Identification of planning mismatches and their origins in the Baltic Sea

Dominic Plug, German Federal Maritime and Hydrographic Agency (BSH)
The world from a Mariners’ point of view

Maritime Spatial Planning (MSP) as central instrument for creating balance between sectors and managing the sea in a sustainable way.

Freedom of navigation prevails – but space is getting scarce!
Goals of Maritime Spatial Planning

Goals

• Assessment of human activities
• Prevention from conflicts of uses
• Safeguarding safety standards
• Protection of maritime environment
• Implementation of political goals (e.g. Blue Growth Strategy, Renewable Energy Act)

How to get there?

• Precautionary principle
• Holistic approach
• Transnational cooperation
Baltic LINes core topics

Key questions

What are the sectoral spatial needs – now and in future?

Which data(format) is needed to plan transnationally coherently?

Which methods can be used to plan coherently across borders?
Work Package 4: Coherent planning of ship corridors across borders

Development of three deliverables with the following objectives:

- Identification of planning mismatches and suggestions for planning solutions
- Assessment of national approaches and planning criteria (differences)
- Step-wise approach for the planning of ship corridors in MSP

All reports available under https://vasab.org/project/balticlines/project-outputs/
**EXAMPLES OF MSP PLANNING ISSUES IN THE BALTIC SEA**

**Case 1: Area around Åland**  
Countries: Sweden, Finland  
Planning issue: Different methods to transfer IMO regulations into national MSP ship corridors

**Case 2: South-West of Saarema Island**  
Countries: Estonia, Sweden, Latvia  
Planning issue: Mismatches between ship corridors and potential impact on navigational safety from planned offshore wind farm

**Case 3: South-East Baltic Sea**  
Countries: Sweden, Latvia, Lithuania, Russia, Poland  
Planning issue: Mismatches between ship corridors of several countries (gaps between, and different widths of corridors)

**Case 4: Area around and east of Bornholm**  
Countries: Poland, Sweden, Denmark, Germany  
Planning issue: Mismatches between ship corridors (gaps between, and different widths of corridors), issues between shipping and energy (shift of traffic due to OREI)

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Due to practical issues and limitations, country term definitions are not projected here. Instead, collective terms are used to retain similar coordinates.
Planning mismatches and their origins

Types of mismatches

- Some countries add additional safety zones along routeing measures while others just transfer the spatial dimension of the routeing scheme as such.
- Ship corridors are designated in one country but not continued in the next bordering country.
- Ship corridors have different widths in one country as compared to its continuation in the next bordering country.

⇒ Mismatches can lead to potential planning issues/conflicts.

* Due to practical layout issues different national terms and definitions are not reflected in the maps. Instead, collective terms are used to obtain similar color codes.
Assessment of national approaches in MSP

Differences in national approaches for MSP relate to choice of

- Different stages in MSP process
- Scale and level of detail
- Temporal planning horizon
- Legal status of MSP
- Plan objectives (dependent on national political agenda)
### National approaches for ship corridor designation in MSP

<table>
<thead>
<tr>
<th>Planning criteria used for MSP shipping area designations</th>
<th>Denmark</th>
<th>Estonia</th>
<th>Finland</th>
<th>Germany</th>
<th>Latvia</th>
<th>Lithuania</th>
<th>Poland</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of priority areas + safety zones according to traffic density (AIS data from 2016) and ship sizes on main traffic routes, guidance taken from Nautical Institute paper. Corridor widths between 6 and up to 10 nm.</td>
<td>Priority areas for shipping shall safeguard space for ship traffic, no</td>
<td>“Fairways” (parts of a waterway that are most suitable for water traffic) are</td>
<td>Presently priority areas are shipping lanes, traffic separation schemes</td>
<td>Priority areas for shipping shall safeguard space for ship traffic, no</td>
<td>Priority areas for shipping shall safeguard space for ship traffic, no</td>
<td>Priority areas for shipping shall safeguard space for ship traffic, no</td>
<td>Priority areas for shipping shall safeguard space for ship traffic, no</td>
<td>Priority areas for shipping shall safeguard space for ship traffic, no</td>
</tr>
<tr>
<td>AIS based shipping density is used for discussing/deciding on multi-use of marine space or establishing spatial constraints (e.g. Ships’ routes design).</td>
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<tr>
<td>Shipping density maps based on HELCOM AIS data will be used to determine corridor width</td>
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</tr>
<tr>
<td>Larger corridors equal widths of TSS: 1nm width for 1000-4900 vessels/year; 10nm for &gt;10,000 ships. Designations in MSP from 2009 based on AIS data from 2005-2009 (national stations).</td>
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<tr>
<td>Width of priority areas (incl. safety zones) based on traffic density (10 year AIS data + 2016), guidance taken from Nautical Institute paper. Corridors widths between 5.14nm from/to big ports and for transit, and 1.72nm from/to small ports.</td>
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<tr>
<td>Shipping routes and roodsteads are well defined and strictly respected in the MSP documents and charts. Yearly summary of ship density was taken as basic information for justification of the corridors.</td>
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</tr>
<tr>
<td>Widths of priority areas not defined in detail yet.</td>
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</tr>
<tr>
<td>AIS data was used to designate national interest areas which were the basis for later designations of areas in MSP. MSP only covers the nationally most important corridors. Smaller routes rely on the “freedom of navigation”.</td>
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</tr>
</tbody>
</table>

### Differences in designating ship corridors in MSP result from

- Different importance is given to the shipping sector in MSP
- Different methods are used to transfer spatial IMO regulations into the national MSPs
- Different methods are used to determine the widths of ship corridors
Differences in designating ship corridors in MSP in the North Sea

- Different variation (different vessel data used)
- Different timeline
- Criteria are in every country different
- Different identification of national lanes
- Different approach of priority (soft or hard spatial claim)
Planning transnational shipping in the North Sea

Report from WP4 in the NorthSEE project

Henrik Nilsson, World Maritime University
Objective of the report

- Identify current shipping routes in the North Sea
- Compare it with routes as described in national MSP plans
- Analyze coherence in transnational planning
- Provide recommendations
Traffic density 2016 – Seasonal maps

Feb

May
Traffic density 2016 – Seasonal maps
IMO routes North Sea
IMO routes and OWF

North Sea

South North Sea
Traffic density (AIS)
Inconsistencies?
Reflections

• Difficult to obtain historical data
• Importance of relying on the same data source in order to develop one coherent North Sea MSP plan
• Are identified inconsistencies reliable?
• How can seasonal variations in traffic be taken into account in MSP?
THANK YOU!
Suggestion of a step-wise approach for the coherent planning of ship corridors in MSP

Dominic Plug, German Federal Maritime and Hydrographic Agency (BSH)
Practical guide to the designation of ship corridors in MSP

Why did we develop this practical guide?
• Avoidance of planning mismatches by using similar or at least comparable methods for the designation of ship corridors
• Coherency enhances safety at sea → contributes to better environmental conditions, lower economic costs and reduces risk for the loss of human life
• Common approach increases the comparability and mutual understanding of national decisions

What can the planning approach not provide?
• Cannot present the one-and-only way to designate ship corridors → dependent on national context other methods may be preferable
• Cannot replace Formal Safety Assessments (FSA) → need to be accomplished on a case-by-case basis by experts
• Cannot substitute weighing process to balance between sectoral interests
Suggestion of step-wise planning approach

Step 1: Transfer of different types of IMO routeing schemes to the MSP
Suggestion of step-wise planning approach

<table>
<thead>
<tr>
<th>Ship traffic density (vessels per year)</th>
<th>Number of vessels taking over</th>
<th>Number of ship lengths needed</th>
<th>Path width for standard ship size of 400m</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4,400</td>
<td>2</td>
<td>4</td>
<td>4 x 400m = 1.6km (~0.9nm)</td>
</tr>
<tr>
<td>4,400 - 18,000</td>
<td>3</td>
<td>6</td>
<td>6 x 400m = 2.4km (~1.3nm)</td>
</tr>
<tr>
<td>&gt;18,000</td>
<td>4</td>
<td>8</td>
<td>8 x 400m = 3.2km (~1.7nm)</td>
</tr>
</tbody>
</table>

Step 2: Analysis of AIS data and draft of continuous ship corridors*

* HELCOM AIS Expert Working Group agreed on a methodology to produce density maps and statistics from AIS data (Annex I of the Maritime Assessment / codes: GitHub). This helps to use the same methodology and to be able to compare the AIS data products between countries.

** Method developed by Maritime Institute of the Netherlands (MARIN)
Suggestion of step-wise planning approach

Step 3: Assessment of future developments and related spatial demands
Suggestion of step-wise planning approach

Step 4: Assessment of spatial demands across sectors
Step 5: Transnational exchange between planners to increase coherency of designations
Suggestion of step-wise planning approach

Step 6: First draft including area categorization and related textual regulation open for consultation
Main messages

✓ MSP as central instrument for balancing between sectoral interests and sustainable sea management

✓ Transnational coherency of plans required by EU Directive (2014)

✓ In the MSP draft phase, still many cross-border mismatches can be found between designated ship corridors

✓ Mismatches often relate to different national approaches for MSP as well as different methods for ship corridor designation

✓ Baltic LINes developed methods to enhance coherence for the planning of ship corridors and energy infrastructure

✓ Agreement on common methodology for whole Baltic Sea would be ideal, but is not feasible

✓ Baltic LINes suggests a practical guide for ship corridor designation in MSP to increase transnational coherency
Questions?

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Future trends of Shipping

Jeroen van Overloop, FOD Mobiliteit en Vervoer
Future scenarios

• Ship size
• Specialization
• Automatization
• Fuel
Ship size

- Containerization
- Large container vessels, plus 400 metres
- Limited by draught and manoeuvrability
- Smaller Short Sea Shipping Vessels
Specialization

- Construction windfarms
- Development of other offshore activities
- Specialised Ships
- Heavy Lifting
Automatization

• Unmanned Vessels
• Platooning
• Unmanned Services
Fuel
future
Recommendations for shipping

Jeroen van Overloop, FOD Mobiliteit en Vervoer
• Maps and map data
• Analysis of data
• Recommendation
• criteria
Shipping map

• IMO routes
• MSP’s
• Priority routes for shipping
• ...
Conclusion

• No real mismatches
• No coherence in used techniques
  • IMO routes
  • National priority lanes
  • ...
• Border situations
• Some gaps
No coherence in technique

• IMO routes
  • Traffic separation
  • Two way route
  • Precautionary area
  • ...

• National priority
  • No definition on type of route
Border situations

• Traffic separation on the Dutch site
• Priority on the German site
• Different size
• No gateways at the border
Gaps

- North – South Traffic
- Priority Germany
- Priority Netherlands
- Gap in between
- Possible other use for open space
• Ships do sail in gap area
First questions

• Why one country priority for shipping and not the other?
• Why IMO and sometimes not?
• Why TSS, two-way route,…?
• No coherence between countries
MAP vs AIS

• Is the map correct?
• Based on all information?
• Coherent with AIS?
Compare AIS density map with
• Differences between AIS image and protected area
Closer look

• Traffic going all directions
• Is allowed to do this
Conclusion

• Not all shipping routing measures are coherent with real situation
• Map might be wrong
Sustainable solutions

- Transnational cooperation
- Use same techniques/terminology
- Close the gaps
- Use same criteria
Transnational cooperation

• Shipping is international, don’t tackle it nationally
• Good practice BE – NE cooperation windfarms
techniques/terminology

- IMO Resolution A.572(14)
  - TSS
  - Traffic lane
  - Separation zone
  - ... (14 different measures)
- International recognized
- IMO regulated
- Can be used on national level
Close the gaps

• Make one coherent priority shipping transit
• For the Northsea
• No gaps
• Designated North-South connection
• IMO or national priority
Criteria

• Same criteria for protective measures
  • Example: +25,000 ships/year in one lane

• Not always traffic routes
  • Also precautionary area for example
Conclusion

• One closed system for ships in all the North sea
• Same terminology, easy for international shipmasters
• Same criteria, coherent decisions