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# «Base Map» - a new vector tiles-based map for mobile applications

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**Keywords:** Vector tiles, Point of interest, Mobile cartography, Terrain representation

## Abstract:

Over the years, swisstopo's cartographic products have undergone significant technological advances and are constantly being further developed to meet the changing needs of users. With the advent of the internet, web maps and the mobile use of geodata on smartphones, maps have become a widespread and indispensable source of information. However, expectations of digital maps have increased as users demand more dynamic and customised features.

In line with its 2025 strategy, swisstopo is committed to adapting its services to the needs of future generations and their changing usage patterns. As part of this strategic direction, the “Next Generation Map” project was launched, which focuses on creating innovative cartographic solutions.

## A New Mobile Base Map

Launched at the end of 2021, the “Next Generation Map” project has reached an important milestone: in spring 2024, the “Base Map” was published in the swisstopo app. This dynamic, web-based map uses vector tile technology to provide an optimised solution for mobile users. The “Base Map” complements swisstopo's existing portfolio and offers a modern alternative designed specifically for smartphones.

While inspired by the classic national map, the “Base Map” has been adapted to improve performance and legibility on mobile devices and to appeal to younger generations. The terrain representation, a signature feature of the Swiss national map, has been redesigned using vector-based technology to ensure high-quality representation with low memory requirements. Notably, the fully functional map of Switzerland and Liechtenstein requires less than 3 GB of memory.

A standout feature of the “Base Map” is the integration of points of interest and real-time information. Mobile map applications are particularly valuable for tasks such as orientation,

routing and search, where up-to-date information is crucial. The “Base Map” seamlessly combines swisstopo's own data with external sources and acts as a bridge between static map visualisations and dynamically integrated data from third-party platforms. This ensures that users have easy access to relevant information in real time. The vector tile service is also available free of charge as part of the “Swiss Map Web” product line and enables integration by third parties.

## User-focused Development

The development of the ‘Base Map’ was based on a user- focused approach. The young generation of map users under the age of 30 was actively involved in the design phase. A developed prototype was discussed and evaluated in three focus groups. Important findings from this user research were incorporated directly into the product development. The launch of the “Base Map” was then deliberately carried out in the form of a ‘Minimum Viable Product’ (MVP) with the aim of collecting feedback from users. This approach allowed swisstopo to quickly adapt the product based on real-world user needs, preventing misaligned developments and ensuring continuous improvement.

Six months after its launch, swisstopo conducted a user survey to assess the map's strengths and areas for improvement. Among the 4,849 participants, around two-thirds rated the “Base Map” positively, highlighting its user-friendliness, modern design, and clear presentation. Users under 35 years old were particularly enthusiastic, using the map more frequently and confirming the project's goal of catering to a younger demographic. Despite the positive reception, some areas for improvement were identified. Users highlighted issues such as slow loading times and the map's low colour contrast compared to the classic national map. These concerns will be addressed in future development phases to enhance the overall user experience.

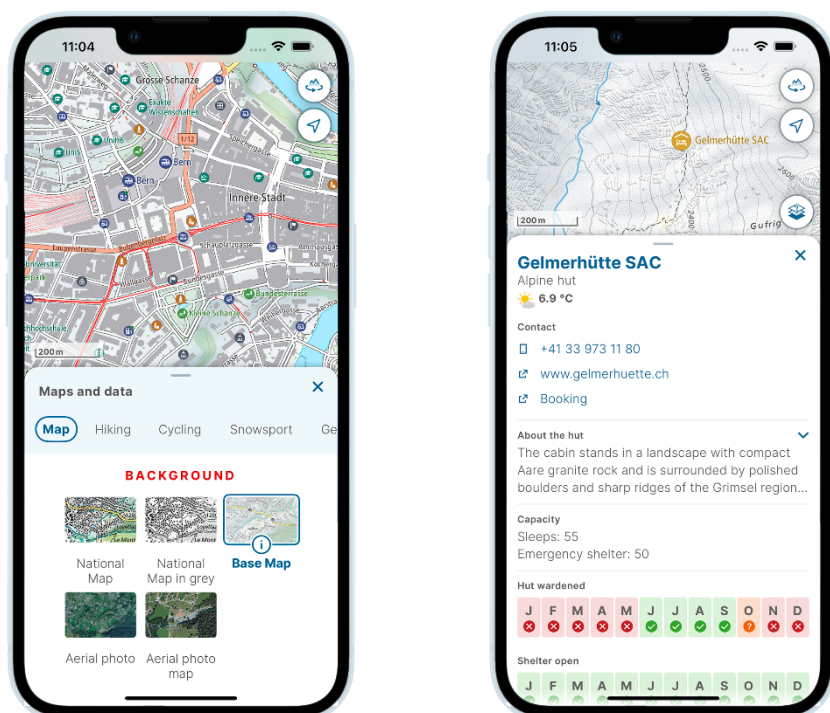


Figure 1 (left): Example of the map representation. Figure 2 (right): Example of user interface design.