ROAD MAP High-Speed Nordic

19 May 2015
The aim of the roadmap is to suggest ideas and solutions for a future Swedish high-speed concept that delivers end customer value, satisfies societal sustainability requirements and is affordable.

Based on the customer's current and future needs the passenger train service must be much more attractive, reliable and efficient. At the same time the improved traffic solution must also be commercially viable for the operators and acceptable for infrastructure managers.

The roadmap focuses on the train and its interaction with the infrastructure. An action plan for a gradual realisation of a Swedish Green Train high-speed concept by 2030 is suggested.
COMMON VISION

Contribution from the following partners

Bombardier
KTH
Trafikverket
SJ
Vectura
Chalmers
LTU
Lundberg Design
VINNOVA
### ROAD MAP High-Speed Nordic

<table>
<thead>
<tr>
<th>Technologies and governance/regulations for C-class trains</th>
<th>Environmental performance</th>
<th>Shorter travel times</th>
<th>Reliable journey</th>
<th>Cost efficiency</th>
<th>More comfortable journey</th>
<th>Increased capacity</th>
<th>Incremental implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technologies for comfortable trains</td>
<td></td>
<td></td>
<td></td>
<td>2015</td>
<td>2018</td>
<td>2018</td>
<td>2018</td>
</tr>
<tr>
<td>Technologies for energy efficient trains</td>
<td></td>
<td>2015</td>
<td></td>
<td>2018</td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
</tr>
<tr>
<td>Gröna Tåget 2 prototype car (1)</td>
<td></td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
<td>2020</td>
</tr>
<tr>
<td>Final implementation of Gröna Tåget train service</td>
<td></td>
<td>2025</td>
<td>2025</td>
<td>2025</td>
<td>2025</td>
<td>2025</td>
<td>2015</td>
</tr>
</tbody>
</table>
SHORTER TRAVEL TIME

New vehicle class for shorter travel times with light carbody tilt

Pantograph catenary interaction

Aerodynamics for train speeds 250-350 km/h
RELIEABLE JOURNEY

Experience feedback testing of new technologies

Winter design

Reliability in strategic systems in vehicle and track

Fire safety design

Automatic electrical couplings between train sets
COST EFFICIENCY

ROAD MAP High-Speed Nordic

Wide body trains for Scandinavia

Lighter carbodies with thinner walls

Condition based maintenance

New design solutions using multidisciplinary optimization

New train configurations

Conventional tracks vs slab tracks and viaducts

Integrate technical evaluations in the planning process
IMPROVED ENVIRONMENTAL PERFORMANCE

Energy efficiency

Energy efficient power system

Material technology

Communication

External noise

Ground vibrations
MORE COMFORTABLE JOURNEY

Acoustic comfort in trains

More attractive stations and terminals

Design and flexible interiors

Active suspension

Accessibility for disabled passengers

Integrated information systems
INCREASED CAPACITY

Passenger flows (trains and stations)

Capacity and mixed traffic

More intelligent traffic control at regular conditions

Intelligent maintenance of infrastructure and rolling stock
**SWOT ANALYSIS**

**Strengths:**
Existing and functioning forms of co-operation between universities, industry, public bodies and society lead to better results with higher quality and level of innovation.
All actors have a high competence. All are active nationally with established and strong international networks.

**Weaknesses**
The railway system is sensitive and failures can have a large influence on the system.

**Possibilities**
Possibilities to introduce solutions incrementally where benefits are obtained at each step, also internationally, which paves the way for export.

**Threats**
A situation with mixed traffic (fast and slow trains) limits the possibilities of, and gains from higher speeds and may cause additional demands on
In the socio-economic calculations, a speed increase for express trains from 200 km/h to 250 km/h is tested route by route. The results show that the socio-economic return is very good on those routes where there is a relatively large proportion of track that has been built or rebuilt without level crossings since the 1990s, which reduces the need for technical upgrading. There is as a rule also free track capacity to increase the express trains’ speeds. On the other main lines, where the standard is lower and capacity already strained, the benefits outweigh the costs as regards express trains’ higher speeds. By means of reinvestments in new track, overhead contact wires and signalling systems that can handle 250 km/h from the outset, the object-specific costs can be brought down.
WORKING PLAN AND IMPLEMENTATION

Find project set-up and partners contribution

Go for SIO program?

Cooperation to EU programs i.e. Shift²Rail?

Feedback from Board?