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Unitised Goods via Danish Ports in 2004 and the North Sea Region



**EC INTERREG IIIB PROGRAMME
SUTRANET-PAPER
Work Package 1.3
Task 2.0**

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Summer 2006**

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1. Introduction

This working paper has been prepared as part of Work Package 1 under the SUTRANET project. **Sustainable Transport Research & Development Network** in the North Sea Region. SUTRANET is a project within the framework of the Interreg IIB North Sea Programme, where one of the main objectives of the SUTRANET project is to “expand the reserve of knowledge upon which transport related policy is based in the North Sea Region” (SUTRANET WP1, 2005).

Figure I1: The North Sea Region (NSR) as defined by SUTRANET (Source: BBR Bonn 2000)



As the above depicted figure I1 indicates, all of the Kingdom of Denmark falls within the eligible area of the North Sea Region (NSR), and thus one could speculate that all of the Danish ports are potential transport nodes in the wider North Sea Region.

This would, however, be a spurious deduction, as several of the Danish ports also serve as either transit ports and/or are ports, which primarily serve the Baltic Sea Region.

At present, the statistical data, which is available to SUTRANET does not permit a stratification of the throughput via the Danish Ports into unitised goods primarily bound for the North Sea Region and goods primarily bound for the Baltic Sea Region, and as a consequence it has been necessary to view all Danish ports as potential gateways to the North Sea Region.

This paper will therefore include some 16 Danish ports, which together handled almost 22 million tonnes of unitised goods to and from Denmark in the year of 2004. A list of the included ports can be seen in Annex 1, where the unitised throughput from the 16 ports in question is broken down into unitised goods shipped by ferries, other RoRo vessels and containers (LoLo).

The 16 included ports are all ports, which handle unitised goods in some form or the other. Bulk goods are not included in the data presented in Annex 1 or this working paper, and this distinction implies, that the 16 ports included in this working paper are not necessarily the largest ports in Denmark when the total throughput (including bulk) of the port is used as the measuring yard stick (see table I1).

**Table I1: The 10 largest ports in Denmark by total international and domestic throughput (2004):
P = private port (Source: Søfartsstyrelsen, 2005)**

	1000 tonnes
Fredericia	16653
Aarhus	10357
Statoil (P)	8753
Copenhagen	6215
Roedby	4911
Elsinore	4422
Esbjerg	3665
Kalundborg	3401
Enstedvaerket (P)	4916
Frederikshavn	3145
Total	66438

However, the aim of this paper is not to present a complete picture of the Danish ports and their total throughput. Rather, the paper has the intention to present an overall account of the international throughput of unitised goods from the major Danish publicly owned and operated ports – a “snapshot picture” of the throughput of unitised goods through Danish ports in the one particular year of 2004.

Thus, the ports elaborated on in this paper are the Jutland ports of Frederikshavn, Hirtshals, Hanstholm, Aalborg, Grenaa, Aarhus, Esbjerg, Fredericia, and Aabenraa; the Zealand ports of Elsinore, Roedby, Gedser and Copenhagen; and the ports of Roenne, Havneby and Hundested, which primarily serve as nodes in local routes to and from Denmark.

This paper has been written by a team of researchers at Aalborg University, Department of Development and Planning. Useful comments and contributions have been received from our partners in SUTRANET.

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Summer 2006

2. Danish Container Ports and the North Sea Region

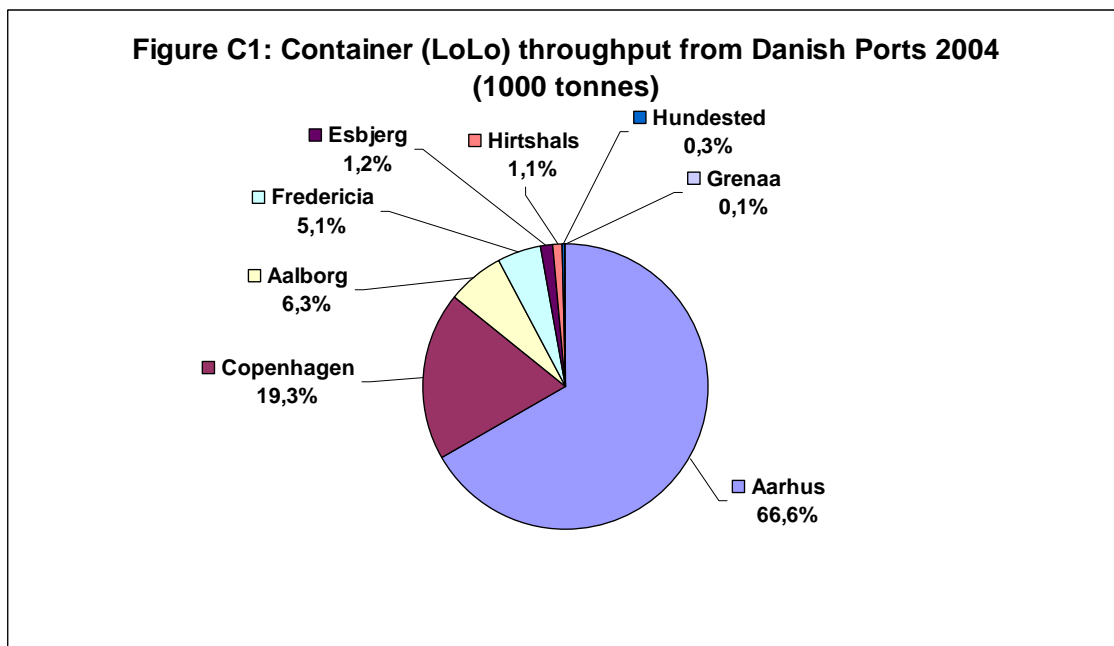
2.1 Container throughput via Danish Ports 2004

The port of Aarhus is by far the largest operator of LoLo throughput in the Danish market, with the port of Copenhagen a distant second.

Table C1: Container (LoLo) throughput via Danish Ports 2004

	1000 tonnes
Aarhus	2589
Copenhagen	749
Aalborg	244
Fredericia	197
Esbjerg	48
Hirtshals	42
Hundested	12
Grenaa	4
Total	3885

Aarhus ships some 2.6 million tonnes via its container terminals, whereas the port of Copenhagen barely reaches a throughput of some 750 thousand tonnes. The remaining six ports in Denmark, which handle LoLo throughput, collectively handle some 550 thousand tonnes.



The port of Aarhus thus handles some two thirds of the total Danish container (LoLo) throughput, and the ports of Aarhus and Copenhagen together cope with almost 86 percent of the container throughput in Denmark. The remaining 6 Danish ports, which have a container (LoLo) throughput, collectively process some 14 percent of the total Danish container throughput.

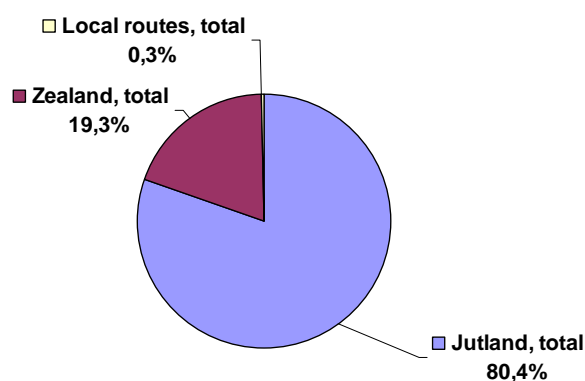
2.2 Container throughput via Danish Ports 2004 – Regional Stratification

A regional stratification of Denmark into the regions of Jutland and Zealand complemented by local Danish ports show that the container throughput via ports in Jutland handle some 3.3 million tonnes of goods compared to less than 800 thousand tonnes of unitised goods by the rest of the country's ports.

Table C2: Container (LoLo) throughput via Danish Ports 2004 – Regional Stratification

	1000 tonnes
Ports in Jutland, total	3124
Ports in Zealand, total	749
Local cross-border routes, total	12
Denmark, total	3885

Figure C2: Container (LoLo) throughput via Danish Ports 2004 - Regional Stratification (1000 tonnes)



Over 80 percent of the Danish LoLo throughput in 2004 was handled via ports located in the western part of Denmark, leaving the major ports on the island of Zealand with a total container-market share of less than 20 percent of the total container throughput in 2004.

2.3 Container throughput via Danish Ports 2004 – Sub-regional Stratification

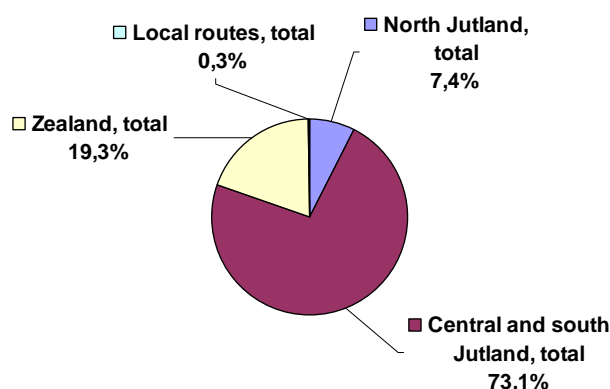
A further stratification of the container throughput from the peninsula of Jutland into North Jutland and Central and south Jutland reveals, that nearly 75 percent of the Danish container throughput is shipped through ports located in the central and southern parts of Jutland.

The ports of North Jutland, Zealand as well as local cross-border routes account for a little over 25 percent of the Danish container throughput.

Table C3: Container (LoLo) throughput via Danish Ports 2004 – Sub-regional Stratification

	1000 tonnes
Ports in Central and South Jutland, total	2838
Ports in Zealand, total	749
Ports in North Jutland, total	286
Local cross-border routes, total	12
Demark, total	3885

Figure C3: Container (LoLo) throughput via Danish Ports 2004 - Sub-regional stratification (1000 tonnes)



Interestingly the ports of North Jutland only handle a bit more than 7 percent of the total container throughput in Denmark despite the fact that these ports are located in the Danish region that has historical and geographical links with the south-western part of Norway. This is probably due to the fact that distances are relatively short favouring ferry transport rather than container flows.

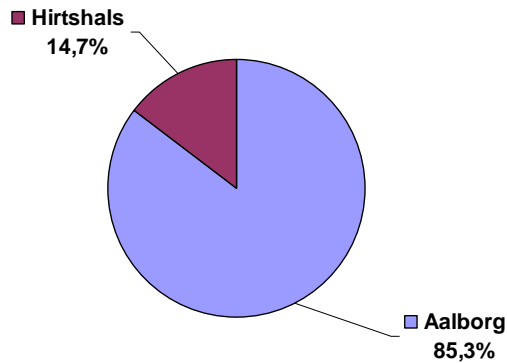
2.4 Container throughput via Danish Ports in North Jutland 2004

Table C4: Container (LoLo) throughput via Danish Ports in North Jutland 2004

	1000 tonnes
Aalborg	244
Hirtshals	42
Frederikshavn	0
Hanstholm	0
North Jutland, total	286

Of the four ports, which serve the northern part of Jutland, only the ports of Aalborg and Hirtshals have any sort of container throughput. The ports of Frederikshavn and Hanstholm play no role whatsoever as container terminals in North Jutland.

Figure C4: Container (LoLo) throughput via Danish Ports in North Jutland 2004 (1000 tonnes)



Of the total container throughput via the ports in North Jutland of some 286 thousand tonnes, the port of Aalborg channels more than 85 percent (equivalent to some 244 thousand tonnes) of the container throughput, leaving the port of Hirtshals with a market share of less than 15 percent in North Jutland.

However, it should be noted that almost all of the container throughput from the port of Aalborg has its origin or destination in Greenland (see Annex 1). In a North Sea Region perspective, this implies, that the port of Aalborg plays a transit-oriented role rather than being a port of some regional significance in the NSR.

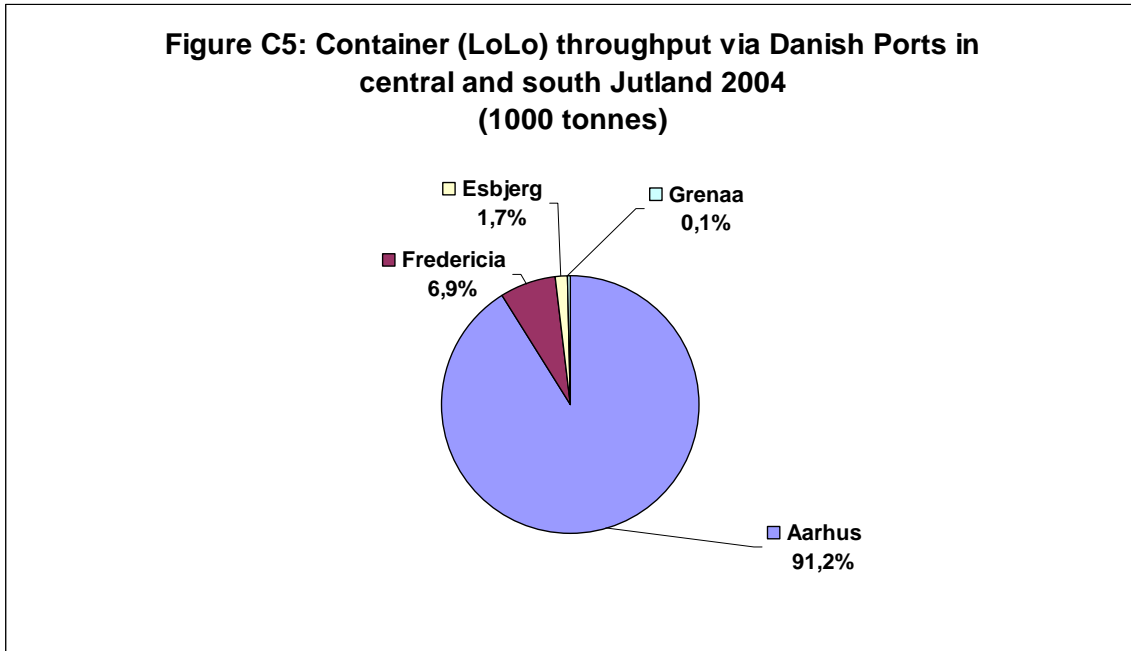
2.5 Container throughput via Danish Ports in Central and South Jutland 2004

Four of the five ports located in central and southern parts of Jutland had a container throughput in 2004. However, only the ports of Aarhus and Fredericia could reasonably be said to have a throughput of some significance.

Table C5: Container (LoLo) throughput via Danish Ports in Central and South Jutland 2004
1000 tonnes

Aarhus	2589
Fredericia	197
Esbjerg	48
Grenaa	4
Aabenraa	0
Central and South Jutland, total	524

Collectively the three ports of Fredericia, Esbjerg and Grenaa handled less than 9 percent of the container throughput in 2004 compared to the port of Aarhus, which alone accounted for more than 90 percent of the container throughput in the central and southern parts of Jutland.



In effect the port of Aarhus seems to have cornered the market of container shipping in central and southern parts of Jutland.

2.6 Container throughput via Danish Ports primarily to and from the NSR 2004

Although it is difficult to distinguish between container throughput bound for the Baltic Sea Region and throughput bound for the North Sea Region, a tentative (and qualitative) estimate as to which Danish ports serve the North Sea Region, are the ports of Aarhus, Copenhagen, Esbjerg and Hirtshals.

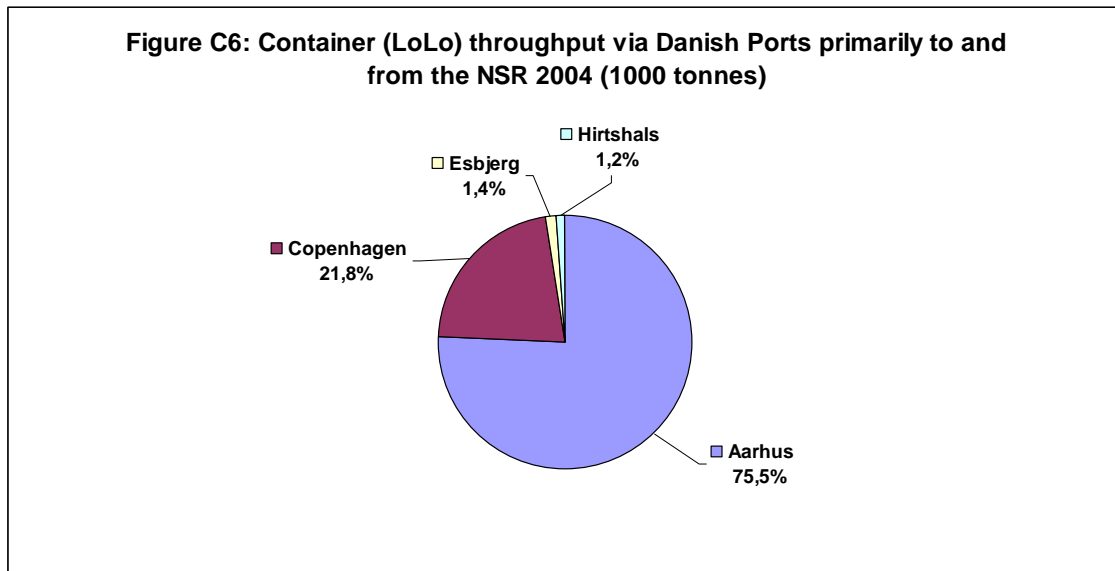
Table C6: Container (LoLo) throughput via Danish Ports primarily to and from the NSR 2004
1000 tonnes

Aarhus	2589
Copenhagen	749
Esbjerg	48
Hirtshals	42
Total	3428

The ports of Copenhagen and Aarhus have a clear duality in their relationship with the two sea regions surrounding Denmark, as both ports serve both the NSR and the BSR. This is partly due to their geographical location, partly due to their size, and partly due to the fact that the former port has a close collaboration with the Swedish port of Malmö and the latter port has a form of

collaboration with the Swedish port of Gothenburg, This should be brought to mind when the data depicted in table C6 and figure C6 is analysed.

In contrast the ports of Esbjerg and Hirtshals can be said to have a more clear orientation towards the North Sea Region.



With the above mentioned reservations in mind, the pattern of the overall container throughput from the four ports in question clearly indicates that the ports of Esbjerg and Hirtshals at best account for a marginal percentage of the Danish container throughput to and from the North Sea Region.

Even allowing for the fact that an undisclosed amount of the container throughput from the ports of Aarhus and Copenhagen is bound for Baltic Sea Region, the two primary Danish container ports with regards to the North Sea Region are the ports of Aarhus and Copenhagen – with the port of Aarhus being the primary port by far.

3. Danish Ferry Ports and the North Sea Region

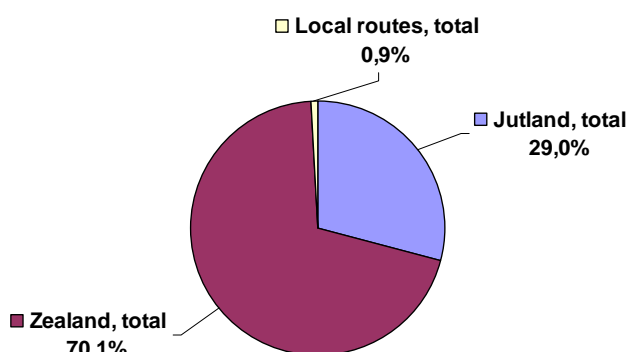
3.1 Ferry throughput via Danish Ports 2004 – Regional Stratification

In 2004 15.5 million tonnes of unitised goods were shipped by ferries via Danish ports. Of these 15,5 million tonnes some 10.8 million tonnes were handled by ports located on the island of Zealand, whereas ports in Jutland handled some 4.5 million tonnes. Ports serving local cross-border routes handle less than 150 thousand tonnes.

Table F1: Ferry throughput via Danish Ports 2004 – Regional Stratification

	1000 tonnes
Ports in Jutland, total	4474
Ports in Zealand, total	10797
Local cross-border routes, total	141
Denmark, total	15412

Figure F1: Ferry throughput via Danish ports - Regional Stratification 2004 (1000 tonnes)

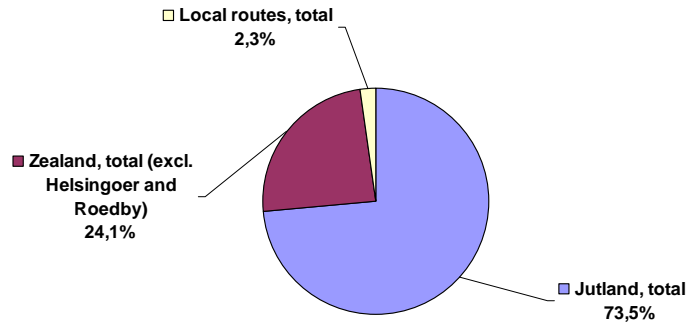


Over 70 percent of the Danish ferry throughput is thus handled by ports located in the eastern part of Denmark. However, if one was to exclude ferry routes that primarily exist due to the “lack of a fixed connection”, such as the ferry routes of Helsingoer-Helsingborg and Roedby-Puttgarten, the overall picture presented is quite different.

Table F1b: Ferry throughput via Danish Ports 2004 – Regional Stratification (excl. Helsingoer and Roedby)

	1000 tonnes
Ports in Jutland, total	4474
Ports in Zealand (excl. Helsingoer and Roedby), total	1469
Local cross-border routes, total	141
Denmark, total (excl. Helsingoer and Roedby)	6084

Figure F7b: Ferry throughput via Danish Ports (excl. Helsingoer and Roedby) - Regional Stratification 2004 (1000 tonnes)



The ferry ports of Jutland handle almost three times the amount of unitised goods that the ports of Zealand do – again excluding the Zealand ports of Helsingoer and Roedby.

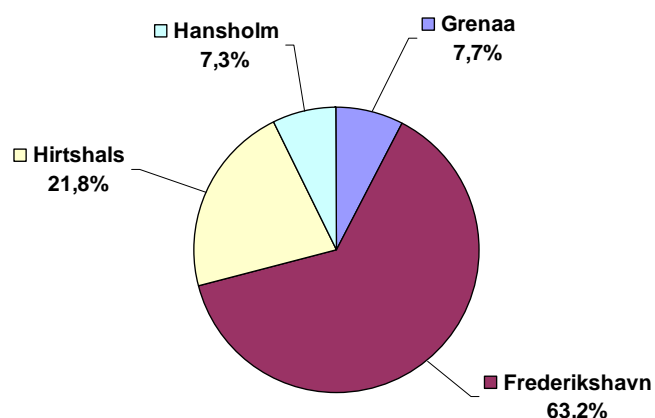
3.2 Ferry throughput via Danish Ports in Jutland 2004

Table F2: Ferry throughput via Danish Ports in Jutland 2004

	1000 tonnes
Grenaa	346
Frederikshavn	2827
Hirtshals	974
Hanstholm	327
Jutland, total	4474

The slightly less than 30 percent of the total Danish ferry throughput (or 74 percent of the Danish ferry throughput if one excludes the ports of Helsingoer and Roedby), which is shipped via ports in Jutland is handled by the four ports of Hirtshals (21.8%), Hanstholm (7.3%), Grenaa (7.7%) and Frederikshavn (63.2%).

**Figure F2: Ferry throughput via Danish ports in Jutland 2004
(1000 tonnes)**



With a little more than 2.8 million tonnes out of a total ferry tonnage from Jutland of a little less than 4.5 million tonnes, the port of Frederikshavn is the primary ferry port of the western part of Denmark.

3.3 Ferry throughput via Danish Ports in Zealand 2004

The ferry throughput from the island of Zealand is more or less split between the ports of Elsinore and Roedby, with the ports of Gedser and Copenhagen playing less important roles.

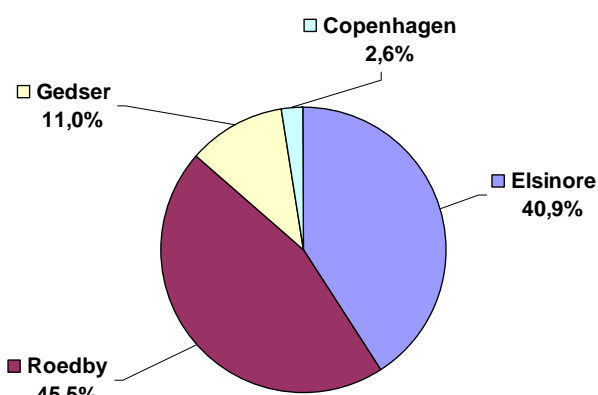
Table F3: Ferry throughput via Danish Ports in Zealand 2004

	1000 tonnes
Elsinore	4417
Roedby	4911
Gedser	1188
Copenhagen	281
Zealand, total	10797

Elsinore (with a throughput of some 4.4 million tonnes) and Roedby (with a annual throughput of just below 5 million tonnes) together handle over 85 percent of the total yearly ferry throughput from the ports in Zealand, with the port of Roedby being slightly larger than Elsinore.

The port of Elsinore is considered the northern part of the island of Zealand's gateway to Sweden, whereas both the port of Roedby and the port of Gedser collectively serve the north German market.

**Figure F3: Ferry throughput via Danish ports in Zealand 2004
(1000 tonnes)**



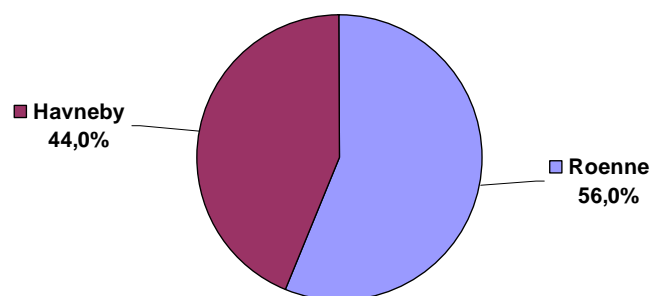
The port of Copenhagen only plays a marginal role as a ferry port in the eastern part of Denmark.

3.4 Ferry throughput via Local cross-border routes in Denmark 2004

Table F4: Ferry throughput via Local cross-border routes in Denmark 2004

	1000 tonnes
Roenne	79
Havneby	62
Hundested	0
Local cross-border routes, total	141

Figure F4: Ferry throughput via Local cross-border routes in Denmark 2004 (1000 tonnes)



The two small ports of Roenne and Havneby together have a ferry throughput of less than 150 thousand tonnes a year, and although these ports serve a significant role for their immediate hinterlands, neither port plays an important role for the North Sea Region or the Baltic Sea Region.

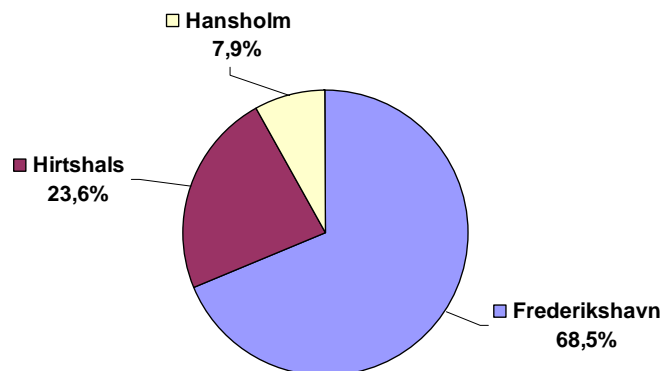
3.5 Ferry throughput via Danish Ports in North Jutland 2004

Of the four ports located in North Jutland, only the ports of Hirtshals, Frederikshavn and Hanstholm have a ferry throughput of unitised goods.

Table F5: Ferry throughput via Danish Ports in North Jutland 2004

	1000 tonnes
Aalborg	0
Hirtshals	974
Frederikshavn	2827
Hanstholm	327
North Jutland, total	4128

Figure F5: Ferry throughput via ports in North Jutland (1000 tonnes)



The port of Frederikshavn handles almost 70 percent of the ferry throughput in North Jutland, compared to the 24 percent, which is shipped through the port of Hirtshals, and the 8 percent, which is run through the port of Hanstholm.

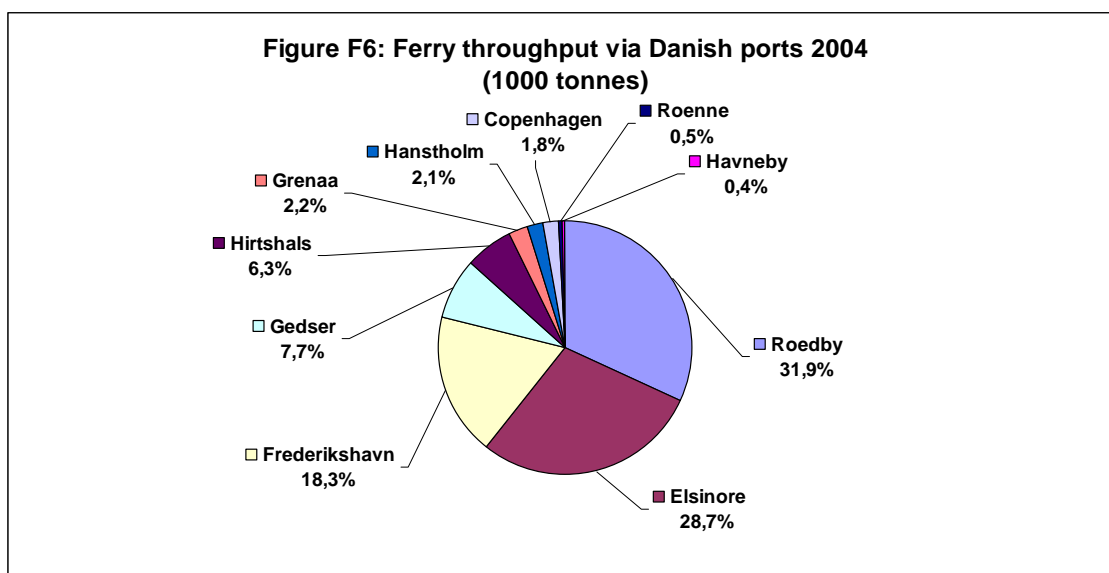
3.6 Ferry throughput via Danish Ports 2004 – Port Stratification

Ten out of the sixteen ports included in this paper had a ferry throughput of unitised goods in 2004. The three ports of Roedby, Elsinore and Frederikshavn together handled nearly 80 percent of the Danish ferry throughput in 2004. The top five ferry ports in Denmark collectively ship some 93 percent of the total Danish ferry throughput, leaving less than 8 percent for the remaining 5 smaller ports.

The two Zealand ports of Roedby and Elsinore alone handle some 60 percent of the total ferry throughput; a clear indication of an increased specialisation within the Danish port structure – also within the Danish ferry.

Table F6: Ferry throughput via Danish Ports 2004
1000 tonnes

Roedby	4911
Elsinore	4417
Frederikshavn	2827
Gedser	1188
Hirtshals	974
Grenaa	346
Hanstholm	327
Copenhagen	281
Roenne	79
Havneby	62
Denmark, total	15412



3.7 Ferry throughput primarily to and from the NSR via Danish Ports 2004

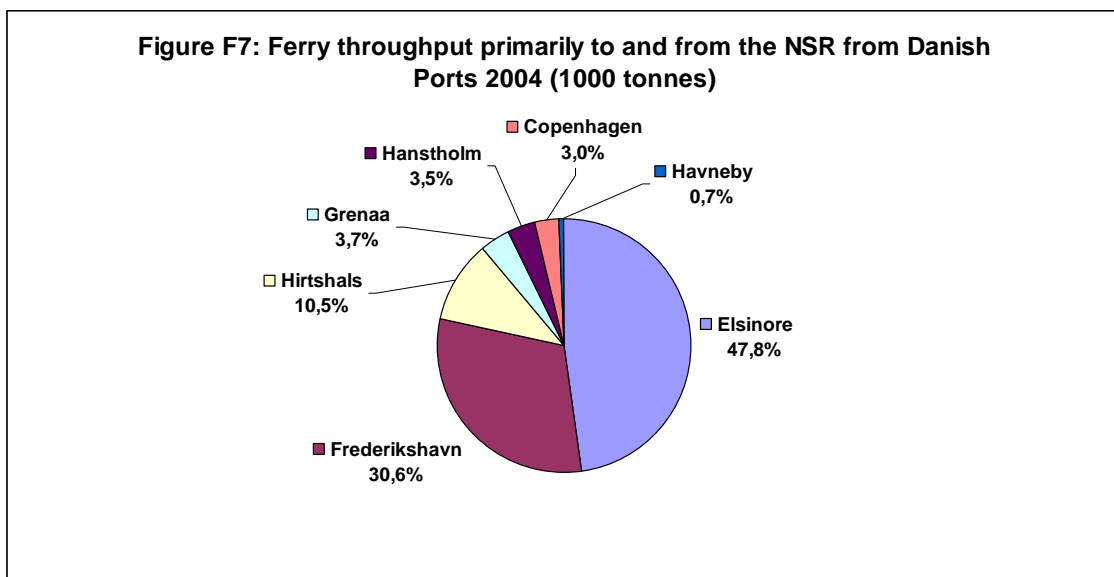
As already mentioned, it is difficult to differentiate between ports, which primarily serve the North Sea Region and ports, which primarily serve the Baltic Sea Region. In principle all the 10 ferry ports in Denmark fall within the eligible North Sea Region area, and all 10 ports should therefore be seen as ports, which are potentially interesting to the SUTRANET programme.

It could, however, be argued that especially the ports of Roedby and Gedser to a higher degree, than the remaining ports in question, fall within the sphere of Baltic Sea Region, and thus have a less clear and more tentative relation with the North Sea Region. The following breakdown of the ferry throughput data from Danish ports in 2004 has therefore omitted the two ferry ports of Roedby and Gedser in order to present a picture of the Danish ferry ports, which exhibit

the greatest potential in relation to the North Sea Region. The small port of Roenne has also been omitted for the same reasons.

Table F7: Ferry throughput primarily to and from the NSR from Danish Ports 2004

	1000 tonnes
Elsinore	4417
Frederikshavn	2827
Hirtshals	974
Grenaa	346
Hanstholm	327
Copenhagen	281
Havneby	62
Total	9234



With the above mentioned reservations in mind, the port of Elsinore seems to stand out as the most important Danish ferry port in the North Sea Region. With almost 50 percent of the ferry throughput, the port of Elsinore handles almost as much ferry freight as the 6 other “NSR-ports” combined.

The second most important Danish ferry port of interest to the NSR is the port of Frederikshavn (30.6 percent). Together with the port of Hirtshals (10.5 percent) these two ports handled a little more than 40 percent of the Danish ferry throughput in 2004. However, the importance of the ports of Frederikshavn and Hirtshals is nearly doubled if the port of Elsinore is excluded as a NSR-port (see comment on page 11).

4. Danish RoRo Ports and the North Sea Region

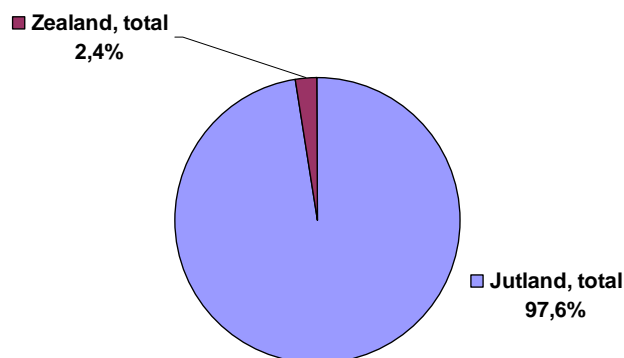
4.1 Other RoRo throughput via Danish Ports 2004 – Regional Stratification

Almost 2.5 million tonnes of unitised goods were carried by other vessels than RoPax ships in 2004. Ports in Jutland handled more than 97 percent of this cargo compared to a meagre 2.4 percent from ports located on the island of Zealand.

Table R1: Other RoRo throughput via Danish ports 2004 – Regional Stratification (1000 tonnes)

Jutland, total	2416
Zealand, total	60
Local routes, total	0
Denmark, total	2476

Figure R1: Other RoRo throughput via Danish ports - Regional Stratification 2004 (1000 tonnes)



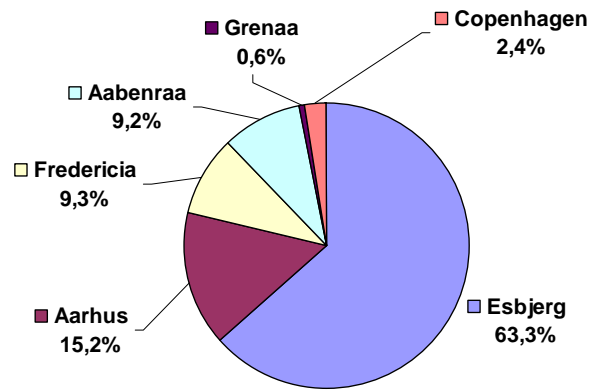
4.2 Other RoRo throughput via Danish Ports 2004 – Port Stratification

Of the 2.5 million tonnes of Other RoRo throughput handled by Danish ports in 2004, the port of Esbjerg alone handled nearly 1.6 million tonnes or almost 64 percent.

Table R2: Other RoRo throughput via Danish Ports 2004 (1000 tonnes)

Esbjerg	1567
Aarhus	376
Fredericia	230
Aabenraa	227
Copenhagen	60
Grenaa	16
Denmark, total	2476

**Figure R2: Other RoRo throughput via Danish Ports 2004
(1000 tonnes)**

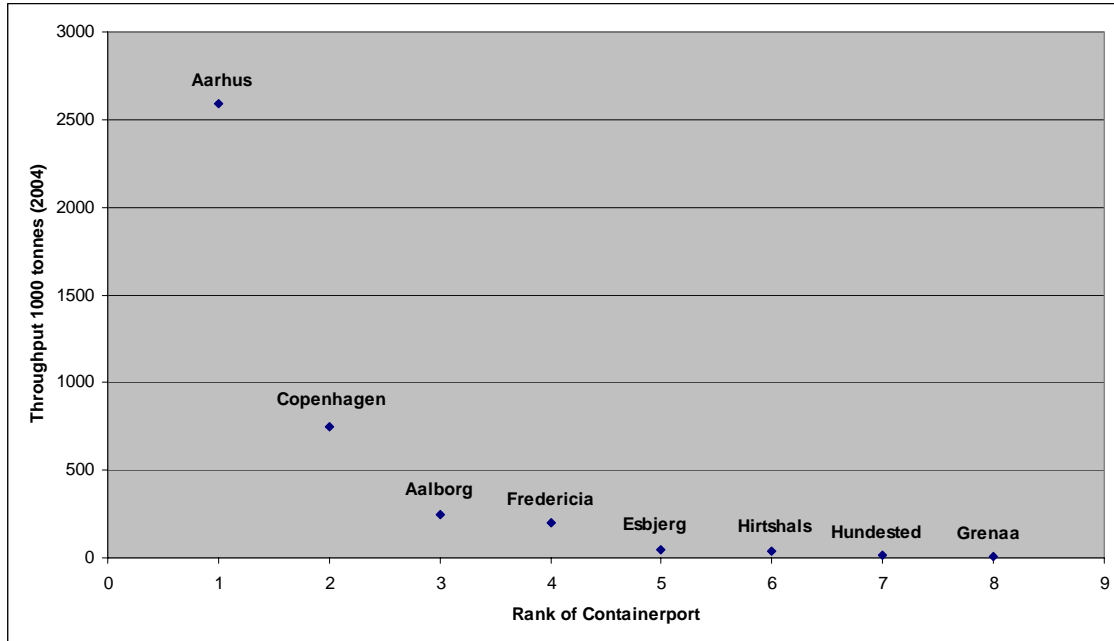


The port of Aarhus saw a share of some 15 percent of this throughput, with the ports of Fredericia and Aabenraa each taking a little more than 9 percent of the total Danish RoRo throughput in 2004. This implies that the four ports in central and south Jutland serve nearly all RoRo traffic via Danish ports.

5. Conclusions

The results presented in this paper confirms that the unitised ports market in Denmark exhibits a large degree of specialisation, where most of the unitised goods throughput via Danish ports is handled by a selected few ports. These ports increasingly seem to have specialised in handling either LoLo, ferry or other RoRo cargo.

Figure Con1: Rank size of Danish Container Ports (2004)



The port of Aarhus is by far the most important container port in Denmark compared to ports like Copenhagen and Aalborg.

Almost two-thirds of the total container throughput via Danish ports in 2004, were processed by the port of Aarhus. With the current expansion plans for this port, there is little to suggest, that this port's control with the Danish container market will change in the future.

Even though the throughput from Danish ferry ports is not quite as specialised as the LoLo throughput, the three ports of Roedby, Elsinore and Frederikshavn collectively shipped some 80 percent of the total Danish ferry throughput in 2004.

Although there is some indication of operators partially re-locating their operations from the port of Frederikshavn to the port of Hirtshals, there is no evidence, that the present five largest ferry ports of Roedby, Elsinore, Frederikshavn, Gedser and Hirtshals also in the future will dominate the ferry ports market in Denmark – with the ports of Roedby and Elsinore taking the lions share.

Figure Con2: Rank size of Danish Ferry Ports (2004)

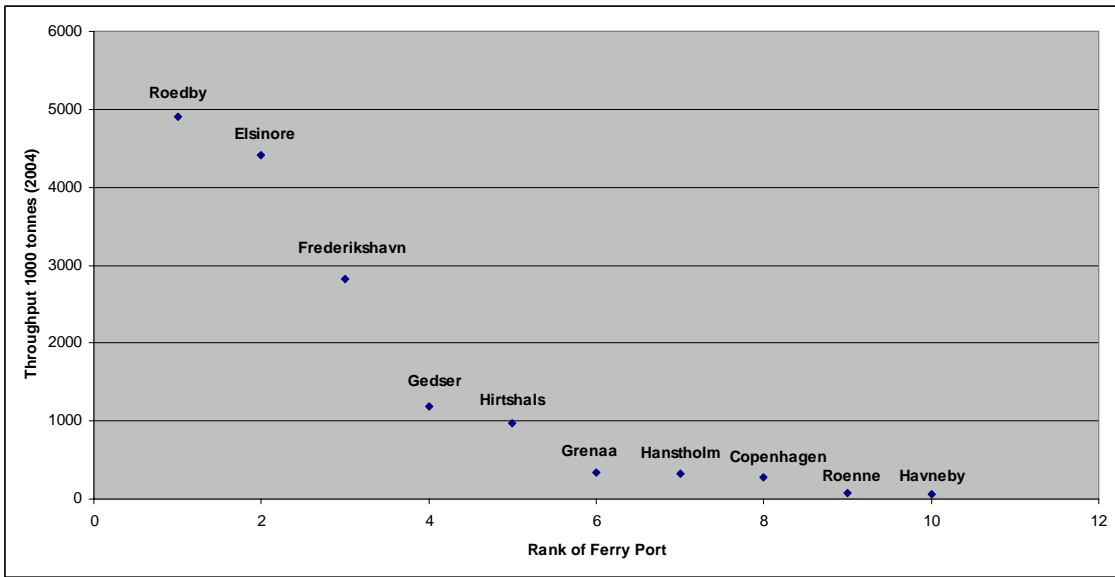


Figure Con3: Rank size of Danish Ferry Ports excluding the ports of Roedby and Elsinore (2004)

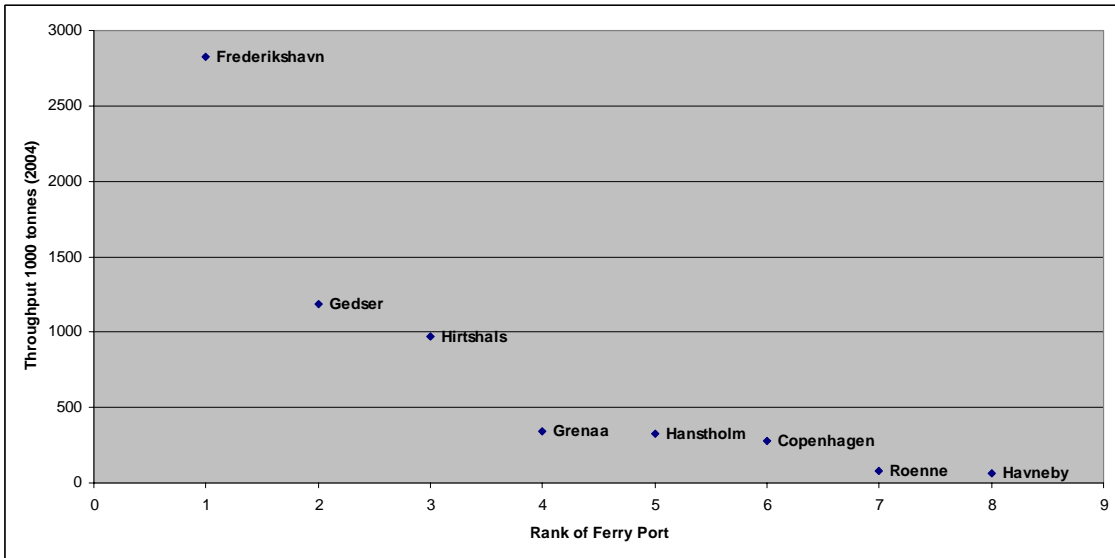
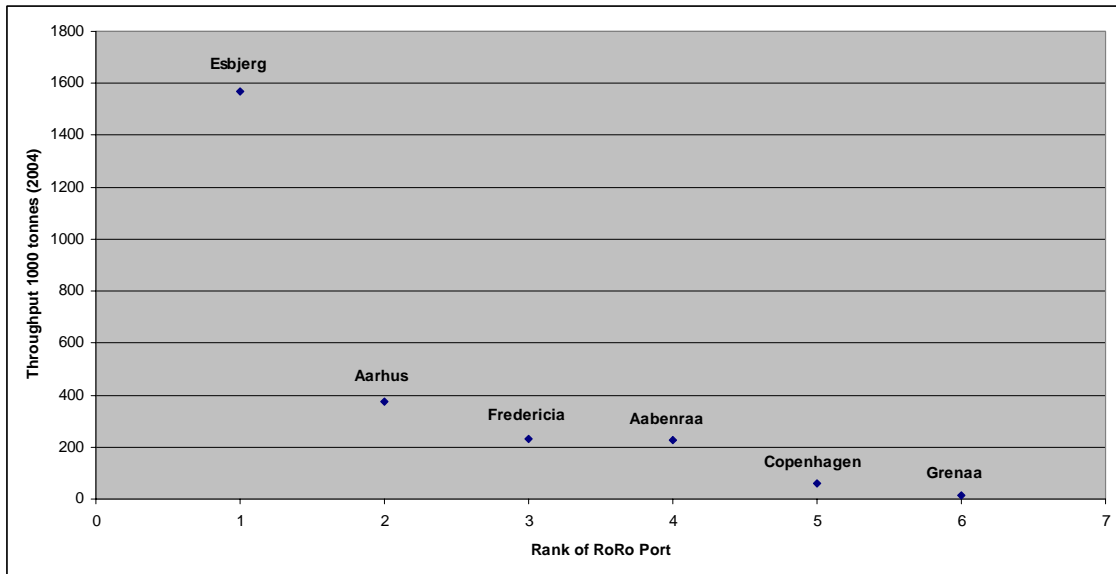


Figure Con4: Rank size of Danish RoRo Ports (2004)



As was the case with the port of Aarhus in regards to the Danish container port market, a similar degree of concentration and specialisation can be observed in the other RoRo market.

The port of Esbjerg dominates this port market in Denmark with a market-share of some 64 percent.

The future Danish port structure is expected to consolidate a picture of increasing concentration and specialisation of perhaps a handful of Danish ports.

ANNEX 1

Unitised Goods via Danish Ports 2004

Unitised Goods via Danish Ports 2004 Comparative Table

No	Port	Ferries						Other RoRo			Containers (LoLo)			
		A1 1000 tonnes	A1 1000 units	A2 1000 tonnes	A2 1000 units	A1+A2 1000 tonnes	A1+A2 Pct.	A1+A2 1000 units	B 1000 tonnes	B Pct.	B 1000 units	C 1000 tonnes	C Pct.	C 1000 TEU
1	Frederikshavn	?	185	?	18	2.827		203	0			0		
2	Hirtshals	?	?	?	?	974		90	0			42		5
3	Hanstholm	?	8	?	18	327		26	0			0		
4	Aalborg	0	0	0	0	0			0			244		52
1-4	North Jutland, total					4.128	26.8	319	0	0	0	286	7.4	57
5	Grenaa	?	3	?	18	346		21	16		1	4		1
6	Aarhus	0	0	0	0	0			376		25	2.589	66.6	337
7	Esbjerg	0	0	0	0	0			1.567	63.4	96	48		6
8	Fredericia	0	0	0	0	0			230		15	197		18
9	Aabenraa	0	0	0	0	0			227		11	0		
5-9	Central and south, total		3		18	346	2.2	21	2.416	97.7	148	2.838	73.1	362
1-9	Jutland, total					4.474	29.0	340	2.416	97.7	148	3.124	80.4	419
10	Elsinore	4.417	377	0	0	4.417		377	0			0		
11	Roedby	?	?	?	?	4.911		296	0			0		
12	Gedser	?	?	?	?	1.188		71	0			0		
13	Copenhagen	?	10	?	12	281		22	60		4	749		105
10-13	Zealand, total					10.797	70.1	766	60	2.4	4	749	19.3	105
1-13	Total					15.271	99.1	1.106	2.478	100.0	152	3.873	99.7	524
14	Roenne	?	4	?	2	79		6	0			0		
15	Havneby	62	8	0	0	62		8	0			0		
16	Hundested	0	0	0	0	0			0			12		
14-16	Local routes, total	?	12	?	2	141	0.9	14	0		0	12	0.3	2
1-6	Denmark, total					15.412	100.0	1.120	2.476	100.0		3.885	100.0	?

Sources: Statistics Denmark, Tables SKIB43 and SKIB49 (www.statistikbanken.dk); Transport 2005:12, Tables 11 and 12
SKIB32: International transport by ferry by ferry route and unit (1990-2004)
SKIB43: Throughput of goods in Danish ports in international traffic by seaport, direction and type of goods (1997-2004)
SKIB49: Throughput of containers and ro-ro units in major Danish ports by seaport, direction, unit of cargo and unit (1997-2004)

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Notes:

1) The weight of goods figures include the immediate packaging. The weights of the transport unit, and the tare weight of the container or the RoRo unit are excluded.

2) Domestic goods transport between Danish ports is not included.

3) **A1 figures** include ferry goods quantities carried on road goods vehicles and accompanying trailers. **A2 figures** are ferry goods quantities carried on unaccompanied road goods trailers (semi-trailers). Any ferry goods by 'unregistered vehicles' etc. is not included.

The "Transport 2005 Table 12" provides a breakdown of unit figures on accompanied and unaccompanied trailers, except for the ports of Hirtshals, Gedser and Roedby. Table 12 provides no breakdown on A1 and A2 tonnes figures.

4) No international goods traffic on rail wagons (**A3 figures**) were reported via Danish ports in 2004.

5) "Local routes" are the cross-border ferry routes Roenne/Bornholm-Sassnitz (Germany), Roenne/Bornholm-Ystad (Sweden), Havneby/Roemoe-List (Germany) and international container traffic of 12,000 tonnes via the small port of Hundested (Zealand).

6) Small deviations of the sum figure from the Denmark total figures is due to indication in 1,000 tonnes unit.

7) Number of other RoRo units and container TEU via Grenaa are estimated. TEU via Hundested is estimated as well.

8) The number of TEU includes empty containers.

9) All of the container traffic via Aalborg is to/from Greenland.

10) Table "Skib49" provides figures for container units and TEU, but only for major ports, and these figures include domestic traffic. Thus some of the TEU figures are estimated as follows:

Number of TEU via Copenhagen is estimated: $120.6 \times 749 / 857.5 = 105$ (the figure 120.6×1000 TEU includes domestic traffic of containers).

Number of TEU via Aarhus is estimated: $341.3 \times 2589 / 2618.9 = 337$ (the figure 341.3×1000 TEU includes a small portion of domestic traffic).

Number of TEU via Hirtshals is estimated ($42 / 8.5$ tonnes per container = approximately 5×1000 TEU).