

## A Study of Accessibility in Translation of Navigation Signs in Tehran Metro

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### Abstract

This study examines the accessibility of translated navigational signs in Tehran Metro as a key site of public translation. Using field observations supported by the User-Centered Translation (UCT) framework, it assesses the clarity, consistency, and usability of bilingual signage and other multimedia features across multiple metro stations and lines. The analysis identifies recurring inconsistencies in transliteration, translation choices, and the alignment between station names at stations and on the official metro map. These variations demonstrate the lack of a standardized approach to multilingual communication within the network and highlight the impact of such discrepancies on user navigation. The study contributes empirical data to ongoing discussions of translation in public spaces by showing how multilingual signage practices can either facilitate or hinder effective wayfinding in transit environments.

**Keywords:** Accessibility, station name, user-centered translation, Tehran metro

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## 1. Introduction

The cultural turn in translation studies during the 1980s and 1990s changed the focus of translation from linguistic to cultural studies. One of the main consequences of the shift is the change of focus from source to target text, the target audience, and the target audience needs. As a result, the main tasks of the translator in the process changed to provide a mental model of the audience's needs. As Reiss and Vermeer (2014, p. 91) noted in their Skopos theory, "A *skopos* cannot be set unless the target audience can be assessed". If the target audience is not known, it is impossible to decide whether or not a particular function makes sense for them. This means that the translators should be aware of the audience's needs through assessments that they conduct beforehand. Recognizing the audience's needs and appealing to them has been given great attention in translation studies. One of the significant contributions to functional approaches in translation studies is relevant to Katharina Reiss. She made a distinction between text types based on equivalence. This means "when translating an appeal-dominant text, the translator should make sure that the appellative effect of the source text works in the same way for the target-culture audience, even though this may mean changing content or form or both" (Nord, 2024, p. 169). Since the 1980s, the functional approach to translation studies has been one primary trend, focusing on the purpose of the translation and arguing that the translator needs to adapt the text according to the needs of future readers (Suojanen et al., 2014). This highlights the significance of the study in social settings and maintaining the audience's needs in order to achieve more accessibility.

With the shift of focus from linguistic aspects to readers, readers gain significance in the process of translation. In other words, translators set the scene for readers to understand the content of the text, and based on that, readers decide the action that they want to take. This process changes the role of translators from just a mediator between languages to individuals who actively participate in real-time decisions and activities. The concept of accessibility enables translators to use translation to engage with users with different profiles and needs (Maaß & Hansen-Schirra, 2022).

"Accessibility is the extent to which products, systems, services, environments, and facilities can be used by people from a population with the widest range of characteristics and capabilities, to achieve a specified goal in a specified context of use" (International Organization for Standardization (ISO), 2018). However, translational research about accessibility in public places has largely gone unnoticed. Accessibility in translation has expanded to include considerations of diverse user needs, including linguistic, cognitive, and physical abilities. However, it should be noted that most of the attention has been toward cognitive accessibility.

The present research examined the accessibility of navigational signs and digital screens in Tehran Metro. The navigational signs and digital screens have been analyzed by user-centered translation (UCT) framework, which is both practical and theoretical. This approach is important because it emphasizes the central role of the user, or reader, in the translation process (Suojanen et al., 2014, p. 1). UCT allows gathering as much information about our users as possible, and design and revise the translation based on this information (Suojanen et al., 2014). The present research was conducted in furtherance of multiple aims. To identify and analyze inconsistencies in the translation of navigational signs and digital screens, to assess the extent to which current translation practices in Tehran Metro address social inclusivity and meet the needs of a multicultural and multilingual urban population, and to propose recommendations for improving navigation.

Tehran is one of the largest cities in the world, with a population of nearly 9.4 million. The larger Tehran metropolitan area has a population estimated at 14 million, which makes it the largest city in Western Asia and one of the three largest cities in the Middle East after Cairo and Istanbul (World Population Review, 2024). Consequently, the daily commute of citizens has become one of the most

major functions within urban areas. In Tehran, the metro system facilitates approximately 2.5 million daily ridership. As a result, improvements can attract more users to use public transportation (Nassereddine & Eskandari, 2017). Translation, in this process, transforms public information from a barrier into a bridge, enabling all users to participate fully in city life.

## 2. Literature Review

To date, several studies have attempted to examine the translation of station names. Liangqiu and Shang (2019) explore the names of Beijing subway stations, aiming to retranslate subway station names with classification, to provide a reference for the English translation of subway station names. Their research, grounded in Skopos theory, revealed that translators should pay attention to the conciseness and understandability of the target text, as well as its consistency with the ground transportation system.

Luo and Li (2023) conducted a research on the translation of metro station names in Guangzhou and Foshan. They focused on the symbolic functions of names from the perspective of translation and linguistic theories, revealing that there is over-transliteration of metro station names in Guangzhou and Foshan. Common nouns and position words are transliterated into Pinyin instead of being freely translated into English. This over-transliteration practice fails to consider the symbolic functions. They recommended adopting free translation for common nouns and position words, and using a consistent format across Guangzhou and Foshan metro station names to improve translation. Their initial purpose of adopting transliteration for Metro station names was to establish Chinese dominance, and to better publicize the Chinese language and culture; however, the over-use of transliteration ended in the audience misunderstanding and failure to retain the symbolic function.

Both studies underscore the need for high-quality translation in subway environments. They similarly conclude that translation in this context is not merely the transfer of words from one language to another, but a practice with the potential to enact social and communicative functions (Harvey 2003, p. 46). This aligns with Simeoni's (1998) notion of the translator's "submissive" habitus, which holds that the formation of a translation field is possible only under specific conditions. He further argues that:

As long as this assumption holds, it will be difficult to envisage actual products of translation as anything more than the results of diversely distributed social habituses or, specific habituses governed by the rules pertaining to the field in which the translation takes place. (Simeoni, 1998, p. 19)

This suggests that translators should be aware of the socio-cultural contexts in which their habitus is formed and should act as active agents of change to enhance their visibility and professional prestige (Wolf, 2007, p. 115). Chesterman (2008) similarly argues for making translation research more responsive to societal needs, proposing the concept of translation practice as the set of translation events shaped by specific temporal, institutional, and cultural conditions. Together, these perspectives highlight the translator's role as more than a linguistic mediator, emphasizing the importance of understanding the social dynamics that shape translation and the agentive potential of translators within those dynamics.

Fraszczyk, Weerawat, and Kirawanich (2020) examined metro station naming practices in seven megacities selected according to several criteria, including representation of both established and emerging megacities, capital cities with metro systems, developed and developing contexts, as well as different continents and languages. Their study compared five general parameters of each metro system (number of lines, average stations per line, total unique station names, total stations, and number of interchange stations) alongside five parameters specific to station names (average length

in characters and words, the use of English or transliteration, name categories, and unique naming conventions). The analysis indicated that street-based naming is the most common strategy.

They argue that the language used in metro station names is crucial, especially in cities with high tourist traffic, where many passengers may be unfamiliar with the local language. Providing English station names on maps and signage can greatly improve the travel experience. Alternatively, they suggest that dual naming systems, such as combining full names with letter–number codes, offer an intuitive approach worth considering.

These findings underscore the importance of translation in urban transportation systems, particularly in multicultural and tourist-oriented environments. The relationship between translation and tourism has gained increasing attention only recently, despite its significance in shaping how visitors navigate and experience a city. As Sulaiman and Wilson (2019) note, the role of language in tourism—especially in promoting and facilitating it—has been comparatively understudied, indicating a need for further research in this area.

Iran's rich cultural and historical heritage offers considerable potential for tourism, yet this potential has been underutilized. Strategic advertising and social media outreach can help reshape international perceptions and attract more visitors. As Tütüncü (2024) notes, higher perceived risk in a host country reduces the number of international tourists; therefore, improving a country's image can contribute to increased tourism and, in the long term, support economic and policy development. Within this process, transportation plays a significant role, and in Iran, the metro system is one of the most important modes of public transit.

Today, metro systems are recognized as efficient and environmentally sustainable transportation options, particularly in densely populated cities. Among their key advantages are reduced greenhouse gas emissions and improved urban air quality. This is especially relevant in Tehran, where air pollution is a persistent challenge. Khoshakhlagh et al. (2023) report that approximately 84% of air pollution in Tehran originates from mobile sources. They argue that expanding and modernizing public transportation—including metro, bus, and taxi fleets—is among the most effective solutions. Similarly, studies indicate that metro construction and operation can significantly reduce CO<sub>2</sub> emissions compared to reliance on private vehicles (Andrade, 2024). Within this context, translators can act as social agents of change, contributing to environmental communication by facilitating the exchange of knowledge across linguistic and cultural boundaries. By ensuring that scientific information, policy initiatives, and community guidance are accessible to diverse audiences, translators help overcome language barriers that might otherwise limit public awareness and engagement—particularly in multilingual and multicultural urban environments.

### 3. Methodology

This study employed field research informed by the User-Centered Translation (UCT) model. Fieldwork involved direct observation and documentation at Tehran metro stations over an eight-month period, during which station names and multimodal features were recorded and supplemented with photographs of relevant signs and symbols. The collected station names were then compared with their equivalents on the official metro map available at the Tehran Metro website ([www.metro.tehran.ir](http://www.metro.tehran.ir)) to identify discrepancies between the two. Accessibility of multimodal features were also examined to assess their alignment with the translated names and overall navigational clarity. Figure 1 presents the official Tehran Metro map, which served as the primary reference for the comparative analysis in this study.

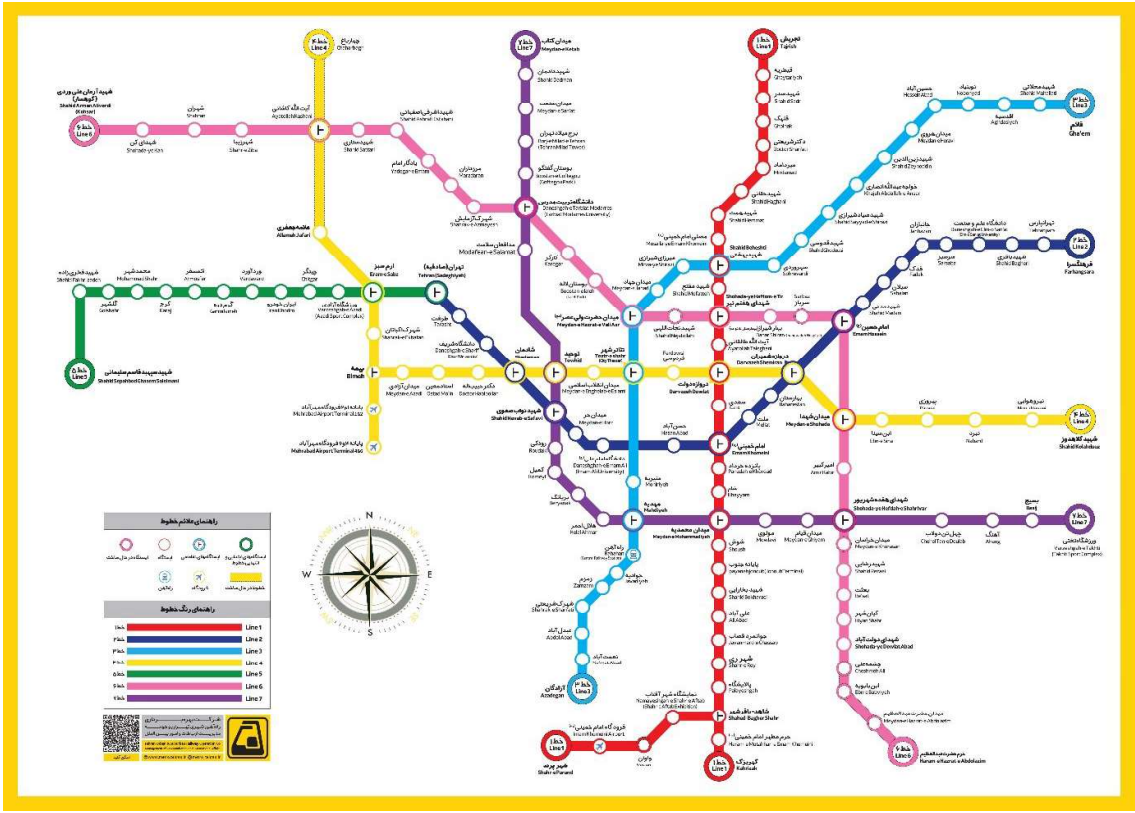


Figure 1. Official map of Tehran metro

The analytical framework was based on the UCT model, a functionalist, reader-oriented approach that emphasizes usability and user experience. In UCT, translation is treated as an iterative process in which information about users is continuously gathered and integrated into translation decisions (Suojanen et al., 2014). Usability is understood as the ease with which users can accomplish their intended goals, while user experience refers to the emotional and cognitive responses elicited during use. The model therefore prioritizes translation solutions that clearly address user needs and minimize interpretive effort. Figure 2 illustrates the iterative structure of the UCT process.

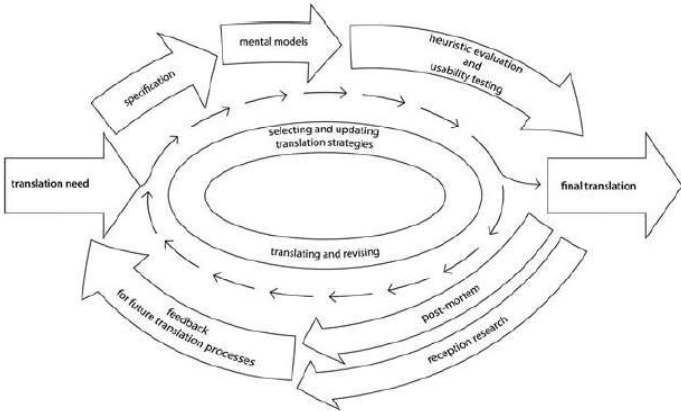


Figure 2. User-centered translation process © Anni Otava

Data interpretation drew on UCT's iterative methodology, in which translation analysis, evaluation, and revision occur cyclically rather than linearly. The original usability heuristics proposed by Suojanen et al. (2014) (see Table 1) were used in this study.

Table 1. Usability heuristics for user-centered translation (Suojanen et al., 2014, p. 90)

|    |                                             |                                                                                                                                                                                                                                                                                                                 |
|----|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Match between translation and specification | Why is the translation needed and does it fulfill the requirements defined in the specification?                                                                                                                                                                                                                |
| 2  | Match between translation and users         | Who are the users of the translation and how do their characteristics affect translation solutions?<br>Are there possibilities for supporting different kinds of users?<br>Do the textual choices reflect the information needs of the users?                                                                   |
| 3  | Match between translation and real world    | Is the translation aligned with its cultural context? Is cultural adaptation required?                                                                                                                                                                                                                          |
| 4  | Match between translation and genre         | Does the translation match the conventions of the genre in question?<br>Are the visual, auditory and other multimodal elements appropriate for the new context?                                                                                                                                                 |
| 5  | Consistency                                 | Is the translation consistent in terms of style, terminology, phraseology and register?                                                                                                                                                                                                                         |
| 6  | Legibility and readability                  | Do the visual elements of the translation correspond to the reader's physiological capabilities and relevant cultural guidelines?<br>Is the user guided through the translation by using appropriate signposting for the genre in question?<br>Are the user's efforts of interpretation sufficiently minimized? |
| 7  | Cognitive load and efficiency               | Is the translation well crafted enough to be easy to memorize and learnable – that is, clear and comprehensible?<br>Do the users need guidance for using the translation and, if so, in which format?                                                                                                           |
| 8  | Satisfaction                                | Does the translation produce a pleasurable and/or rewarding user experience?                                                                                                                                                                                                                                    |
| 9  | Match between source and target texts       | Has all relevant source material been translated?<br>Is there unwanted linguistic or structural interference?                                                                                                                                                                                                   |
| 10 | Error prevention                            | Have the potential risks of misunderstanding been minimized?                                                                                                                                                                                                                                                    |

#### 4. Results and Discussion

After extracting station names and comparing them with the official Tehran Metro map, the data were classified into four groups to highlight key variations in translation practices. Group A comprises stations with consistently transliterated names across both signage and maps, Group B includes stations with inconsistent transliteration, Group C features stations with both transliteration and English translation, and Group D contains stations presented exclusively in English translation.

Figures 3 and 4 illustrate examples from Group A, where uniform transliteration ("Meydan-e Ketab" and "Meydan-e San'at") is consistently applied at stations and on the map. This consistency reduces confusion for non-Persian speakers and enhances navigability.



Figure 3. Directional sign at Meydan-e San'at



Figure 4. Directional sign at Meydan-e Ketab

A close examination of Group B shows noticeable inconsistencies between the names used on station signage and those presented on the official map. One example is the treatment of two stations on Line 1 that share the same referent. While one is labeled *Emam Khomeini*, the other appears as *Haram-e Motahar-e Emam Khomeini*. Another inconsistency appears in the interchange station *Meydan-e Mohammadiyeh*, which is rendered differently across metro lines: on Line 7 it appears as *Meydan-e Mohammadiyeh*, whereas on Line 1 it is spelled *Meydan-e Mohammadiyeh*. Similar variation is seen in *Kolahdouz* (کلاهدوز), which appears in two transliterated forms—the difference being *douz* versus *dooz*. This discrepancy likely stems from interchangeable transliteration conventions in which *ou* and *oo* represent the same Persian vowel sound. The same type of variation affects *Nirou Havaei* (نیروی هوایی) and *Pirouzi* (پیروزی). Further inconsistencies involve the use of apostrophes, as in *Ostad Moe'in* (استاد معین). The use of the apostrophe in *Ostad Moe'in* suggests an attempt to indicate correct pronunciation, yet this convention is not consistently observed in other similar cases. These irregularities indicate that while some naming choices aim for phonetic clarity, the lack of uniform application prevents the establishment of a stable system. Additional examples from Group B are presented in Table 2.

Such inconsistencies can undermine the effectiveness of the metro system by increasing cognitive load for both local and international users. When multiple spellings or transliteration strategies coexist, passengers must spend additional time interpreting station names, which may lead to confusion, slower navigation, or misidentification of destinations. For tourists and non-Persian speakers, the lack of standardization can create significant barriers to independent travel and may discourage use of the public transit system. Ultimately, inconsistent naming reduces overall usability and weakens the communicative function of public signage, which relies on clarity, predictability, and ease of recognition.

Table 2. Examples of naming inconsistencies between station signage and official metro maps in Group B

| Station Names in Persian | Station Names in English at Stations | Station Names in English on Map |
|--------------------------|--------------------------------------|---------------------------------|
| حرم مطهر امام خمینی      | Haram-e-Motahar-e Imam Khomeini      | Haram-e-Motahar-e Emam Khomeini |
| سعدی                     | Sa'adi                               | Sa'di                           |
| دکتر شریعتی              | Doctor Shariati                      | Doctor Shari'ati                |
| قیطریه                   | Gheytarieh                           | Gheydariyeh                     |
| نعمت آباد                | Nemat Abad                           | Ne'mat Abad                     |
| شهرک شریعتی              | Shahrak-e Shariati                   | Shahrak-e Shari'ati             |
| مهدیه                    | Mahdieh                              | Mahdiyeh                        |
| میدان حضرت ولی عصر       | Meydan-e Hazrat-e Vali-e Asr         | Meydan-e Hazrat-e Vali Asr      |
| میرزای شیرازی            | Mirzaye Shirazi                      | Mirza-ye Shirazi                |
| میدان محمدیه             | Mohammadiyeh                         | Mohammadiyeh                    |

|                    |                         |                          |
|--------------------|-------------------------|--------------------------|
| شهید زین الدین     | Shahid Zeyn-o-ddin      | Shahid Zeynoddin         |
| قائم               | Ghaem                   | Gha'em                   |
| کلاهدوز            | Kolahdooz               | Kolahdouz                |
| نیروی هوایی        | Niroo havaei            | Nirou havaei             |
| استاد معین         | Ostad Moein             | Ostad Moe'in             |
| مولوی              | Molavi                  | Mowlavi                  |
| شادمان             | Shade'man               | Shademan                 |
| پیروزی             | Piroozi                 | Pirouzi                  |
| دکتر حبیب الله     | Doctor Habib-o-llah     | Doctor Habibollah        |
| حسن آباد           | Hassan Abad             | Hasan Abad               |
| دانشگاه علم و صنعت | Daneshgah-e Elm-o Sanat | Daneshgah-e Elm-o San'at |

Group C consists of stations where transliterated names appear on station signage, while translated English equivalents are used on the official metro map. This pattern is particularly common at locations that attract high numbers of visitors, such as cultural landmarks, universities, major parks, and transportation hubs. For example, *Bahar Shiraz* is displayed in transliterated form at the station (Figure 5), while on the map it is given as *Khanevadeh Hospital*. A similar pattern occurs with *Daneshgah-e Emam Ali* (Figure 6), which appears as *Imam Ali University* on the map.



Figure 5. Directional sign at Bahar Shiraz station



Figure 6. Directional sign at Daneshgah-e Emam Ali station

This mixed denomination suggests an attempt to improve clarity and accessibility for international and non-Persian-speaking users by providing recognizable English descriptors for well-known destinations. However, because the practice is applied selectively rather than systematically, it can create uneven expectations for navigation across the network. Further examples of Group C naming patterns are presented in Table 3.

Table 3. Examples of naming inconsistencies between station signage and official metro maps in Group C

| Station Names in Persian       | Station Names in English at Stations | Station Names in English on Map |
|--------------------------------|--------------------------------------|---------------------------------|
| ورزشگاه آزادی                  | Varzeshgah-e Azadi                   | Azadi Sport Complex             |
| دانشگاه شریف                   | Daneshgah-e Sharif                   | Sharif University               |
| دانشگاه تربیت مدرس             | Daneshgah-e Tarbiat Modarres         | Tarbiat Modarres University     |
| بهار شیراز (بیمارستان خانواده) | Bahar Shiraz (Khanevadeh Hospital)   | Khanevadeh Hospital             |

|                    |                             |                          |
|--------------------|-----------------------------|--------------------------|
| دانشگاه علم و صنعت | Daneshgah-e Elm-o San'at    | Elm-o San'at University  |
| دانشگاه امام علی   | Daneshgah-e Emam Ali        | Imam Ali University      |
| تئاتر شهر          | Teatr-e shahr               | City Theater             |
| راه آهن            | Rahahan                     | Central Railway Station  |
| نمایشگاه شهر آفتاب | Namayeshgah-e Shahr-e Aftab | Shahr-e Aftab Exhibition |
| پایانه جنوب        | Payaneh Jonoub              | Jonoub Terminal          |
| برج میلاد تهران    | Borz-e Milad-e Tehran       | Tehran Milad Tower       |
| بوستان گفتگو       | Boostan-e Goftegou          | Goftegou Park            |
| بوستان لاله        | Boostan-e laleh             | Laleh Park               |

Group D stations present names exclusively in English translation, with no accompanying Persian script or transliteration. This group demonstrates markedly higher consistency, reflecting a deliberate institutional approach aimed at facilitating international accessibility. Examples include airport terminals, major railway stations, and prominent tourist sites. While this approach improves navigability for non-Persian speakers, it simultaneously diminishes linguistic diversity and highlights hierarchical distinctions within the urban environment, privileging international travelers over local users. From a semiotic perspective, this practice contributes to the formation of the city's linguistic landscape, aligning with global trends toward standardized, internationally legible signage (Landry & Bourhis, 1997). Examples of Group D naming patterns are presented in Table 4 and two instances can be found in Figures 7 and 8.



Figure 7. Directional signs at Mehrabad Airport Terminal



Figure 8. Directional signs at Imam Khomeini Airport

Table 4. Examples of naming inconsistencies between station signage and official metro maps in Group D

| Station Names in Persian     | Station Names in English at Stations and on Map |
|------------------------------|-------------------------------------------------|
| پایانه ۱ و ۲ فرودگاه مهرآباد | Mehrabad Airport Terminal 1 & 2                 |
| پایانه ۴ و ۶ فرودگاه مهرآباد | Mehrabad Airport Terminal 4 & 6                 |
| فرودگاه امام خمینی           | Imam Khomeini Airport                           |

Overall, the results highlight a spectrum of translation practices in Tehran Metro. While Group A and Group D exemplify consistent approaches—either through unified transliteration or English-only

translation—Groups B and C reveal variability and partial implementation of accessibility standards. Transliteration inconsistencies, typographical variations, and uneven application of bilingual signage create barriers for non-Persian speakers and indicate a need for standardized, user-centered translation strategies. The findings suggest that integrating transliteration, translation, and multimodal accessibility systematically across all stations could significantly improve navigability and the overall commuter experience.

### Multimodal Features in Metro Stations

Beyond station names, multimodal accessibility features were also examined. Standardized visual elements, including pictograms (Figure 9), color-coded lines (Figure 10), high-contrast signage, tactile pathways, and braille, were widely observed. Color-coded lines assist with navigation, although naming for these lines is not consistently translated, which may complicate transfers at interchange stations.



Figure 9. Pictograms in metro



Figure 10. Color-coded lines in metro

Digital screens further support accessibility: real-time train transfer displays (Figure 11) indicate train location, upcoming stops, and delays in both Persian and English. In-car screens (Figure 12) display station names in Persian and scrolling English transliterations or translations, serving both informational and crowd management functions. These multimodal features enhance usability, reduce cognitive load, and accommodate diverse passenger needs, reflecting partial implementation of user-centered translation principles.



Figure 11. Real-time train transfer digital screen



Figure 12. Digital screen inside the car

While these features demonstrate meaningful steps toward improving accessibility, several challenges remain. The absence of translated line names means that users must rely primarily on color cues, which can complicate navigation at busy interchange stations, particularly for visitors unfamiliar with the system. The uneven distribution of tactile pathways and braille signage likewise suggests that accessibility accommodations are not yet standardized across all stations, leading to variable user experiences. Real-time transfer screens and in-car bilingual displays help reduce cognitive load, especially in crowded conditions where visual access to external signage is restricted; however, their effectiveness depends on consistent placement and maintenance. More broadly, the variation in how English is incorporated into signage reveals differing assumptions about who the ‘intended user’ is. In some contexts—particularly airports and major transport hubs—English appears as the primary communicative mode, signaling prioritization of international travelers. However, this may also contribute to the erasure of Persian in areas associated with global mobility. Addressing these inconsistencies would require the development of unified, user-centered translation guidelines that balance accessibility with cultural presence.

## 5. Conclusion

The analysis of naming and signage practices in Tehran Metro reveals that translation is not merely a technical or lexical task, but a socio-functional process. The inconsistencies observed—particularly between transliterated station signs and translated map labels—demonstrate the absence of a unified, user-centered translation. When station names shift between transliteration and translation without clear rationale, the system requires passengers to infer meaning, placing a cognitive burden on international users and occasionally even on local commuters. At the same time, the presence of translation reflects a deliberate attempt to open the metro network to non-Persian users and to present Tehran as a connected and globally oriented city. The challenge, therefore, lies in maintaining accessibility while ensuring that linguistic choices remain consistent, intuitive, and context-appropriate.

A cohesive approach to metro translation should integrate linguistic accuracy with practical functionality. Standardizing naming conventions, aligning signage with maps, and incorporating supplementary tools such as digital supports or community-informed language choices would improve clarity and reduce navigation barriers. Crucially, translation should not erase the cultural specificity embedded in Persian place names, but rather translate in ways that communicate their historical, social, and spatial significance. A coordinated, multilingual signage system—developed collaboratively by translators, linguists, designers, transit authorities, and users—has the potential to enhance mobility, support intercultural communication, and reinforce Tehran’s identity as a city that is both rooted in its heritage and engaged with the global world.

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