

Long-term Effects of an Underfunded Road Maintenance Budget

A Country of Sweden Case Study

BACKGROUND

Sweden's national road network plays a crucial role for Swedish society and quality of life. The basis for a well-functioning highway system is to guarantee citizens with full accessibility, ensure safe travel, and provide a strong business competitiveness through an efficient movement of goods and services. Recognizing the importance of the national road network, the Swedish Confederation of Transport Enterprises commissioned Infrastructure Solutions (in collaboration with Kristin Eklöf, Data Scientist, PhD) to study its current and future funding requirement. This analysis includes all national paved roads and is based on public, open data provided by the Swedish Transport Administration. DOT (Decision Optimization Technology)TM software is used to provide a multiyear, multi-constraint optimization algorithms to build defensible and implementable 10-year capital plans.

The current and projected national road maintenance budget will not maintain current levels of service or correct an increasing maintenance deficit

SOLUTION

In recognition of the Swedish Transport Administration's challenge in servicing the entire network, the government's current strategy was to prioritize the maintenance of metropolitan roads, roads that form a connected network, and high-traffic roads. The analysis of the long-term impact of current level of investment on the national road network also determined the required level of investment to preserve current level of service. Road condition measurements were combined with Service life analysis to create a compound condition index. Estimations of the expected service life for each road section used data from previous research at Dalarna University and the National Road and Transport Research Institute. DOTTM software analyzed the Sweden's national road network data of over 440,000 segments, representing one of the largest road network optimizations ever undertaken. The analysis indicated that based on the current order of priority, roads of lesser priority will continue to deteriorate and without a substantial budget increases, the maintenance deficit is expected to increase.

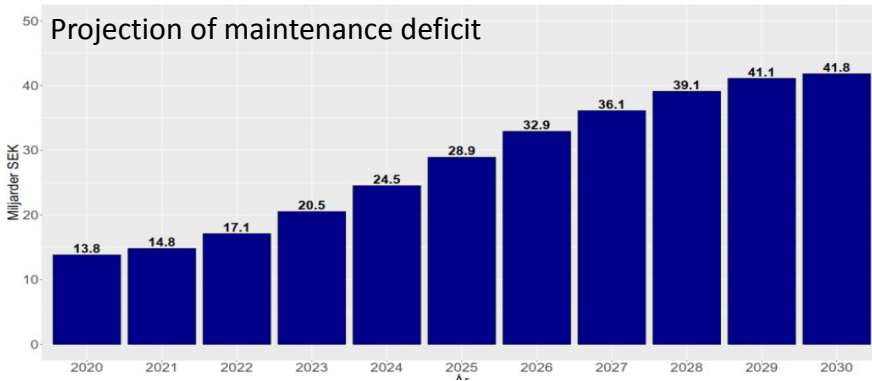
KEY RESULTS



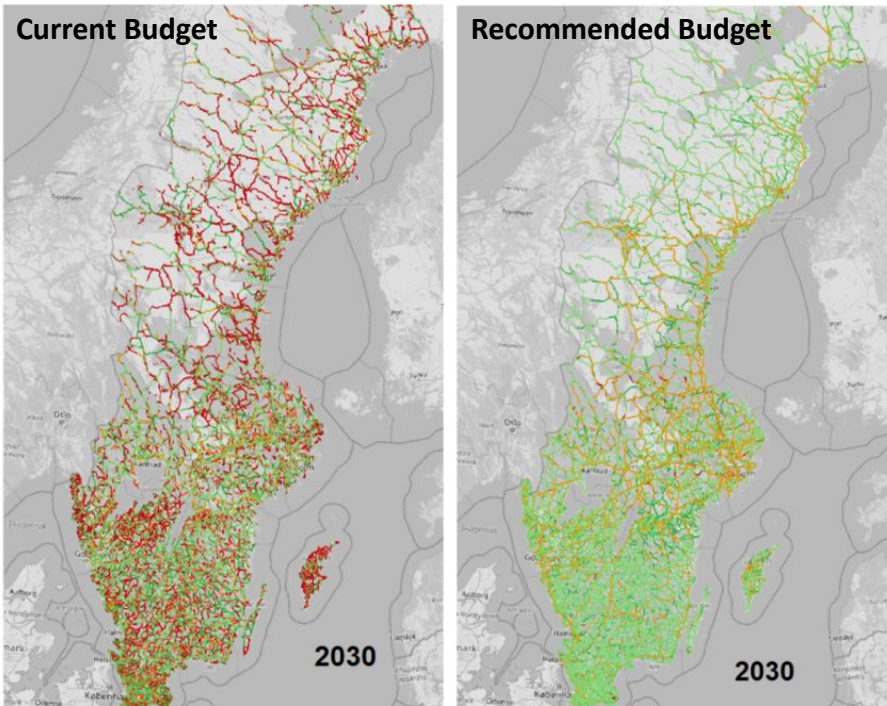
Without substantial budget increases, the maintenance deficit on the Swedish road network is expected to increase from 19.7 billion SEK in 2020 to 41.8 billion SEK in 2030.



To stem further deterioration and maintain the current condition and maintenance deficit of the road network, the maintenance budget would need to increase by 2 billion SEK per year, from an average of 3.4 billion to an average of 5.4 billion per year.



Map of the expected condition of the Sweden's national paved road network in 2030 under current and recommended budget



Required increase in maintenance investment

100%



Improvement of roads in poor condition

32%



Practical and easy-to-use decision support tools that make the process of capital planning **transparent, defensible, and technically robust.**