Ship Traffic Analysis on the NSR and Development of the NSR’s Transport and Logistics System

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System’s Approach to Arctic Logistics

Eurasian Arctic Transportation and Logistics System

- Optimization of Intermodal Transport Infrastructure
  - Traffic Analysis
  - Cargo Base Analysis
- Optimization of Logistics and Cargo Flow
  - Cost Benefit Risk Analysis
- Optimization of Transport Safety and Low Environmental Footprint
  - Investments & Financing Mechanism

Railway Infrastructure
River Transport Infrastructure
Maritime Infrastructure
Road Transport Infrastructure
Air Transport Infrastructure

Optimization of Logistics and Cargo Flow

Cost Benefit Risk Analysis

Traffic Analysis
Cargo Base Analysis

Optimization of Intermodal Transport Infrastructure

Maritime Infrastructure

Optimization of Transport Safety and Low Environmental Footprint
Inventory of Infrastructure on the NSR

CHNL’s Interactive NSR Infrastructure Map
Ship Traffic Analysis on the NSR 2016-2017

Capotage shipping: 86.7 - 92.3 %
Destination shipping: 12.1 - 7.5 %
Intern. transit shipping: 8 & 12 voyages

CHNL’s Arctic Shipping Database
<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of vessels</td>
<td>297</td>
<td>283</td>
</tr>
<tr>
<td>Number of voyages</td>
<td>1,705</td>
<td>1,908</td>
</tr>
<tr>
<td>Vessels of less than 5000 GRT</td>
<td>43%</td>
<td>50%</td>
</tr>
<tr>
<td>Vessels with no or weak ice-class</td>
<td>41.0%</td>
<td>47.4%</td>
</tr>
<tr>
<td>Number of shipping companies</td>
<td>129</td>
<td>121</td>
</tr>
<tr>
<td>Number of Non-Russian companies</td>
<td>54</td>
<td>47</td>
</tr>
<tr>
<td>Voyages made by Russian vessels</td>
<td>70%</td>
<td>81%</td>
</tr>
<tr>
<td>Voyages from European ports to NSR</td>
<td>65</td>
<td>63</td>
</tr>
<tr>
<td>Voyages from Asian Pacific ports to NSR</td>
<td>39</td>
<td>12</td>
</tr>
</tbody>
</table>
Year-Round Shipping on the NSR

Number of Voyages

January February March April May June July August September October November December

2016 2017
Total Cargo Volumes on the NSR 1933-2017

Source: NSRA
## Three Modes of Maritime Transportation

<table>
<thead>
<tr>
<th>Capotage Shipping</th>
<th>Destination Shipping</th>
<th>Int. T. Shipping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resupplying remote Arctic communities with goods</td>
<td>Shipments of project cargo for large Arctic energy and mining projects</td>
<td>Demonstration voyages; repositioning of vessels</td>
</tr>
<tr>
<td>Transport oil, coal, metals and ore from remote locations</td>
<td>Transport of LNG from the Yamal LNG plant (to be replaced by capotage)</td>
<td>Transport of oil products and project cargo (e.g., windmill components); transport of coal and frozen fish/meat</td>
</tr>
<tr>
<td>Geological and geophysical exploration of Arctic seas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establishing and servicing energy and mining projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Servicing and maintaining several new security/military bases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modernization of existing Arctic ports and new port development</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Arctic Transshipment Hubs

Year-Round Cargo Transportation

NSR WEST
Transshipment Hub A

Eastbound
High Ice-Class Vessels

NSR

Westbound
High Ice-Class Vessels

NSR EAST
Transshipment Hub B
NSR’s Future Transshipment Hubs

To Northwest Europe
To East Coast of America
To West Coast of America
To Northeast Asia

An image of the Arctic sea ice on March 24, 2016 (maximum ice extent)
Thank You!