

On the road to recovery from COVID: transit ridership decline and recovery in 10 European cities

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1 Introduction

Human interaction and spatial mobility are vital to the spread of COVID-19. Therefore, shortly after the onset of the pandemic, many countries restricted human interactions and limited the mobility of citizens. These restrictions had a significant impact on daily routines, especially in densely populated cities. As a consequence, many cities reported an unprecedented drop in transit ridership that has been sustained during 2020 and 2021 (GOOGLE LLC 2022; TIRACHINI et al. 2020). Nevertheless, the analysis of transit data over two years shows that cities report different patterns of the decline and recovery of public transportation use (figure 1).

2 Research questions

Why is there a difference in transit ridership recovery paths between different cities? Why transit systems of certain cities recover faster from the COVID-19 shock than others? Why transit systems of certain cities recover almost fully from this shock and others do not? It is critical to understand the factors behind the decline and the recovery of transit ridership and the differences between cities.

The disparity in the impact of COVID-19 on transit ridership can be explained by various factors, including : changes in daily routines (work from home, school from home, etc.), policy stringency (social gathering bans, travel ban, non-essential business closure, etc.), fear of COVID-19 in transit or reduction in transit supply.

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Percent change in transit stations attendance in 2020 and 2021 (baseline = median day of period Jan 3 – Feb 6, 2020)

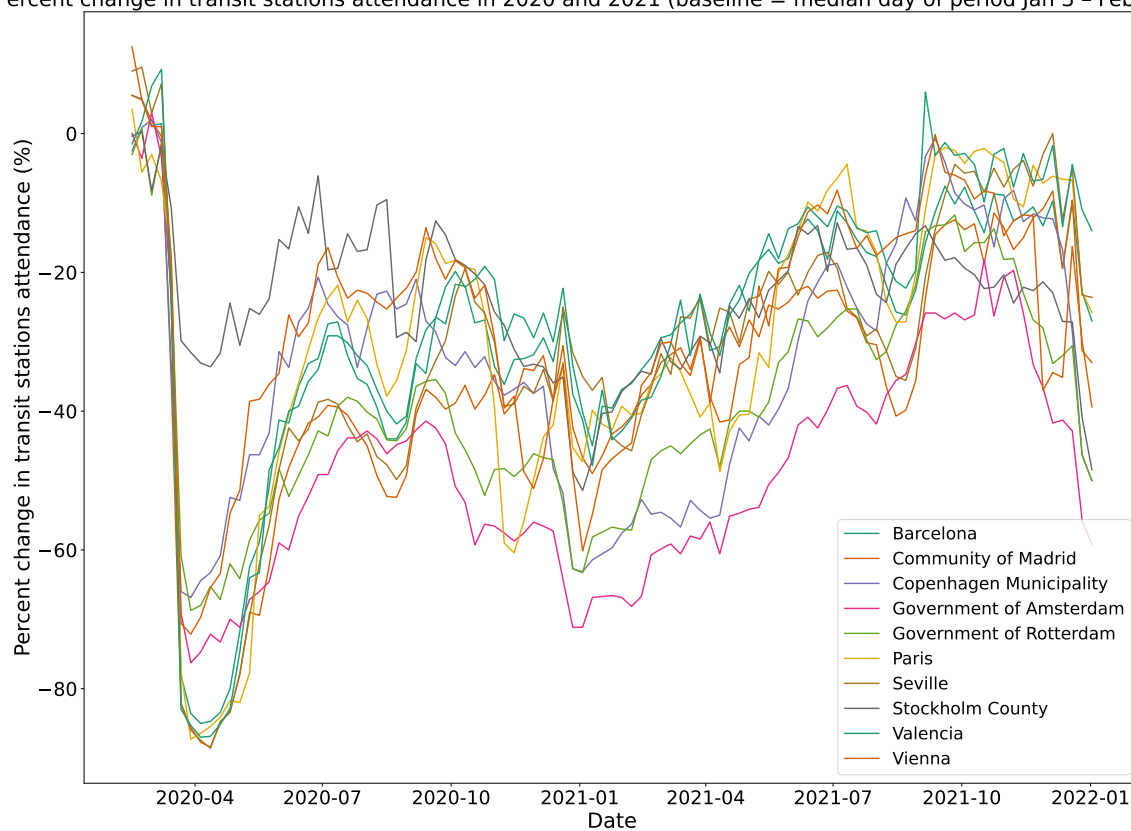


FIGURE 1 – Percent change in transit stations attendance during 2020 and 2021 in comparison with a median day from the 5 first weeks of 2020 (Google mobility reports 2022)

3 Methods and materials

We tackle these questions by comparing transit station ridership from 6 European countries and 10 big cities (more than 600,000 inhabitants) : Austria (Vienna), Denmark (Copenhagen), France (Paris), the Netherlands (Amsterdam and Rotterdam), Spain (Madrid, Barcelona, Seville and Valencia) and Sweden (Stockholm). Depending on data availability, other countries and cities can be also included in the final results.

Two-year historical data from Google mobility reports are used to compare the patterns of transit station attendance between the 10 cities (GOOGLE LLC 2022). Different factors are tested to explain the variability of transit decline and recovery : COVID-19 infections (time series), COVID-19 policy stringency (time series), industrial classification data (static), remote work and home activity changes (time series), transit supply (periodic data). These factors are used to explain the variability in the reaction of different transit systems to the shock brought about by COVID-19.

4 Expected results

Results of this research will : (i) contribute to our understanding of the resilience of public transportation as a mobility system ; (ii) explore some of the factors behind the recovery of public transportation. These results can give an insight on how public transportation systems might react to comparable shocks in the future and how they might recover from such shocks.

Références

- GOOGLE LLC (2022). *Google COVID-19 Community Mobility Reports*. URL : <https://www.google.com/covid19/mobility/%20Accessed:%202022-03-01>.
- TIRACHINI, Alejandro et Oded CATS (2020). “COVID-19 and public transportation: Current assessment, prospects, and research needs”. In : *Journal of Public Transportation* 22.1, p. 1.