

Evolving winter navigation in the Baltic

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FTIA and Winter Navigation

- Responsible authority for ensuring year-round maritime traffic to and from Finnish ports and arranging winter navigation. Safe and fluent traffic.
- Chartering/procurement of icebreaker services and co-operation with Sweden.
- Icebreaking service is partly funded by fairway dues, collected by all traffic to Finnish ports.
- Icebreaking service is free for merchant ships.
- Setting of assistance restrictions, based on Finnish Swedish Ice Class Rules, safety basis. HELCOM Recommendation 25/7
- Icebreaker assistance is provided to 30 winter ports with class 1 fairways minimum 8 m deep + Lake Saimaa.
- Strategic and operational icebreaking management co-operation with Sweden and Estonia (common assistance restriction policy, IBNet etc.)



Winter navigation system factors

- Icebreakers – limited capacity
- Merchant fleet (ice classed tonnage)
- Legislation, ice class rules, restriction policy

- The system has been developed because of the needs of the Finnish industry and Finland's competitiveness
- The effectivity within the system and balance between the factors result in a certain service level



Finland's icebreaker fleet

- Icebreakers specially designed for assisting merchant ships, 9+1 icebreaker fleet + co-operation (FI-SE)
 - During a severe winter up to 4 000 assistances of which abt. 500 are tows



Polaris
110*24,0*22000



KONTIO
98,6 * 24,2 * 8,0 * 15 000



OTSO
98,6 * 24,2 * 8,0 * 15 000



SISU
106,6 * 23,8 * 8,3 * 16 200



URHO
106,6 * 23,8 * 8,3 * 16 200



VOIMA
83,5 * 19,4 * 7,0 * 10 200



Zeus
45 * 14 * 6,7 * 5200



FENNICA
116,0 * 26,0 * 8,4 * 15 000



NORDICA
116,0 * 26,0 * 8,4 * 15 000



Removable bow Saimaa – innovation

- Pilot study as part of WINMOS II project, co-funded by the European Union
 - Building of removable bow
 - Modification works on pusher tug
- Purpose built for Lake Saimaa
 - Delivery 3.12.2020
- Pusher is procured – tug Calypso



Merchant vessel fleet

- The system needs ice classed merchant ships for safe navigation, Finnish Swedish Ice Class Rules (FSICR), adopted by most Classification Societies.
- Continuously developed and research is funded for this purpose in co-operation between Finland and Sweden.
- Performance in ice channel is crucial for system performance
- For better ice going capability (high ice class) there is a decrease in open water efficiency
- Change in traffic volumes during the last 50 years
- EEDI, EEXI, ETS, vessel size and capability are changing

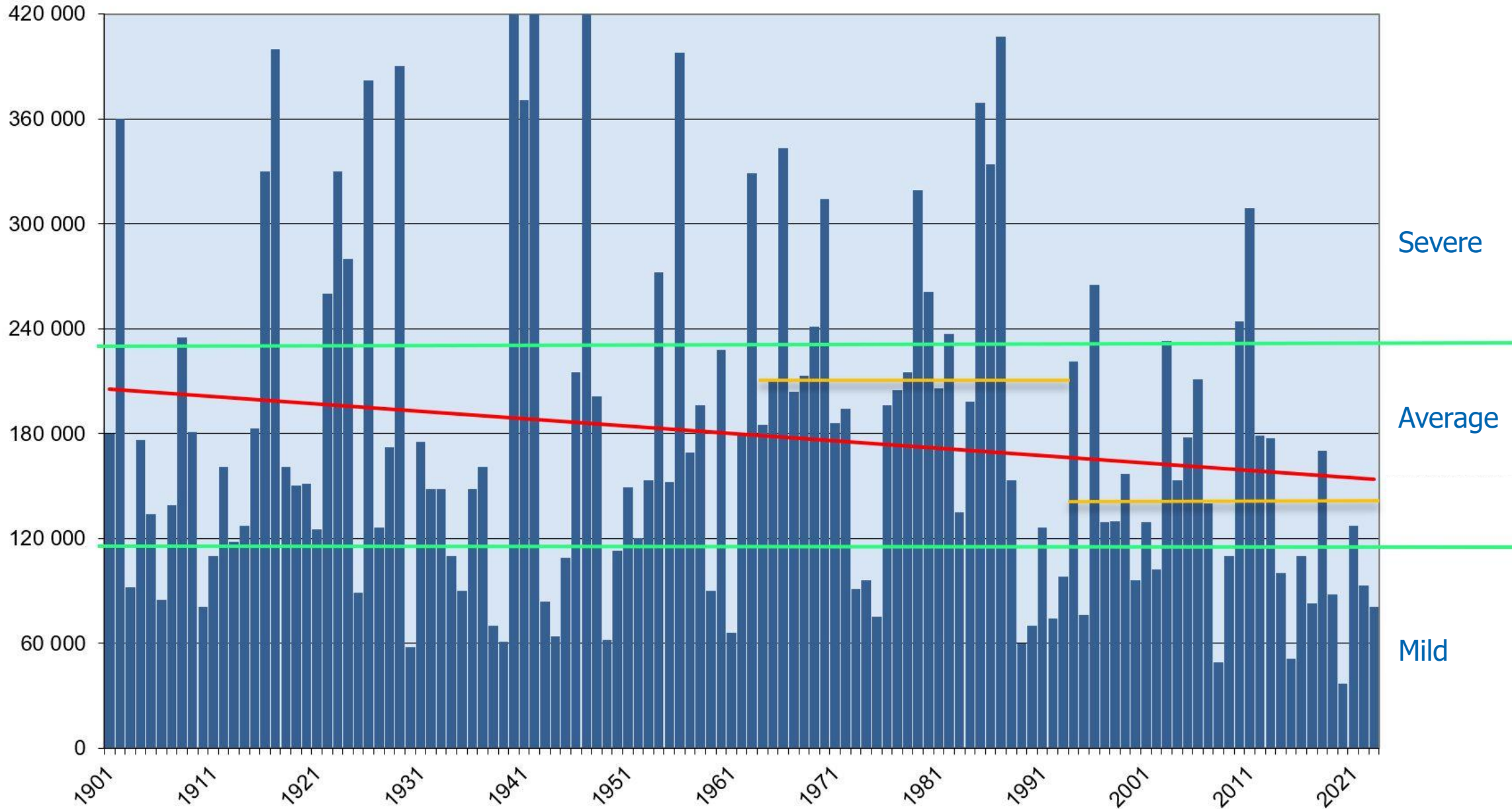


An aerial photograph of a vast, snow-covered mountain range. The terrain is rugged and textured, with numerous ridges and valleys. The snow is bright white, and the overall scene is bathed in a soft, blue light, suggesting a clear, cold day. A semi-transparent blue gradient bar is overlaid on the lower portion of the image, providing a background for the text.

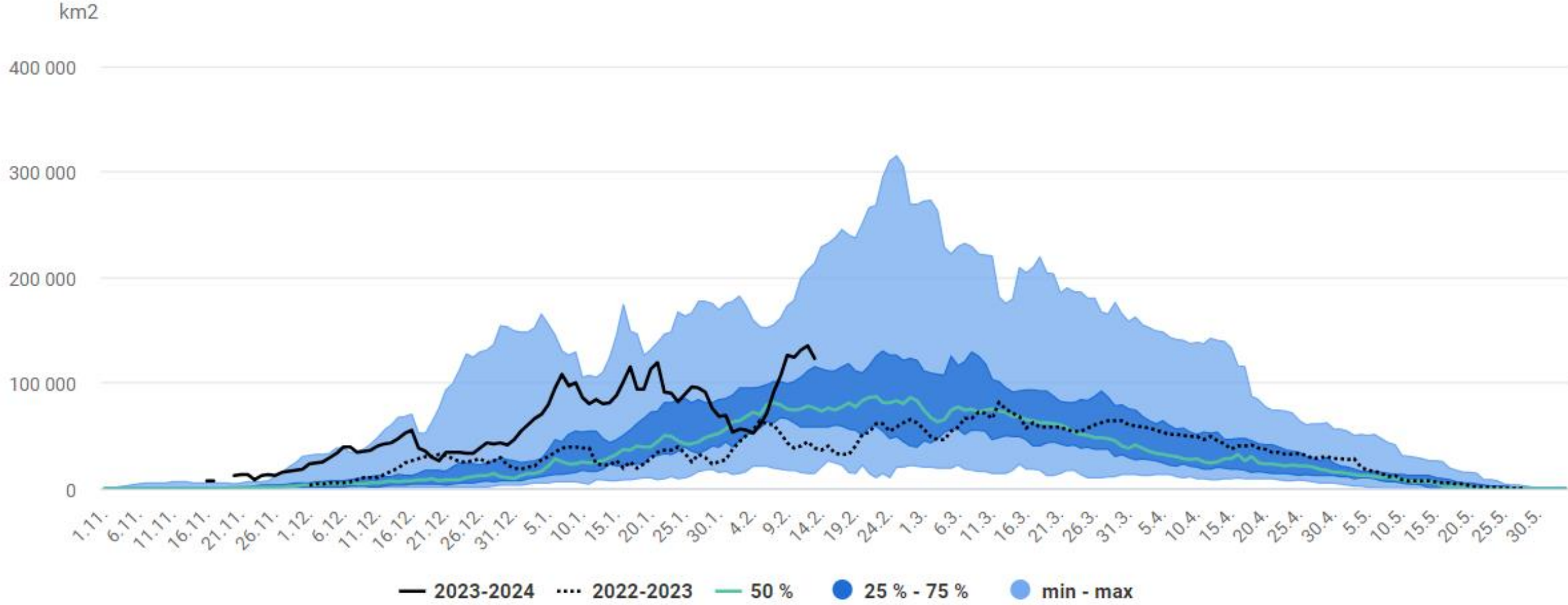
Winters

Typical and atypical

Maximum ice extent 1901 - 2023



Ice extent



A wide-angle photograph showing several icebreaker ships navigating through a vast field of sea ice. The ice consists of numerous small, broken floes. In the foreground on the right, the stern of a large blue icebreaker is visible, moving towards the viewer. In the middle ground, a smaller blue and white icebreaker is moving away. To the left, a yellow and black offshore supply vessel is also present. The sky is overcast and grey, and the water is a pale blue-grey color. A semi-transparent blue banner is overlaid across the middle of the image, containing white text.

Means of icebreaker assistance

Guidance and monitoring, leading (escorting) and towing

Escort assistance

- Easy ice conditions, no ice pressure
- Speed 10 knots or more, depending on assisted vessel
- Some icebreakers have propulsion arrangements that give an opportunity to widen channel when large merchant vessels are assisted
- Tandem operations are also done for large merchant vessels



Icebreaker assistance – towing

- Depending on the merchant vessel size, bow shape
- Icebreaker capability (propulsion arrangement)
- Predictability and knowledge of ice conditions ahead
- Three types of towing; in the notch, slightly off from the notch and long wire towing (very rare)
- Speed is usually maintained at 6 – 8 knots



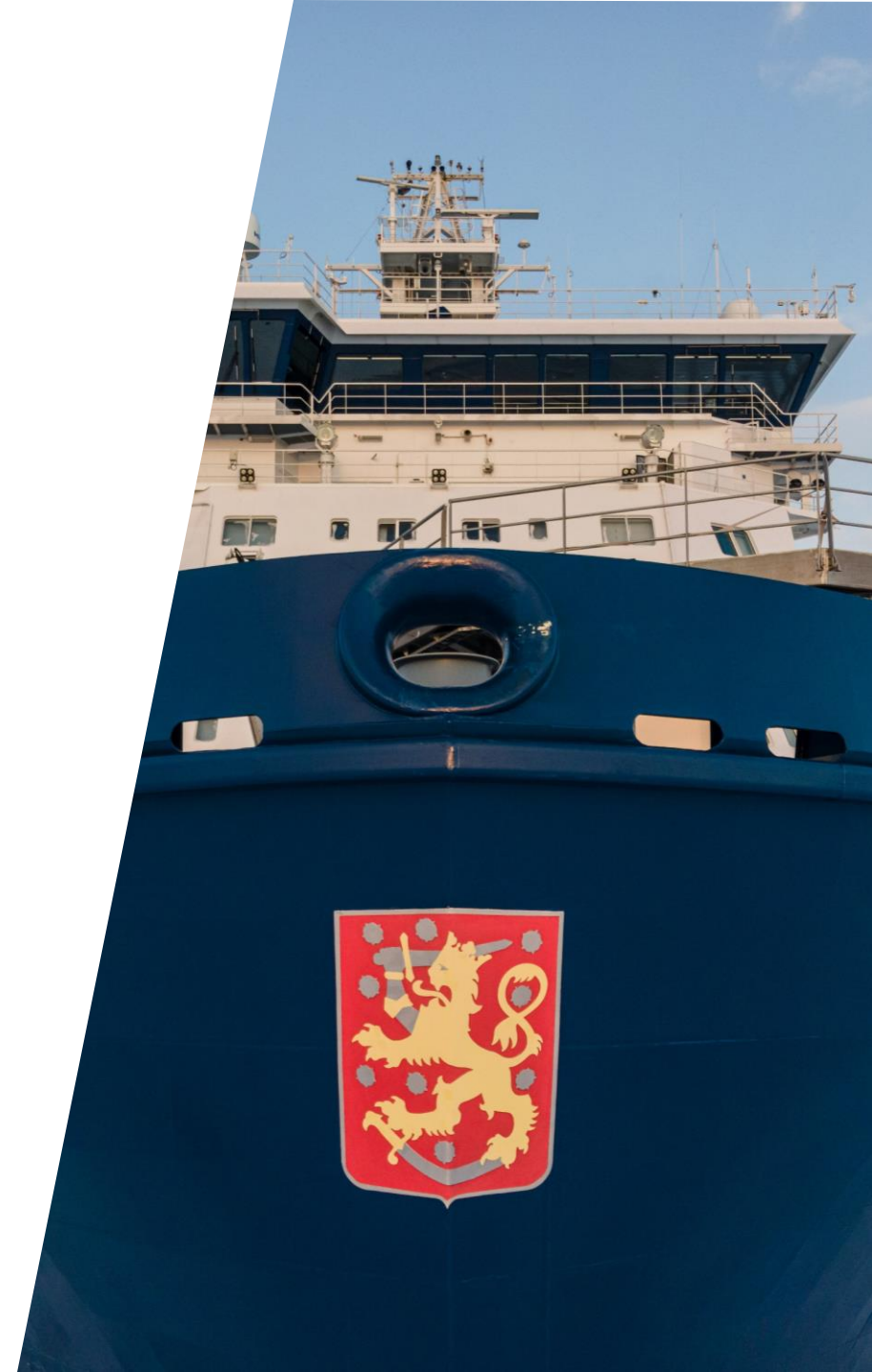
Trying to predict the future

- Traffic flows, changes in routes and volumes, ship sizes
- Environmental legislation, independent ice going performance of merchant ships
- Climate change – windy winters and variations, predictability is becoming weaker – icebreakers' seakeeping performance is emphasized
- Planned wind power in the Bay of Bothnia
- Wind farm and ice interaction



Next generation icebreaker – what do we need from it?

- More icebreakers that are smaller?
- Seakeeping capability!
- Channel width 25 m – 32 m
- We need a versatile fleet of icebreakers with adaptability for different fuel solutions in the future
- Studies in Winmos III, co-funded by the EU
 - New A-class icebreaker, design of B-class icebreaker and holistic studies of the system performance and factors influencing it





Väylävirasto
Trafikledsverket



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