Enhancing Communication-Focused Accessibility for Suburban to Urban Commuting in Munich

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Abstract

Enhancing communication-focused accessibility for commuters traveling from suburban to urban areas in Munich is crucial, especially for visually impaired, hearing impaired, and non-German speaking individuals. While infrastructural changes to the train network are long-term solutions, immediate improvements can be achieved through effective communication strategies. Inspired by the tactile station layout in Genoa, this proposal focuses on prioritizing accessibility for all commuters, especially the visually impaired, hearing impaired, and non-German speaking individuals. Implementing more accessible Braille and tactile signage, visual cues, and multi-language announcements can significantly reduce confusion and stress during travel disruptions, creating a seamless commuting experience. This proposal addresses the needs of marginalized groups often overlooked in transport planning, fostering a more inclusive and supportive public transport system. The anticipated societal benefits include improved accessibility, reduced travel stress, and a more inclusive public transportation environment in Munich, setting a new standard for accessibility in urban transit systems. The strengths of this approach lie in its inclusivity and technological integration, with potential challenges including initial implementation costs and the need for ongoing updates. This communication-focused strategy provides a practical and impactful solution to enhance commuter convenience and accessibility in Munich.
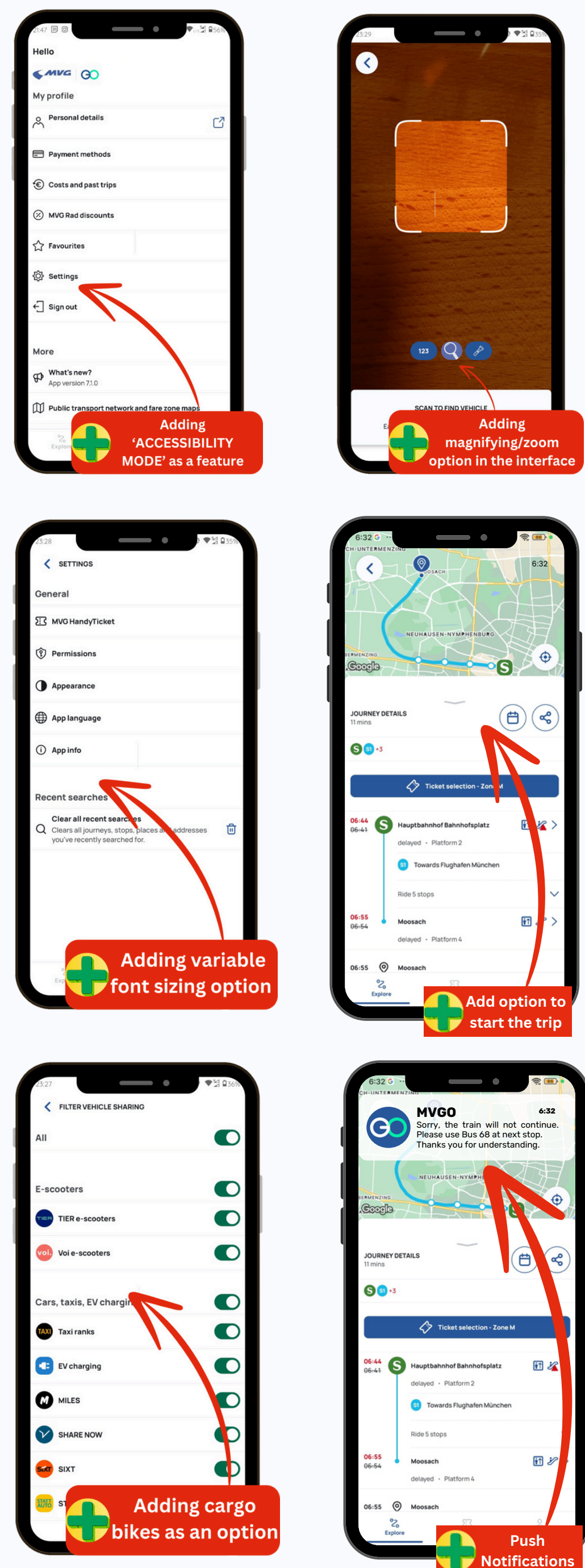
Proposed Additions to MVGO app

Figure 1: Illustration of possible accessibility improvements for MVGO app.

The MVGO application in Munich serves as a crucial tool for navigating the city's public transportation system. For an enhanced user experience, integrating **accessibility features** such as alternative route prompts during disruptions, read-aloud functionalities, Sign language announcements, variable font sizing, and different contrast viewing modes, the app then promises to cater to the diverse needs of its audience.

In cases of service disruptions, **having real-time alternative route notifications** (in different languages and sign) ensures that all users, including those with disabilities, receive timely updates, enhancing their safety and reducing travel-related stress.

Proposed Accessibility Features

1. *Alternative Routes as Push Notifications*
   - **Real-Time Updates:** During disruptions, the app can send push notifications with alternative routes, ensuring users are immediately informed of their options.
   - **Customizable Alerts:** Users can customize alerts based on their preferred routes or frequently travelled paths, making the information more relevant and useful.
2. *Reading Aloud Routes and Destination Details*
   - **Voice Assistance:** Integrating text-to-speech functionality can help persons with visual impairment by reading aloud route details, stops, and any changes in the journey.
   - **Language Options:** Providing voice assistance in multiple languages can further enhance accessibility for non-native speakers and tourists.
3. *Magnification/Zoom Feature*
   - **Map and Text Zoom:** Allowing users to magnify maps and text within the app ensures that those with low vision can navigate more comfortably, this can be integrated to the QR Code scanner available in the app.
4. *Variable Font Sizing*
   - **Adjustable Text Size:** Users should have the option to increase or decrease text size within the app according to their preferences, improving readability for individuals with visual impairments or dyslexia.
5. *Contrast Viewing Options*
   - **High-Contrast Mode:** Implementing high-contrast viewing options can aid persons with color blindness or low vision in distinguishing between different elements on the screen.

Visual cues

Visual cues are proposed to display **multilingual train announcements**, ensuring that non-German speakers can easily understand important travel information. These can be shown on the screens within trains and at station platforms to provide real-time updates on arrivals, departures, delays, and route changes.

For visually impaired commuters, high-contrast text and large fonts are used to enhance readability. These onscreen announcements can be synchronized with the audio announcements, creating a multi-sensory communication system. This approach not only assists those with hearing impairments but also caters to a broader audience by offering clear and immediate information.

Figure 5: Prototype of visual announcement in a train.

Problem definition

Based on our observations of both opportunities for improving accessibility and the existing deficiencies in accessibility within public transportation in Genoa and Munich, we have focused our research on the topic of accessibility for suburban to urban commuters. Consequently, we formulated the following research question:
How might we enhance communication-focused accessibility measures to improve the commuting experience on trains for suburban to urban areas in Munich?

Prototype

Our proposal focuses on enhancing communication accessibility in public transportation. **Braille and tactile signage** will provide essential route and safety information on doors, station entrances, and platforms. **Visual cues,** such as **real-time updates and important announcements**, will be displayed on digital screens with flashing lights and colour-coded maps. **Multi-sensory announcements** will combine audio in multiple languages, synchronized text displays, and tactile indicators. Accessible ticket machines and information kiosks with Braille, tactile buttons, visual displays, and audio guidance will be placed at key locations. Additionally, the public transport apps will feature accessibility options. A couple of examples are detailed below.
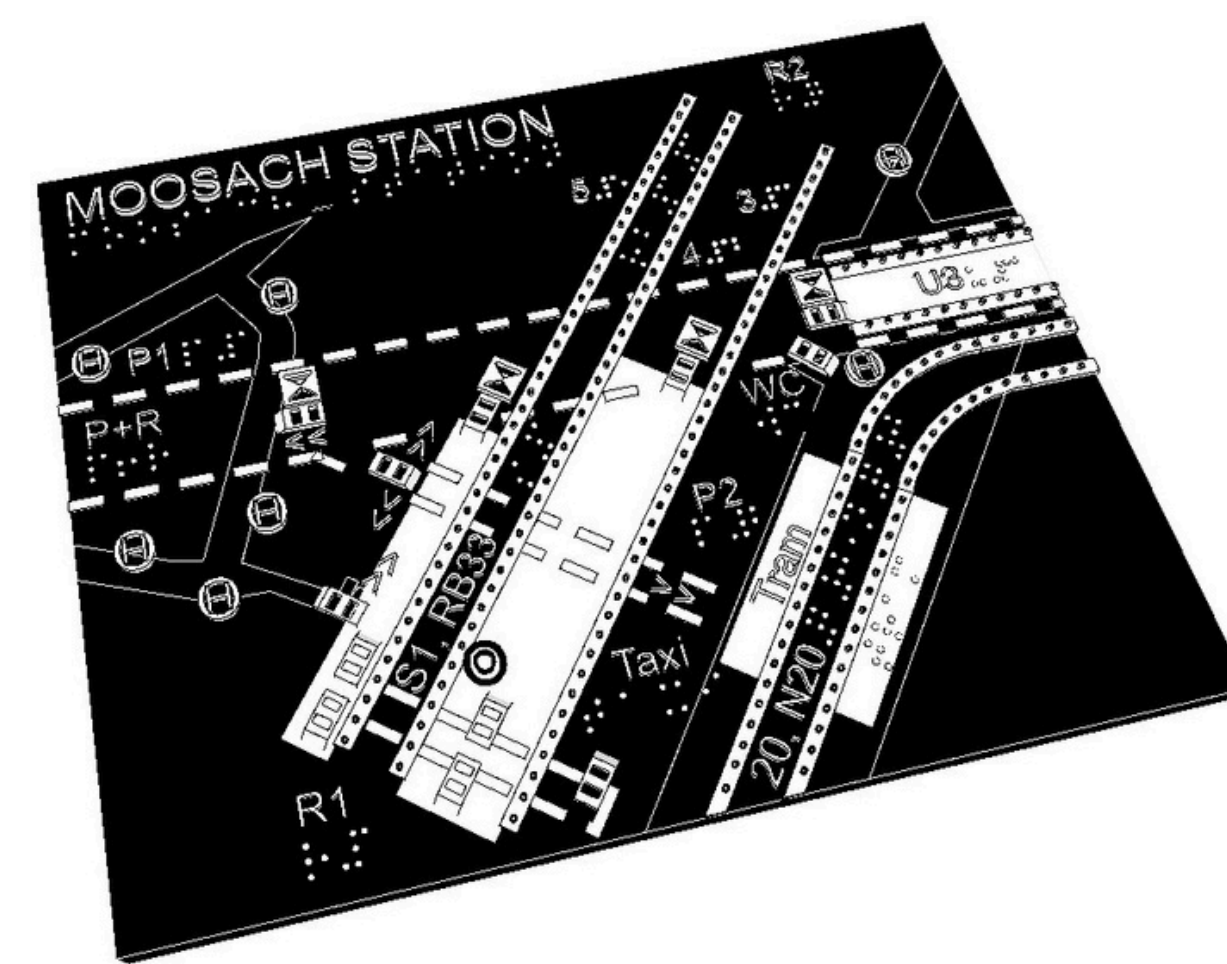

Figure 2: Braille layout of Moosach station (self-constructed).

Figure 3: Braille legend for Moosach train station layout (self-constructed).

Braille plate

While observing commuting behaviours and public transport in Genoa, we noticed Braille plates at many stations, unlike in Germany. These plates seemed to be a very effective way to improve independent commuting for people with visual impairments. We wanted to illustrate this experience using a Munich station to demonstrate the immense potential of such an intervention. Consequently, we created a Braille plate for the Moosach station.

The plate features the layout of Moosach station, including its various tracks, underpasses, and the different modes of transportation accessible from the station. Stairs and elevators are also depicted. All of this can enhance orientation within the station. The 3D print makes the plate tangible. The plate was created with high contrast to be more readable for people with partial vision. Additionally, the legend is provided in German, English, and Braille to ensure readability.

Overall, the intervention is not only easy and inexpensive to install, but also offers a valuable aid in station navigation, reassuring the audience about its practicality and effectiveness.

In designing the plate, we drew upon existing examples. We could not consult with an expert due to the limited timeframe. Therefore, it is important to clarify that this Braille plate is not intended to be perfect, but rather to illustrate the value and potential of such an intervention.

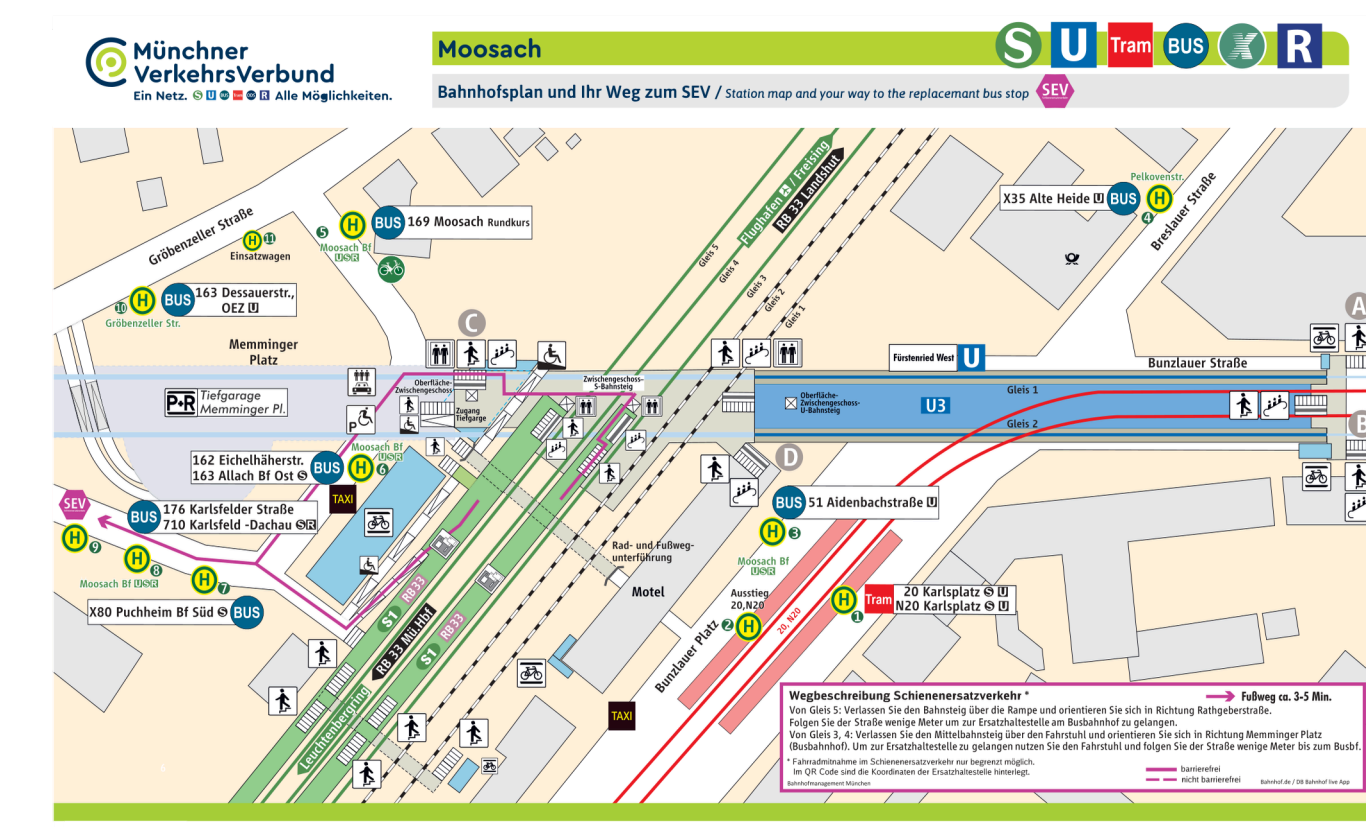Figure 4: Inspiration for the train station braille map found on our trip to Genoa.

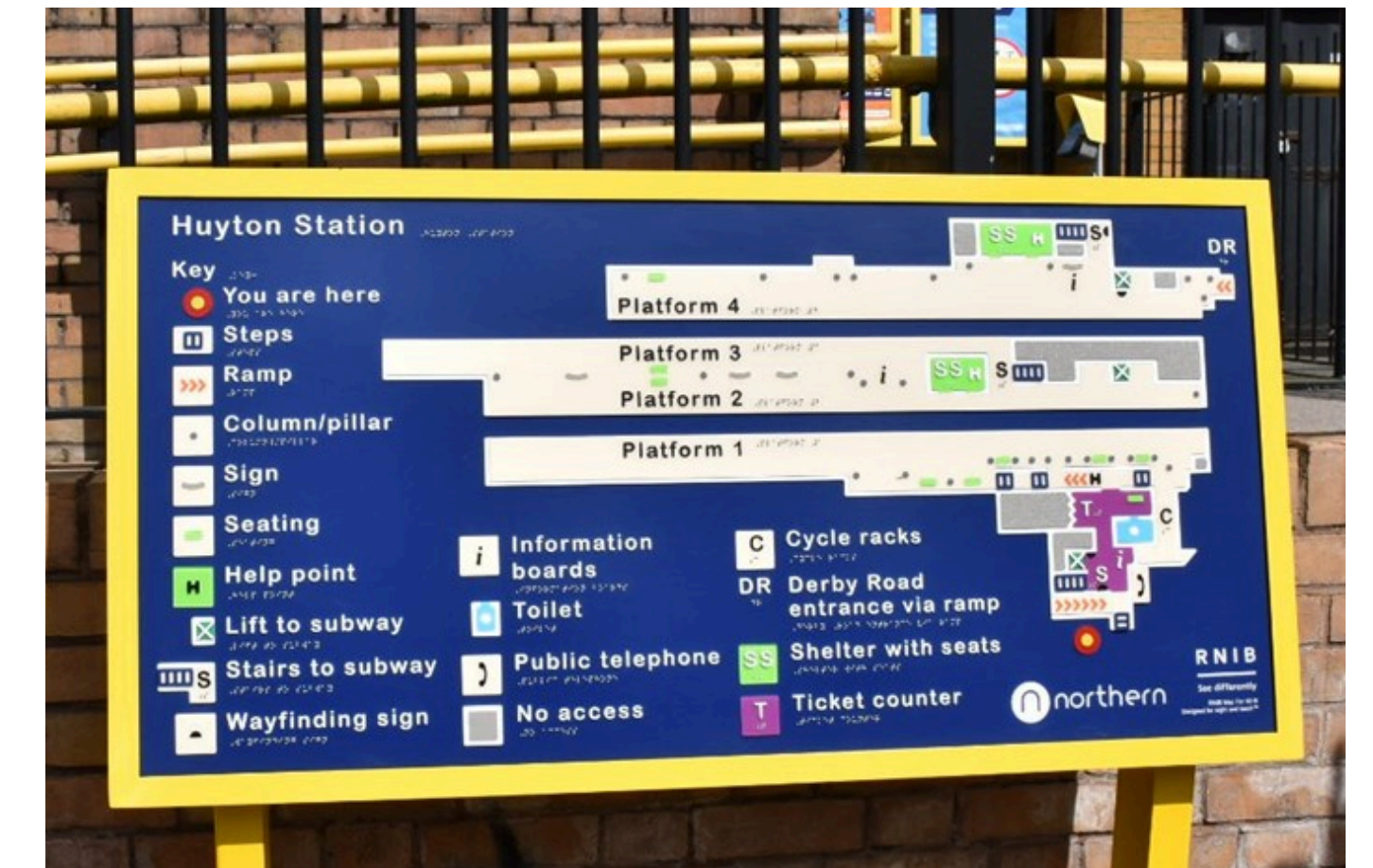Figure 6: Moosach train station as orientation for creating the braille map.

Figure 7: Further inspiration for the train station braille map to get an overview.

Social Impacts

By better incorporating communication strategies for visually impaired, hearing impaired, and non-German speaking commuters, we can significantly improve their daily traveling experience. Improved accessibility to Braille and tactile signs, visual cues, and multilingual announcements are some of the major outcomes of our approach. Immediate benefits from these upgrades will involve a better commute in general and a reduction in confusion and stress during travel interruptions. In the long term, our proposal will lead to a more inclusive society where public transport is accessible to everyone, regardless of physical ability or language skills. The strengths of our approach lie in its inclusivity and technological integration. Potential drawbacks, however, might be the initial implementation cost as well as the ongoing upkeep and upgrades required. Possibilities exist for applying this paradigm to more cities and areas, establishing a new benchmark for accessibility. Technical difficulties that might delay implementation or stakeholders that are reluctant to change are two possible sources of implementation hurdles.

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Scan the QR code
Explore how accessibility measures can enhance the travel experience for people with disabilities. Discover innovations like video announcements, Braille maps, and more
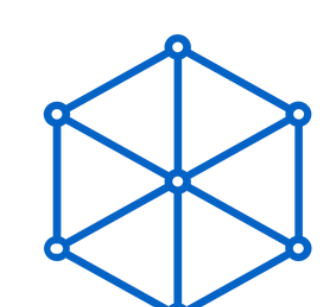
User Groups

The aging population in Germany is predicted to cause a large increase in the number of visually and hearing impaired people by 2030. (Peracino, 2015; Finger et al., 2011). Our plan is to improve Munich commuters' experiences, with an emphasis on increasing accessibility for underrepresented populations. Our plan will be beneficial to a number of key user groups, such as the visually impaired who will benefit from tactile and Braille signage, the hearing impaired who will benefit from multi-sensory announcements and visual cues, and non-German speakers who will value the multi-language assistance. By including these groups in our proposal, we ensure that ll commuters feel valued and supported through enhanced accessibility features and inclusive communication strategies. Addressing the needs of often-overlooked marginalized groups ends up bridging significant gaps in transport planning.

Conflicts & Challenges

Implementing communication-focused accessibility measures in Munich's public transportation system can face several significant conflicts and challenges.
- Resistance from stakeholders, including transport operators and commuters, may arise due to disruptions during installation and adjustments to new systems.
- Equity issues might emerge, with perceptions of unequal resource distribution among different areas or groups, making comprehensive accessibility audits and transparent decision-making essential.
- The initial costs for installing Braille and tactile signage, visual cues, and multi-language announcements may strain the city's budget, necessitating careful financial planning and securing additional funding sources.

Despite these conflicts, addressing them can drive technological innovation, foster inclusivity, and set a precedent for other cities, ultimately contributing to a more accessible and inclusive public transport in Munich.

Sources

- Figure 6: https://efa.mvv-muenchen.de/sta2/moosach.pdf
- Figure 7: https://media.northernrailway.co.uk/resources/this-image-shows-the-new-braille-map-at-huyton-station
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