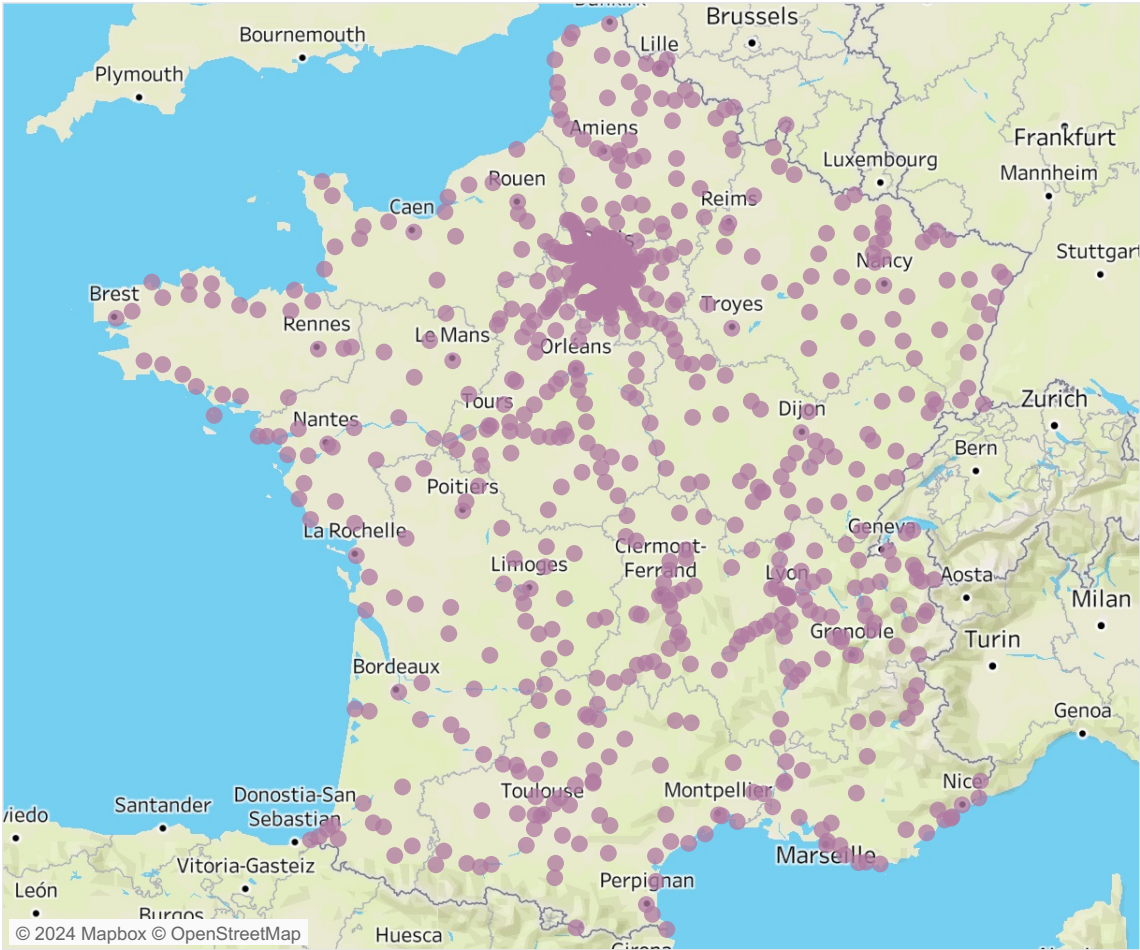


# Assistance for Disabled People in French SNCF Stations

Assistance for Disabled People in Fr..	Correlation Matrix and Scatterplot	Linear Regression and Clusterisation	Cluster Analysis	Geographic Distribution of Statio..	Strategic Recommendations fo..	Limitations and Next Steps
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## ASSISTANCE FOR DISABLED PEOPLE IN FRENCH STATIONS

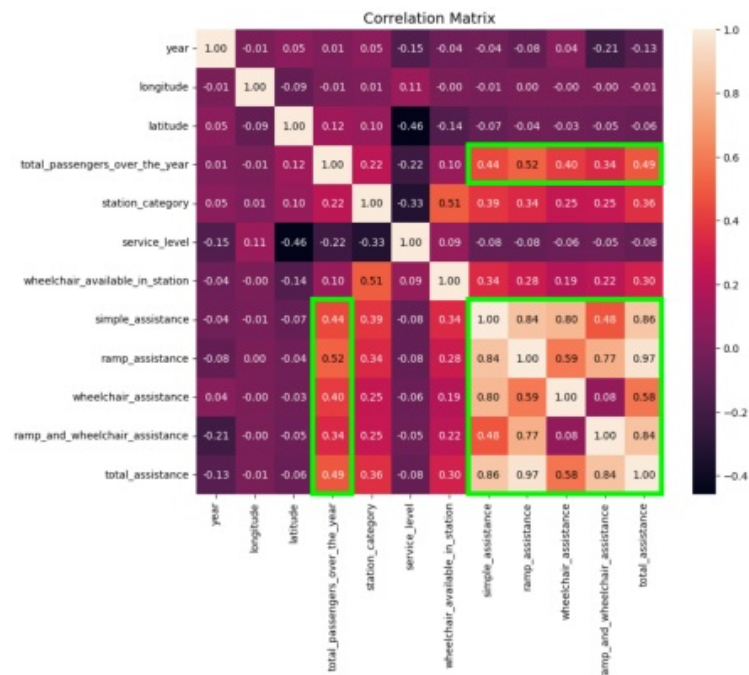
The Société nationale des chemins de fer français (abbreviated as SNCF; French for "National Company of the French Railways") is France's national state-owned railway company.

SNCF owns more than 3,000 stations in France, 871 of which welcomed people with reduced mobility between 2015 and 2022. The aim of this analysis is to propose recommendations for improving reception conditions in the network's stations, and to identify priority stations.



# Assistance for Disabled People in French SNCF Stations

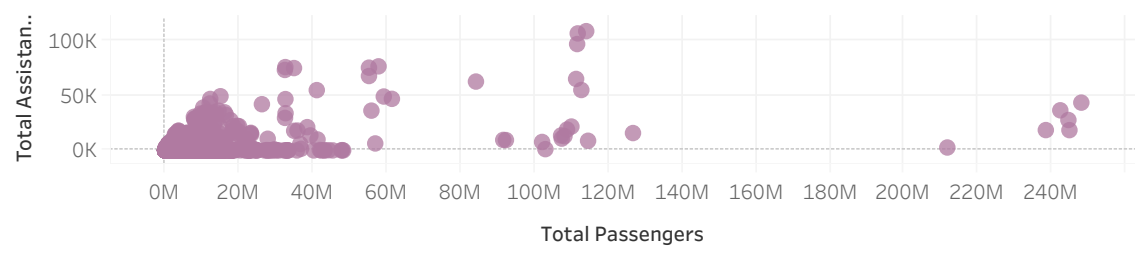
Assistance for Disabled People in Fr..	Correlation Matrix and Scatterplot	Linear Regression and Clusterisation	Cluster Analysis	Geographic Distribution of Statio..	Strategic Recommendations fo..	Limitations and Next Steps
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For the sake of exploration, we delved into the relationships between various variables within the dataset. As anticipated, the strongest correlations emerged amongst the different types of assistance (highlighted in the correlation matrix's lower right). This pattern aligns with our expectations since different assistance types often go hand-in-hand, reflecting integrated service provisions in stations.

However, these internal correlations between assistance types, while interesting, are not our primary focus. **We shift our attention to the more pertinent relationship between the total number of passengers at a station and the total assistance provided.** Here, a moderate yet significant correlation surfaces, suggesting a link that merits further investigation.

The scatterplot distinctly showcases this relationship: stations with a higher passenger count tend to report more total assistance instances. This observed trend supports our hypothesis that a station's total passenger throughput is a predictor of its total assistance volume. **As passenger numbers rise, the demand for assistance services increases,** underscoring the need for scalable support systems in busier stations.



# Assistance for Disabled People in French SNCF Stations

Assistance for Disabled People in Fr..	Correlation Matrix and Scatterplot	Linear Regression and Clusterisation	Cluster Analysis	Geographic Distribution of Statio..	Strategic Recommendations fo..	Limitations and Next Steps
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Our analysis began with the hypothesis that an increase in total passengers at a station would correlate with a rise in the demand for assistance services. **A linear regression model tested this hypothesis, revealing that total passenger numbers account for only 24% of the variance in the data.** This suggests that while there is a relationship, it is not strictly linear, as indicated by the many data points deviating from the regression line, particularly at higher passenger volumes.

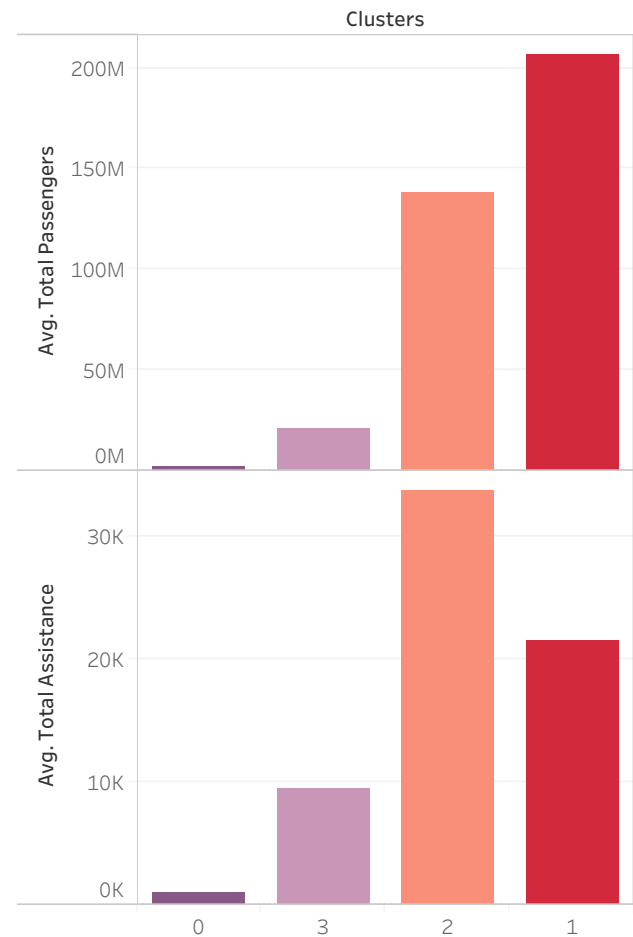
**Recognizing that a linear model does not fully capture the complexities of our data, we turned to cluster analysis for deeper insights.** This technique segments data points into 'clusters' based on similarities, allowing us to discern underlying patterns that might not be immediately apparent.

**The result of our cluster analysis identified four distinct groups, visualized in the lower scatterplot with varying color intensities: dark purple, purple, light red, and red.** Each cluster represents a unique combination of total passengers and assistance provided, offering a nuanced view of the relationship between these variables and suggesting factors beyond passenger volume influence the need for assistance services.



# Assistance for Disabled People in French SNCF Stations

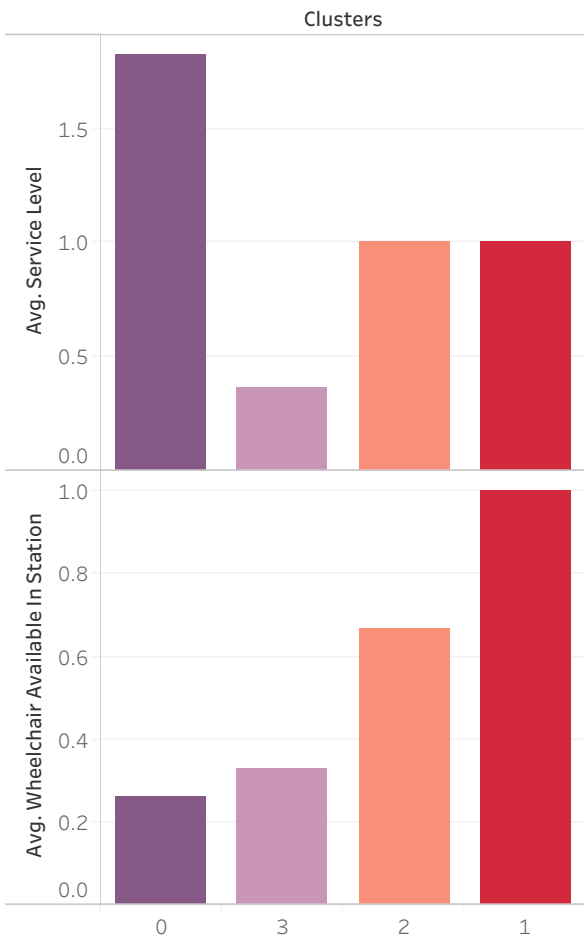
Assistance for Disabled People in Fr..	Correlation Matrix and Scatterplot	Linear Regression and Clusterisation	Cluster Analysis	Geographic Distribution of Statio..	Strategic Recommendations fo..	Limitations and Next Steps
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As expected thanks to the linear regression, there is generally an increase in average assistances with the average number of passengers per cluster. However, an exception exists in the red cluster, which despite having the highest number of passengers, does not follow this trend. This anomaly is due to the red cluster representing a singular, exceptionally busy station (Paris Nord Grandes Lignes).

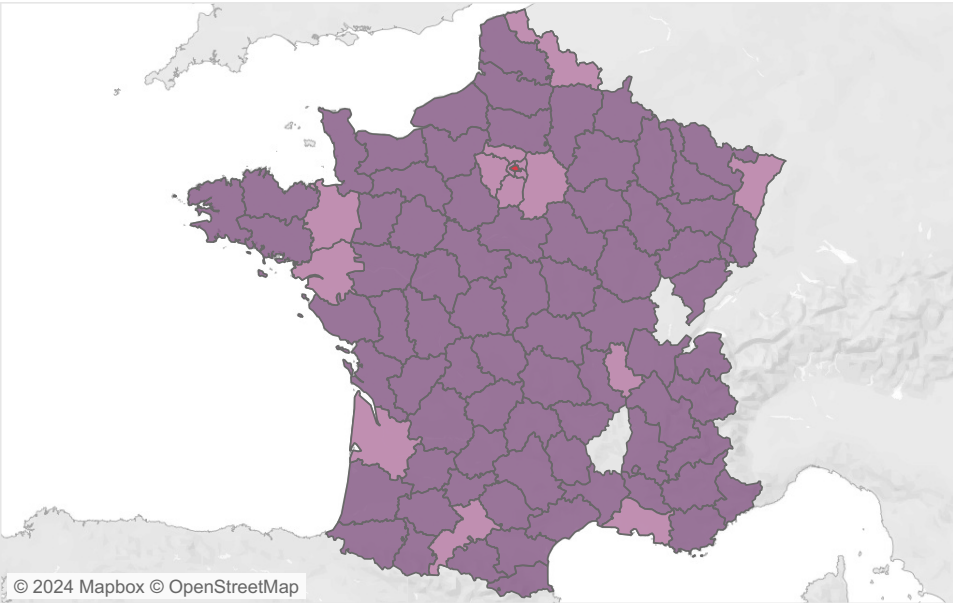
There are 4 levels of service to disabled people (Level 0: Station not accessible; Level 1: Station not accessible but alternative transport available; Level 2: Station accessible with the help of an agent; Level 3: Fully independent station access). **Surprisingly the stations with the higher level of service are the stations with the least passengers and the least assistances** (dark purple cluster). The stations with the lower level of service are the ones of the purple cluster. Stations in the light red and red clusters, which have a higher volume of passengers and assistance, display an intermediate service level.

The data also sheds light on wheelchair availability in stations. As anticipated, **stations with increased passenger volumes show a higher likelihood of having wheelchairs available. This suggests that busier stations are better equipped to cater to the needs of passengers requiring mobility assistance.**



# Assistance for Disabled People in French SNCF Stations

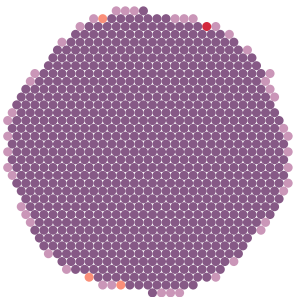
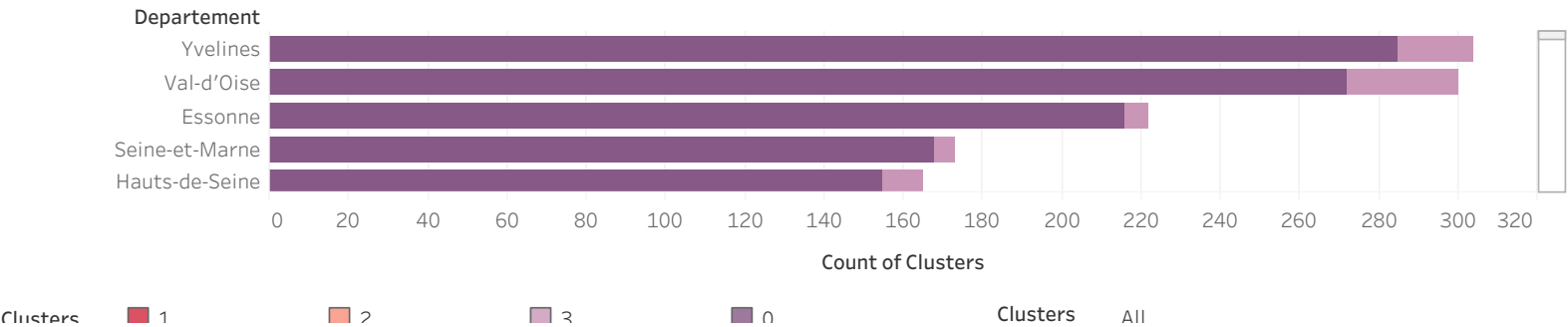
Assistance for Disabled People in Fr..	Correlation Matrix and Scatterplot	Linear Regression and Clusterisation	Cluster Analysis	Geographic Distribution of Statio..	Strategic Recommendations fo..	Limitations and Next Steps
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On this slide, feel free to explore the distribution of station clusters across French regions with the interactive Cluster filter. The map vividly illustrates the prevalence of different cluster types by region. Below it, a bar chart details the count of clusters in each region (organized in descending order providing a clear visualization of where each cluster is most common).

You'll notice that the majority of regions predominantly feature stations classified within the dark purple cluster, indicative of fewer passengers and lower assistance needs. Regions home to larger cities (like Lyon, Marseille, Bordeaux, Lille, or Strasbourg) are characterized by the purple cluster, with stations of an intermediate size. The light red and red clusters, marking the highest passenger volumes and assistance services, are exclusively found in Paris, the nation's capital.

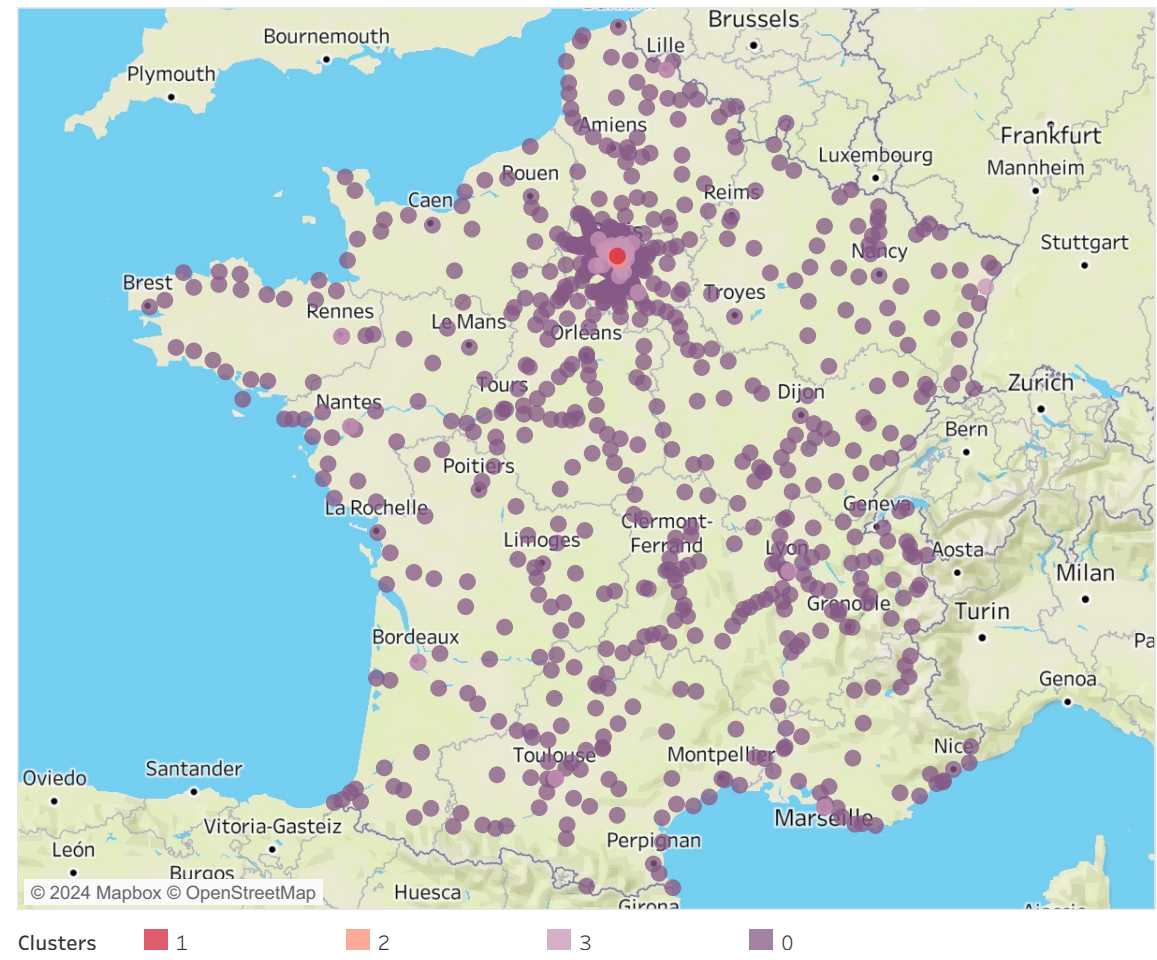
**This visualization underscores the relationship between regional passenger volumes, assistance requirements, and urban centrality, offering a granular perspective on service distributio..**





# Assistance for Disabled People in French SNCF Stations

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Our comprehensive analysis has yielded vital insights into the current state of assistance services across the SNCF network. To enhance accessibility and service quality for individuals with reduced mobility, we propose the following strategic recommendations:

- **Prioritize High-Traffic Stations:** Allocate additional resources to high-traffic stations, specifically those in the red cluster, to meet the higher demand for assistance services effectively.
- **Improve Service Level in Intermediate Stations:** Stations in the purple cluster, typically found in regions with large cities, should focus on elevating service levels to ensure passengers receive the required assistance promptly.
- **Expand Wheelchair Availability:** Ensure that wheelchair availability keeps pace with passenger volume, particularly in the busiest stations where the need for mobility assistance is greatest.
- **Targeted Accessibility Upgrades:** For stations in the dark purple cluster, which offer the highest level of independent access yet serve fewer passengers, evaluate the cost-benefit ratio of further accessibility upgrades to balance service quality with efficiency.



# Assistance for Disabled People in French SNCF Stations

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## Limitations of the Case Study:

This analysis is subject to certain limitations, including the exclusion of qualitative factors such as passenger feedback, and the assumption that current trends will continue unchanged. Additionally, the focus on quantitative data may overlook the nuanced experiences of passengers with reduced mobility.

## Next Steps:

To build on this case study, we propose the following next steps:

- Incorporate Qualitative Data: Gather and analyze passenger feedback to complement the quantitative data, ensuring a holistic view of service quality.
- Monitor Implementation: Track the impact of any changes made as a result of these recommendations, using key performance indicators to measure success.
- Iterative Improvement: Adopt an iterative approach to service upgrades, allowing for continuous refinement based on real-world outcomes and passenger needs.

*Thank you to everyone who has followed our journey through this analysis. Your engagement and insights are invaluable to the ongoing efforts to enhance the SNCF network's accessibility. For those interested in delving deeper into the methodologies and data that informed our study, we invite you to explore our Python analysis on GitHub ([https://github.com/j2raison/Assistance\\_for\\_Disabled\\_in\\_SNCF\\_Stations/tree/main](https://github.com/j2raison/Assistance_for_Disabled_in_SNCF_Stations/tree/main))*