INTERMODAL HCT

-The case of Jula

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Transport solution

Rail 120 km
Göteborg- Falköping

HCT 28 km
Falköping-JULA, Skara
Background

- First departure Skandiahamnen - Falköping 4th of September 2013
- 5 times/week, 84TEU per departure
- As of 2018, >25,000TEU whereof Jula -50%. Other customers: IKEA, Swedish Match, MIO, A Lot of Decoration, Parker Hannifin...
- Challenging distance for competitive intermodal transport! Important with very high cost awareness amongst partners and sub-contractors.
Structure of agreements

- **DB Schenker**
  - Jula
    - Tågfrakt
      - Rail operator
    - TBN
      - Terminaloperator
    - Haulier (SkaraT.)
      - Road transport
    - APM Terminals
  - Falköping Municipality
    - Land owner
    - Swemaint/BS Mekaniska
      - Wagon maintenance
    - Pre- and post haulage
      - Skaraterminalen AB
    - Net Rail
      - ECM
    - Container deposits
      - 2-3 shipping lines
- Open book

Results

- As of 2018, >25,000 TEU whereof Jula ~50%. Other customers: IKEA, Swedish Match, MIO, A Lot of Decoration, Parker Hannifin…

- Cost benefits
  - Congestion charges
  - Stable flow of containers
  - Less sensitive to disturbances
  - More 40f! Requires consolidation at supplier location.

- No waiting times at Port of Gothenburg

- Less environmental impact

- Improved safety (E20)

- One of the biggest challenges has been to lower cost of pre-and post haulage!
Project: Intermodal HCT

• Very positive results and experiences from previous test and project, e.g. DUO2
• Wish to extend the concept of HCT to intermodal transport solutions and perspectives.
• Little research on Intermodal HCT and the interplay between HCT on road with rail-based intermodal transport where a large DC is involved

The project analyse how Intermodal HCT can improve efficiency and logistics quality. Hopefully this knowledge can facilitate further development in allowing for intermodal HCT to and from nearby intermodal terminals. Focus, in short:

» Cost
» Logistics quality
» Environmental impact
HCT

• Application 2012 Transportstyrelsen. Granted Dec 2014 (3y)
• Application Länsstyrelsen Dec 2014. Granted Januari 2015 (3y)

• Application (extension) Dec 2017 Transportstyrelsen. Granted Dec 2017 (5y)
• Application (extension) Länsstyrelsen Dec 2017. Granted Dec 2017 (5y)

• 32m, same weight, standard components
System design

<table>
<thead>
<tr>
<th></th>
<th>Inland terminal</th>
<th>Road haulage</th>
<th>Distribution centre</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity</strong></td>
<td>-1 reach stacker</td>
<td>-2 trucks</td>
<td>-Between 12-24 gates</td>
</tr>
<tr>
<td></td>
<td>-22 chassis (either 1<em>40ft or 2</em>20ft per chassis)</td>
<td>-5 lorry drivers</td>
<td>-Staffing 2 shifts of 14 on average per shift</td>
</tr>
<tr>
<td><strong>Opening/operating hours</strong></td>
<td>Mon-Fri 05.00-18.00</td>
<td>Mon-Fri 04.30-23.30</td>
<td>Mon-Thu 06.00-23.00</td>
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<td>Fri 06.00-16.00</td>
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<td></td>
<td></td>
<td>Sat 06.00-20.00</td>
</tr>
<tr>
<td><strong>Activity and lead-times</strong></td>
<td>-Loading/unloading time: 2-5min per chassis</td>
<td>Transport time: 30-35 min (one way).</td>
<td>Time for marshalling of chassis including leaving/picking up chassis at the gate: 20-35min</td>
</tr>
</tbody>
</table>
# Systems performance

<table>
<thead>
<tr>
<th></th>
<th>Initial design (2013-2014)</th>
<th>HCT design (2015-)</th>
<th>HCT design (2018-) Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time for a round-trip:</strong></td>
<td>1 hour 20 min</td>
<td>1 hour 35 min</td>
<td>1 hour 35 min</td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>2 trucks<em>9hours 1 truck</em>8hours 1 dolly ~15 chassis Monday-Friday</td>
<td>2 trucks*9hours 2 dollies 22 chassis Monday-Friday</td>
<td>2 trucks<em>9hours 1 truck</em>8hours 3 dollies 22 chassis Monday-Friday</td>
</tr>
<tr>
<td><strong>Productivity (TEU)/hour</strong></td>
<td>~1.5 TEU/hour and truck (18+9 hours of total driving) Total capacity/day: ~40 TEU</td>
<td>~2.6 TEU/hour and truck (18 hours of total driving) Total capacity/day: ~47 TEU</td>
<td>~3 TEU/hour and truck 18+9 hours of total driving) Total capacity/day: ~81 TEU</td>
</tr>
<tr>
<td><strong>Cost/container (TEU)</strong></td>
<td>- Round-trip: 80min/60min*87 (€/hour) = €116  - TEU per round-trip (TEU): 2.4 (average)  - Cost per TEU: 116/2.4 = €48 per TEU</td>
<td>- Round-trip: 95min/60min*87 (€/hour) = €137  - TEU per round-trip (TEU): 3.8 (average)  - Cost per TEU: 137/3.8 = €36 per TEU</td>
<td>- Round-trip: 95min/60min*87 (€/hour) = €137  - TEU per round-trip (TEU): 3.8 (average)  - Cost per TEU: 137/3.8 &lt; €36 per TEU</td>
</tr>
</tbody>
</table>
Summary and conclusions

The operational benefits are summarised below, which lists the actions taken (x axis) against the benefits achieved (y axis), ranking them as high, medium and low benefit.

Benefits of last mile optimisation strategies

<table>
<thead>
<tr>
<th>Benefits of last mile optimisation strategies</th>
<th>Adoption &amp; optimisation of HCT</th>
<th>Asset management (chassis &amp; trucks)</th>
<th>Information sharing</th>
<th>Container storage at the terminal</th>
<th>Access to terminal after opening hours</th>
<th>Longer delivery window at DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughput</td>
<td>H</td>
<td>H</td>
<td>M</td>
<td>L</td>
<td>H</td>
<td>H</td>
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<tr>
<td>Capacity</td>
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<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>H</td>
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<tr>
<td>Responsiveness</td>
<td>L</td>
<td>M</td>
<td>L</td>
<td>H</td>
<td>H</td>
<td>M</td>
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<tr>
<td>Flexibility</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>H</td>
<td>H</td>
<td>H</td>
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<tr>
<td>Cost</td>
<td>H</td>
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<td>L</td>
<td>L</td>
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<td>M</td>
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<tr>
<td>Service quality</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>M</td>
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<td>M</td>
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</table>

The continuous improvement and integration of the three elements of terminal operations, road haulage and handling at the DC have enabled an impressive 70% improvement in productivity and 25% decrease of cost per container (TEU) at the same time as the service quality and flexibility have increased with the use of more chassis. This is of course, a key for the success of the intermodal transport solution and further emphasises the importance of the last mile and the importance of supply chain collaboration involving the transport actors. The cost per container (TEU) is even more impressive when looking at the cost per TEU and km: €0.67/TEU/km which is similar to the cost normally associated with low-cost long-distance haulage (cf. Martinez-Lopez et al. 2013; AECOM, 2014).

~130-140SEK/10km
Future focus and development

• Continue to improve and study the new project period of Intermodal-HCT (e.g. time for marshalling at DC)

• Want to combine this with longer train (750m) (when infrastructure is ready)

• Studying ”effects” of the port conflict given the intermodal HCT setup

Great policy potential!
-Sustainable cost-efficient intermodal transport
-Modal shift

Publications


• Lin, N., Hjelle, H., Cullinane, K., Bergqvist, R., Eidhammer, O., Wang, Y., Qu, Z., Yang, Z., 2016, Potential Solutions to Upstream Buyer Consolidation in the China–Europe Container Trades - An Exploratory Study, 6th International Conference on Logistics, Informatics and Service Sciences (LISS), 24-27 July, 2016, Beijing

• Bergqvist, R. and Monios, J., 2016, Inbound logistics, the last mile and intermodal high capacity transport, World Conference on Transport Research - WCTR 2016 Shanghai. 10-15 July 2016, Shanghai, China.


