Manchester Urban Institute

Governing Urban Transformation

The Connectivity of Manchester's Public Transport Systems

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Author declaration:

I Lydia Gillibrand confirm that this report is based on my own work and that I am happy with both my own and my partner's Isabella Yates' contribution to the final submitted version.

Contents

List of Figures

Abstract

Exploring the connectivity of Manchester's public transport system, this report highlights the main challenges to the integratedness of the city's mobility services. Inextricably linked, the key issues were identified as; fragmented intermodal transport links and, as a result, increased journey time, which reduced efficiency and access to services between a Greater Manchester suburb (Rochdale) and the University of Manchester. From these, suitable solutions have been discussed, suggesting Manchester should integrate the intermodal services via time-table synchronisation, and systems via combined service infrastructure such as stations. Furthermore, the use of electronic ticket scanning and smart-phone apps were suggested as potentially useful in aiding a more efficient and seamless journey, reducing time taken to travel.

Introduction

As an inherently mundane geographical discourse, transport, is a critical element in the life of a modern metropolitan (Jensen, 2006). It enables the transfer of more than just people but additionally goods and information, across time and space. This, embedded in the geographical theory of 'nomadism' (Jensen, 2006) where transport erodes distance restricting boundaries and barriers, reflecting the shrinking notion of Harvey's (1990) time-space compression. Thus, provoking a more integral and fluid, networked urban system (Pincetl et al, 2012) deemed necessary for the development of a globally competitive city. Focusing on connected public transport systems, this communal category is a more sustainable way for people to move through a region, with minimum environmental impact (Murray, 2001). With urban populations increasing and the rise in global surface temperatures, an effective shift from the private automobile to public transport as a means for urban mobility is becoming ever more vital for reaching city sustainability goals (Keeling, 1995). Yet, for most cities, implementing a successfully connected system of different transport services can pose many challenges.

Commissioned by Manchester City Council, this report aims to explore specifically the City of Manchester and the connectivity of it's public transport routes. Intermodal networks and journey time are the key challenges, which further affect access to services, especially regarding suburbs to city centre links. Subsequently, this investigation continues to explore and suggest ways in which the integration of multi-modal public transport systems in Manchester can be improved. Thus, aiding in the bolstering of Manchester within a globally competitive network of cities.

Context

Literature has identified two major interlinking challenges to be related to the connective efficiency of transport. These being; intermodal transport interchange and time taken affecting access to the services (Hine and Scott, 2000). Beginning with intermodal interchange, for one study, citizens in a focus group identified how they avoided public transport if the journey had no direct route. This resulted in an increased likelihood of waiting times and stress from a disjointed journey (Hine and Scott, 2000), including having to walk between bus stops and train stations.

Thus, adding time onto their journey, increasing the risk of missing a connection, intrinsically linking the two challenges together.

Nevertheless, concentrating on the city of Manchester, a recent drive by the city council has encouraged growth relating to the connectivity of public transport services. Academic sources have identified how these two pressing concerns mentioned above, need to be included in Manchester's transport connectivity agenda (ManchesterCityCouncil, 2017). City council reports have suggested developments will lead to a more interlinked city locally and globally, making journeys faster and smoother. Yet, while most documents and policies have concentrated on radial or city to city links, there appears to be less consideration towards Greater Manchester's suburb interconnectivity with the city centre. In the 2040 vision, Greater Manchester has, however been included in the theoretical developments around the Oxford Road corridor, Salford and Trafford then more widely to Bury, Stockport and Wigan. This especially, poignant with the new Victoria Station development, improving transport connection infrastructure of the local lines particularly between the train and the tram (Cox, 2017). Though, from this research studying the connectivity from the suburb of Rochdale to Manchester city centre, such notions of improving wider-city connections can be tested. Thus, indicating not only the extent to which Rochdale needs to be considered in Manchester's transport connection strategy but additionally highlight any remaining spatial disparities of transport connection present in the suburbs of Greater Manchester compared to the city centre. From challenges raised it may be possible to suggest ways in which to solve issues of transport fragmentation, covering a wider scale of Greater Manchester. Thus, fostering a globally connected city for everyone regionally and beyond.

Many possible solutions to these major city challenges of inter-transport connectivity have been identified on a global scale. The most successful could be Hong Kong's TOD network, happily marrying the flow of multimodal public transport services via a multi-functioning transport system (Loo et al, 2010). As a solution involving an integrated and networked approach, this civic mobility is the product of a governance reshuffling structured around a joined up thinking approach. The governing body itself forming a sustainable urban development company (Cervero and Murakami, 2009). Nevertheless, each urban environment is different and so Manchester must also be considered individually. Though, the critical paradigm of a more collaborative approach to the governance of public transport systems could perhaps be considered. This notion concerning an increasing synergy between different public transport companies, not just improvements to intermodal infrastructural assimilation. Furthermore, this actor assimilation could be applied through smart data solutions such as Beijing's metro (Sun and Xu, 2012) passes or Austria's amalgamation of bus timetables from different transport companies (Janic, 2010). Ideas which could be of particular benefit in Manchester multimodal transport network, reaching further out from the centre to the suburbs. Thus, by taking a more integrated approach to governing public transport systems, it could create better connected multi-modal transport services. Therefore, through the use of appropriate research methods, this study will aid in the provocation of Manchester as a globally competitive city.

Method

To fully understand the connectivity of Manchester's Transport system, the qualitative research method utilised was Autoethnography. As a new tool for geographic investigation, autoethnography was used alongside the analysis of secondary data and involves the researcher as the author to transcribe their own experience of the landscape (Butz and Besio 2009: Santoro 2015). As autoethnography is an embodied process (Spry, 2001), the environment was negotiated through the senses of sight, sound, smell. This aiding in a deeper and more complex, understanding of the terrain (Hesser-Biber and Leavy, 2010).

Both researchers carried out three autoethnographic extracts on the three public transport systems from Rochdale to the University of Manchester, which were the train, tram and bus. This provided a trajectory from Greater Manchester to the city centre, thus analysing the effectiveness of the transport's connectivity between the suburbs and the city centre. The route was completed on Wednesday 3rd May during 6.50am and 8.59am (Figure 1, 2 and 3) replicating what a daily commuter would experience during peak rush hour times over the 17 miles trip from Rochdale to the University of Manchester.

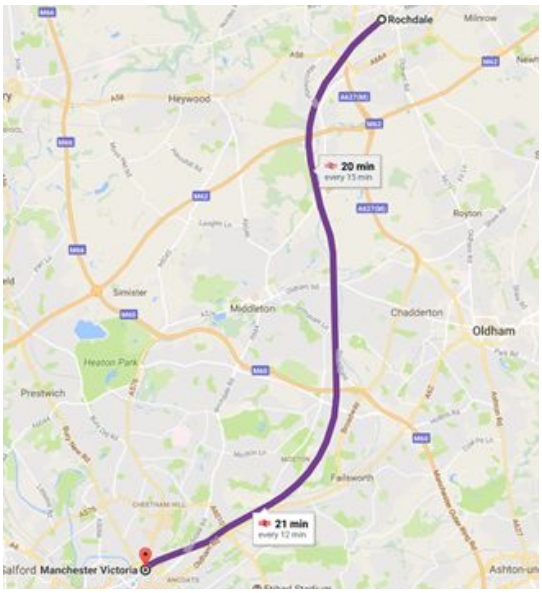

Figure 1 - TRAIN journey; Rochdale Train Station

Figure 2 - TRAM journey; Manchester Victoria to Market Street

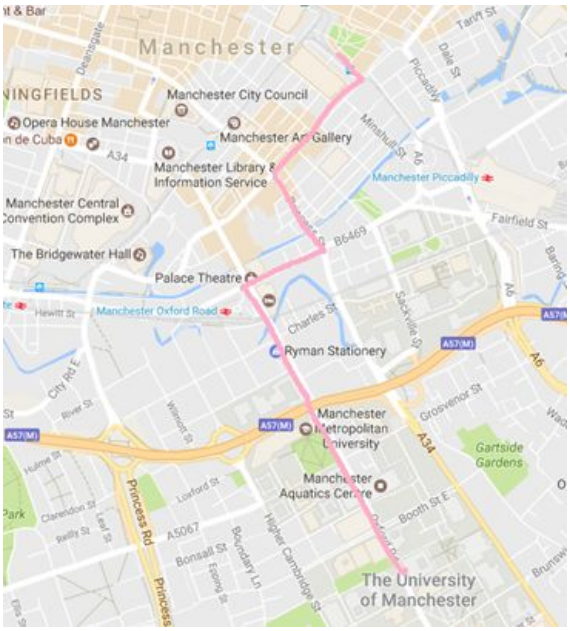

Figure 3 - BUS journey; Piccadilly Gardens to University of Manchester

As an indirect route, walking was required between the three transport modes, in which the timings for and between each journey were noted in a diary log as illustrated in Figure 4. Thus, giving an insight into how well intermodal public transport integration is in and around Greater Manchester. The connectivity regarding fluidity and ease were noted as well as time/cost efficiency and comfort on the different transport types. By having two differing individual interpretations, a more indepth and truthful set of data was captured.

Journey type	Time (am)
Walk to Rochdale train station	6.40 - 7.10
Wait for train	7.10 – 7.41
Train	7.41 - 8.03
Walk to tram stop	8.03 – 8.06
Tram	8.06 – 8.18
Walk to bus stop	8.18 – 8.31
Bus	8.31 – 8.45
Walk to University of Manchester	8.45 – 8.59

Total journey time; 2 hours and 19 minutes

Figure 4 - Diary log indicating each transport's duration

Nevertheless, the researcher's own positionality as two white females may alter the results with regards to ethics, so this must be taken into account throughout (England, 1994). Yet, with two researchers carrying out the study, any bias opinions can be identified and discussed. Additionally, further research over a longer period of time could provide a more accurate representation of Manchester's public transport connections. For example, repeating the journey

everyday for a week at different times, and considering the difference in passenger numbers at the weekend. Furthermore, as a felt negotiation, autoethnography exposes the vulnerabilities of the researcher, and so throughout the process, this should be noted.

Analysis

This analysis section is broken down into two research questions based around the key findings. From this data, new solutions have been suggested to combat these challenges, via the improvement to existing infrastructure. This aiming to ameliorate Greater Manchester's public transport connectivity and advocate its existence as a globally competitive city.

How connected is Greater Manchester's intermodal transport interchange?

Firstly, an un-connected transit route was identified because of the fragmented intermodal transport interchange. This was due to the dispersed location of the different transport pick-up and drop-off points, alongside the unco-ordinated transport timetables (Autoethnographic 5, 2017). Walking was required between stops of several minutes as Figure 5 indicates.

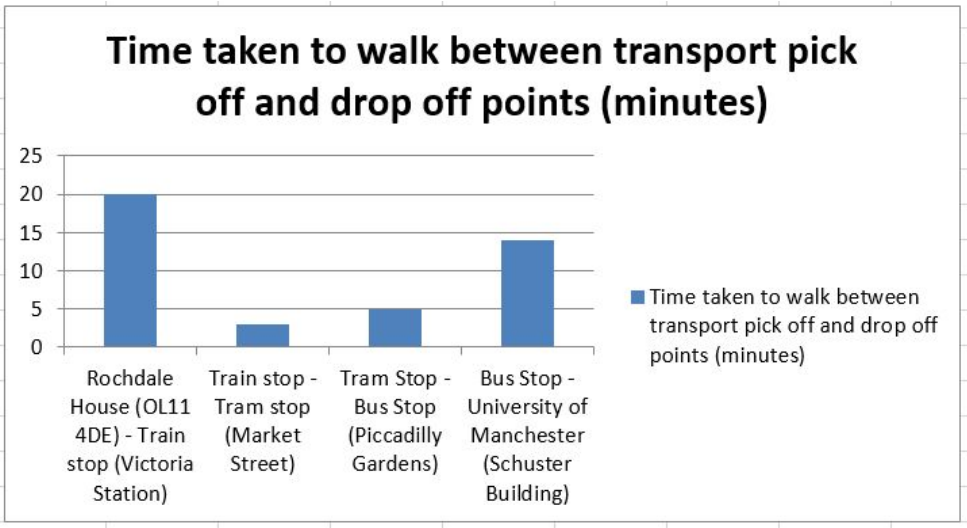

Figure 5

Yet, this didn't guarantee a smooth transport transition, as we missed the bus after walking 5 minutes from the tram stop and having to wait a further 8 minutes for the bus (Autoethnographic extract 6, 2017). This illustrated how the tram and bus timetables didn't operate in conjunction, enabling intermodal fragmentation to decrease connectivity for passengers. Victoria Station was the only stop which linked two transport types (train and tram) throughout the journey (Auto-ethnographic extract 4), as a new 44 million connected transportation system (Cox,2017). Thus, highlighting Manchester's evolving understanding of Ceder's (2016) and Hadas and Ranjitkar's (2012) notions of synchronized transport interchanges and timetables to reduce the likelihood of intermodal transfer fragmentation and longer journey times.

Regarding connectivity solutions, Manchester needs to develop these multi-functioning transportation stations, like Victoria Station. This station accommodates a higher capacity of passengers and connects public transport services as similarly portrayed by Guihaire and Hao (2008) who recognise transport connectivity as an objective focus for city planners. Additionally, Manchester could replicate the city of Graz**'**s public transportation structure in Austria which has introduced a signal, enabling waiting buses to detect if there is an approaching tram (Janic, 2010). Hence, the bus can delay its departure for a smoother transport transfer for the tram passengers, which would be idyllic for Manchester. Furthermore, Manchester should utilise the governance of multiple transports to it's advantage. Although, the train, tram and bus are all owned by private companies in Manchester - National Rail, Metrolink and Stagecoach/First Buses respectively, there is a potential opportunity to create a multi-functioning transport app for smartphones. This could provide timetables for all transport modes in Manchester, to give passengers awareness of the transport times, pick-ups and drop-offs to maximise the transport's connectivity potential. This is highlighted in Preuss and Syrbe's (1997) theory of cities requiring an integrated online traffic information system, which includes electronic schedules and route finders, which would enhance the connectivity of Manchester's highly dense transport network. Thus, providing a more connected multi-modal transport system, via the fostering of a more integrated approach to transport governance. This encapsulates the notion of eradicating space by time (Harvey,1990) as the smartphone is bringing passenger's digitally closer to the transport system's daily routine. However, this solution may create a digital divide by further exacerbating the gap between those who are digitally literate (for instance; having and understanding smartphones) and those who don't as similarly illustrated by Selwyn (2002). Yet, this strategy shouldn't be perceived as disadvantaging individuals as it is an opportunity for encouraging those who are digitally literate, and supporting those who are not. This creating a more integrated public transport system, establishing a world class city for everyone.

How does this connectivity affect journey time efficiency and accessibility?

Poor connectivity increased journey time and reduced efficiency of the transport system. A high influx of passengers during peak times, particularly on the train, reduced transport accessibility by there being inadequate space for all passengers. This forced us to wait for the 7.41am train as the 7.20am train was full (Auto-ethnographic extract 1, 2017), extending our journey time by 26 minutes (Figure 6) as this train stopped at three additional stops and did not travel directly to Manchester Victoria (Auto-ethnographic extract 2, 2017) (Figure 6).

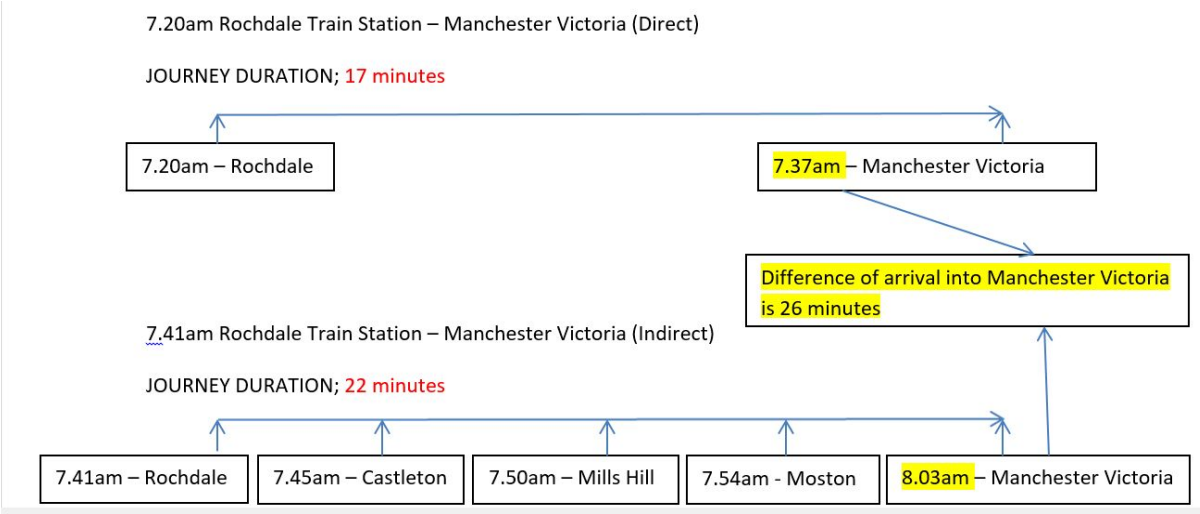

Figure 6 - the 7.20am and 7.41am train times and routes

This illustrates how the intermodal fragmentation is intrinsically linked to access and journey time efficiency, correlating to Hine and Scott's (2000) concept as there is reduced accessibility to public transport, due to carriages reaching their full passenger capacity during peak commuting times, particularly 6am-8am.

Regarding this challenge's solution, Manchester could use an integrated data system similar to Sun and Xu's (2012) study strategy of an 'automatic fare collection data' on Beijing's metro. This strategy assesses each passenger's travel time by using smart card transactional data, which all passengers use by scanning on a tracker when their journey is completed. If Manchester could implement a scanning device into tickets, it could analyse when and where the highest amount of journeys are taking place on each transport mode. Passengers could scan their ticket on a standing tracker when they get on and off, imitating the same successful structure of London's oyster card system (Bagchi and White, 2005). In Manchester, this would be useful, particularly with System One's joint weekly and monthly passes, which we enquired about when buying a train ticket (Auto-ethnographic 3, 2016) and enabled access to multiple forms of transport; like the train, tram and bus, being more cost efficient (Systemonetravelcards.co.uk, 2017). Thus, as a more integrated approach, implementing a similar rapid scan system to London and Beijing, would improve access to, and efficiency of intermodal transport connections in Manchester. Furthermore, this could reduce the likelihood of trains breaching their full capacity and a passenger's overall journey time, especially during peak times. Thus, overall advocating a fully connected flow of intermodal transport services, critical for the evolution of Manchester as a globally competitive city.

Conclusion

Overall, this research has uncovered some of Manchester's issues regarding transport connectivity. These include having a fragmented intermodal transport interchange between

different transport modes and the inability to provide sufficient transport access for the high passenger demand, particularly during peak times. All these obstacles increased the journey's duration, which was 2 hours and 19 minutes as indicated in Figure 4. Interestingly, this journey duration is longer than the commute from Manchester Piccadilly to London Euston, which is 161 miles. Comparing this to the 17 miles travelled from Rochdale to the University of Manchester, it is almost 10 times the amount of miles covered in a shorter time frame of only 2 hours and 9 minutes on a direct train (Auto-ethnographic extract 5, 2017). This highlights Harvey's (1990) theory of the successful advancements in technological transportation to eradicate space by time. It is extremely striking how a journey from a Greater Manchester suburb (Rochdale) to Manchester City Centre can take longer than travelling from two major cities in England. Thus, Manchester's City Council needs to continue improving the existing transportation connectivity projects highlighted above including Victoria Station's transport transformation. Furthermore, with more extensive research, new solutions such as the ones discussed in this study could be tested and potentially incorporated in Manchester public transport services such as the multifunctioning app. This, fostering an integrated and efficient multimodal public transport system and bolstering Manchester's position in the world as a globally competitive and connected city.

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