamburg, too*, calculates its port fees based on a ship's ecological impact.*

4. **"Eco Partnership" programme**, an initiative by the City of Hamburg and private businesses that aims at promoting sustainable management, joined by numerous companies from the maritime and logistics trade, among them Hamburger Hafen und Logistik AG (HHLA).

5. **Implementation of electro mobility** (electrically powered vehicles) in commercial traffic and transfer containers.

6. **Shore power options and supply options** for seagoing vessels and land transport vehicles powered with liquid natural gas (LNG).

7. **Installing renewable sources generator systems in the port**, for example wind turbines.
8. **Compensation and replacement measures** according with nature conservation of the ecosystem.

[74] Google images

6.2.3 Sustainability initiatives relevant for the cruise terminals

Two specific initiatives in the port of Hamburg deserve special attention.

6.2.3.1 Shore power plant at the Cruise Center in Altona

The power plant is part of the overall concept for the alternative energy supply of cruise ships in the Port of Hamburg. Since April 2017, the regular operation runs at the Cruise Center Altona. The cruise ships can shut down their own generators to generate electricity and are supplied with zero-emission power from land.

The system offers a power supply with two frequencies – 60 Hertz and 50 Hertz. In international shipping, roughly 75 percent of all ships are equipped with 60 Hz networks, but very few countries have electricity grids that run on this frequency. The shore-side electricity infrastructure sets a new standard in this area by offering both frequency ranges.

The power offered at the plant is renewable as Hamburg energy in cooperation with Port of Hamburg has installed wind farms in the port areas which cover the power demand for cruise ships.

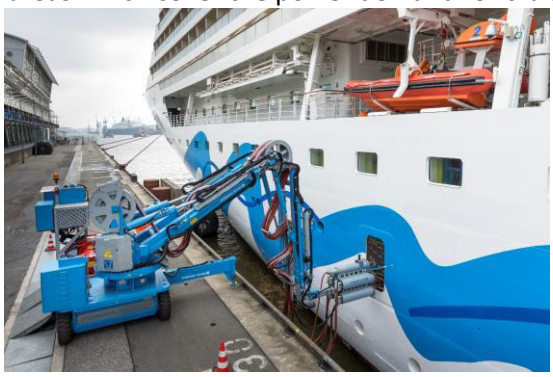

Image 16. Shire power supply at the port of Hamburg.[75]

6.2.3.2 LNG power barge

Classified as a seagoing vessel, the world's first LNG Power Barge is in operation in the port of Hamburg is 76.0 m long, 11.4 m wide with a draught of 2.5 m. It is equipped with five silently operating 1.5 MW LNG GenSets fuelled by two 17 t LNG containers. The barge is produced by Becker Marine Systems.

The barge has a location flexibility therefore it can be moved to any of the cruise terminals as needed.

Image 17. LNG Barge[76]

[75] www.hafen-hamburg.de
[76] © HPE Hybrid Port Energy

6.3 Ports of Stockholm

6.3.1 General information

Ports of Stockholm is group of ports around the city of Stockholm that offers quay-berths, facilities and services for ferry, cruise and goods traffic (one of the most important ports in Sweden). It is also responsible for the development and maintenance of inner-city quays, as well as services for archipelago and other waterborne local traffic.

The Port of Stockholm comprises a number of port areas. In the summer Stadsgården, Skeppsbron and Frihamnen are the ports favoured by the international cruise liners.

The Port of Nynäshamn has the capacity to accommodate the very largest international cruise ships. The advantages of Nynäshamn are short approach lanes and less dependency on wind and light conditions.

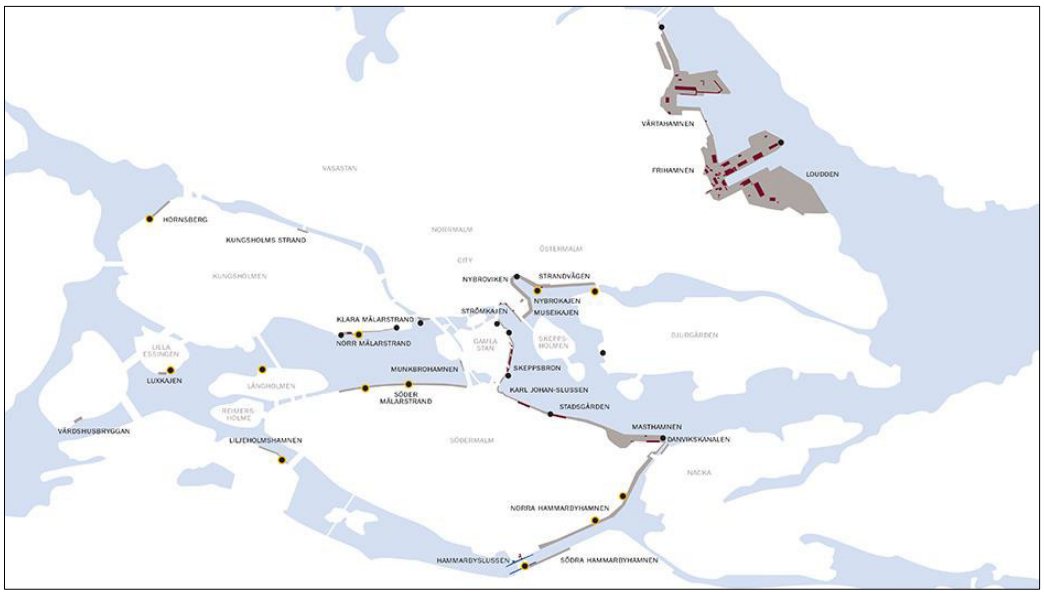

Figure 8. Port of Stockholm map.[77]

6.3.2 Sustainability background

Environmental efforts are an integrated part of the daily operations and Stockholm's three ports are leading ports within the area of the environment. Ports of Stockholm is certified according to quality and environment standard ISO 9001 and ISO 14001. This means that the company works with environmental issues in a structured and systematic way to achieve continuous improvements and reduced environmental impact.

It has an operating policy that includes environmental guidelines. Each year a sustainability report is prepared that demonstrates how the company works to achieve sustainable development and the results. The sustainability report is part of Ports of Stockholm's annual report.

The Ports of Stockholm's environmental targets are:

- Energy consumption must reduce by 50 percent between 2005 and 2025.
- Zero fossil fuel carbon dioxide emissions by 2025.
- Reduced environmental impact in choice of materials.
- The proportion of waste from which materials are recycled or reused must increase to a minimum of 80 percent by 2020.
- Increased use of Ports of Stockholm's environmentally beneficial services.

[77] Port of Stockholm

Environmental measures running in Ports of Stockholm:

1. Energy efficiency

Working actively to make operations more energy efficient. The energy consumption consists of the energy used in buildings, port electricity (such as outdoor lighting, gangways and ramps) and fuel use.

2. Reduced fossil fuel emissions

The target is to be entirely fossil fuel-free by 2025. It has invested in solar cell systems and has established five facilities at Frihamnen, Värtahamnen, Port of Nynäshamn and Port of Kapellskär. 2.081 solar panels have been installed, generating 510.000 kW/year.

3. Waste management

To reduce waste amounts and to recycle as much material as possible, both in daily operations and in the projects. The company also enables shipping companies and tenants to use environmentally adapted waste management. There are also waste management stations along the quays of the inner-city for the archipelago traffic to use.

4. Material selection

All rebuilding work uses SundaHus, a tool to enable good materials from environmental and health perspectives to be selected.

5.Smart purchasing

Environmental demands are imposed on all relevant purchasing. This could be a matter of chemical products being environmentally labelled, fruit being KRAV marked, the type of vehicle entrepreneurs are allowed to use and the demand that contractors must have their own strategic environmental policies.

6. Environmentally beneficial services

Offering shipping companies services within a number of areas to encourage them to implement measures to reduce the environmental impact of vessels.

- 6.1. Environmentally differentiated port fees. Vessels that run on LNG pay a discounted port fee, as do vessels that reduce their nitrous oxide emissions. Cruise ships that offload sorted waste also pay a discounted port fee.
- 6.2. Electricity connection for vessels. They offer onshore power supply at several quays in Stockholm. Vessels that are renovated to enable onshore power supply can receive a grant of SEK 1 million.
- 6.3. Managing black and grey water, sewage. Stockholm is one of the few ports where vessels have been able to offload black and grey water, or in other words sewage, for a number of years. These waste water facilities are used in the main by all of the regular scheduled ferry traffic, as well as eight out of ten cruise ships. Vessels can also offload sewage to tanker trucks and boats in Stockholm.
- 6.4. Waste management. Vessels have the possibility to offload waste at all Ports of Stockholm ports. New regulation more stringent in 2019.

7. Reduced noise and emissions

Ports of Stockholm works actively to reduce the noise pollution from port operations, for example by using noise reduction ramps for vehicles driving onto and off vessels. If a vessel is perceived to be a source of noise disturbance Ports of Stockholm will attempt to reduce the disturbance if possible, for example by attempting to have the vessel introduce noise reduction measures. Sometimes it is possible to turn the vessel or to move it to another quay-berth. Whenever possible, connection to onshore power supply is the best alternative for reducing noise pollution and emissions.

When it comes to engine idling Ports of Stockholm strives to enable haulage vehicles to spend no more time than necessary in the port area. Some haulage vehicles and trailers contain refrigerated or frozen goods and must then have a generator running to maintain a set temperature. At a number of sites at the ports electricity posts have been erected where haulage vehicles and trailers that are parked to wait for the departure of a vessel can connect to the electricity supply so that they do not need to run their generators.

Image 18. Solar system in Ports of Stockholm[78]

6.3.3 Specific sustainability features of cruise terminals

6.3.3.1 Sustainability features at the Värtahamnen Port

The *Värtahamnen port* is a modern green port with many environmentally smart solutions. The construction of the pier results in a minimal impact on the prevailing currents in *Lilla Värtan bay*.

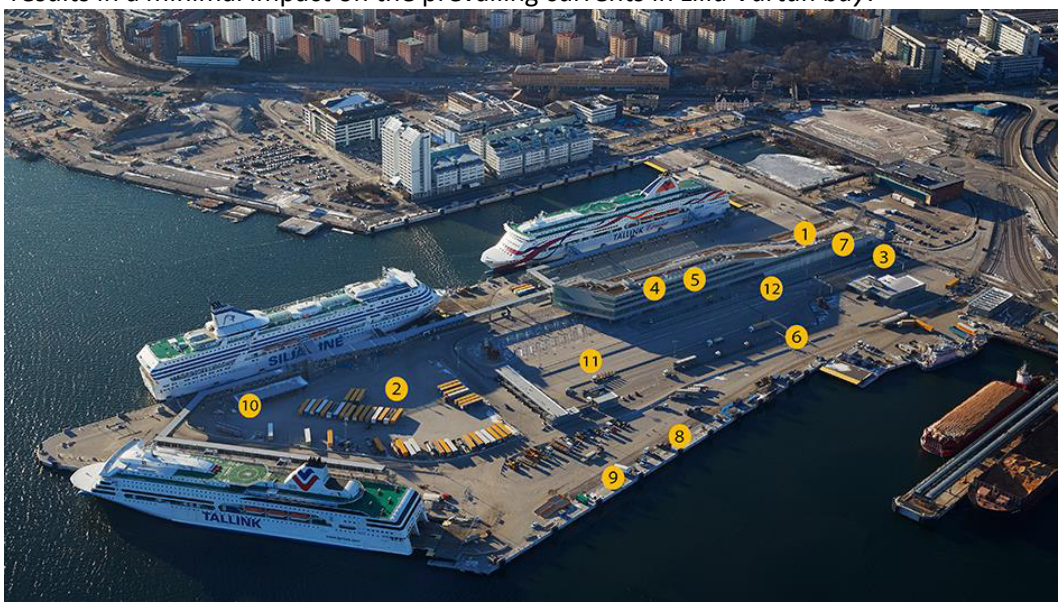

Image 19. Värtahamnen Port.[79]

1. Environmentally classified building.
2. Energy efficient LED lighting
3. Energy storage provides heating and cooling
4. 270 m² solar cell system on the roof
5. Green terraces with practical functions
6. Underground surface water drainage system
7. Well-planned and documented material selection
8. Black and grey water facilities in all ports
9. Onshore power supply reduce emissions and noise pollution
10. Waste recycling on the esplanade and inside the terminal

[78] Ports of Stockholm
[79] Ibid

11. Stone paving instead of asphalt

6.3.3.2 LNG bunkering at Ports of Stockholm

Ports of Stockholm is one of the first ports in the world to offer a bunkering infrastructure solution for the provision of LNG to a large passenger ferry.

Today Viking Line's ferry Viking Grace is LNG bunkering in Port of Stockholm. Viking Grace is unique as it is the world's first large passenger ferry to run on LNG.
LNG bunkering of a full-size passenger ferry has never been done before. For this reason, logistics and safety procedures have been developed in close collaboration between AGA, the supplier of the gas, Viking Line, who invested in the new vessel, Ports of Stockholm and the relevant authorities.

Image 20. Viking Line's ferry at Port of Stockholm.[80]

6.3.3.3 Retractable pier at at the Port of Nynäshamn

From 2016 onwards Ports of Stockholm is able to offer a new quay solution for the cruise traffic at the Port of Nynäshamn using a pier known as a Seawalk, a retractable, manoeuvrable floating pier.

Image 21. Seawalk retractable pier[81]

6.4 Kristiansand

6.4.1 General information

With its 85,000 inhabitants, Kristiansand is today the fifth largest city in Norway and the number one holiday destination for the domestic market in the summer.

[80] Port of Stockholm
[81] Ibid

The *Port of Kristiansand* is the preferred cruise port between Oslo and Bergen, and has over the last years experienced a tremendous growth within the cruise market. In 2017 the Port of Kristiansand received 50 port calls.

Image 22. Port of Kristiansand terminal and cruise.[82]

The new cruise pier open in 2017 allows the Port of Kristiansand to welcome Oasis-class ships, and is an important part of their strategy of increasing the number of port calls and improving the trademark of the Port of Kristiansand as one of Norway`s most attractive cruise ports.

6.4.2 Shore power supply project

The EU has already set a goal for shore power in its largest ports from 2025. The Port of Kristiansand has also benefitted from this strategy in the form of EU funding to cover a large part of the investment into shore power infrastructure.

The Port of Kristiansand in cooperation with the Danish company *PowerCon*, and the local energy company *Agder Energi Nett* are establishing Europe's largest shore power facility in the port. The project is co-financed by the European Union and the *Horizon 2020 SME* programme for research and innovation, the total investment is EUR 4 million. The shore power system is of such a scale that even the world's largest cruise ships can connect and shut down their engines while at berth. The system has been installed and tested during the 2018 cruise season and is fully operational as of late summer 2018.

What makes the shore power system unique is the frequency converter that can provide the ships with both 50 and 60 Hz, depending on the ships demand. The system is integrated in a total of 8 20¨ containers that can deliver up to 16 MVA electrical energy and in accordance with the international high voltage IEC 80005-1 standard. PowerCon is developing the facility and has over recent years delivered a range of shore power systems to a number of Norwegian ports. They deliver variable input and output voltage from 400V to 60kV, power range from 100kVA to 100MVA.

[82] Port of Kristiansand

Image 23. Powercon energy station in the port of Kristiansand[83]

Image 24. Powercon energy stations in the port of Kristiansand. [84]

6.5 Tallinn Port

6.5.1 General information

Port of Tallinn is the biggest port authority in Estonia. Cruise vessels are mainly accommodated in the Old City Harbour, located in the very heart of Tallinn. Old City Harbour is an excellent harbour for servicing passengers due to its central location.

[83] Port of Kristiansand
[84] Ibid

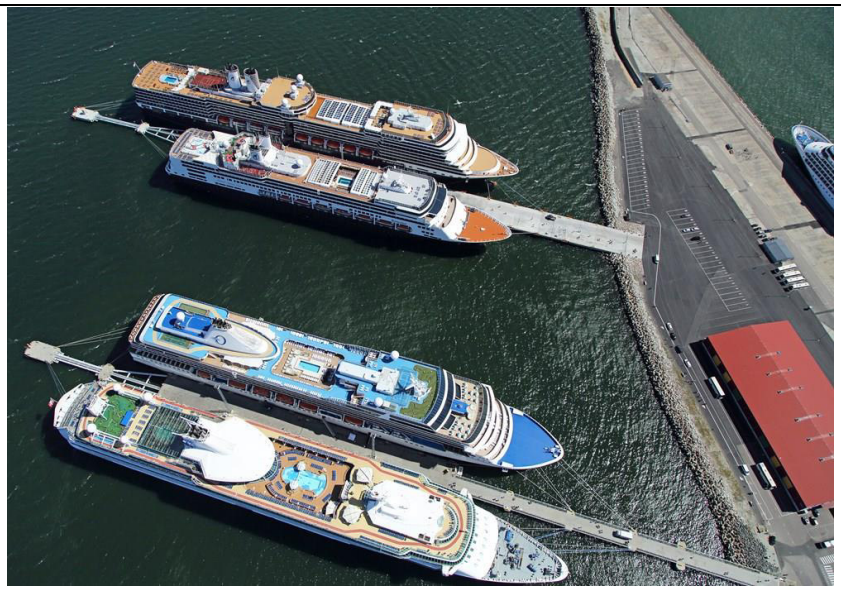

Image 25. Tallinn cruise terminal[85]

6.5.2 Sustainability background

The port of Tallinn is a founding member of the Estonian Association for Environmental Management, a member of the European prestigious inter-port environmental protection organisation Ecoports, and a supporting member of the world ports climate initiative C40 World Ports Climate Declaration.

Port of Tallinn Operating principles of environmental management:

- operate environmentally friendly ways pursuant to the environmental pollution prevention principle;
- assess all environmental impacts when planning development activities;
- take into consideration the public opinion and the suggestions made by our clients and customers in making any decision;
- comply with Estonian, EU, European Sea Ports Organisaiton (ESPO), and other international environmental legislations and guidelines;
- raise the environmental awareness of our employees and to work in close co-operation with Estonian and international organisations, scientific establishments and research institutions, and consultation companies in pursuit of our environmental policies and goals.

Image 26. Port of Tallinn. [86]

[85] https://www.cruisemapper.com/ports/tallinn-port-46
[86] Ibid

6.5.3 Environmental measures relevant for cruise terminals

The following environmental initiatives relevant for the cruise terminals can be found in the Port of Tallinn:

6.5.3.1 LNG bunkering

The port of Tallinn is developing an LNG terminal that will make possible LNG bunkering of cruise ships.

6.5.3.2 Waste water management

The measures are implemented to ensure waste water reception capacities at Old City Harbour (incl. building the microtunnel to receive waste water and increasing reception capacities to 1200 m^3/h).

6.5.3.3 Shore power supply

The port is preparing to supply shore electricity to ships in the Old City Harbour, resulting in lessening air pollution and noise levels at the city center.

6.5.3.4 Solid waste management

In port of Tallinn reception of ship-generated waste and cargo residues is performed in accordance with "*Port Act*" of the Republic of Estonia and "Ship-generated waste and cargo residues reception and handling plan" effective in the port. Wastes subject to above terms are collected and recycled by *Port of Tallinn* authorized waste handling company Green Marine Ltd.
Ships have to pay a waste fee for their amount of residues and waste.

6.5.3.5 Sustainable urban mobility

The port of Tallinn is a good example of cruise terminal location in terms of vicinity to the tourist attractions and extensive public transport system with connection to the city and the airport.

Bus 2 runs between the Old City Harbour and the airport via city centre. Bus stops: "Reisisadam A-terminal" and "Reisisadam D-terminal". There is a hop-on/hop-off bus stopping in the harbour. Within the walking distance (about 700 m) from the Terminal A is the closest tram stop "Linnahall" for the tram lines No 1 and 2 and also bus stops "Linnahall" for the buses No 3, 52 and 73.
Velotaxis operate from the old city harbour from March to October.

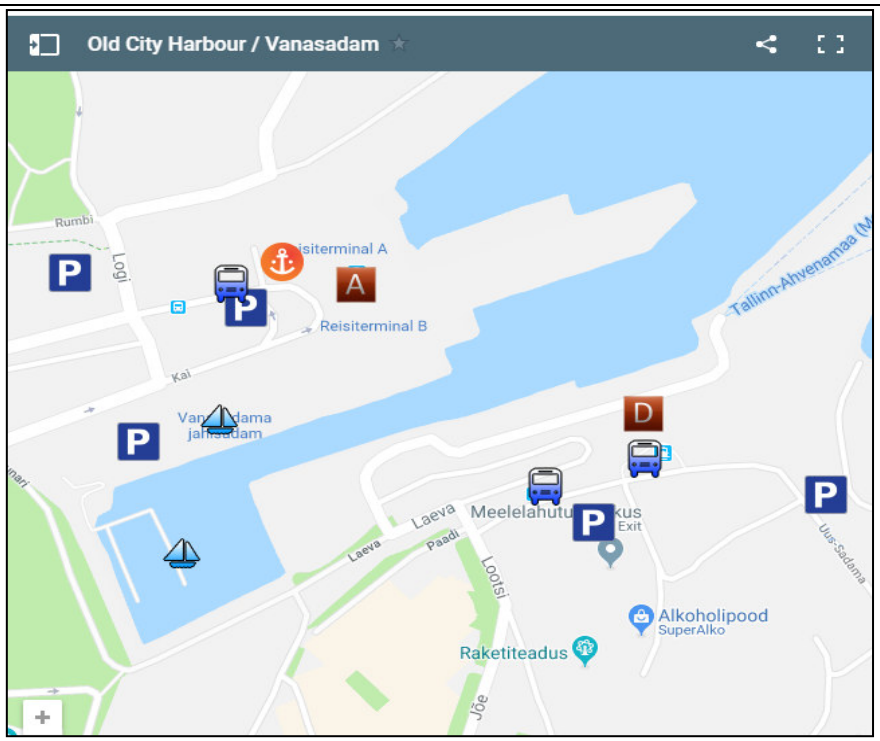

Figure 9. Map of the Vanasadam terminal.[87]

6.5.3.6 Building energy efficiency

The Port of Tallinn has compiled a study on the possibilities for developing a cruise terminal using sustainable solutions suitable for the northern climate, is drawing up a construction project for the corresponding cruise terminal.

[87] *Port of Tallinn*

7 Main criteria for determining cruise terminals' locations and the methodology for selecting cruise terminals' locations

The criteria for the terminal location were identified based on good international practice, as well as development trends in the cruise sector and sustainable terminal infrastructure, taking into account infrastructure, environment and accessibility requirements, transport connections to the city's street network, etc. The importance of each criteria was evaluated and the methodology - evaluation tool for the assessing of the cruise terminals' location was developed. The assessment methodology was developed separately for the midpoint terminals and for the home terminals.

The assessment methodology was created as an assessment scale, where a maximum of 100 points can be obtained. In total, 18 criteria are evaluated in four categories: (1) zoning compliance; (2) sea and berth elements; (3) accessibility and transport infrastructure and (4) ship handling infrastructure. The most important are the sea and berth elements, the accessibility and the transport infrastructure, a total 75 points because the attractiveness, economic viability and sustainability of the location are most directly affected by these groups of criteria, while it was assumed that, within a single port, the possibilities for provisioning a sustainable ship maintenance infrastructure are relatively similar. The home terminal has a higher score for the traffic connections, as the airport's and the international railway station's connections play an important role in this case. This importance is determined by the cost of the infrastructure concerned and the importance for the cruise companies. The criteria and its maximum points to be reached are listed in the table below.

Table 14. Summary of the cruise terminal location comparison criteria and scoring

Criteria	The maximum number of points – incoming terminal	The maximum number of points – home terminal
1. Zoning compliance	**10**	**10**
2. Sea and berth elements, incl.	**35**	**30**
2.1 Approach channel and turning basin's parameters	20	17
2.2 Berth parameters	15	13
3. Accessibility and transport infrastructure	**40**	**45**
3.1 Walking connections to the tourist attractions	5	2
3.2 Walking time to the tourist attractions*	10	4
3.3 Existence of the public transport stops near to the terminal	5	2
3.4 Time by the public transport to the tourist attractions at 9:00 of working day	5	2
3.5 Time by the car / bus to the tourist attractions at 9:00 of working day	10	4
3.6 Bicycle infrastructure (connections) to the tourist attractions	5	2

3.7 Time by the bus / private car / taxi to the international railway station at 9:00 of working day	0	4
3.7 Time by the public transport to the international railway station at 9:00 of working day	0	5
3.8 Time by the bus / private car / taxi to the international airport* at 9:00 of working day	0	5
3.9 Time by the public transport to the international airport* at 9:00 of working day	0	15
4. Ships' handling infrastructure	**15**	**15**
4.1 A possibility to provide a waste water reception at the terminal place by direct connection	2	2
4.2 A possibility to provide a water supply at the terminal place by direct connection	2	2
4.3 A possibility to establish a ship's power supply connection at the terminal place	3	3
4.4 A bunkering possibility: LNG	3	3
4.5 A bunkering possibility: MDO/MGO	3	3
4.6 A bunkering possibility: methanol	2	2
Total	**100**	**100**

The composition of the criteria as well as the allocation of points can be tailored to the specific port situation, taking into account the local context. The full methodology for the points' allocation is attached in the appendix.

8 Potential cruise terminal sites in Riga and their comparison

Three potentially suitable territory for the creation of the cruise ship terminal in Riga are offered - 1. "Eksportosta terminal", in the territory of the Eksportosta, in the place of the present Riga trading port; 2. “Andrew Island Terminal", Andrejsala, opposite to the Viestur Garden (Viestura dārzs), in the place of the open warehouse; 3. "Ķīpsala Terminal", near to the Ķīpsala Beach *(see Figure)*. Looking at the proposed locations in a common view, each of them has its advantages and disadvantages - existing/non-existing infrastructure, location in relation to tourist attractions or, for example, the distance from Riga Airport and Riga Central Railway Station.

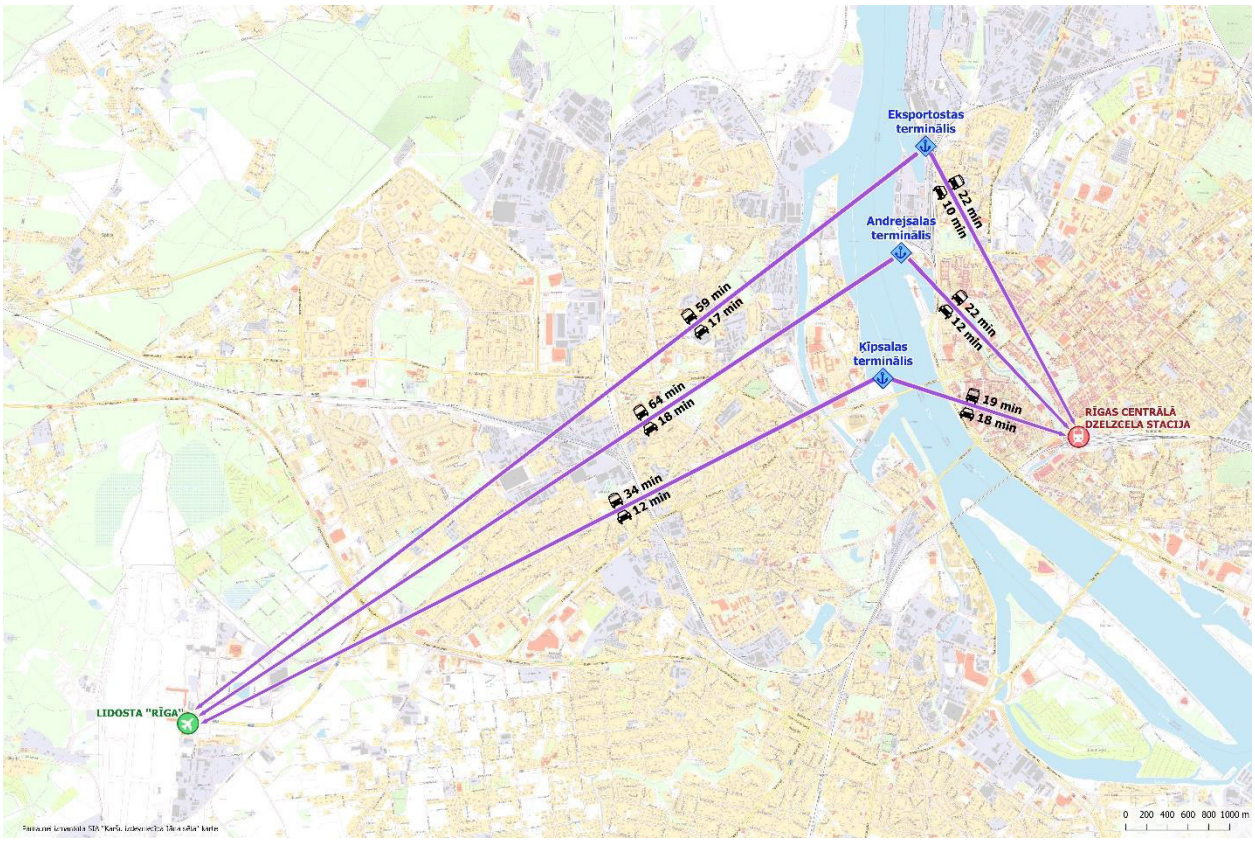

Figure 10. The location of the potential cruise terminals in Riga in relation to Riga Airport and Riga Central Railway Station. The driving time is indicated by public transport and by car at 9:00 of working day from the terminal to the Airport / Railway Station, calculated using Waze mobile application and Riga Traffic route planner.

8.1 The descriptions of the terminal locations

8.1.1 Eksportosta

The potential Eksportosta cruise ship terminal is physically located at the current Riga commercial port, on the right coast of Daugava, furthest north compared to the other terminal locations offered (Geographical Coordinates: 56° 58' 20'' N 24° 5' 43'' E) .
Functional zoning in the development stage of Riga TP: JC7, DA4 and Ū3
Functional zoning according to the Local plan of Eksportosta: northern part berths - Technical building area (TA5), which allows the construction of a quay for passenger ships.
Ownership: State

Berth parameters

The total berth length – 618 m (EO-6 = 240 m, EO-7 = 190 m, EO-8 = 188 m)

Maximal permissible draught of the vessel at the berths -
EO-6 9.9 m, EO-7 8.8 m, EO-8 8.7 m
Maximal length of the ship – up to 250m, width – up to 35m[88]
Minimal depth at berths: EO-6=10.4 m, EO-7=9.3 m, EO-8=9.2 m

Engineering communications

The nearest sewage pumping station to the Eksportosta cruise ship terminal located at Vezu Street (Vēžu iela), the closest self-propelled sewage collectors D1840 and D1500 are on Export Street (Eksporta iela) .

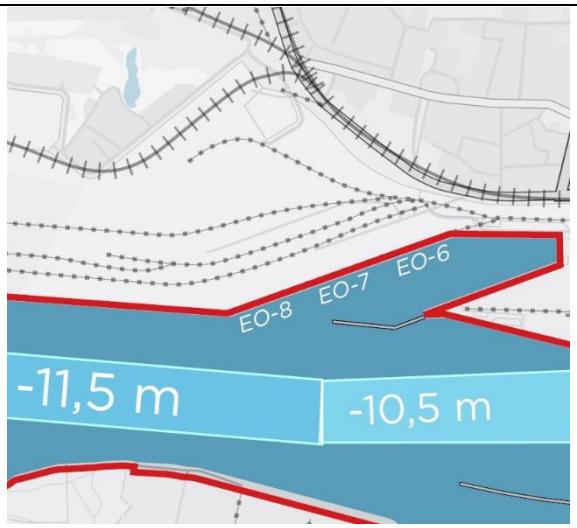

Figure 11. Berths in the Export port (Eksportosta) (Author: Riga Free Port, 2018)

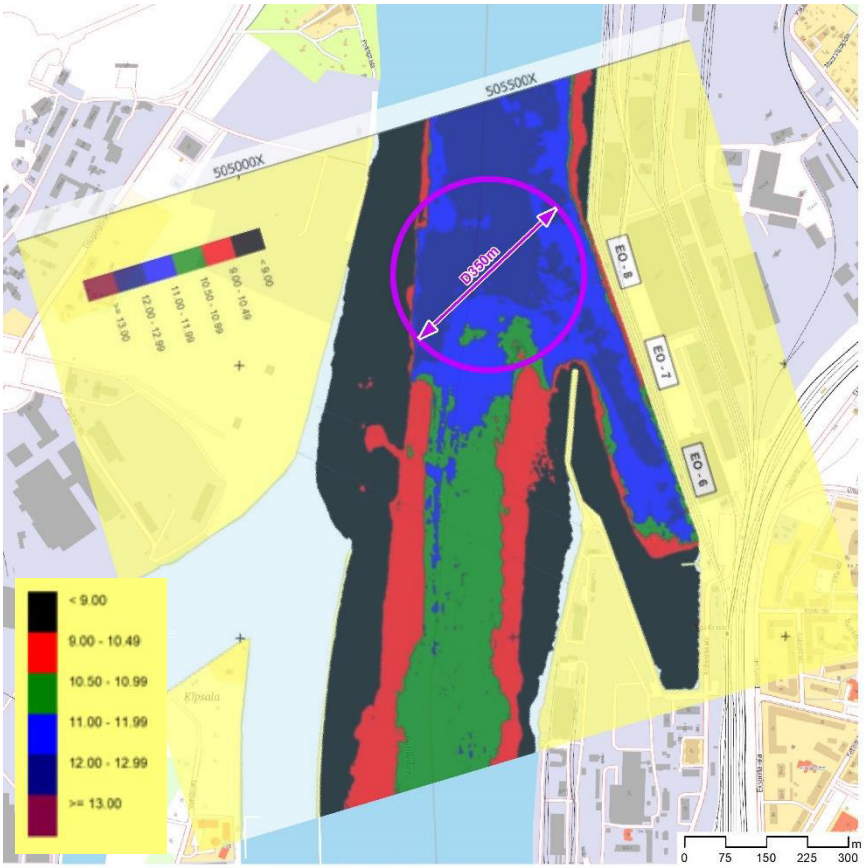

Figure 12. The fragment from the Daugava's Depth Map (Author: Riga Free Port, 2018)

[88] *Those are currently parameters, but by performing the removal / reconstruction of the Export port wave breaker, these indicators can be increased*

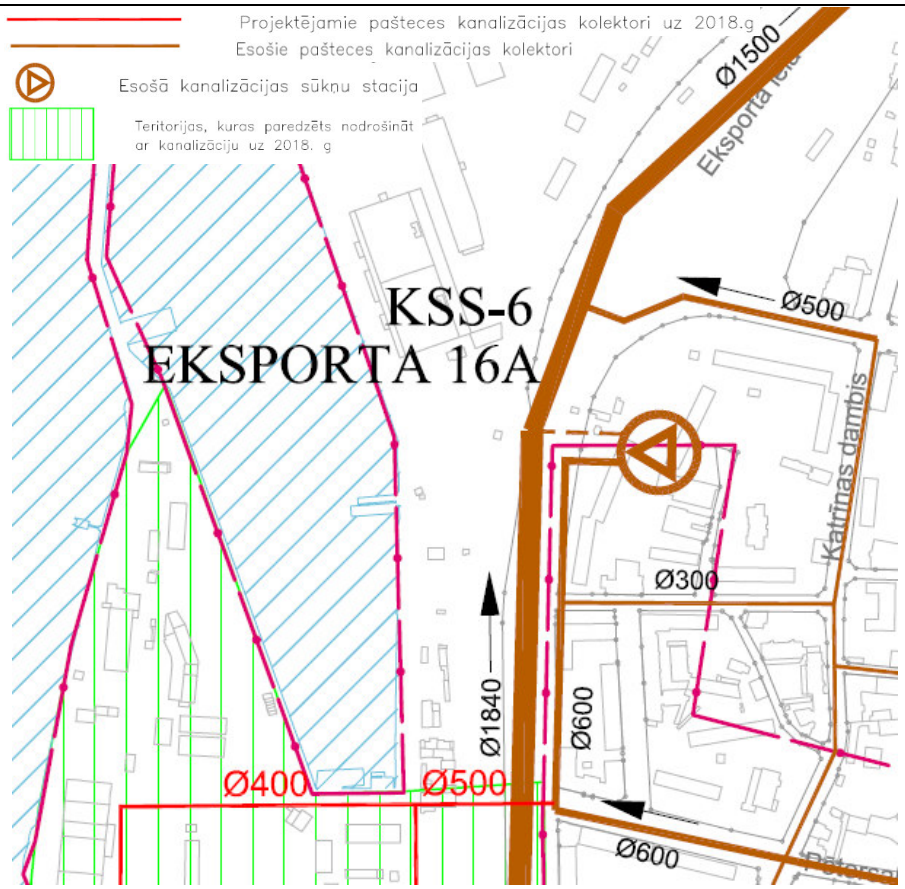

Figure 13. The screen shot from the project "The Development of Guidelines for the Further Development of the Riga City Engineering Infrastructure", the schematic map "Trunk network and construction scheme of the sewerage system" (SIA Aqua-Brambis, 2008)

The connection with the Riga Airport and the Riga Central Railway Station

From the Eksportosta Terminal to the Airport "Riga" on a working day at 09:00 it is possible to drive by car in 17 minutes, while by public transport in 59 minutes (the calculations are made using the mobile application Waze and the Riga traffic route planner, the walking distance to the public transport stop and the public transport waiting time is calculated). To the Riga Central Railway Station on a working day it is possible to drive by car in 10 minutes, while by public transport in 22 minutes.

The connections to the Riga transport networks

Street infrastructure and railways

The nearest "C" category street to the Eksportosta terminal is Export street (Eksporta iela) which provide connection to the central part of Riga. Export street (Eksporta iela) is reachable by crossing the railway rails opposite the Eksportosta or more to south, opposite the Andrew port (Andrejosta), driving along the Andrew port street (Andrejostas iela). The predicted quality improvement of the of the road infrastructure in the territory in the case of realization of the Andrew Islands (Andrejsala) detailed plan.

In the south of Andrejsala the rails from the main lane connect to the port elevators and in the north – to "Riga Central Terminal" LTD. The historic railway function - the service of the port is actual at the time. The main use of the railway is related to the delivery of cargo to the Andrejsala, Export port's (Eksportosta) district and Kundzin Island (Kundziņsala). Coal and other bulk cargoes are transported, its total volume is about 12 Mt per year. The railway routes to the Eksportosta in the northern part of the Andrejsala are most congested where manoeuvring train compositions often interrupts a road transport traffic at a crossing of the Andrew Port street (Andrejostas iela). In the Riga Territory Plan 2006-2018 an ambitious modernization of the Riga railway junction is planned in order to optimize the connection between the railway and the Free port of Riga territory and to relieve the city centre from rail freight flows. Within the framework of this project a dismantling of the railway tracks throughout Andrejsala is planned.[89] On the basis of the above, expected changes and improvements in the road transport, the bicycle and pedestrian routes infrastructure, which in the implementation case would significantly improve the potential of the mobility options of the cruise ships' passenger at the Eksportosta Terminal.

The thematic plan of the Freeport of Riga, developed in 2016 within the framework of the development of the Riga Territorial Plan, states that the rails to Andrejsala are planned to be dismantled after: 1. The transhipment of coal will be transferred to the Russian Island; 2. A new railway branch will be constructed which will require trains not to be maneuvered through Andrejsala; 3. RCT Ltd. will build one more railway branch which will to serve the company, as a result it will be no need to manoeuvre on the current Andrejsala tracks. In the developing of the Thematic Plan has not yet been clear about the configuration, the execution time or the feasibility of these intentions, and it has not been clear what will happen to the delivery of Andrejsala companies if they continue its operation. Specific solutions and deadlines for its completion intended to be specified in the future planning process.[90]

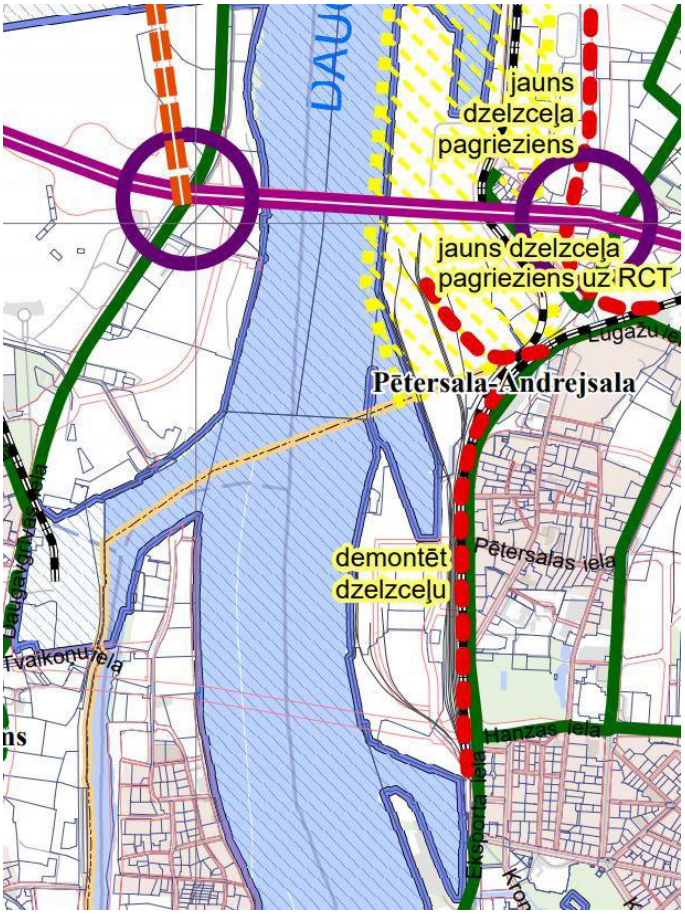

Figure 14. The screen shot from the Thematic Plan of Riga Free Port (RDPAD, 2016)

[89] Andrejosta detailed plan, "Grupa93" Ltd., 2008, page 25.

[90] http://www.rdpad.lv/wp-content/uploads/2016/10/BRIVOSTA/paskaidrojuma_raksts_RBO.pdf

The bicycle infrastructure

There is no bicycle path in the immediate vicinity of the territory, the nearest existing bicycle path starts at the intersection of Export street (Eksporta iela) and Elizabetes street (Elizabetes iela) (along the Elizabetes Street (Elizabetes iela)) approximately 1.5 km from the Eksportosta Terminal. There is also no bicycle rental point in the immediate vicinity of the Eksportosta Terminal, the nearest bicycle rental point SIXT is in the Riga Passenger Port. According to the perspective defined by the Traffic Department of Riga City Council for the bicycle paths in Riga and Andrejsala in the Detailed Planning of bicycle infrastructure, a high quality connection

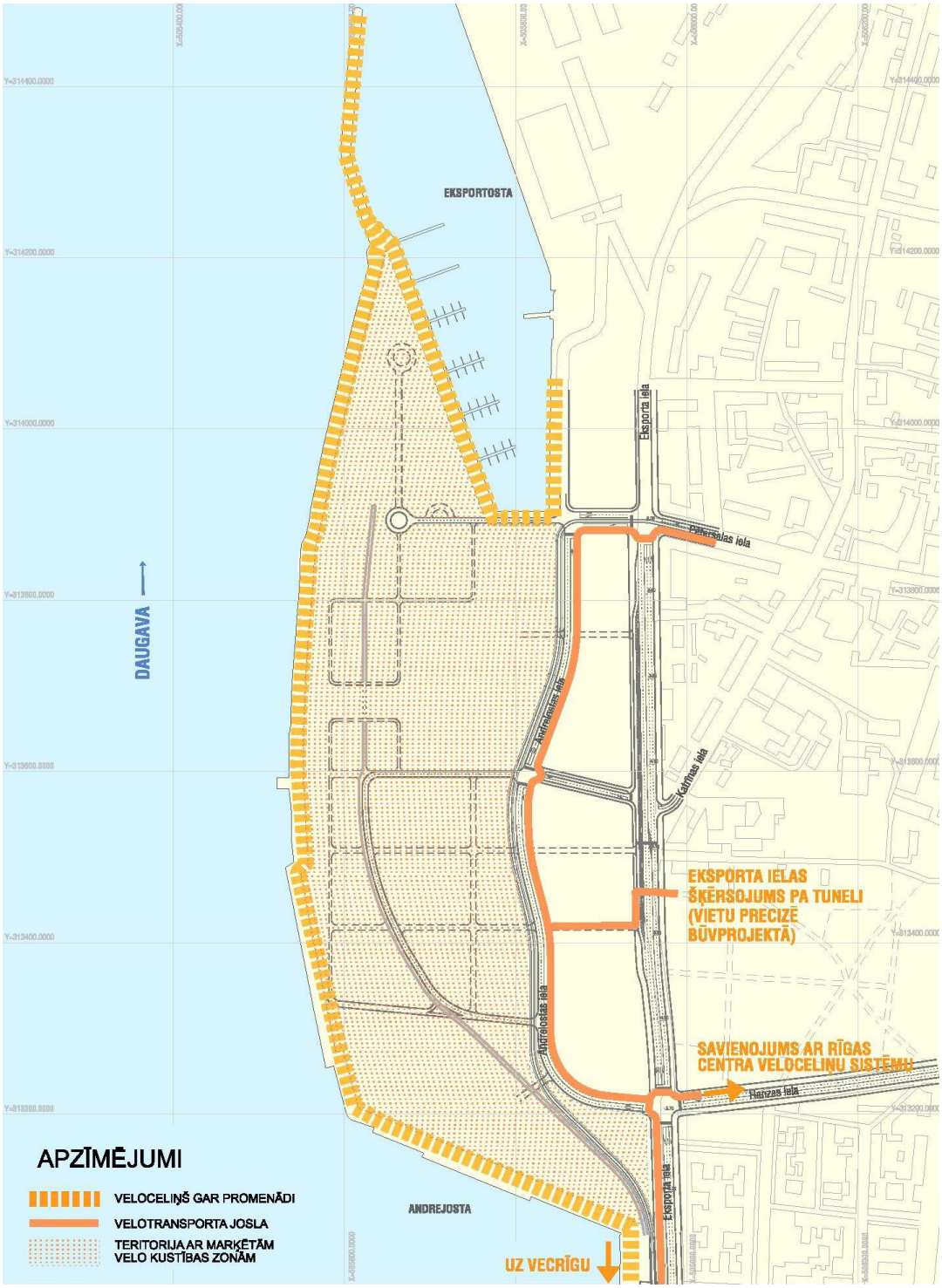

Figure 15. The planned development of the bicycle infrastructure in Andrew Island (Andrejsala) which is connected with the bicycle paths system of the Riga centre (Andrew Island (Andrejsala) Detailed Planning, "Grupa93" Ltd., 2008, Scheme "Organization of the bicycle traffic")

with the Riga centre's bicycle paths system through the rebuilt Andrew Port street (Andrejostas iela) and further the Hanzas street (Hanzas iela) is planned.

The public transport and pedestrian infrastructure

The nearest public transport stop "Export street" (Eksporta iela) is located at a distance of 5 minutes walk from the planned Export port's (Eksportosta) cruise ship terminal, the trams 5 and 9 running on the specific route. It takes 7 minutes driving to reach the public transport stop "National Theatre" near the Old Riga border and in the immediate vicinity of many interesting tourist attractions. At the moment, the pedestrian paths from the Eksportosta Terminal to the city centre are of poor quality at the beginning, and unsafe crossing of the railway tracks should be accented. As the closest tourist attraction this study defines the Art Nouveau pearl "Alberta Street" (Alberta iela) which can be reached walking in 27 minutes.

Figure 16. The location of the Export port (Eksportosta) and Andrew Island (Andrejsala) terminals in the relation to the Riga City public transport, bicycle infrastructure and walking distances to the nearest tourist attractions.

8.1.2 Andrejsala

The potential Andrejsala cruise ship terminal is physically located at the Andrejsala on the right bank of the Daugava opposite to the Viestur Garden (Viestura dārzs), in the place of the open warehouse. In the Andrejsala detailed plan drawn up in 2008 the potential terminal location is defined as the "Berth for Cruise Ships" (the geographical coordinates: 56° 57' 50'' N 24° 5' 29'' E) .
Functional zoning in the development stage of Riga TP: DA4, TR, JC7 and Ū3.
Ownership: State

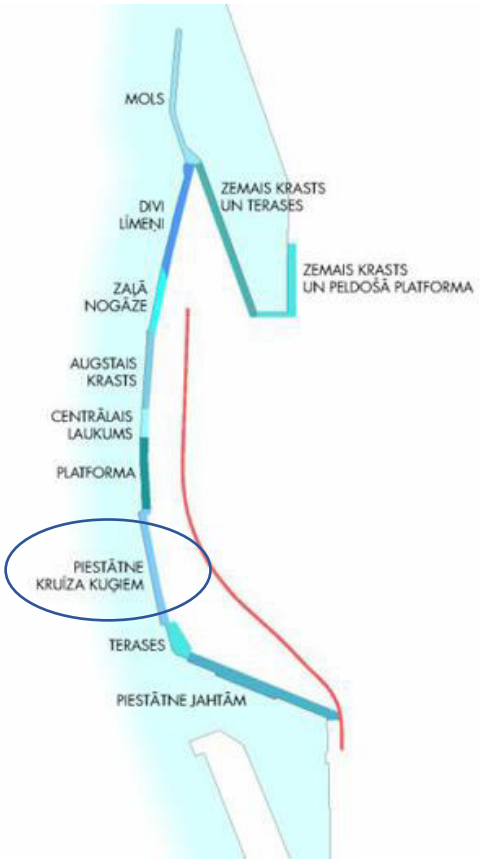

Figure 17. "The berth for cruise ships" provided by the detailed plan of Andrew Island (Andrejsala) ("Grupa93" Ltd., 2008)

<u>The parameters of the approach channel</u>
The total berth length: ~ 230 m
Maximal permissible draught of the vessel at the berths: ~ 8.5m
Maximal length of the ship – up to 210 m, width – unlimited
Minimal depth at berths: 9.0 m

<u>Engineering communications</u>
Based on the information available in the project "Development of guidelines for the further development of the Riga city engineering infrastructure" significant changes in the sewerage system infrastructure are intended at the Andrejsala. It is planned to create a Hansa reservoir (Hanzas rezervuārs) with a capacity of 10000 m³ and pump station, as well as to eliminate the existing common system's sewerage overlay collector, replacing it with a new collector, which would divert sewerage system to the south of the intended cruise berth .

In the context of the choice of this cruise terminal's potential location, it should be emphasized that the Paragraph 63 of the "Riga Sustainable Development Strategy until 2030" states that in 2030:
"**The passenger port terminal in the Andrejsala and cruise ship berth are a city's new business card for tourists** who come to the city by the ferry and cruise traffic. The international accessibility of Riga is promoted by the railway infrastructure corridor implemented by the "Rail Baltica". Rail transport connects the city centre with the international airport "Riga"."

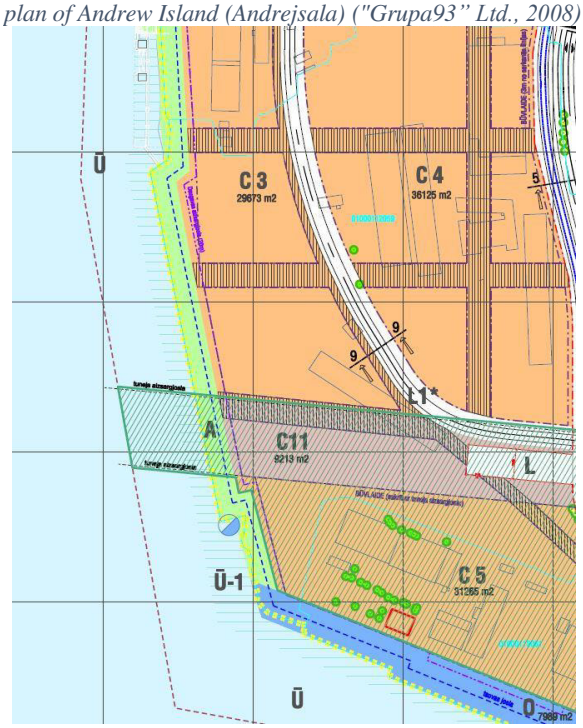

Figure 18. Functional zoning in the potential Andrejsala Terminal territory, as defined in the Andrejsala Detailed Planning

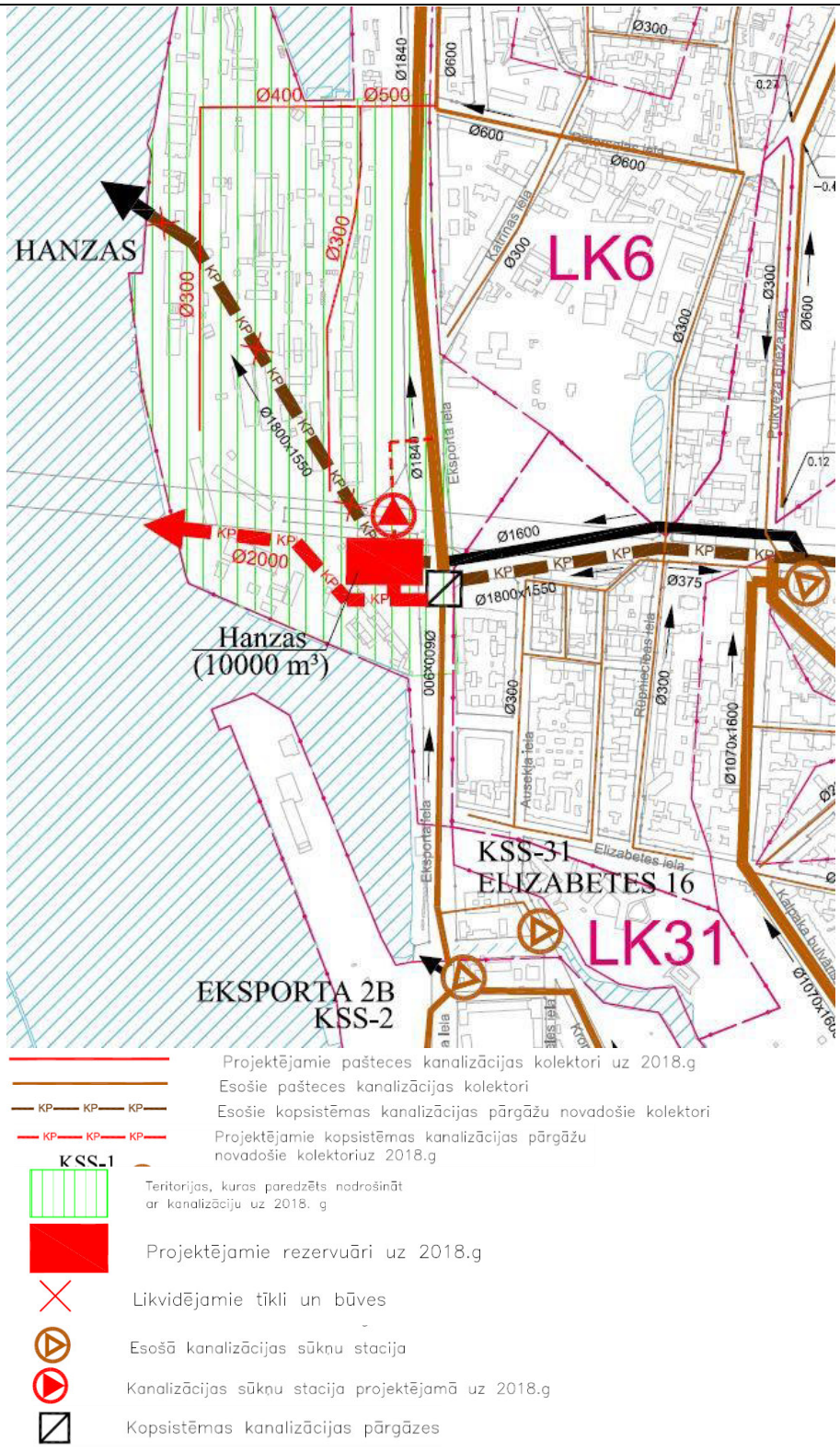

Figure 19. The screen shot from the project "The Development of Guidelines for the Further Development of the Riga City Engineering Infrastructure", the schematic map "Trunk network and construction scheme of the sewerage system" (SIA Aqua-Brambis, 2008)

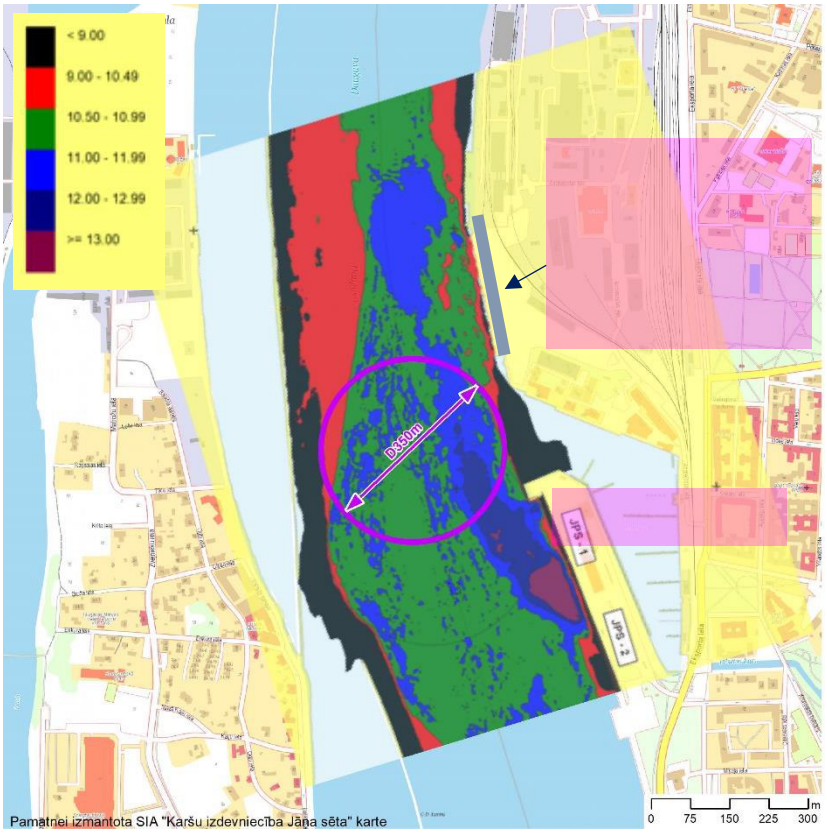

Figure 20. The fragment from the Daugava's Depth Map (Author: Riga Free Port, 2018)

The connection with the Riga Airport and the Riga Central Railway Station

From the Andrew Port (Andrejosta) Terminal to the Airport "Riga" on working day at 09:00 it is possible to drive by car in 18 minutes, while by public transport in 64 minutes (the calculations are made using the mobile application *Waze* and the *Riga traffic route planner*, the walking distance to the public transport stop and the public transport waiting time is calculated). To the Riga Central Railway Station on a working day it is possible to drive by car in 12 minutes, while by public transport in 22 minutes.

The connections to the Riga transport networks

Street infrastructure and railways

Like for the Eksportosta terminal, the nearest "C" category street to the Andrew port (Andrejosta) terminal is the Export street (Eksporta iela) which provide connection to the central part of Riga. The Export street (Eksporta iela) is reachable by crossing the railway rails in the south-east direction of Andrew port (Andrejosta) looking from the Andrew port (Andrejosta) Terminal. In the case of implementation the Andrew port (Andrejosta) Detailed Planning and dismantling of railway tracks, an ambitious improvement in the quality of road infrastructure in the territory is expected, making it much more convenient and more enjoyable for the potential cruise ship passengers .

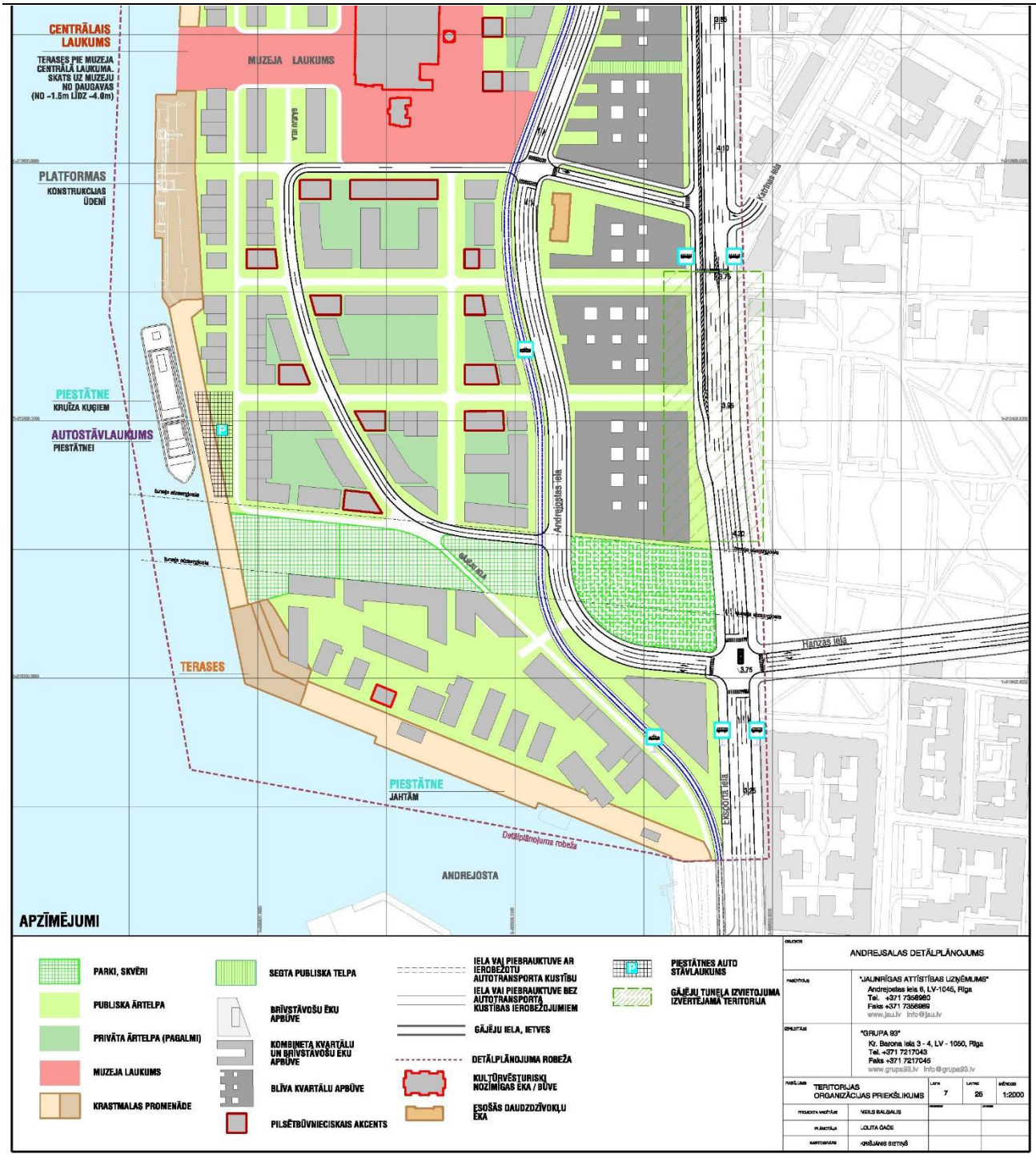

Figure 21. The screen shot from the detailed plan of Andrejsala . The proposal of the territory organization ("Grupa93"Ltd., 2008)

The bicycle infrastructure

At this time the nearest official bicycle path starts at the intersection of Export street (Eksporta iela) and Elizabetes street (Elizabetes iela) (along the Elizabetes Street (Elizabetes iela)) approximately 730m from the Andrew port (Andrejosta) Terminal . The nearest bicycle rent points with a relatively similar walking distance (~ 1,1 km) are located at the Riga Passenger port and at the intersection of the Elizabetes street (Elizabetes iela), P.Brieza street (P.Brieža iela) and Kalpaka boulevard (Kalpaka bulvāris), opposite the *Narvesen* kiosk.

The Andrejsala detailed plan foresees the construction of bicycle paths at the Export street (Eksporta iela) and Andrew port street (Andrejostas iela). A special track for the bicyclists is also planned on the waterfront and local roadways. All parts of the Andrejsala are connected with an continuous pedestrian and bicycle zone, which, in realization case, would provide an easy way for the cruise ship passengers from both the potential Eksportosta terminal and the Andrejsala terminal.[91].

The public transport and pedestrian infrastructure

The nearest public transport stop "Washington Square" is located at a distance of 10 minutes walk from the Andrejsala cruise ship terminal (movement is limited by railway rails, in the case of the rails disassembly, in a straight line the stop would be reached in 5 minutes), the trams 5 and 9 running on the specific route. It takes 5 minutes driving to reach the public transport stop "National Theatre" near the Old Riga border and in the immediate vicinity of many interesting tourist attractions. At the moment, the pedestrian paths from the Andrejsala Terminal to the city centre are of poor quality at the beginning, as well as in some places along the carriageway it is not at all. As the closest tourist attraction this study defines the Art Nouveau pearl "Alberta Street" (Alberta iela) which can be reached walking in 19 minutes.

8.1.3 Ķīpsala

The potential Ķīpsala cruise ship terminal is physically located near the Ķīpsala beach on the left bank of Daugava (the location defined only indicative)

Functional zoning in the development stage of Riga TP: JC7, DA4 and Ū3.

Ownership: Municipality and State

The parameters of the approach channel

The total berth length: no existing berth m

Maximal permissible draught of the vessel at the berths: <8.5 m

Maximal length of the ship – 300 m

Minimal depth at berths: < 9.0 m

[91] The Andrew port's (Andrejosta) detailed plan, "Grupa93" Ltd., 2008

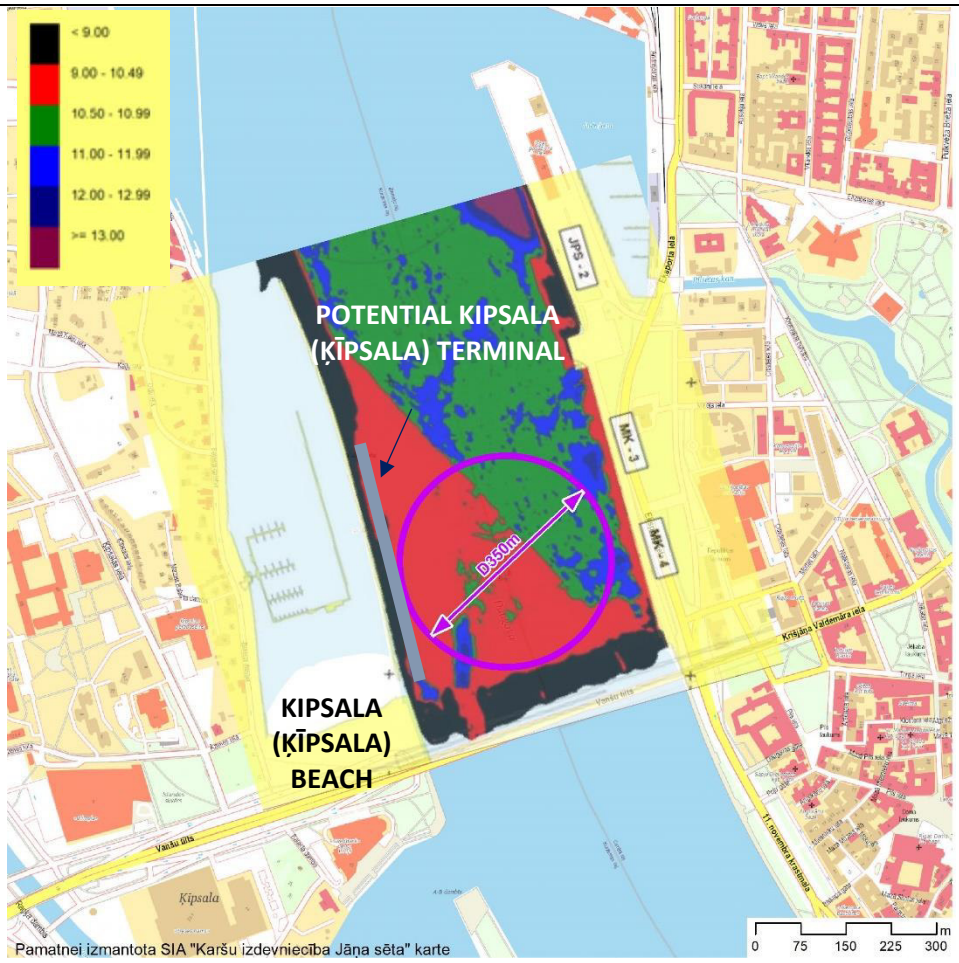

Figure 22. The fragment from the Daugava's Depth Map (Author: Riga Free Port, 2018)

The connection with the Riga Airport and the Riga Central Railway Station

From the Ķīpsala Terminal to the Airport "Riga" on working day at 09:00 it is possible to drive by car in 12 minutes, while by public transport in 34 minutes (the calculations are made using the mobile application *Waze* and the *Riga traffic route planner*, the walking distance to the public transport stop and the public transport waiting time is calculated). To the Riga Central Railway Station on a working day it is possible to drive by car in 18 minutes, while by public transport in 19 minutes.

The connections to the Riga transport networks

The street infrastructure

The Balasta Dambis and the Krishyan Valdemar streets (Krišjāņa Valdemāra iela) are the closest to the Ķīpsala terminal.

The bicycle infrastructure

The nearest official bicycle route is ~ 200 m away, the nearest bicycle rental place is at the shopping centre "Olimpia".

The public transport and pedestrian infrastructure

The nearest public transport stop "Kipsala" (Ķīpsala) is located at a distance of 5 minutes walk from the Ķīpsala cruise ship terminal at the specified stop the trolleybuses 5, 12, and 25 are running, the buses 13, 30, 37, 41, 53 and 57, as well as minibuses . It takes 7 minutes driving to reach the public transport stop "Zigfrida Anna Meierovica Boulevard" (Zigfrīda Annas Meierovica bulvāris) in the immediate vicinity of many interesting

tourist attractions. The walking paths from the Ķīpsala terminal to the city centre are of good quality. As the closest tourist attraction this study defines the Presidential Palace which can be reached walking in 16 minutes.

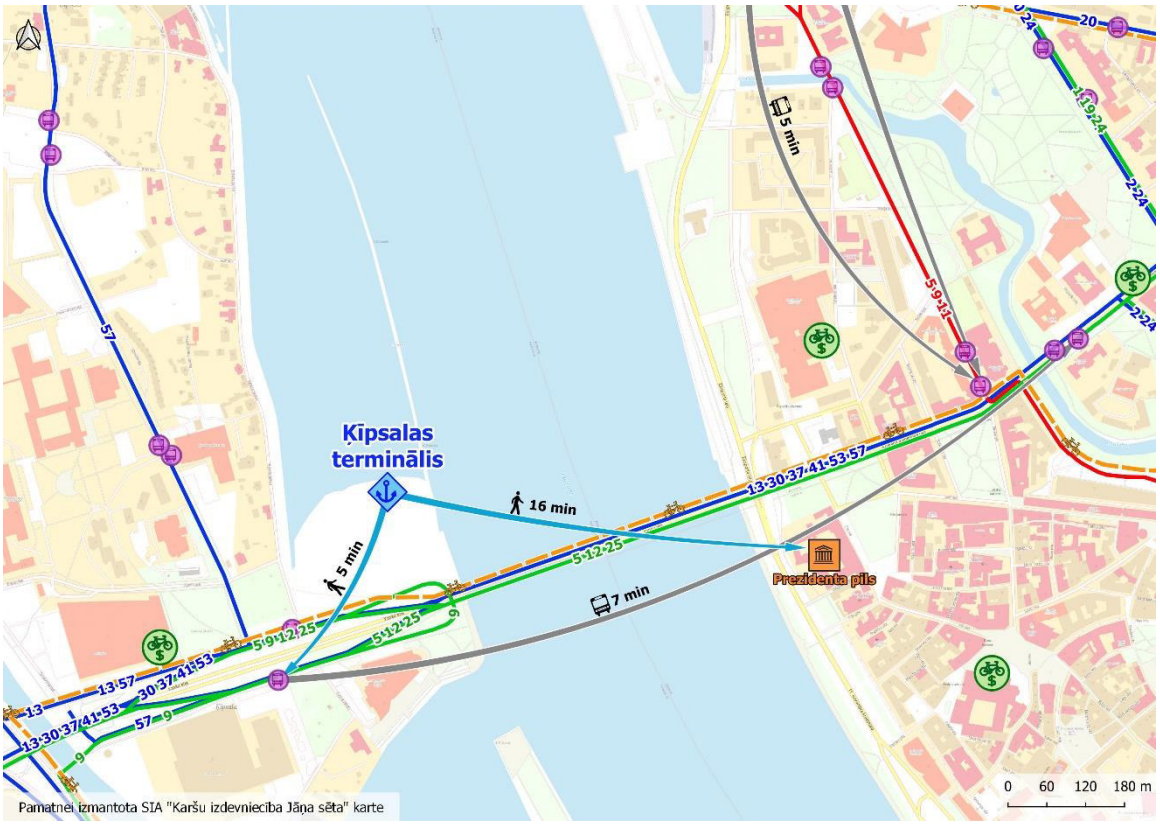

Figure 23. The location of the Ķīpsala terminals in the relation to the Riga City public transport, bicycle infrastructure and walking distances to the nearest tourist attractions

8.2 Currently operating cruise terminals

8.2.1 Riga Passenger port

The Riga Passenger Port berths are located on the right bank of the River Daugava near the Vanshu Bridge (Vanšu tilts) next to Old Riga, what is also the main advantage of Riga Passenger Port. The Riga Castle (Presidential Palace) which is one of the nearest tourist attractions can be reached in 5 minutes by walking. Necessary improvements – indications and map to allow passengers on cruise ships to reach the Old Riga intuitively and easily when they leave the ship.

According to the schedule of cruise ships in the 2018 cruise season 83 cruise ships with a total maximum passenger capacity of 62 934 will be manned at the berths of the Riga Passenger Port.[92] The calculations do not include the passengers from the cruise ships mooring at the Russian Island terminal and the ferry passengers of AS TALLINK Group.

The parameters of the approach channel

The total length of the berth: 462 m (**MK-3** 240 m, **MK-4** 222 m);
Maximal permissible draught of the vessel at the berths: MK-3 8.6 m, MK-4 7.9 m
Maximal length of the ship: 295 m
Minimal depth at the berths: MK-3 9.1 m, MK-4 8.4 m
JPS-1 berth maximal allowed length of the ship: 110 m; Maximal permissible draught of the vessel: 7.6 m
The JPS-2 berth is intended for ferries but can also be used for the cruise ships. There is also a terminal building at this berth.
At this berth the maximum permissible length of the ship is 280 m and the draught 7.6 m. On request water is available, charging from the shore and access at the shore.[93]

Figure 24. The berths of the Riga Passenger Port (Rīgas pasažieru osta) (Author: Riga Free Port, 2018)

[92] http://rop.lv/lv/pramji-un-kruizi/kruizs/kruiza-kugu-grafiks.html?sort=from_dt
[93] http://www.rigapt.lv/services/ship-services/cruise-ships/

Since 2006 in Riga port the shipping company AS TALLINK Group has been provided the passenger transportation on the Riga – Stockholm route. In this line the ships Romantica and Isabelle are operating, providing passenger, passenger vehicles and cargo transportation between Latvia and Sweden by departing from the Riga and Stockholm ports every day. The Tallink ferries in Riga are serviced by "Riga Passenger Terminal" Ltd (SIA "Rīgas pasažieru terminmāls").

In 2017 the largest ship in the port history was serviced at the port - five times the famous cruise ship Celebrity Silhouette (319 m) arrived at the port.[94] At the 2018 cruise season the ships Azamara Journey, MSC Orchestra, Queen Elisabeth, Silver Spirit and TUI Discovery entered the port of Riga for the first time. Separate ships are manned at the terminal "KS Terminal" on the Krievu sala (the berth KRS-1)[95]

8.2.2 Krievu sala

The Krievu sala terminal is located on the Krievu sala, Voleri, on the left bank of the river Daugava, 13 km from the central part of Riga. The nearest public transport stop is 3.3 km away and the urban environment in the area is not attractive to the tourists. The passengers of the cruise ship have to take the buses to the central part of the city, the arrival time is relatively long and tourists on average are not interested. It is important that from March next year the coal's transhipment operations will be transferred from the place of the former commercial activity in the Eksportosta to the Krievu sala.
2018 in the summer 7 cruise ships with a total maximum passenger number of 16 873 berthed at this terminal [96]

The parameters of the approach channel
The total length of the berth: 333 m (KRS-1 166 m, KRS-2 167 m);
Maximum permissible draught of the vessel at the berths: KRS-1 13.2 m, KRS-2 13.2 m;
Maximum length of the ship: 300 m;
Minimal depth at the berths: 13.7m

Figure 25. The berths Russian island (Krievu sala) (Author: Riga Free Port, 2018)

[94] http://rop.lv/lv/pramji-un-kruizi/kruizs.html
[95] http://rop.lv/lv/pramji-un-kruizi/kruizs/kruiza-kugu-grafiks.html?sort=berth_name
[96] http://rop.lv/lv/pramji-un-kruizi/kruizs/kruiza-kugu-grafiks.html?sort=berth_name

8.3 Main advantages and disadvantages

The table below summarizes the advantages and disadvantages of the existing and alternative sites of the cruise terminals.

Table 15. Advantages and disadvantages of alternative cruise terminal location in the port of Riga

	Eksportosta	Andrejsala	Ķīpsala	Riga Passenger Port	Krievu sala
Advantages	- Proximity to the city centre and transport infrastructure; - Existing berth infrastructure; - The length and depth of the berth at the berth allows to serve several vessels simultaneously, incl. the biggest; - Sufficient territory for both the incoming terminal and home terminal; - The main water supply and sewerage system offers the possibility of direct connection to the ships; - The high voltage power lines and a substation are near the site which can be used for a providing of coastal power supply; - The terminal's operator is interested in	- Proximity to the city centre and transport infrastructure; - Existing berth infrastructure; - Good ship channel parameters depth, turning basin); - Sufficient territory for both the incoming terminal and home terminal; - Good location in the city in accordance with the Andrejsala detailed plan; - The main water supply and sewerage system offers the possibility of direct connection to the ships; - The high voltage power lines and a substation are near the site which can be used for a providing of coastal power supply;	- Proximity to the city centre and transport infrastructure; - Good pedestrian connections to the city centre; - Good connection to the airport; - The main water supply and sewerage system offers the possibility of direct connection to the ships;	- Proximity to the city centre and transport infrastructure; - Good pedestrian connections to the city centre; - Existing berth infrastructure; - The length and depth of the berth at the berth allows to serve several vessels simultaneously, incl. the biggest; - The main water supply and sewerage system offers the possibility of direct connection to the ships;	- Existing berth infrastructure allows to admit the large vessels (up to 300 m); - Depth at the berth allows you to serve the largest ships; - Sufficient territory for both the incoming terminal and home terminal; - The main water supply and sewerage system offers the possibility of direct connection to the ships; - The high voltage power lines and a substation are near the site which can be used for a providing of coastal power supply;

	Eksportosta	Andrejsala	Ķīpsala	Riga Passenger Port	Krievu sala
	the developing of the cruise segment;				
Disadvantages	- A reconstruction of the port boom is required (shortening, to allow the largest vessels to enter); - The parameters of the turning basin may to require more complicated manoeuvring; - The pedestrian connections with the city centre are not sufficiently convenient; significant improvements are required; - A public transport stop is not close enough, a stop closer to the terminal is required	- The existing berth cannot provide a reception of the largest ships, it is possible to place one vessel up to 210 m, a significant reconstruction for larger ships is required; - The operator does not consider this area as prospective for the cruise segment; - The pedestrian connections with the city centre are not sufficiently convenient; significant improvements are required; - A public transport stop is not close enough, a stop closer to the terminal is required	- the zoning of the territory does not correspond to the port function; - There are no port infrastructure in the area, large capital investments are required; - A complex transport organisation; - Existing depths do not allow to take the largest ships; - The problems can be with the provision of electricity supply capacity for shore electricity supply; - The terminal can damage the landscape of Ķīpsala.	- Existing depths do not allow to take the largest ships; - Limited territory for the terminal 's expansion and provision of necessary functions, especially in the case of a home terminal; - A public transport stop is not close enough, a stop closer to the terminal is required; - The problems can be with the provision of electricity supply capacity for shore electricity supply;	- The existing berth cannot provide a reception of the largest ships; - A large distance from the city centre; - A location is in an unattractive industrial and coal transhipment territory; - Pedestrian connections to the city centre are impossible; - A public transport stop is not close enough, a stop closer to the terminal is required;

8.4 The comparison of the terminals' location according to the set of selected criteria

The tables below reflect the comparison criteria of the location.

Table 16. Alternative cruise terminal location specification according to the comparison criteria

Criteria	Eksportosta terminal	Andrejsala Terminal	Ķīpsala Terminal	Cruise ship terminal of the Riga Passenger Port	Krievu sala terminal
The parameters of the approach channel	The depth: max 11.5 m The width: up to 35 m The turning basin 250 m	The depth: max 10.5 m The turning basin ~ 300 m	The depth: max 9 m The turning basin ~ 350 m	The depth: max 12 m The turning basin: ~350m (opposite Andrew port (Andrejosta))	The depth: max 15.99 m The turning basin: ~350 m
Berth parameters	The total berth:- 618 m (EO-6 = 240 m, EO-7 = 190 m, EO-8 = 188 m) Minimal depth at the berths: EO-6=10.4 m, EO-7=9.3 m , EO-8=9.2 m	The length: ~ 230 m Minimal depth at berths: < 9 m	The length: currently undetectable, as there is no existing infrastructure Minimal depth at berths: < 9 m	The length: total - 462 m (MK-3 240 m, MK-4 222 m); Minimal depth at the berths: MK-3 9.1m, MK-4 8.4m	The length: total 333 m (KRS-1 166 m, KRS-2 167 m); Minimal depth at the berths: 13.7 m
Walking connections to the tourist attractions	The poor quality crossing over the railway track, a pedestrian path along Export street (Eksporta iela), which is further connected with the pedestrian friendly to the travel routes	There is no the pedestrian sidewalks on Andrew Port street (Andrejostas iela), an insecure railway crossing, the pedestrian walkway starts on the Export Street (Eksporta iela), further turning on Elizabeth Street	The convenient connection over the Vanshu bridge (Vanšu tilts)	The city centre is within easy walking distance	Is not

Criteria	Eksportosta terminal	Andrejsala Terminal	Ķīpsala Terminal	Cruise ship terminal of the Riga Passenger Port	Krievu sala terminal
		(Elizabetes iela) both pedestrian and bicycle paths are available			
Walking time to the tourist attractions*	27 min to the Alberta Street (Alberta iela)	19 min to the Alberta Street (Alberta iela)	16 min to the Presidential Palace	6 min to the Presidential Palace	2.5 h to the Presidential Palace
The presence of public transport stops near the terminal, which goes to tourist attractions	5 min walk distance	10 min walk distance	5 min walk distance	The nearest public transport stop is already at tourist attractions	40 min walk distance
Guaranteed time by the public transport to the tourist attractions at 9:00 of working day	7 min	5 min	7 min	The nearest public transport stop is already at tourist attractions	Is not
Bicycle infrastructure and connections to the tourist attractions	There is no bicycle path in the immediate vicinity, the nearest one starts at the intersection of Export street (Eksporta iela) and Elizabetes street (Elizabetes iela) (~ 1.5 km)	The nearest bicycle path starts at the intersection of Export street (Eksporta iela) and Elizabetes street (Elizabetes iela) (~ 740m)	The bicycle route on the Vanshu bridge (Vanšu tilts) is easily reachable (~ 200 m)	The nearest official bicycle route is located on Vanshu bridge (Vanšu tilts) (~ 200 m), however the central part of the city can easily be reached by moving along the Daugava promenade.	Is not
Time by the bus / private car / taxi to the international	10 min	12 min	18 min	9 min	43 min

Criteria	Eksportosta terminal	Andrejsala Terminal	Ķīpsala Terminal	Cruise ship terminal of the Riga Passenger Port	Krievu sala terminal
railway station at 9:00 of working day					
Time by the public transport to the international railway station at 9:00 of working day	22 min	22 min	19 min	20 min	1.5 h
Time by the bus / private car / taxi to the international airport at 9:00 of working day	17 min	18 min	12 min	34 min	16 min
Time by the public transport to the international airport at 9:00 of working day	59 min	64 min	34 min	50 min	1.5 h
A possibility to provide a waste water reception at the terminal place	By barge / tank truck	By barge / tank truck	By barge / tank truck	By barge / tank truck	By barge / tank truck
A possibility to establish a ship's power supply connection at the terminal place	Possible with substation expansion	Possible with substation expansion	Possible with new substation	Possible with high voltage network improvement	Possible with substation expansion
A bunkering possibility: LNG	Not present currently, possible in future with new LNG terminal	Not present currently, possible	Not present currently, possible in future	Not present currently, possible in future with new LNG terminal	Not present currently, possible in future with new LNG terminal

Criteria	Eksportosta terminal	Andrejsala Terminal	Ķīpsala Terminal	Cruise ship terminal of the Riga Passenger Port	Krievu sala terminal
		in future with new LNG terminal	with new LNG terminal		
A bunkering possibility: MDO/MGO	Not presently, available on request	Not presently, available on request	Not presently, available on request	Not presently, available on request	Not presently, available on request
A bunkering possibility: methanol	Not present, available on request	Not present, available on request	Not present, available on request	Not present, available on request	Is not, available on request

The Annex 20 shows the assessment of the cruise terminal locations in accordance with the developed assessment methodology. The analysis summary is shown below.

Table 17. Scoring of the alternative cruise terminal locations

Location / Criteria group	1. Zoning compliance	2. Sea and berth elements, incl.	3. Accessibility and transport infrastructure	4. Ships' handling infrastructure	Total
Eksportosta-midpoint terminal	10	25	20	7	**62**
Eksportosta-turnaround terminal	10	21	29	7	**67**
Andrejsala - midpoint terminal	10	15	25	6	**56**
Andrejsala - turnaround terminal	10	12	24	6	**52**
Ķīpsala-midpoint terminal	0	10	38	6	**54**
Ķīpsala-turnaround terminal	0	8	44	6	**58**
Riga Passenger Port- midpoint terminal	10	20	35	5	**70**
Riga Passenger Port-turnaround terminal	10	17	35	5	**67**
Krievu sala-midpoint terminal	10	25	0	7	**42**
Krievu sala-turnaround terminal	10	21	9	7	**47**

As the result of the analysis, the best location for the midpoint terminal - the current location, followed by Eksportosta. Regarding the location of the home terminal, Riga Passenger Port and Eksportosta have the same number of points. These results are explained by suitability of existing infrastructure for cruise ship berthing and low level of investment needed for starting cruise operations in Eksportosta, compared to other alternative locations. However, Eksportosta loses in terms of pedestrian accessibility as well as visual attractiveness of the site, the challenge that needs to be dealt with by improving urban environment in the area, including pedestrian and public transport connections. Andrejsala is probably the best location in terms of visual attractiveness for cruise passengers, however it requires massive investment into waterside and berth infrastructure. Ķipsala scores high in accessibility both as a midpoint and turnaround terminal, however it faces planning challenges and massive investment not justified by the demand and potential revenue. These results indicate the potential of both Riga passenger port for continuing and improving midpoint cruise operations and Eksportosta developing as an alternative midpoint and primary turnaround terminal.

8.5 General Cost-Benefit Analysis for Eksportosta cruise terminal

A general cost-benefit analysis (CBA) has been prepared for the Cruise Terminal at Eksportosta. The financial return and viability of the investment in terminal, as well as the socioeconomic value of the investment have been assessed.

Two terminal development scenarios have been analysed: Midpoint terminal and Turnaround terminal. The calculations have been made for various development programs (scenarios), depending on the scale of the investment. The financial and socioeconomic returns have been analysed for different investments separately – for the main infrastructure of the cruise terminal, for sustainable infrastructure (shore power, shore water supply and sewerage) and for city transport infrastructure connections. This means that a total of six scenarios has been calculated - three for midpoint terminal and tree for turnaround terminal.

Considering that the terminal business model, ownership and investment structure are not clear, but investments are needed both in the terminal, port infrastructure and urban infrastructure, the analysis has been carried out in a combined manner for the Freeport Authority, the terminal operator and the Riga municipality, as well separately for each stakeholder.

Based on the cost-benefit analysis guidelines for EU investment projects, the preliminary CBA has been prepared for a period of 25 years.

Detailed CBA assumptions and calculations are provided in the appendices and the attached Excel model, this section provides information on key assumptions and results.

8.5.1 Key assumptions about investments

Calculations made for investment in terminal with the following parameters:

- Apron area: 25 x 300 m = 7500 m²;
- Ground transportation area 10000 m², incl.:
  - 40 buses, 4000 m²;
  - 50 car parking lots, 1250 m²;
  - 20 taxi parking lots, 500 m²;
  - Kiss and Ride zone, other transport: 500 m²;
  - Other driveways and squares: 2500m²;
  - Free territory and pedestrian sidewalks: 1250 m²;
- Other areas 2500m²;
- Midpoint terminal: Information point/toilet/kiosk with total area of 200 m²;
- Turnaround terminal: Terminal building with a total area of 1000m² in place of the existing warehouse, adjoining area with total area of 6484 m².

It was assumed that investments in the development of the terminal would be be made gradually, in parallel with the growth of number of calls.

8.5.1.1 Midpoint terminal

Investments for the main functionality of the terminal area are calculated for 2019: restoration of the covering, track closure, covering the existing warehouse with a decorative net. The total investment amount is EUR 229 661. It was assumed that the investment would be made by the terminal operator.

Investments in terminal improvement were calculated for 2025: shortening / dismantling of the Export Port wavebreaker (investment of the Freeport Authority), resurfacing and traffic organization in the apron and ground transport area, rainwater drainage, lighting, power and low-voltage networks, information point / toilet / kiosk - construction and equipment (investment of the terminal operator). The total estimated investment amount is 5 155 000 EUR.

Separately investments into coastal water supply and domestic sewage for a total amount of 230 000 euros, as well as a shore power supply with a maximum capacity of 7MW and a cost of 8 050 000 euros have been calculated for 2025. It is assumed that the investment is shared by the Freeport of Riga Authority and the terminal operator.

Separately investments into connections with the city transport infrastructure have been calculated for 2025, which included the reconstruction of access roads, the construction of a pedestrian and bicycle road along Eksporta Street to Elizabetes Street, the construction of 3 pedestrian crossings at Eksporta Street and the construction of a mobility point at the terminal (public transport stop and ticket machine, shared bicycle and car parking lots, bicycle racks, traffic information, electric car charging station). It was assumed that the investment was made by the municipality.

8.5.1.2 Turnaround terminal

It was assumed that apron area and ground transportation area program will be the same as for the midpoint terminal. Regarding the terminal building needed for the turnaround cruise servicing, it was assumed that during the period of 2024 - 2030 turnaround cruise ships will be serviced at a temporary terminal, renting the necessary furniture and equipment, while in 2030 a permanent terminal will be built and starting from 2031 cruise ships will be served at the permanent terminal. Taking into account that in the calculation the existing warehouse building with an area of 7484 m² was dismantled, after the new one-story building with an area of 1,000 m², the area of 6484 m² is freed, which, in the calculation, is intended to be improved and used for the needs of the terminal.

8.5.2 Key assumptions about operating income and expenses

Parameter	Assumption
Number of calls at the midpoint terminal	5 vessels in 2019, then half of the total increase in number of cruise ships calls at the porto of Riga: gradual growth from 5 in 2019 to 77 in 2044.
Number of calls at the turnaround terminal	One vessel with 4 calls in 2024, an increase in one vessel and 4 calls every 5 years.
Parameters of number of ships and passengers	Average LOA from 270 m in 2019 up to 306 m in 2044 (increase 0.5% per year) Average GT from 80 000 t in 2019 up to 90 624 t in 2044 (increase of 0.5% per year) Average number of passengers from 2000 in 2019 up to 2266 in 2044 (increase of 0.5% per year)
Number of passengers disembarking in port	90% of all passengers
Freeport administration revenues positions	Port charges, calculated in accordance with the existing Freeport Authority price list.
Terminal operator revenue positions	Terminal charges, calculated in accordance with the existing Freeport Authority price list.

Parameter	Assumption
	Payments for provision of shore power supply (0.01 EUR / kWh, water supply and sewerage (0.2EUR / m^3)
Freeport administration cost positions	Freeport administration additional costs estimated at 5% of port fees
Terminal operator expense items	Staff (paid by hourly rates on cruise time) Maintaining terminal areas For midpoint terminal and turnaround terminal information point building and permanent terminal building of the turnaround terminal: maintenance of the building Temporary turnaround terminal: rental of buildings and equipment Other terminal charges, estimated at 10% of terminal fees
Depreciation of the investment for the calculation of the residual value	30 years
Financial discount rate for the calculation of net present value	4%

8.5.3 Key assumptions concerning the socio-economic analysis

Parameter	Assumption
Fiscal adjustments	Personal income tax on investment costs and operating costs
Socio-economic benefits associated with the operation of the terminal	Economic return on investment: The net wage of personnel involved in the ongoing construction work spent in Latvia Financial expenses of cruise passengers in Riga city: jobs created by tourism service providers and net wages Property value increase in the adjoining territory
Socio-economic benefits for sustainable infrastructure	Coastal electricity: the economic expression of CO2, NOx, SO2, PM emission reduction
Socio-economic benefits of urban connections	Property value increase in the adjoining territory Fuel savings and CO2, NOx, SO2, PM less for road users for cruise passengers and people in the surrounding area
Socio-economic discount rate for the calculation of net present value	5%

8.5.4 CBA results

8.5.4.1 Financial analysis

The table below summarizes the results of a financial analysis of the various scenarios

Scenario and indicator	Midpoint terminal	Turnaround terminal
1. Investments only in the core infrastructure of the terminal		
FNPV (25 years)	12 037 127 €	12 019 295 €
incl. Freeport	11 458 160 €	14 352 761 €
incl. terminal operator	578 967 €	-1 599 144 €
FIRR (25 years)	24%	22%
incl. Freeport	35%	38%
incl. terminal operator	6%	0.3%
2. Investments in the core infrastructure of the terminal and in sustainable infrastructure		
FNPV (25 years)	6 045 859 €	6 156 872 €
incl. Freeport	8 312 101 €	11 206 701 €
incl. terminal operator	-2 266 242 €	-4 315 507 €
FIRR (25 years)	10%	9%
incl. Freeport	20%	23%
incl. terminal operator	-0.4%	-2.7%
3. Investments in the core infrastructure of the terminal, sustainable infrastructure and urban interconnections		
FNPV (25 years)	4 562 404 €	4 673 417 €
incl. Freeport	8 312 101 €	11 206 701 €
incl. terminal operator	-2 266 242 €	-4 315 507 €
incl. municipality	-1 483 455 €	-1 483 455 €
FIRR (25 gadi)	8%	7%
incl. Freeport	20%	23%
incl. terminal operator	-0.4%	-3%
incl. municipality	-100%	-100%

Financial analysis shows that from the point of view of the overall project, the investments are both financially reasonable both in the midpoint terminal and in the turnaround terminal in all the scenarios examined. However, in the model under consideration, most of the revenue is generated by the Freeport Authority in the form of port charges, and the smallest - the terminal operator in the form of terminal fees, while the investment burden rests on the terminal operator's shoulders. The result of such a distribution of expenses and revenues is that the terminal operator has a positive financial return for the investment in the midpoint terminal infrastructure only. Additionally, profitability only occurs in the long term, while in the short term, investment even in basic infrastructure is not paying off. This means that it is advantageous for the terminal operator to invest only in the midpoint terminal's minimum program, while in order to realize the full potential of the cruise terminal, investment in terminal infrastructure would require the support of the Freeport Authority and/or municipality and/or EU funds.

With regard to sustainable infrastructure (mainly shore power supply), without the public or electricity supply company financial support for infrastructure, this infrastructure is not financially viable, as the intermediary's low revenues for infrastructure use are disproportionate to the amount of investment required.

8.5.4.2 Socio-economic analysis

The table below summarizes the results for the socio-economic analysis of different scenarios.

Scenario and indicator	Midpoint terminal	Turnaround terminal
1. Investments only in the core infrastructure of the terminal		
ENPV (25 years)	23 498 538 €	23 845 613 €

EIRR (25 years)	65%	69%
2. Investments in the core infrastructure of the terminal and in sustainable infrastructure		
ENPV (25 years)	21 407 201 €	22 841 108 €
EIRR (25 years)	36%	38%
3. Investments in the core infrastructure of the terminal, sustainable infrastructure and urban interconnections		
ENPV (25 years)	22 625 570 €	24 003 320 €
EIRR (25 years)	38%	40%

The socio-economic analysis shows that the construction of the cruise terminal is beneficial for the public in all options and slightly more advantageous in the case of a turnaround terminal. Such a small difference can be explained by the high construction costs of a turnaround terminal building, which can be reduced by using lighter and simpler modular designs. Another way to increase the financial and socioeconomic returns of the turnaround terminal would be to reconstruct the existing warehouse building, to form part of the first floor premises of the cruise terminal space and to adjust the rest of the building to offices, trade, exhibitions, etc. functions.

The socio-economic returns are lower with shore power supply, which can be explained by the relatively low number of vessels using this infrastructure in this analysis.
Investments in the shore power to pay off from the point of view of society require a much higher number of calls or alternatively a shore power supply using an LNG barge can also be used, which can also be used at other port berths.

9 Conclusions

The world cruise market and Baltic Sea Region in particular in the last decade has continuously been growing and will continue to grow in the future.

Forecasting the number of cruise passengers and cruise calls in the ports of the Baltic Sea region, where the year of 2017 was taken for the base year, in the case of slow growth scenario the estimated numbers of cruise passengers may reach 7. 71 million passengers and 3, 230 cruise calls in 2030, in the case of base scenario – 9.3 million cruise passengers and 3, 904 cruise calls, in the case of fast growth scenario –11. 18 million passengers and 4, 710 cruise calls.

The forecasts for Riga port for 2030 include: in the slow growth scenario the estimated number of passengers – 131 thousand and the estimated number of calls – 111, in the baseline scenario – 158 thousand passengers and 132 cruise calls, in the fast growth scenario – 190 thousand passengers and 160 cruise calls. Fulfilment of this potential, however, depends on the availability of proper infrastructure, as current cruise terminal facilities are limited.

Over the last years, the majority of European sea region ports have made considerable investments in port infrastructures with the aim of fulfilling the statutory requirements, as well as in order to facilitate the development of cruise tourism.

Main prerequisites for creation of the sustainable cruise terminal infrastructure are present in the city of Riga. Present Riga Passenger terminal (berth) is well located, however lacks both berth length as well as the space for ground handling operations to handle increasing demand of the cruise ships. Krievu sala terminal, presently used for cruise ship berthing during high demand periods is not suitable for cruise ship handling due to remote and unattractive location. An alternative location is needed and Andrejsala and Eksportosta are best alternatives, with Eksportosta being most suitable to start cruise ship handling with least investment.

The midpoint terminal at Eksportosta is more financially viable compared to the turnaround terminal. Cruise operations can be started immediately with little (up to 200 thousand EUR) investment. In the medium-term, investment into waterside infrastructure (removal of the wave breaker) and ground transportation area is needed, with the total amount of around 5 million EUR.

Investment into permanent terminal may reach 10 million EUR which can pay off for the terminal operator if, in addition to regular cruise calls, there are at least 20 turnaround calls per year. Such investment should be considered after turnaround calls are well established with the temporary terminal building and there is a positive forecast for turnaround calls increase.

From the combined project perspective, both investments into midpoint and turnaround terminal are financially viable in all considered scenarios, moreover the investments have high socio-economic return. However the largest share of the revenues are received by the port authority through port fees and smaller – by the terminal operator through the terminal fees, at the same time investment costs are mostly carried by the terminal operator. The terminal operator is motivated to invest only into the minimum programme of the midpoint terminal and in order to reach full potential of the cruise terminal, co-financing of investment is needed from the port authority, the municipality or the EU funds.
With regard to sustainable infrastructure (mainly shore power supply), without the public or electricity supply company financial support for infrastructure, this infrastructure is not financially viable, as the intermediary's low revenues for infrastructure use are disproportionate to the amount of investment required. Moreover, in order for the environmental benefits to outweigh investment costs, much higher number of cruise ship calls is needed than envisaged at present. A viable alternative for the dedicated shore power connection at the cruise terminal could be an LNG barge, that could also serve other berths at the port.

Investments into sustainable connections with the city transport infrastructure have positive socio-economic return as they benefit not only cruise passenger mobility but the mobility of surrounding areas as well.

The development of cruise tourism in the Port of Riga will be more likely to reach its full potential if the municipality together with the port authority will develop strategy for the sector and will work purposefully to implement it.

10 Sources

1. Bergen og Omland Havnevesen. 2018. Onshore Power Supply for Cruise Vessels –Assessment of opportunities and limitations for connecting cruise vessels to shore power
2. Chevron Global Marine Products. 2012. Everything You Need to Know About Marine Fuels. https://www.chevronmarineproducts.com/content/dam/chevron-marine/Brochures/Chevron_EverythingYouNeedToKnowAboutFuels_v3_1a_DESKTOP.pdf
3. City & Port Development, CMP and the City of Copenhagen. 2015. Options for establishing shore power for cruise ships in port of Copenahgen Nordhavn
4. CLIA. Cruise Travel Report. January 2017. https://cruising.org/docs/default-source/research/clia_cruisetravelreport_2017.pdf
5. Contribution of Cruise Tourism to the Economies of Europe 2017. https://www.cruising.org/docs/default-source/market-research/contribution-of-the-cruise-tourism-the-economies-of-europe-2017.pdf?sfvrsn=0
6. Copenhagen Malmo Port. New cruise-ship quay. http://www.cmport.com/corporate/investments/new-cruise-ship-quay
7. Copenhagen Malmo Port. Go-ahead for new cruise terminal in Copenhagen. http://www.cmport.com/news-and-media/pressreleases/2017/2017-10-04
8. Copenhagen Malmo Port. Visby Cruise Terminal. http://www.cmport.com/business/cruise-ships/visby-cruise-terminal
9. COWI A/S and Kosan Krisplant A/S.
10. CRUISE BALTIC Market Review 2018. https://api.cruisebaltic.ovdal.dk/media/4160/cruise-baltic-market-review-2000-2018-pdf.pdf
11. CRUISE BALTIC. Cruise Lines in the Baltic. https://www.cruisebaltic.com/modularpages/cruise-lines-in-the-baltic https://www.cruisebaltic.com/allportinfo
12. CRUISE BALTIC. Services available for guests 2018. https://api.cruisebaltic.ovdal.dk/media/5371/services-available-for-guests-2018.pdf
13. Cruise Industry News. Guidelines for Cruise Terminal Design and Operations. https://www.cruiseindustrynews.com/cruise-news/14077-guidelines-for-cruise-terminal-design-and-operations.html
14. Energy and Environmental Research Associates, LLC. 2017. Evaluation of Cruise Industry Global Environmental Practices and Performance. Prepared for Cruise Lines International Association (CLIA).
15. European Commission. 2016. REFIT Evaluation of Directive 2000/59/EC on port reception facilities for ship generated waste and cargo residues. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2016:0168:FIN:EN:PDF
16. European Sea Ports Organisation. 2012. Green guide: towards excellence in port environmental management and sustainability. Annex 2: Legislation influencing European ports
17. European Sea Ports Organisation. 2018. ESPO ENVIRONMENTAL REPORT 2018: EcoPortsinSights 2018. https://www.espo.be/media/ESPO%20Environmental%20Report%202018.pdf
18. Freeport of Riga Authority. 2018. Freeport of Riga Cruise Infrastructure.
19. Freeport of Riga Authority. 2009. Freeport of Riga development programme 2009-2018.
20. HELCOM. 2013. Interim guidance on technical and operational aspects of delivery of sewage by passenger ships to port reception facilities.
21. Helsinki Turnaround terminal for Cruises around the Baltic Sea. https://www.portofhelsinki.fi/sites/default/files/attachments/homeport.pdf
22. International Maritime Organisation. 2018. Consolidated guidance for port reception facility providers and users

23. Latvian Cabinet of Ministers. 2017. CM resolution No. 202 "On alternative fuels development plan 2017-2020.
24. Latvian University. 2015. Study on cruise tourism in Riga.
25. Maritime Institute in Gdansk. Report "Common standards in the measurement of economic effects by cruise tourism". http://www.greencruiseport.eu/files/public/download/studies/Common%20Standards%20in%20the%20measurement%20of%20economic%20effects%20by%20cruise%20tourism_30.06.2017_Gdansk.pdf
26. PIANC (The World Association for Waterborne Transport Infrastructure). 2016. Guidelines for Cruise Terminals.
27. Port of Gdansk. Investments carried out in recent years. https://www.portgdansk.pl/about-port/investments-carried-out-in-recent-years
28. Port of Helsinki. Developing West Harbour. https://www.portofhelsinki.fi/en/making-new/developing-west-harbour
29. Port of Klaipeda. Klaipeda Central Terminal. http://www.portofklaipeda.lt/passenger-terminals
30. Port of Kristiansand. Opening of the New Cruise Pier in Kristiansand. http://www.portofkristiansand.no/en/en-historisk-dag-i-kristiansand-havn/
31. Ports of Stockholm. Development 2013-2016. http://www.portsofstockholm.com/stockholm/port-areas/vartahamnen/development-2013-2016/
32. Port of Tallinn. Ongoing Projects. http://www.portoftallinn.com/eu-ongoing-projects
33. Port of Tallinn. Old City Harbour Development Plans. http://www.portoftallinn.com/old-city-harbour-development-plans
34. Presentation to Seatrade Cruise Global "Guidelines for Cruise Terminals". http://www.medcruise.com/sites/default/files/2016-pianc_wg152-presentation.pdf
35. Project for the construction of offshore dolphins. https://www.portspb.ru/en/about/info_about_port/investments
36. Sciozi D. Et al. Structural analysis of cruise passenger traffic in the world and in the Republic of Croatia // Scientific Journal of Maritime Research 29 (2015) 8-15. file:///C:/Users/Liene/Downloads/324_15_6_Sciozzi_Poletan_Jugovic%20(1).pdf
37. Seatrade Cruise News. Visby's new cruise berth officially opens. http://www.seatrade-cruise.com/news/news-headlines/visby-celebrates-as-new-cruise-berth-officially-opens.html
38. Seatrade Cruise News. First study on guidelines for building cruise terminals unveiled by Port of Barcelona. http://www.seatrade-cruise.com/news/news-headlines/first-study-on-guidelines-for-building-cruise-terminals-unveiled-by-port-of-barcelona.html
39. SSAB. Building a new cruise quay in Hernesaari next to Helsinki's West Harbour. https://www.ssab.com/company/newsroom/media-archive/2018/03/20/12/44/building-a-new-cruise-quay-in-hernesaari
40. St. Petersburg cruise terminal redevelopment project gets the nod from Russia's state expert appraisal board. http://en.portnews.ru/news/263301/
41. Sweco Projekt AS. 2017. Cruise Terminal of Old City Harbour, Port of Tallinn: Sustainable energetic solutions for cruise terminal buildings in Northern Climate
42. 10 reasons to book a Baltic Cruise. https://www.mundycruising.co.uk/cruise-news/destination-review/why-book-baltic-cruise
43. The Baltic Course. Klaipeda port to invest EUR 400 mln in infrastructure in next 3 years. http://www.baltic-course.com/eng/good_for_business/?doc=143173

44. TVnet. Sākta jaunā Rīgas ostas attīstības plāna izstrāde. https://www.tvnet.lv/4539104/sakta-jauna-rigas-ostas-attistibas-plana-izstrade
45. TVnet. "Rīgas pasažieru terminmāla" peļņa pērn sasniegusi € 1,243 miljonus. https://www.tvnet.lv/4526609/rigas-pasazieru-terminala-pelna-pern-sasniegusi-1-243-miljonus
46. Uniconsult. 2014. Pre-Feasibility Study "Assessment of the cruise market in the Baltic Sea Region (BSR) and the neighboring North Sea area in the light of SECA/NECA regulations (2015) – cruise line strategies and needs to improve sustainable port facilities"
47. World Port Sustainability programme. Port of Kristiansand – Shore power supply for cruise ships. https://sustainableworldports.org/project/port-of-kristiansand-shore-power-supply-for-cruise-ships/

11 Appendices

Annex 1

Cruise Companies and Their Fleet in the Baltic Sea in 2018 [97]

Cruise Company	Cruise ships in the Baltic Sea	Calls at the port of Riga						
		2013	2014	2015	2016	2017	Total	Number of arriving passengers
AIDA CRUISES	AIDAaura				1		**15**	1 317
	AIDAbella							
	AIDAcara			4		5		10 182
	AIDAdiva							
	AIDAluna							
	AIDAmar							
	AIDAprima							
	AIDAvita				4	1		6 150
AZAMARA CLUB CRUISES	Azamara Journey							
	Azamara Pursuit							
	Azamara Quest							
BIRKA CRUISES	Information not found							
CELEBRITY CRUISES	Celebrity Reflection						**5**	
	Celebrity Silhouette					5		10 804
COSTA	Costa Pacifica	6	7	7	5	3	**29**	86 650
	Grand Mistral	1						904
CRUISE&MARITIME VOYAGES	Astor	1	1	2	1	1	**9**	2 789
	Astoria		2			1		767
	Columbus							
	Magellan							
	Marco Polo							
CRYSTAL CRUISES	Crystal Serenity						**1**	
	Crystal Symphony			1				881
CUNARD	Queen Elizabeth							
	Queen Victoria							
DISNEY CRUISE LINE	Disney Magic							
FRED OLSEN CRUISE LINES	Balmoral				1	2	**8**	3 521
	Black Watch		1		1			1 423
	Braemar			2				1 433
	Boudicca		1	1				1 544
FTI CRUISES	Berlin	1			1	1	**3**	1 029
GRAND CIRCLE CRUISE LINE	M/V Clio					12	**25**	1 019
	Corinthian			5	8			1 240
HAPAG LLOYD CRUISES	Europe	3	2	3	2	2	**16**	4 053
	Europe 2			1	1			936
	Columbus 2	2						1 243
HOLLAND AMERICA LINE	Prinsendam	1	1				**2**	1 451
	Nieuw Statendam							
	Rotterdam							
	Veendam							
	Zuiderdam							
KRISTINA CRUISES*	Kristina Katarina	1					**1**	295
LINDBLAD EXPEDITIONS*	Nat Geo Explorer	1					**5**	150
					2	2		393

[97] https://www.cruisebaltic.com/modularpages/cruise-lines-in-the-baltic

Cruise Company	Cruise ships in the Baltic Sea	Calls at the port of Riga						
		2013	2014	2015	2016	2017	Total	Number of arriving passengers
	National Geographic Orio							
MAJESTIC INTERNATIONAL CRUISES	Ocean Majesty	2	2	2	2	3	**11**	4 974
MARELLA CRUISES	Explorer Celebration Spirit	1 1	 1			 1	**4**	694 1 209 2 495
MSC CRUISES	MSC Magnifica MSC Opera MSC Meraviglia MSC Poesia				 3	2	**5**	5 054 6 487
NOBLE CALEDONIA	Serenissima Island Sky	 4	2	4 1		2 4	**17**	703 945
NORWEGIAN CRUISE LINE	Norwegian Escape Norwegian Getaway Norwegian Pearl Norwegian Spirit							
OCEANIA CRUISES	Oceania Maria Nautica Marina Sirena (previous Ocean Princess)	 2 4 1	 2 3 2	 1 3 2	 2 4	 1 4	**31**	 5 310 21 900 3 280
PEACE BOAT	Ocean Dream	1				1	**2**	1 942
PHOENIX REISEN GMBH	Albatros Amadea Artania Deutschland	2 1 2	2 1 2 1	2 1 2	1 2	 1 1 2	**24**	5 258 1 582 8 152 1 827
PLANTOURS KREUZFAHRTEN	Hamburg	1	2		2	3	**8**	2 860
P&O CRUISES	Arcadia Aurora Azura Britannia					 1	**1**	 1 827
PONANT	LE DUMONT-D'URVILLE Le Boreal	 3					**3**	 656
PRINCESS CRUISES	Pacific Princess Regal Princess Sapphire Princess Sea Princess				1 1	2	**4**	1 963 1 837
PULLMANTUR CRUISES	Information not found							
REGENT SEVEN SEAS CRUISES	Seven Seas Explorer Seven Seas Navigator Seven Seas Voyager	 2	 5	 5	 5	5 1	**23**	3 552 493 11 907
ROYAL CARIBBEAN INTERNATIONAL	Brilliance of the Seas Explorer of the seas						**31**	

Cruise Company	Cruise ships in the Baltic Sea	Calls at the port of Riga						
		2013	2014	2015	2016	2017	Total	Number of arriving passengers
	Serenade of the Seas			5	6	7		42 457
	Legend of the seas		6					11 663
	Vision of the Seas	5				2		15 329
SAGA	Saga Pearl II		1				**8**	407
	Saga Ruby	2						918
	Saga Sapphire Spirit of Discovery		1	2		2		3 094
SEA CLOUD CRUISES	Sea Cloud II		1	1	1	2	**5**	267
SEABOURN	Seabourn Quest							
	Seabourn Oviation							
SILJA LINE	Baltic Princess	1	1	1	1	1	**8**	7 155
	Baltic Queen			1				1 461
	Europe					1		2 376
	Victoria I	1						1 748
SILVERSEA	Silver Cloud					1	**11**	283
	Silver Whisper	2	3	3	2			3 813
	Silver Spirit							
	Silver Wind							
ST. PETER LINE*	Princess Anastasia	1	1		1	1	**6**	6 858
	Princess Maria	1	1					2 770
TUI CRUISES	Mein Schiff	1					**4**	2 004
	Mein Schiff 1 Mein Schiff 2 Mein Schiff 3							
	Mein Schiff 4			2	1			8 101
VARIETY CRUISES	Information not found							
VISHAL CRUISES*	Delphin	2	1				**3**	1 207
VIKING OCEAN CRUISES	Viking Star						**4**	
	Viking Sea							
	Viking Cinderella	4						5 889
WINDSTAR CRUISES	Club med 2		1				**1**	345
	Voyager (BS)		1				**1**	412
	KOPĀ	**64**	**58**	**64**	**62**	**86**	**332**	**426 279**

* Not mentioned in the list of CRUISE BALTIC

Sources: *CRUISE BALTIC*, www.seascanner.com, Websites of cruise companies, data of Riga Freeport Authority

Annex 2

The Dynamics of the Number of Cruise Passengers in the Baltic Sea Ports from 2005 to 2017 [98]

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Arendal	714	194	10	158	2.342	480	-	496	1 775	630	5 250	3 200	2 384
Copenhagen	428 000	458 000	509 000	560 000	675 000	662 000	819 000	840 000	800 500	739 000	677 000	740 000	850 000
Elsinore	3 245	3 322	1 800	-	450	2 600	5 500	2 560	2 900	1 700	200	1 040	3 124
Fredericia	-	-	-	-	-	-	-	-	-	2 076	11 668	6 746	12 099
Gdansk	8 353	9 703	12 193	13 276	16 753	8 378	6 787	8 294	10 508	14 974	10 814	12 566	31 790
Gothenburg	12 700	11 272	11 404	12 445	35 598	51 730	62 154	83 000	50 000	107 971	95 000	56 082	56 000
Helsingborg	5 984	8 311	7 350	3 900	25 987	15 648	7 600	11 300	6 800	4 800	6 700	14 000	6 600
Helsinki	240 000	270 000	260 000	360 000	360 000	342 000	385 000	368 000	420 000	420 000	436 500	409 000	478 000
Kalmar	2 134	2 717	1 007	1 100	1 158	325	-	1 235	1 745	1 500	328	1 528	500
Kalundborg	6 335	1 250	17 531	14 684	4 222	6 589	-	17 482	9 554	5 170	-	706	7 850
Karlskrona	1 350	2 460	3 100	5 778	1 250	1 000	680	850	5 200	3 230	600	1 600	4 800
Kemi	1 750	2 000	2 020	2 000	2 145	1 773	2 126	3 145	2 423	505	2 500	812	-
Kiel	131 784	154 250	172 937	222 130	291 388	341 391	377 205	348 180	363 476	354 050	458 771	485 497	513 909
Klaipeda	23 701	24 914	35 680	32 820	33 300	35 201	21 478	26 769	32 750	57 797	60 202	64 285	74 716
Kotka	-	-	-	-	302	380	-	542	-	-	-	-	8 600
Kristiansand	43 000	38 000	52 000	22 000	24 000	31 700	50 000	70 000	105 000	120 000	69 221	100 000	109 000
Luebeck-Travemunde	-	-	-	-	-	-	-	-	-	-	-	15 374	13 000
Malmö	523	1.350	565	500	625	850	777	-	31 500	32 500	31 700	1 600	-
Marienhamn	3 764	3 366	4 934	2 174	2 426	5 312	3 500	6 742	4 851	6 537	5 500	7 513	11 890
Oslo	183 725	206 234	197 173	239 991	269 763	261 000	312 859	303 486	298 403	234 000	199 000	171 480	195 000
Riga	48 028	40 843	65 438	50 077	69 413	58 248	63 527	83 000	66 968	58 972	67 687	71 400	85 923
Rostock	124 500	173 500	133 700	171 500	161 800	214 800	257 300	385 800	483 000	509 000	485 000	553 000	641 000
Rønne	13 800	16 311	13 046	16 921	21 864	14 894	18 095	31 717	30 562	30 841	7 885	9 307	12 441
Saaremaa	-	4 909	2 580	1 974	1 030	683	5 655	1 120	6 456	7 500	3 623	720	1 500
Skagen	2 565	2 150	3 302	541	3 206	1 966	4 892	2 671	2 541	7 564	21 888	10 880	33 088
St. Petersburg	299 703	305 835	335 502	394 827	425 665	427 500	472 000	452 000	523 525	512 543	505 359	487 648	581 422
Stockholm	250 000	287 000	281 000	365 000	447 000	415 000	452 000	470 000	485 581	470 000	530 229	500 000	600 000
Tallinn	295 424	305 026	292 158	375 578	415 575	390 000	437 517	440 504	519 319	479 000	500 622	474 000	562 000
Turku	9 700	3 273	2 372	2 996	2 736	2 000	5 456	2 600	1 300	-	7 500	4 325	3 300

[98] https://api.cruisebaltic.ovdal.dk/media/4161/cruise-passengers-calls-turnarounds-2018-overview.pdf

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Visby	113 387	77 578	62 263	64 324	32 874	52 067	42 819	54 158	48 620	57 600	39 975	39 036	41 101
Aalborg	410	2.550	-	1 813	3 130	386	4 596	6 451	7 042	793	12 685	18 380	31 464
Aarhus	30 514	26 317	18 043	25 536	22 815	6 325	39 472	39 436	36 197	26 500	29 400	71 804	82 348
TOTAL	**2 285 093**	**2 442 635**	**2 498 108**	**2 964 043**	**3 353 817**	**3 352 226**	**3 857 995**	**4 061 538**	**4 358 496**	**4 266 753**	**4 282 807**	**4 333 529**	**5 054 849**
Yearly Growth %	**22.7**	**6.9**	**2.3**	**18.7**	**13.2**	**0**	**15.1**	**5.3**	**7.3**	**-2.1**	**0.4**	**1.2**	**16.6**

Annex 3

Characteristics of Ships Having Arrived at Baltic Sea Ports in 2018[99][100]

Cruise line	Cruise ship	Length of ship, m	Gross tonnage	Maximum number of passengers on board*
Aida	Aura	202.85	42,289	1,300
	Bella	251.89	69,203	2,500
	Cara	193.34	38,557	1,339
	Diva	251.89	69,203	2,500
	Luna	251.89	69,203	2,500
	Mar	253.22	71,304	2,686
Azamara	Journey	181	30,277	781
Birka	Stockholm	177	34,924	2,000
Celebrity	Eclipse	317.14	121,878	3,420
	Silhouette	315	122,210	3,463
Costa	Favolosa	289.65	113,307	3,617
	Magica	272.19	102,784	3,250
	Pacifica	289.59	114,425	3,617
Cruise & Maritime Voyages	Astor	176.25	20,704	650
	Astoria	160.07	16,144	600
	Columbus	245.6	63,786	1,855
	Magellan	221.55	46,052	1,452
	Marco Polo	176.28	22,080	850
Crystal	Serenity	250	68,870	1,254
Cunrad	Queen Elizabeth	294	90,901	2,503
	Queen Victoria	294	90,746	2,489
Disney	Magic	294.06	83,969	2,456
Fred.Olsen	Balmoral	217.91	43,537	1,420
	Boudicca	206.96	28,551	924
	Braemar	195.82	24,344	970
FTI	Berlin	139.3	9,570	420
Grand Circle	Clio	100.26	3,504	90
	Corinthian	89.35	4,077	100
Hapag-Lloyd	Europa	198.52	28,890	408
	Europa 2	225.62	42,830	516
Holland America Line	Koningsdam	296	99,836	394
	Prinsendam	204	39,051	1,006
	Rotterdam	237.95	61,849	1,685
	Zuiderdam	285.42	82,820	2,364
Marella	Discovery	264.26	69,472	2,074
Majestic International	Ocean Majesty	136	10,417	621
MSC	Meroviglia	315.83	171,589	5,386
	Orchestra	293.8	92,409	3,060
	Preziosa	333.33	139,072	4,378
Norwegian	Breakaway	325.64	145,655	4,819
Noble Caledonia	Island Sky	90.6	4,200	118
	Serenissima	87.4	2,598	118

[99] https://www.marinetraffic.com/en/ais/details/ships/shipid:369075/mmsi:308693000/vessel:MARCO%20POLO

[100] *https://www.cruisemapper.com/wiki/761-cruise-ship-passenger-capacity-ratings

Cruise line	Cruise ship	Length of ship, m	Gross tonnage	Maximum number of passengers on board*
Oceania	Marina	239.3	66,084	1,447
	Nautica	181	30,277	803
P&O	Aurora	270	76,152	2,258
	Arcadia	285.11	84,342	1,904
	Azura	289.61	115,055	3,737
	Britannia	329	143,730	4,406
Peace boat	Ocean Dream	204.75	35,265	1,422
Phoenix reisen gmbh bonn	Albatros	205.46	28,518	830
	Amadea	192.82	29,008	624
	Artania	230	44,656	1,260
	Deutschland	142	15,187	636
Plantours	Hamburg	144.13	15,067	420
Ponant	Le Boreal	142.1	10,944	264
	Le Soleal	142.1	10,992	264
	Le Laperouse	131	9,900	184
Princess	Pacific Princess	181	30,312	804
	Regal Princess	330	142,714	4,272
	Sapphire Princess	290	115,875	3,214
Pullmantur	Zenith	208	47,413	1,828
Regent	Seven Seas Explorer	224.02	55,254	829
	Seven Seas Navigator	170.69	28,803	557
RoyalCaribbean	Brilliance of the Seas	292	90,090	2,580
	Navigator of the Seas	311	139,570	3,926
	Serenade of the Seas	293.2	90,090	2,580
Saga	Pearl II	164.35	18,627	512
	Sapphire	199.62	37,049	748
Sea Cloud	Sea Cloud II	105.9	3,849	96
Seabourn	Quest	198	32,477	540
	Ovation	210	40,350	638
Silversea	Silver Spirit	210.7	39,444	648
	Silver Wind	155.75	17,235	355
TUI	Mein Schiff I	315.7	111,500	2,894
	Mein Schiff III	293.2	99,526	2,700
	Mein Schiff IV	293.2	99,526	2,700
Variety	Voyager	65.95	1,593	75
Viking	Sea	228,2	47,842	928
	Sky	228.28	47,842	928
	Star	228.2	47,842	928
	Sun	228.3	47,842	928
Windstar	Star Breeze	133.4	9,975	254

Characteristics of the Port of Copenhagen

	Langelinie Pier 190 - 198	Ocean Quay 331-334	Ndr. Toldbod 177
Max LOA	700 m	1100 m	240 m
Max depth	South part 9.1 m North part 10.0 m	10.5 m	7.4 m
Type of berth (passenger, cargo, bulk traffic)	Passsenger	Passsenger	Passsenger
Fenders available (brand and type)	V - fender	V - fender	No data
Bollard strength	50 ts	125 ts / storm 200 ts	40 ts
Info on tides	Not Available	Not Available	None
Info on wind	No data	No data	No data
Info on currents	No data	No data	No data
Restrictions	No	No	Max LOA 210 m
Distance to the city center (in Kilometers)	4	8	3
Are shuttle buses required?	No	No	No
Distance to the airport (in Kilometers)	10	14	10
Clean pier before arrival + maintenance during the day	Available	Available	Available
Good functional fenders	Available	Available	Available
ISPS certified - compulsory	Available	Available	Available
Cleared and well signaled entrance / exit to/ from the pier	Available	Available	Available
Pilotage service available	Available	Available	Available
Bunkers available	Available	Available	Available
Tug available, bollard pull (14 t)	Not Available	Not Available	Not Available
Fresh water available - supply rate (30 m3/hour)	Not Available	Not Available	Not Available
Solid waste disposal	Available	Available	Available
Toxic waste disposal	Available	Available	Available
Bilge and Sludge disposal facilities	Available	Available	Available
Black and grey water disposal facilities	Available	Available	Available
Necessary space, facilities and labor to handling ship's stores and provision	Available	Available	Available
Restrooms available	Available	Available	Available
Facilities for handicaps: ramps, toilettes	Available	Available	Not Available
Tourism information available at the port	Available	Available	Available
Cruise terminal or tent facilities w/ checkin, luggage and waiting areas)	Not Available	Available	Not Available
X-ray available	Available	Available	Available

	Langelinie Pier 190 - 198	Ocean Quay 331-334	Ndr. Toldbod 177
Porters and stevedors available	Available	Available	Available
First aid equipment available	Not Available	Available	Not Available
Shore gangways available on request	Not Available	Not Available	Not Available
Airline check-in at the port (desirable)	Available	Available	Available
Parking space for private vehicles	Not Available	Available	Not Available
Fixed sign / map at the port with directions between port and city	Not Available	Available	Not Available
Dedicated local cruise network and website	Available	Available	Available
Taxi stand and general price guidance information	Available	Available	Available
City maps available at pier	Available	Available	Available
Crew designated centre available at the port	Not Available	Available	Not Available

Annex 5

Characteristics of the Port of St. Petersburg

	Cruise Terminal No. 1	Cruise Terminal No. 2	Cruise Terminal No. 3	Cruise Terminal No. 4
Cruise ship berths	6. and 7.	4. and 5.	2. and 3.	1. and 2.
The building of Cruise Terminal	1	2	3	4
Parking for tourist minibuses	36 places	10 places	23 places	20 places
Parking for cars	119 places	49 places	246 places	158 places
Inside the terminal building	Vending machines; Souvenir shops; City Tourist Information Booth; Taxi desk; ATMs; Fur store	Vending machines; Souvenir shops; Taxi desk; ATMs	Traditional cuisine cafe; Vending machines; Souvenir shops; Taxi desk; ATMs; Post Office; Duty-free shop	Vending machines; Souvenir shops; Taxi desk; ATMs

Annex 6

Characteristics of the Port of Talinn

	Pier No. 1	Pier No. 17	Pier No. 24	Pier No. 25
Max LOA	252 m	183 m	339	339
Max depth	8.5	10	10.7	10.7
Type of berth (passenger, cargo, bulk traffic)	Passenger and RO-RO	Passenger	Passenger	Passenger
Fenders available (brand and type)	Plate fender (CF800)	Cylindrical fenders L=2000mm diam. 400mm, (pack of 3 fenders)	Trapezoid fenders (LMD 1000H x 1300L CLA)	Trapezoid fenders (LMD 1000H x 1300L CLA)
Bollard strength	Bollards 750 kN tower bollards 1000 kN	Bollards 750 kN tower bollards 1000 kN	Bollards 1000 kN	Bollards 1000 kN
Info on tides	No tides	No tides	No tides	No tides
Info on wind	0-20 m / s	0-20 m / s	0-20 m / s	0-20 m / s
Info on currents	No currents	No currents	No currents	No currents
Restrictions	Height above sea level 2.25 m	Height above sea level 2.25 m	Height above sea level 2.4 m	Height above sea level 2.4 m
Distance to the city centre (in Kilometers)	1	1	1	1
Are shuttle buses required?	No	No	No	No
Distance to the airport (in Kilometers)	5.5	5.5	5.5	5.5
Clean pier before arrival + maintenance during the day	Available	Available	Available	Available
Good functional fenders	Available	Available	Available	Available
ISPS certified - compulsory	Available	Available	Available	Available
Cleared and well signalled entrance / exit to/ from the pier	Available	Available	Available	Available
Pilotage service available	Available	Available	Available	Available
Bunkers available	Available	Available	Available	Available
Tug available, bollard pull (14 t)	Not available	Not available	Not available	Not available
Fresh water available - supply rate (30 m3/hour)	Not available	Not available	Not available	Not available
Solid waste disposal	Available	Available	Available	Available
Toxic waste disposal	Not available	Not available	Not available	Not available
Bilge and Sludge disposal facilities	Available	Available	Available	Available
Black and grey water disposal facilities	Available	Available	Available	Available

	Pier No. 1	Pier No. 17	Pier No. 24	Pier No. 25
Necessary space, facilities and labour to handling ship's stores and provision	Available	Available	Not available	Not available
Restrooms available	Available	Available	Available	Available
Facilities for handicaps: ramps, toilettes	Available	Available	Available	Available
Tourism information available at the port	Available	Available	Available	Available
Cruise terminal or tent facilities w/ checkin, luggage and waiting areas)	Not available	Available	Available	Not available
X-ray available	Not available	Not available	Not available	Not available
Porters and stevedores available	Available	Available	Available	Available
First aid equipment available	Available	Available	Available	Available
Shore gangways available on request	Available	Not available	Not available	Not available
Airline check-in at the port (desirable)	Not available	Not available	Not available	Not available
Parking space for private vehicles	Available	Available	Available	Available
Fixed sign / map at the port with directions between port and city	http://www.tourism.tallinn.ee/static/files/051/kaart_a3_2013.pdf	http://www.tourism.tallinn.ee/static/files/051/kaart_a3_2013.pdf	http://www.tourism.tallinn.ee/static/files/051/kaart_a3_2013.pdf	Available
Dedicated local cruise network and website	Available	Available	Available	Available
Taxi stand and general price guidance information	Available	Available	Available	Available
City maps available at pier	Available	Available	Available	Available
Crew designated centre available at the port	Available	Available	Available	Available

Characteristics of the Port of Helsinki

	EKL	EO1	ERA-ERB	LMA&LMB	LHC
Max LOA	200m	180m	215m	330m - no specific loa limitations	330 m -no specific loa limitations
Max depth	7.9 m	7.9 m	9.3 m	10.8m - no specific loa limitations	8.9m - no specific loa limitations
Type of berth (passenger, cargo, bulk traffic)	Passenger	Passenger	Passenger	Passenger	Passenger
Fenders available (brand and type)	Plate fenders & tyres	Plate fenders	Plate fenders & tyres	Vertical & horizontal rubber cylinder & rubber tyres	Rubber
Bollard strength	750kN	750kN - 1500kN	750kN	750kN - 1500kN	750kN - 1500kN
Info on tides	No tide	No tide	No tide	No tide	No tide
Info on wind	Helsinku VTS / VHF Ch 71	Helsinku VTS / VHF Ch 71	Helsinku VTS / VHF Ch 71	Helsinku VTS / VHF Ch 71	Helsinku VTS / VHF Ch 71
Info on currents	No current	No current	no current	No current	No current
Restrictions	No data	No data	No data	No data	No data
Clean pier before arrival + maintenance during the day	Available	Available	Available	Available	Available
Good functional fenders	Available	Available	Available	Available	Available
ISPS certified - compulsory	Available	Available	Available	Available	Available
Cleared and well signaled entrance / exit to/ from the pier	Available	Available	Available	Available	Available
Pilotage service available	Available	Available	Available	Available	Available
Bunkers available	Available	Available	Available	Available	Available
Tug available, bollard pull (14 t)	Not available	Not available	Not available	Not available	Not available
Fresh water available - supply rate (30 m3/hour)	Not available	Not available	Not available	Not available	Not available
Solid waste disposal	Available	Available	Available	Available	Available
Toxic waste disposal	Available	Available	Available	Available	Available
Bilge and Sludge disposal facilities	Available	Available	Available	Available	Available
Black and grey water disposal facilities	Available	Available	Available	Available	Available
Necessary space, facilities and labor	Available	Available	Available	Available	Available

	EKL	EO1	ERA-ERB	LMA&LMB	LHC
to handling ship's stores and provision					
Restrooms available	Not available	Available	Available	Available	Available
Facilities for handicaps: ramps, toilettes	Available	Available	Available	Available	Available
Tourism information available at the port	Available	Available	Available	Available	Available
Cruise terminal or tent facilities w/ checkin, luggage and waiting areas)	Not available	Available	Not available	Available	Not available
X-ray available	Not available	Available	Not available	Available	Not available
Porters and stevedores available	Not available	Available	Not available	Available	Not available
First aid equipment available	Not available	Available	Not available	Available	Not available
Shore gangways available on request	Not available	Available	Not available	Not available	Not available
Airline check-in at the port (desirable)	Not available	In progress	Not available	Available	Not available
Parking space for private vehicles	Not available	Available	Not available	Available	Not available
Fixed sign / map at the port with directions between port and city	Available	Available	Available	Available	Available
Dedicated local cruise network and website	Available	Available	Available	Available	Available
Taxi stand and general price guidance information	Available	Available	Available	Available	Available
City maps available at pier	Available	Available	Available	Available	Available
Crew designated centre available at the port	Not available	Not available	Not available	In progress	In progress

Annex 8

Characteristics of the Port of Stockholm

	Nybrovikenn 5	Nynäshamn Seawalk	Buoy at Strömmen	Stadsgården 160	Stadsgården 167	Värtahamnen 523	Värtahamnen 511	Skeppsbron 105	Värtahamnen 515	Frihamnen 638	Frihamnen 634	Frihamnen 650
Max LOA	100 m (length at quay)	Distance between the aft mooringbuoy and shoreline is approximately 500 m.	400 m distance between buoys	300 m (length of quay)	500 m (length of quay)	220 m (length of quay)	266 m (length of quay)	130 m (length of quay)	255 m (length of quay)	400 m (length of quay)	300 m (length of quay)	210 m (length of quay)
Max depth	5 m (depth at quay)	15 m	25 m	7.4 m (depth at quay)	9.4 m (depth at quay)	7.5 m (depth at quay)	10 m (depth at quay)	6 m (depth at quay)	8 m (depth at quay)	9.5 m (depth at quay)	9 m (depth at quay)	9 m (depth at quay)
Type of berth (passenger, cargo, bulk traffic)	Passenger	Passenger	At buoy	Passenger	Passenger	Passenger, bulk	Passenger / cargo	Passenger	Passenger / cargo	Passenger	Passenger / bulk	Passenger
Fenders available (brand and type)	Fixed rubber	Fixed rubber	Fixed rubber	Fixed rubber	Fixed rubber	Fixed rubber	Fixed rubber	Fixed rubber	Fixed rubber	Fixed rubber	Fixed rubber	Fixed rubber
Bollard strength	50 tons	125 tons at each hook at buoy, 150 tonnes at	No data	75 tons	50 - 100 tons	75 tons	80 - 125 tons	30 tons	80 - 125 tons	50 - 125 tons	75 tons	75 tons

	Nybrovikern 5	Nynäshamn Seawalk	Buoy at Strömmen	Stadsgården 160	Stadsgården 167	Värtahamnen 523	Värtahamnen 511	Skeppsbron 105	Värtahamnen 515	Frihamnen 638	Frihamnen 634	Frihamnen 650
		each QRH ashore										
Info on tides	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data
Info on wind	www.smhi.se/en/weather	www.smhi.se/en/weather	www.smhi.se/en/weather	www.smhi.se/en/weather	www.smhi.se/en/weather	www.smhi.se/en/weather	www.smhi.se/en/weather	www.smhi.se/en/weather	www.smhi.se/en/weather	www.smhi.se/en/weather	www.smhi.se/en/weather	www.smhi.se/en/weather
Info on currents	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data
Restrictions	Only at MARSEC level 1	Wind restriction 12 m/s (mean wind) at seawalk	No data	If vessel shall stay overnight, a noise measurement must be performed and No outside loudspeakers after 10:00 pm	No outside loudspeakers after 10:00pm	None	None	Only on MARSEC Level 1	None	No outside loudspeakers after 10:00 pm	No outside loudspeakers after 10:00 pm	No outside loudspeakers after 10:00 pm
Distance to the city centre (in Kilometers)	0.5 km	Nynäshamn 1 km Stockholm 58 km	0 km	1 km	2.2 km	3.5 km	3.5 km	1 km	3.5 km	3.5 km	3.5 km	3.5 km
Are shuttle buses required?	Not required	No data	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required
Distance to the airport (in Kilometers)	40 km	99 km	35 km	40 km	40 km	35 km	35 km	35 km	35 km	40 km	40 km	40 km

	Nybrovikern 5	Nynäshamn Seawalk	Buoy at Strömmen	Stadsgården 160	Stadsgården 167	Värtahamnen 523	Värtahamnen 511	Skeppsbron 105	Värtahamnen 515	Frihamnen 638	Frihamnen 634	Frihamnen 650
Clean pier before arrival + maintenance during the day	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
Good functional fenders	Available	Not available	Not available	Available	Available	Available	Available	Available	Available	Available	Available	Available
ISPS certified - compulsory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cleared and well signalled entrance / exit to/ from the pier	Not available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
Pilotage service available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
Bunkers available	Available	On request	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
Tug available, bollard pull (14 t)	Not available	www.tug.se	www.tug.se	www.tug.se	www.tug.se	www.tug.se	www.tug.se	www.tug.se	www.tug.se	www.tug.se	www.tug.se	www.tug.se
Fresh water available - supply rate (30 m3/hour)	Not available	Not available	Not available	100 m3 / h	100 m3 / h	100 m3 / h	300 m3 / h	Available	350 m3 / h	100 m3 / h	100 m3 / h	100 m3 / h
Solid waste disposal	Available	Not available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available

	Nybrovikeⁿ 5	Nynäshamn Seawalk	Buoy at Strömmen	Stadsgården 160	Stadsgården 167	Värtahamnen 523	Värtahamnen 511	Skeppsbron 105	Värtahamnen 515	Frihamnen 638	Frihamnen 634	Frihamnen 650
Toxic waste disposal	Available	Not available	On request	Available	Available	Available	Available	Available	Available	Available	Available	Available
Bilge and Sludge disposal facilities	Available	Not available	Not available	Available	Available	Available	Available	Available	Available	Available	Available	Available
Black and grey water disposal facilities	Not available	On request	Available	Available, connection on the quay	Available, connection on the quay	Available, connection on the quay	Available: 20 m3/h shore connection or barge 400 m3/h	Available	Available, connection on the quay	Available, connection on the quay	Available, connection on the quay	Available, connection on the quay
Necessary space, facilities and labour to handling ship's stores and provision	Available	Not available	Not available	Available	Available	Available	Available	Available	Available	Available	Available	Available
Restrooms available	Not available	Available	Not available	Available	Available	Available	Available in Värtahamnen Terminal	Not available	Available	Available	Not available	Available
Facilities for handicaps: ramps, toilettes	Not available	Available	Available	Available	Available	Not available	Available	Not available	Available	Available	Not available	Not available
Tourism information	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available

	Nybrovikeⁿ 5	Nynäshamn Seawalk	Buoy at Strömmen	Stadsgården 160	Stadsgården 167	Värtahamnen 523	Värtahamnen 511	Skeppsbron 105	Värtahamnen 515	Frihamnen 638	Frihamnen 634	Frihamnen 650
available at the port												
Cruise terminal or tent facilities w/ checkin, luggage and waiting areas)	Available	Tent facilities available as waiting area	Not available	Available	Available	Available	Available	Not available	Available	Available	Available	Available
X-ray available	On request	On request	On request	On request	On request	On request	On request	On request	On request	On request	On request	On request
Porters and stevedores available	Available	On request	On request	On request	On request	On request	On request	On request	On request	On request	On request	On request
First aid equipment available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
Shore gangways available on request	Available	Not available	Not available	Available	Available	Available	Available	Available	Available	Available	Available	Available
Airline check-in at the port (desirable)	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available
Parking space for private vehicles	Available on the streets, limited parking lots	Not available	Limited	Limited	Available	Available	Limited	Limited	Limited	Limited	Limited	Limited
Fixed sign / map at the	Not available	Available for	Not available	Available	Available	Available	Available	Not available	Available	Available	Available	Available

	Nybroviken 5	Nynäshamn Seawalk	Buoy at Strömmen	Stadsgården 160	Stadsgården 167	Värtahamnen 523	Värtahamnen 511	Skeppsbron 105	Värtahamnen 515	Frihamnen 638	Frihamnen 634	Frihamnen 650
port with directions between port and city		Nynäshamn										
Dedicated local cruise network and website	Available	www.portsofstockholm.com	www.portsofstockholm.com	www.portsofstockholm.com	www.portsofstockholm.com	www.portsofstockholm.com	www.portsofstockholm.com	www.portsofstockholm.com	Available	www.portsofstockholm.com	www.portsofstockholm.com	www.portsofstockholm.com
Taxi stand and general price guidance information	Not available	Available	Not available	Available	Available	Available	Available	Not available	Available	Available	Available	Available
City maps available at pier	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
Crew designated centre available at the port	Seamen's Center (www.sjofartsverket.se/en/New-Seatime/Port-Service/Stockholm/) & Katarina Seafarer's Center (www.katarinasjofart	Seamen's Center (www.sjofartsverket.se/en/New-Seatime/Port-Service/Stockholm/) & Katarina Seafarer's Center (www.katarinasjofart	Seamen's Center (www.sjofartsverket.se/en/New-Seatime/Port-Service/Stockholm/) & Katarina Seafarer's Center (www.katarinasjofart	Seamen's Center (www.sjofartsverket.se/en/New-Seatime/Port-Service/Stockholm/) & Katarina Seafarer's Center (www.katarinasjofart	Seamen's Center (www.sjofartsverket.se/en/New-Seatime/Port-Service/Stockholm/) & Katarina Seafarer's Center (www.katarinasjofart	Seamen's Center (www.sjofartsverket.se/en/New-Seatime/Port-Service/Stockholm/) & Katarina Seafarer's Center (www.katarinasjofart	Seamen's Center (www.sjofartsverket.se/en/New-Seatime/Port-Service/Stockholm/) & Katarina Seafarer's Center (www.katarinasjofart	Seamen's Center (www.sjofartsverket.se/en/New-Seatime/Port-Service/Stockholm/) & Katarina Seafarer's Center (www.katarinasjofart	Seamen's Center (www.sjofartsverket.se/en/New-Seatime/Port-Service/Stockholm/) & Katarina Seafarer's Center (www.katarinasjofart	Seamen's Center (www.sjofartsverket.se/en/New-Seatime/Port-Service/Stockholm/) & Katarina Seafarer's Center (www.katarinasjofart	Seamen's Center (www.sjofartsverket.se/en/New-Seatime/Port-Service/Stockholm/) & Katarina Seafarer's Center (www.katarinasjofart	Seamen's Center (www.sjofartsverket.se/en/New-Seatime/Port-Service/Stockholm/) & Katarina Seafarer's Center (www.katarinasjofart

	Nybroviken 5	Nynäshamn Seawalk	Buoy at Strömmen	Stadsgården 160	Stadsgården 167	Värtahamnen 523	Värtahamnen 511	Skeppsbron 105	Värtahamnen 515	Frihamnen 638	Frihamnen 634	Frihamnen 650
	sklubb.com) & Seamans Mission (http://sjomanskyrkan.com)	sklubb.com) & Seamans Mission (http://sjomanskyrkan.com)	sklubb.com) & Seamans Mission (http://sjomanskyrkan.com)	sklubb.com) & Seamans Mission (http://sjomanskyrkan.com)	sklubb.com) & Seamans Mission (http://sjomanskyrkan.com)	sklubb.com) & Seamans Mission (http://sjomanskyrkan.com)	sklubb.com) & Seamans Mission (http://sjomanskyrkan.com)	sklubb.com) & Seamans Mission (http://sjomanskyrkan.com)	sklubb.com) & Seamans Mission (http://sjomanskyrkan.com)	sklubb.com) & Seamans Mission (http://sjomanskyrkan.com)	sklubb.com) & Seamans Mission (http://sjomanskyrkan.com)	sklubb.com) & Seamans Mission (http://sjomanskyrkan.com)

Annex 9

Characteristics of the Port of Rostock

	P 1 - 4	P 7	P 8	LP 31	LP 41
Max LOA	240 m	295 m	330 m	no limit	no limit
Max depth	7.3 m (21'0")	9 m (29'06")	9.00 m (29'06")	9.3 m	9.30 m (30'06")
Type of berth (passenger, cargo, bulk traffic)	Passenger	Passenger	Passenger	General cargo	General cargo
Fenders available (brand and type)	Cone fender	Cone fender	Cone fender	Cone fender	Cylindrical fender
Bollard strength	10 tons and 60 tons alternately	At both ends one of 100 tons, in between 60 tons	100 tons	100 teach 30 m distance	100 tons, in every 30 m distance
Info on tides	No tides	No tides	No tides	No tides	No tides
Info on wind	No data	No data	No data	No data	No data
Info on currents	No current	No current	No current	No current	No current
Restrictions	Ships with more than 150m length need special berthing permission; not a berth for turnarounds	Ships with more than 250m length need special permission	Ships with more than 300m length need special berthing permission	Use of adjacent berth LP 32 possible	Use of adjacent berth 42 possible
Clean pier before arrival + maintenance during the day	Available	Available	Available	Available	Available
Good functional fenders	Available	Available	Available	Available	Available
ISPS certified - compulsory	Available	Available	Available	Available	Available
Cleared and well signaled entrance / exit to/ from the pier	Available	Available	Available	Available	Available
Pilotage service available	Available	Available	Available	Available	Available
Bunkers available	Available	Available	Available	Available	Available
Tug available, bollard pull (14 t)	Not available	Not available	Not available	Not available	Not available
Fresh water available - supply rate (30 m3/hour)	Not available	Not available	Not available	Not available	Not available
Solid waste disposal	Available	Available	Available	Available	Available
Toxic waste disposal	Available	Available	Available	Available	Available
Bilge and Sludge disposal facilities	Available	Available	Available	Available	Available
Black and grey water disposal facilities	Available	Available	Available	Available	Available
Necessary space, facilities and labor to	Available	Available	Available	Available	Available

	P 1 - 4	P 7	P 8	LP 31	LP 41
handling ship's stores and provision					
Restrooms available	Not available	Available	Available	In progress	Not available
Facilities for handicaps: ramps, toilettes	In progress	Available	Available	In progress	Not available
Tourism information available at the port	Available	Available	Available	Not available	Not available
Cruise terminal or tent facilities w/ checkin, luggage and waiting areas)	Available	Available	Available	Available	Not available
X-ray available	Available	Available	Available	Available	Not available
Porters and stevedores available	Available	Available	Available	Available	Available
First aid equipment available	Available	Available	Available	Available	Available
Shore gangways available on request	Available	Available	Available	Available	Available
Airline check-in at the port (desirable)	Not available	Not available	Not available	Not available	Not available
Parking space for private vehicles	Not available	Available	Available	Available	Available
Fixed sign / map at the port with directions between port and city	In progress	Available	Available	Not available	Not available
Dedicated local cruise network and website	http://www.rostock-marketing.de	http://www.rostock-marketing.de	http://www.rostock-marketing.de	http://www.rostock-marketing.de	http://www.rostock-marketing.de
Taxi stand and general price guidance information	In progress	In progress	In progress	In progress	In progress
City maps available at pier	In progress	Available	Available	Not available	In progress
Crew designated center available at the port	Available	Available	Available	Available	Available
Max LOA	240 m	295 m	330 m	no limit	no limit

Annex 10

Characteristics of the Port of Kiel

	Ostseekai	Ostuferhafen	Norwegenkai
Capacity (cruise passengers)	6000	4000	1000
Berth	27/28	1	22
Length of quayside (m)	355/285	395.	175
Draft (m)	9.5	9.5	9.0
Gangway	boarding bridge	shoreside, mobile	boarding bridge
Waiting areas (sqm)	2,500 / 2,500	1300	1600
Luggage area (sqm)	1200 / 1,300	> 3000	500
Operation areas (sqm)	7,300 / 14,500	13 000	4000
ISPS certificate			Yes
City centre distance	300 m	8 km	300 m

Annex 11

Characteristics of the Port of Oslo

	Sondre Akershus	Revier Quay	Vippetangen	Filipstad Quay
Max LOA	360 m	320 m	252 m	345 m
Max depth	10.3 m	8.4 m	8 m	10.3 m
Type of berth (passenger, cargo, bulk traffic)	Cruise pax	Cruise pax	Cruise pax	Cruise pax
Fenders available (brand and type)	Plate fenders	Rubber fenders	Rubber fenders	Rubber fenders
Bollard strength	8x100 tons, 6x50 tons, 20x30 tons	50 tons	50 tons	27 by 50 tons
Info on tides	30 - 40 cm	30 - 40 cm	30 - 40 cm	30 - 40 cm
Info on wind	S-SW prevailing	S-SW prevailing	S-SW prevailing	S-SW prevailing
Info on currents	Insignificant	Insignificant	Insignificant	Insignificant
Restrictions	Maintenance work not allowed shore side	Maintenance work not allowed shore side	Maintenance work not allowed shore side	Maintenance work not allowed shore side
Distance to the city center (in Kilometers)	1 km	0.75 km	2 km	2.9 km
Are shuttle buses required?	Not needed	Not needed	Not needed	Not needed
Distance to the airport (in Kilometers)	50 km	49.5 km	50 km	52 km
Clean pier before arrival + maintenance during the day	Available	Available	Available	Available
Good functional fenders	Available	Available	Available	Available
ISPS certified - compulsory	Available	Available	Available	Available
Cleared and well signaled entrance / exit to/ from the pier	Available	Available	Available	Available
Pilotage service available	Available	Available	Available	Available
Bunkers available	Available	Available	Available	Available
Tug available, bollard pull (14 t)	Not available	Not available	Not available	Not available
Fresh water available - supply rate (30 m3/hour)	Not available	Not available	Not available	Not available
Solid waste disposal	Available	Available	Available	Available
Toxic waste disposal	Available	Available	Available	Available
Bilge and Sludge disposal facilities	Available	Available	Available	Available
Black and grey water disposal facilities	Available and free of charge	Available	In progress	In progress
Necessary space, facilities and labor to handling ship's stores and provision	Available	Available	Available	Available
Restrooms available	Available	Available	Available	Available
Facilities for handicaps: ramps, toilettes	Available	Available	Available	Available
Tourism information available at the port	Available	Available	Available	Available

	Sondre Akershus	Revier Quay	Vippetangen	Filipstad Quay
Cruise terminal or tent facilities w/ checkin, luggage and waiting areas)	Available upon request	Not available	Not available	Available
X-ray available	Available upon request not included in the port fees	Not available	Not available	Available
Porters and stevedores available	Available upon request	Not available	Not available	Available
First aid equipment available	Not available	Not available	Not available	Available
Shore gangways available on request	Not available	Not available	Not available	Not available
Airline check-in at the port (desirable)	Not available	Not available	Not available	Not available
Parking space for private vehicles	Not available	Not available	Not available	Not available
Fixed sign / map at the port with directions between port and city	Available	Available	Available	Available
Dedicated local cruise network and website	Oslo Cruise Partners.	http://www.oslocruisenetwork.no	http://www.oslocruisenetwork.no	http://www.oslocruisenetwork.no
Taxi stand and general price guidance information	Available	Available	Available	Available
City maps available at pier	Available	Available	Available	Available
Crew designated center available at the port	Not available	Not available	Not available	Not available

Annex 12

Characteristics of the Port of Riga

Technical data	
Total territory of the port	6 348 ha
Land of the port	1 962 ha
Port water area	4 386 ha
Total length of berths	20.0 km
Maximum permissible vessel draft by the berth	15.0 m
Maximum depth	16.0 m

Port infrastructure figures	
Covered warehouses	418 603 m2
Open storage	1 894 278 m2
Capacity of refrigerated storage	46 600 m3
Refrigerated storage (area)	7 800 m2
Refrigerated storage (volume of cargoes)	14 000 t
Capacity of dry bulk silos	217 800 m3
Capacity of liquid bulk tank farm	522 391 m3

Port Area	Pier		Vessel max		Notes
	No.	**length (m)**	**draft at the pier (m)**	**length at the pier (m)**	
Customs embankment	**MK-3**	240	8.5	290	Used as a single pier
	MK-4	222	8.2		
Sea Passenger Station	**JPS-1**	132	7.4	280	Used as a single pier

Annex 13

Characteristics of the Port of Kristiansand

	Pier 10 and 20 Lagmannsholenen, Pier 16 Odderøya
Max LOA	365 m
Max depth	8.8 - 18 m
Type of berth (passenger, cargo, bulk traffic)	General Cargo
Fenders available (brand and type)	Tyres, Pontoons
Bollard strength	100 t
Info on tides	03-05 m
Info on wind	No data
Info on currents	No data
Restrictions	http://www.kristiansandhavn.no/Retningslinjer/Havnereglement
Clean pier before arrival + maintenance during the day	Available
Good functional fenders	Available
ISPS certified - compulsory	Available
Cleared and well signaled entrance / exit to/ from the pier	Available
Pilotage service available	Available
Bunkers available	Available
Tug available, bollard pull (14 t)	Not available
Fresh water available - supply rate (30 m3/hour)	Not available
Solid waste disposal	Available
Toxic waste disposal	Not available
Bilge and Sludge disposal facilities	Available
Black and grey water disposal facilities	Available
Necessary space, facilities and labor to handling ship's stores and provision	Available
Restrooms available	Not available
Facilities for handicaps: ramps, toilettes	Not available
Tourism information available at the port	Available
Cruise terminal or tent facilities w/ checkin, luggage and waiting areas)	Not available
X-ray available	Available at Kjevik Airport
Porters and stevedores available	Available
First aid equipment available	Available
Shore gangways available on request	Not available
Airline check-in at the port (desirable)	Not available
Parking space for private vehicles	Not available
Fixed sign / map at the port with directions between port and city	Available
Dedicated local cruise network and website	http://www.visitkrs.no/
Taxi stand and general price guidance information	Available
City maps available at pier	Available
Crew designated center available at the port	Not available

Annex 14

Characteristics of the Port of Gdansk

	Pier 1
Max LOA	240 m
Max depth	9.30 m
Type of berth (passenger, cargo, bulk traffic)	passenger, cargo
Fenders available (brand and type)	yes
Info on tides	no tides
Info on wind	yes
Info on currents	No data
Restrictions	ships up to 240 m
Clean pier before arrival + maintenance during the day	Not available
Good functional fenders	Available
ISPS certified - compulsory	Available
Cleared and well signaled entrance / exit to/ from the pier	Available
Pilotage service available	Available
Bunkers available	Available
Tug available, bollard pull (14 t)	Not available
Fresh water available - supply rate (30 m3/hour)	Not available
Solid waste disposal	Not available
Toxic waste disposal	Available by truck
Bilge and Sludge disposal facilities	Available by truck
Black and grey water disposal facilities	Available by truck
Necessary space, facilities and labor to handling ship's stores and provision	Available
Restrooms available	Available
Facilities for handicaps: ramps, toilettes	Available
Tourism information available at the port	Available
Cruise terminal or tent facilities w/ checkin, luggage and waiting areas)	Not available
X-ray available	Available
Porters and stevedores available	Not available
First aid equipment available	Available
Shore gangways available on request	Not available
Airline check-in at the port (desirable)	Not available
Parking space for private vehicles	Available
Fixed sign / map at the port with directions between port and city	Available
Dedicated local cruise network and website	Not available
Taxi stand and general price guidance information	Available
City maps available at pier	Available
Crew designated center available at the port	Not available

Annex 15

Characteristics of the Port of Klaipeda

	Pier No. 28, 29, 30, 31, 32	Pier No. 80
Max LOA	285 m	300 m
Max depth	9 m	9,5 m
Type of berth (passenger, cargo, bulk traffic)	Passenger	Passenger, Con Ro
Fenders available (brand and type)	Equipped with rubber cylinder	No data
Info on tides	No tides	No tides
Info on wind	Prevailing westerly weak winds	Web site: meteo.lt
Info on currents	Prevailing current to north abt 0,5 knots	N or S up to 0,8 knot
Restrictions	No restrictions	No restrictions
Clean pier before arrival + maintenance during the day	Available	Available
Good functional fenders	Available	Available
ISPS certified - compulsory	Available	In progress
Cleared and well signaled entrance / exit to/ from the pier	Available	Available
Pilotage service available	Available	Available
Bunkers available	Available	Available
Tug available, bollard pull (14 t)	Not available	Not available
Fresh water available - supply rate (30 m3/hour)	Not available	Not available
Solid waste disposal	Available	Available
Toxic waste disposal	Available	Available
Bilge and Sludge disposal facilities	Available	Available
Black and grey water disposal facilities	Available	Not available
Necessary space, facilities and labor to handling ship's stores and provision	Not available	Available
Restrooms available	Available	In progress
Facilities for handicaps: ramps, toilettes	Available	Available
Tourism information available at the port	Available	Available
Cruise terminal or tent facilities w/ checkin, luggage and waiting areas)	Not available	Not available
X-ray available	Not available	Not available
Porters and stevedores available	Not available	Available
First aid equipment available	Available	Available
Shore gangways available on request	Available	Available
Airline check-in at the port (desirable)	Not available	Not available
Parking space for private vehicles	Available	Available
Fixed sign / map at the port with directions between port and city	Available	Available
Dedicated local cruise network and website	Available	Not available
Taxi stand and general price guidance information	Available	Available
City maps available at pier	Not available	Available
Crew designated center available at the port	Available	Not available

Annex 16

Characteristics of the Port of Visby

	Pier No. 7	Pier No. 1 and 2	Tender Pier No. 1 and 2	Pier No. 4
Max LOA	200 m	150 m	30 m	200/140 m
Max depth	7.5 m	5.5 m	5.5 m	5.5 / 6.5 m
Type of berth (passenger, cargo, bulk traffic)	Passenger, cargo, bulk traffic	Passenger, cargo, bulk traffic	passenger	Passenger, cargo, bulk traffic
Fenders available (brand and type)	VM system	Tractor deck, rubber	Not available	VM system
Bollard strength	25 up to 100 ton	25 up to 100 ton	Pollard for tenders	25 up to 100 ton
Info on tides	ZERO	ZERO	ZERO	ZERO
Info on wind	Mainly SW	Mainly SW	Mainly SW	Mainly SW
Info on currents	No currents	No currents	No currents	No currents
Restrictions	Max 7.5 m draft, at normal water	Max draft 5.5 m at normal water	No data	Max 6.5 m draft at normal water
Clean pier before arrival + maintenance during the day	Available	Available	Available	Available
Good functional fenders	Available	Available	Not available	Available
ISPS certified - compulsory	Available	Available	Available	Available
Cleared and well signaled entrance / exit to/ from the pier	Available	Available	Available	Available
Pilotage service available	Available	Available	Available	Available
Bunkers available	Available	Available	Not available	Available
Tug available, bollard pull (14 t)	Not available	Not available	Not available	Not available
Fresh water available - supply rate (30 m3/hour)	Not available	Not available	Not available	Not available
Solid waste disposal	Available	Available	Available	Available
Toxic waste disposal	Available	Available	Available	Available
Bilge and Sludge disposal facilities	Available	Available	Not available	Available
Black and grey water disposal facilities	Available	Available	Not available	Available
Necessary space, facilities and labor to handling ship's stores and provision	Not available	Not available	Not available	Not available
Restrooms available	Not available	Not available	Not available	Not available
Facilities for handicaps: ramps, toilettes	Available	Available	Available	Available
Tourism information available at the port	Available	Available	Available	Available
Cruise terminal or tent facilities w/ checkin, luggage and waiting areas)	Not available	Not available	Not available	Not available
X-ray available	Available	Available	Available	Available
Porters and stevedores available	Available	Available	Not available	Available
First aid equipment available	Available	Available	Available	Available
Shore gangways available on request	Available	Not available	Not available	Not available

	Pier No. 7	Pier No. 1 and 2	Tender Pier No. 1 and 2	Pier No. 4
Airline check-in at the port (desirable)	Not available	Not available	Not available	Not available
Parking space for private vehicles	Available	Available	Available	Available
Fixed sign / map at the port with directions between port and city	Available	Available	Available	Available
Dedicated local cruise network and website	Available	Available	Available	Available
Taxi stand and general price guidance information	Available	Available	Available	Available
City maps available at pier	Available	Available	Available	Available
Crew designated center available at the port	Not available	Not available	Not available	Not available

Annex 17

Services Available for Guests 2018[101]

	Copenhagen	St. Petersburg[102]	Tallinn	Helsinki	Stockholm	Rostock	Kiel[103]	Oslo	Riga[104]	Kristiansand	Gdansk	Klaipeda	Visby
Pier													
Personal welcome													
Musical welcome and/or leaving													
Free local food samples													
Gifts for passengers													
Cruise guest national flags													
Port													
Independent guest reception and help													
Local life and events with locals													
Mailbox available													
Signed route from pier to city centre and/or public transport													
Tourist information (office or maps) in port area													
Money exchange in port area													
Free Wi-Fi in port													
Transport													
Free shuttle available													
City centre within 1 km from pier													
Publicly regulated taxis													
Bike rental including map or GPS													
Hop on/hop off services in port area													
Shopping & Attractions													

[101] https://api.cruisebaltic.ovdal.dk/media/5371/services-available-for-guests-2018.pdf
[102] https://portspb.ru/en
[103] https://www.portofkiel.com/home-en.html
[104] http://rop.lv/lv/

	Copenhagen	St. Petersburg[102]	Tallinn	Helsinki	Stockholm	Rostock	Kiel[103]	Oslo	Riga[104]	Kristiansand	Gdansk	Klaipeda	Visby
Shops open on Sundays	■	▒	■	■	■	■	▒	■			■	■	■
Shops offer flexible opening hours for cruise guests	▒	▒	▒	▒	▒	▒	▒	■	■		▒	▒	■
Museums offer flexible opening hours for cruise guests	▒		▒	▒	▒	■		▒		■	▒	▒	▒
Shops accept credit card payment with no lower limit	■				■			■	■	■	■	■	■
Destination has special offers for crew	■		■	■	▒	■		■		▒	■	▒	▒
Free city maps	■	■	■	■	■	■	■	■	■	■	■	■	■
City Cards for sale	■		■	■	▒	■		■			■		
Destination collaboration													
Local cruise network	■	■	■	■	■		■	■	■	■		■	■
Authorized guides	■		▒	■	■			■		■	■	■	■
Education of tourism partners on the cruise guest	■		■	■	■	■				■	▒	■	▒
Possibility for special arrangements and flexibility	■		▒	■	■	■		■		■	▒	■	■
Destination video available for Cruise Lines	■		■	■	■	■	■	■	■	■	■	■	
Turnaround facilities													
Scandic Hotel(s) in city	■	■	■	■	■		■	■	■	■	■		■
Cruise-ready hotels	■			■	■	■				■	▒		■
Airport less than one hour drive from port	■	■	■	■	■	■	■	■	■	■	■	■	■
Airport less than one hour drive from city centre	■	■	■	■	■	■	■	■	■	■	■	■	■
Free Wi-Fi in airport	■		■	■	■	■	■	■	■		■	■	■
Airline check-in at port													
Quarters for crew in port	▒												

Always available ■
Available in some cases ▒
Not available

Annex 19

Methodology for assessment of the location selecting for the cruise terminals

Criteria	The maximum number of points – incoming terminal	The maximum number of points – home terminal
1. Zoning compliance	Maximum – 10 points: Territory zoning corresponds to the port and cruise terminal function - 10 points Territory zoning does not match port and cruise terminal function, but zoning change procedure is relatively simple - 5 The zoning of the territory does not correspond to the function of the port and the cruise terminal and the zoning change procedure is relatively complicated - 0	Maximum – 10 points: Territory zoning corresponds to the port and cruise terminal function - 10 points Territory zoning does not match port and cruise terminal function, but zoning change procedure is relatively simple - 5 The zoning of the territory does not correspond to the function of the port and the cruise terminal and the zoning change procedure is relatively complicated - 0
2. Sea and berth elements, incl.	**Maximum – 35 points**	**Maximum – 30 points**
2.1 Approach channel and turning basin's parameters	Maximum – 20 points: The approach channel and the turning basin in the immediate vicinity of the berth allow to moor the cruise ships of a length of 330 m and more, a width of 45 m and more and a draught of 8.8 m and more – 20 The approach channel and the turning basin in the immediate vicinity of the berth allow to moor the cruise ships of a length of 250 - 329 m and more, a width of 30 - 44 m and more and a draught of 7.8 - 8.7 m and more – 10 The approach channel and the turning basin in the immediate vicinity of the berth allow to moor the cruise ships of a length of < 250 m, a width of < 30 m and a draught of 7.8 m – 0	Maximum – 20 points: The approach channel and the turning basin in the direct vicinity of the berth allow to moor the cruise ships of a length of 330 m and more, a width of 45 m and more and a draught of 8.8 m and more – 17 The approach channel and the turning basin in the direct vicinity of the berth allow to moor the cruise ships of a length of 250 - 329 m and more, a width of 30 - 44 m and more and a draught of 7.8 - 8.7 m and more – 8 The approach channel and the turning basin in the direct vicinity of the berth allow to moor the cruise ships of a length of < 250 m, a width of < 30 m and a draught of 7.8 m – 0
2.2 Berth parameters	15 Existing berth with the total length of 650 m and more - 15 Existing berth with the total length of 400 – 650 m - 10 Existing berth with the total length of 200 – 399 m - 5 No berth or berth length less than 200 m - 0	13 Existing berth with the total length of 650 m and more - 13 Existing berth with the total length of 400 – 650 m - 9 Existing berth with the total length of 200 – 399 m - 4 No berth or berth length less than 200 m - 0

Criteria	The maximum number of points – incoming terminal	The maximum number of points – home terminal
3. Accessibility and transport infrastructure	**Maximum – 40 points**	**Maximum – 40 points**
3.1 Walking connections to the tourist attractions	Maximum – 5 points: Existing comfortable and landscape attractive connections from the terminal to tourist attractions - 5 Existing comfortable and landscape attractive connections from the terminal to tourist attractions - 3 There is no comfortable and landscape attractive connections from the terminal to tourist attractions - 0	Maximum – 2 points: Existing comfortable and landscape attractive connections from the terminal to tourist attractions - 2 Existing comfortable and landscape attractive connections from the terminal to tourist attractions - 1 There is no comfortable and landscape attractive connections from the terminal to tourist attractions - 0
3.2 Walking time to the tourist attractions*	Maximum – 10 points: Under 20 minutes – 10 21 – 45 minutes – 5 More than 45 minutes – 0	Maximum – 4 points: Under 20 minutes – 4 21 – 45 minutes – 2 More than 45 minutes – 0
3.3 Existence of the public transport stops near to the terminal	Maximum – 5 points: Distance to public transport is <100 m – 5 Distance to public transport is 100-200 m – 3 Distance to public transport is > 200 m – 0	Maximum – 2 points: Distance to public transport is <100 m – 2 Distance to public transport is 100-200 m – 1 Distance to public transport is > 200 m – 0
3.4 Time by the public transport to the tourist attractions at 9:00 of working day	Maximum – 5 points: Under 15 minutes – 5 16 – 30 minutes – 3 More than 30 minutes – 0	Maximum – 2 points: Under 15 minutes – 2 16 – 30 minutes – 1 More than 30 minutes – 0
3.5 Time by the car / bus to the tourist attractions at 9:00 of working day	Maximum -10 points: Under 15 minutes – 10 16 – 30 minutes – 5 More than 30 minutes – 0	Maximum – 4 points: Under 15 minutes – 4 16 – 30 minutes – 2 More than 30 minutes – 0
3.6 Bicycle infrastructure (connections) to the tourist attractions	Maximum – 5 points: In the immediate vicinity of the terminal (<50 m) the bicycle path/bicycle lane connecting with tourist attractions - 5 Distance to the bicycle path/bicycle lane connecting with tourist attractions is 50 – 200 m - 3	Maximum – 2 points: In the immediate vicinity of the terminal (<50 m) the bicycle path/bicycle lane connecting with tourist attractions - 2 Distance to the bicycle path/bicycle lane connecting with tourist attractions is 50 – 200 m - 1

Criteria	The maximum number of points – incoming terminal	The maximum number of points – home terminal
	Distance to the bicycle path/bicycle lane connecting with tourist attractions is > 200 m– 0	Distance to the bicycle path/bicycle lane connecting with tourist attractions is > 200 m– 0
3.7 Time by the bus / private car / taxi to the international railway station at 9:00 of working day	Do not apply	Maximum – 4 points: Under 30 minutes – 4 31 – 60 minutes – 2 More than 1 hour – 0
3.7 Time by the public transport to the international railway station at 9:00 of working day	Do not apply	Maximum – 5 points: Under 30 minutes – 5 31 – 60 minutes – 2 More than 1 hour – 0
3.8 Time by the bus / private car / taxi to the international airport* at 9:00 of working day	Do not apply	Maximum – 5 points: Under 40 minutes – 5 41 – 60 minutes – 2 More than 1 hour – 0
3.9 Time by the public transport to the international airport* at 9:00 of working day	Do not apply	Maximum -15 points: Under 40 minutes – 15 41 – 60 minutes – 7 More than 1 hour – 0
4. Ships' handling infrastructure	**Maximum – 15 points:**	**Maximum – 15 points:**
4.1 A possibility to provide a waste water reception at the terminal place by direct connection	Maximum – 2 points: Sewerage with a capacity of 300 m3/h is available at the berth – 2 Sewerage with a capacity of 300 m3/h is available in the immediate vicinity of the terminal – 1 There is not sewerage with a capacity of 300 m3/h in the immediate vicinity of the terminal – 0	Maximum – 2 points: Sewerage with a capacity of 300 m3/h is available at the berth – 2 Sewerage with a capacity of 300 m3/h is available in the immediate vicinity of the terminal – 1 There is not sewerage with a capacity of 300 m3 in the immediate vicinity of the terminal – 0
4.2 A possibility to provide a water supply at the terminal place by direct connection	Maximum – 2 points: Water supply system with a capacity 50-100 l/s is available at the berth – 2 Water supply system with a capacity of 50 -100 l/h is available in the immediate vicinity of the terminal – 1	Maximum – 2 points: Water supply system with a capacity 50-100 l/s is available at the berth – 2 Water supply system with a capacity of 50 -100 l/h is available in the immediate vicinity of the terminal – 1

Criteria	The maximum number of points – incoming terminal	The maximum number of points – home terminal
	There is not Water supply system with a capacity of 50 -100 l/h in the immediate vicinity of the terminal – 0	There is not Water supply system with a capacity of 50 -100 l/h in the immediate vicinity of the terminal – 0
4.3 A possibility to establish a ship's power supply connection at the terminal place	Maximum – 3 points: In the immediate vicinity of the terminal is a medium voltage network with an available capacity of 5 MW – 3 It is possible to provide the necessary capacity by expanding the existing substation – 2 It is possible to provide the necessary capacity by construction of a new substation – 1 High voltage network reconstruction is required to provide the necessary capacity – 0	Maximum – 3 points: In the immediate vicinity of the terminal is a medium voltage network with an available capacity of 5 MW – 3 It is possible to provide the necessary capacity by expanding the existing substation – 2 It is possible to provide the necessary capacity by construction of a new substation – 1 High voltage network reconstruction is required to provide the necessary capacity – 0
4.4 A bunkering possibility: LNG	Maximum – 3 points: LNG filling possibilities exist in the port – 3 LNG filling possibilities can be provided in the port from the nearby existing terminals – 2 LNG filling possibilities can not be provided in the port from the nearby existing terminals – 0	Maximum – 3 points: LNG filling possibilities exist in the port (terminal) – 3 LNG filling possibilities can be provided in the port from the nearby existing terminals – 2 LNG filling possibilities can not be provided in the port from the nearby existing terminals – 0
4.5 A bunkering possibility: MDO/MGO	Maximum – 3 points: MDO/MGO filling possibilities exist in the port – 3 MDO/MGO filling possibilities can be provided in the port from the nearby existing terminals – 2 MDO/MGO filling possibilities can not be provided in the port from the nearby existing terminals – 0	Maximum – 3 points: MDO/ LNG filling possibilities exist in the port – 3 MDO/MGO filling possibilities can be provided in the port from the nearby existing terminals – 2 MDO/MGO filling possibilities can not be provided in the port from the nearby existing terminals – 0
4.6 A bunkering possibility: methanol	Maximum – 2 points: Methanol filling possibilities exist in the port – 2 Methanol filling possibilities can be provided in the port from the nearby existing terminals – 1 Methanol filling possibilities can not be provided in the port from the nearby existing terminals – 0	Maximum – 2 points: Methanol filling possibilities exist in the port – 2 Methanol filling possibilities can be provided in the port from the nearby existing terminals – 1 Methanol filling possibilities can not be provided in the port from the nearby existing terminals – 0
Total	**100**	**100**

The Annex 20

The assessment of the cruise terminal locations in the Riga Port

Criteria	Eksportosta-midpoint terminal	Eksportosta-turnaround terminal	Andrejsala-midpoint terminal	Andrejsala-turnaround terminal	Ķīpsala-midpoint terminal	Ķīpsala-turnaround terminal	Riga Passenger Port-midpoint terminal	Riga Passenger Port-turnaround terminal	Krievu sala-midpoint terminal	Krievu sala-turnaround terminal
1. Zoning compliance	**10**	**10**	**10**	**10**	**0**	**0**	**10**	**10**	**10**	**10**
2. Waterside and berth elements, incl.	**25**	**21**	**15**	**12**	**10**	**8**	**20**	**17**	**25**	**21**
2.1 Approach channel and turning basin's parameters	10	8	10	8	10	8	10	8	20	17
2.2 Berth parameters	15	13	5	4	0	0	10	9	5	4
3. Accessibility and transport infrastructure	**20**	**29**	**25**	**24**	**38**	**44**	**35**	**35**	**0**	**9**
Walking connections to the tourist attractions	0	0	0	0	5	2	5	2	0	0
Walking time to the tourist attractions*	5	2	10	4	10	4	10	4	0	0
Existence of the public transport stops near to the terminal	0	0	0	0	3	1	0	0	0	0

Criteria	Eksportosta-midpoint terminal	Eksportosta-turnaround terminal	Andrejsala-midpoint terminal	Andrejsala-turnaround terminal	Ķīpsala-midpoint terminal	Ķīpsala-turnaround terminal	Riga Passenger Port-midpoint terminal	Riga Passenger Port-turnaround terminal	Krievu sala-midpoint terminal	Krievu sala-turnaround terminal
Guaranteed time by the public transport to the tourist attractions at 9:00 of working day	5	2	5	2	5	2	5	2	0	0
Time by the car / bus to the tourist attractions at 9:00 of working day	10	4	10	4	10	4	10	4	0	0
Bicycle infrastructure (connections) to the tourist attractions	0	0	0	0	5	2	5	2	0	0
Time by the bus / private car / taxi to the international railway station at 9:00 of working day	0	4	0	4	0	4	0	4	0	2
Time by the public transport to the	0	5	0	5	0	5	0	5	0	2

Criteria	Eksportosta-midpoint terminal	Eksportosta-turnaround terminal	Andrejsala-midpoint terminal	Andrejsala-turnaround terminal	Ķīpsala-midpoint terminal	Ķīpsala-turnaround terminal	Riga Passenger Port-midpoint terminal	Riga Passenger Port-turnaround terminal	Krievu sala-midpoint terminal	Krievu sala-turnaround terminal
international railway station at 9:00 of working day										
Time by the bus / private car / taxi to the international airport* at 9:00 of working day	0	5	0	5	0	5	0	5	0	5
Time by the public transport to the international airport* at 9:00 of working day	0	7	0	0	0	15	0	7	0	0
4. Ships' handling infrastructure	**9**	**7**	**6**	**6**	**6**	**6**	**5**	**5**	**7**	**7**
A possibility to provide a waste water reception at the terminal place	1	1	0	0	1	1	1	1	1	1
Water supply system	1	1	1	1	1	1	1	1	1	1

Criteria	Eksportosta-midpoint terminal	Eksportosta-turnaround terminal	Andrejsala-midpoint terminal	Andrejsala-turnaround terminal	Ķīpsala-midpoint terminal	Ķīpsala-turnaround terminal	Riga Passenger Port-midpoint terminal	Riga Passenger Port-turnaround terminal	Krievu sala-midpoint terminal	Krievu sala-turnaround terminal
A possibility to establish a ship's power supply connection at the terminal place	2	2	2	2	1	1	0	0	2	2
A bunkering possibility: LNG	0	0	0	0	0	0	0	0	0	0
A bunkering possibility: MDO/MGO	2	2	2	2	2	2	2	2	2	2
A bunkering possibility: methanol	1	1	1	1	1	1	1	1	1	1
Total	**62**	**67**	**56**	**52**	**54**	**58**	**70**	**67**	**42**	**47**