

Bus Franchising in Greater Manchester Assessment September 2019

Network
Supporting Paper

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1 Introduction

- 1.1.1 This paper sets out the approach to reviewing the bus network and developing proposals for the franchising and partnership options for TfGM's assessment of a proposed franchising scheme. It explains the principles used in network planning, the types of interventions and how these have been modelled.

2 Context and background

- 2.1.1 The current deregulated market gives bus operators freedom to choose where to operate services, as well as which days of the week and what times of day. Bus operators can also choose the degree to which they attempt to integrate services with other modes though this may only occur where there is commercial incentive to do so.
- 2.1.2 This has a number of consequences for the bus network. Most importantly, the network is planned as a series of competing and overlapping networks, which means that there are market failures of co-ordination which means that the network is not as efficient as it could be, and hence the mobility offered to passengers is less than it could be. This is true of the commercially run bus network, where bus operators can compete against each other, as well as in terms of how it is co-ordinated with the tendered network (which is necessarily planned reactively) and other modes, particularly Metrolink and rail, with which bus operators compete.
- 2.1.3 This can lead to services not being comprehensive at certain times of the day or week and to operators competing in markets that they regard as being more lucrative and result in over-provision of bus services compared to the actual level of demand. Services can also be timed close together rather than being more evenly timed. It can also mean that integration with other modes does not happen and bus services directly compete against other modes.
- 2.1.4 The GMCA is able to subsidise services which are not provided on a commercial basis where there are social needs, subject to the budget constraints for these subsidised services. In practice, this is done through TfGM subsidising those services on the GMCA's behalf. It is therefore inevitably reactive to market changes and where the market is unstable or reducing significantly TfGM must reprioritise the routes and times where tendered services operate.
- 2.1.5 The current market is thus seen in some respects to be inefficient as it does not enable the transport network to be planned effectively and results in a sub-optimal transport network that is less able to meet GMCA's objectives or

align with the 2040 Vision for Bus, as set out in more detail in the Strategic Case.

- 2.1.6 The network review has sought to identify how this situation could be improved using the network planning principles laid out in section 4.1.3 below. The review used the 2015 bus network as the base, but has also taken into account the changes to, and reductions in, the bus network since 2015 through to early 2019. This resulted in a number of changes being proposed and developed so that could then be evaluated and modelled to determine the benefits under the franchising and partnership options. While networks will evolve over time, this methodology allows a view to be taken of the benefits of moving to a Franchising Scheme or changing the network through other means, such as a partnership.

3 Assumptions for the proposed network changes

- 3.1.1 The proposed network changes were developed using a co-ordinated approach to network design. They address inefficiencies in the current market structure and aim to integrate current commercial and tendered bus services with other modes to produce a more efficient and effective public transport network. The following assumptions were made:

- Network resources could be reallocated irrespective of who the current operator is;
- There would be no overall change to the cost of operating the network;
- The benefits that accrue to passengers are indicative of the benefits that accrue through the whole appraisal period, they are not temporary;
- Services or corridors that provide, or should provide, major links and have the greatest levels of demand were prioritised by identifying key trip attractors such as Manchester city centre, district centres, key employment centres and hospitals, but also taking account of the distribution, density and composition of residential areas;
- Service changes need to deliver meaningful benefits, but given there is likely to be significant change these would need to be phased in to avoid large network upheaval;
- Cross-boundary services would be largely left unchanged, although their scope for performing a local role within Greater Manchester would be considered;
- School and Demand-responsive Transport services were out of scope; and

- Multi-modal integrated fares are in operation, although the impact on demand is not captured.

4 Approach to Network Planning

- 4.1.1 Operating costs were generated at service level, built up from frequencies, running times by operating period, trip length and vehicle type to provide estimated peak vehicles requirements, mileage and operating hours. The cost rates were validated following the information requests made to operators in 2017 and were confirmed as robust and reliable.
- 4.1.2 The approach taken to reviewing the network around Greater Manchester involved splitting Greater Manchester into areas which were mainly based on key radial corridors out of the Regional Centre along with local services anchored on the district centres. In the west of Greater Manchester, due to the different characteristics of the area, the approach was altered to reflect the polycentric characteristics and the complexity of the network between Bolton, Horwich, and Wigan and it being relatively remote from Manchester city centre.

Network Planning Principles

- 4.1.3 The principles used in the network planning are based on a methodology used by Transport for London. These provide a framework for assessing the network and identifying changes to the network that would move it from a set of individually planned network to one that was planned as a whole and delivered a greater deal of benefit to passengers for the same level of inputs.. These are summarised in the table below:

Table 1: Network Planning Principles

What?	Why?	Comments
Comprehensive	To provide people with access to the public transport network at all times and to reach employment, education and other key services.	Essential requirement to provide access to jobs and training by public transport.
Simple	Make the network easy to understand and use.	Encourages greater take-up of bus services.
Frequent	Waiting time is valued highly by passengers.	Key factor in encouraging take-up of bus. Enables times of journeys to work to meet business needs.
Direct	Journey times need to be as quick as possible.	
Reliable	Service reliability is valued highly by passengers.	Unpredictable journey times deter bus use, and incur costs for businesses and public services.
Integrated	Provides the widest range of journey opportunities to people.	Broadens catchment areas to jobs, and minimises overall PT journey times.
Cost-effective	Resources – in particular public funding – are constrained and so must be targeted to the most effective interventions which achieve the greatest benefits	Ensures the public transport system is sustainable over the medium/long term.

4.1.4 Each of the network planning principles have criteria that were used to assess the current network, the proposed interventions and improvements and to determine which changes should be made by ensuring that they answered the ‘What’ question in as objective a way as possible.

4.1.5 The ‘Comprehensive’ criteria were:

- Proximity to a bus service; and
- The ability to reach employment or other key services.

4.1.6 The ‘Simple’ criteria were:

- The number of routes and route variants;
- The interface between commercial services of different operators; and
- The interface between subsidised and commercial services.

4.1.7 The ‘Frequent’ criteria were:

- The proportion of routes operating at every 10 minutes or better; and
- Service levels outside the core operating periods.

4.1.8 The 'Direct' criteria were:

- The extent to which services deviate en-route to key destinations; and
- The availability of fixed track alternatives.

4.1.9 The 'Reliable' criteria were:

- The length of the service and the potential points for delay; and
- The ability to operationally control services.

4.1.10 The 'Integrated' criteria were:

- Planned connections at identified locations promoting bus interchange; and
- Improved connections between bus and the rail/Metrolink network.

4.1.11 The 'Cost-effective' criteria were:

- Overall network cost neutrality, whilst addressing social, economic and environmental objectives;
- Opportunities to make better use of resources where supply exceeded demand within the bus network; and
- The level of bus provision in relation to Metrolink services.

5 Data use

5.1.1 Data related to the current transport network, including bus, rail and Metrolink network maps and current bus timetables were used to determine current network patterns, service frequencies and resource levels. In turn, these were used to assess the network against the network planning principles.

5.1.2 The following data sources were used to establish demand across the network:

- i. Continuous Passenger Sample (CPS) data
 - Alongside the criteria-based assessment, some analysis of CPS data was carried out to provide a more detailed understanding of trip volumes, origin to destination patterns and service loading profiles. Whilst CPS has some limitations on account of it being based on a stratified sample, it is of value for key services.
 - The outputs of the analysis gave an insight into existing usage of services, informed the development of proposed changes, and confirmed whether the proposed changes were suitable or not.
- ii. Cordon-count analysis

- On selected corridors, which predominantly serve the Regional Centre, there are indications that the level of supply exceeds the level of demand. This situation has generally arisen on contested corridors where there is active competition between two or more operators or where a dominant operator possibly maintains a level of service to dissuade others from entering the market. Five specific examples were identified:
 - Oxford Road corridor;
 - A6 Stockport Road corridor;
 - Salford Crescent;
 - Moston Lane/Rochdale Road; and
 - Chorley New Road, Bolton.
- For these corridors, CPS data was analysed as well as the city centre cordon counts undertaken by the TfGM Highways Forecasting and Analytical Service (HFAS) which gave an indication of average vehicle occupancy (TfGM, 2015).
- As the location of the standard cordon counts do not necessarily reflect the peak loading locations on individual corridors, additional cordon counts were commissioned at intermediate locations along these corridors to provide greater depth of information on the loading profiles.
- The data gathered was then analysed to show average vehicle occupancy and provide an indication of the level of resource which could potentially be saved for reinvestment elsewhere, whilst also maintaining sufficient frequency and capacity.

6 Data Validation

- 6.1.1 Following the request to bus operators for the supply of Electronic Ticket Machine (ETM) data, the level of detail, accuracy and comprehensiveness of this data was reviewed.
- 6.1.2 While most operators provided some ETM data, some operators did not provide data and others were not able to provide sufficient ETM data for use in the assessment, either because of limitations with their systems or because they had only recently obtained ETMs. ETM data provide a larger – although incomplete – dataset, but boardings are not always recorded where no revenue is taken and alighting point is not always recorded accurately. The network review, therefore, relied on the use of CPS and cordon counts.

7 Types of interventions

7.1.1 A variety of changes to bus services across Greater Manchester were identified which are described below. In some cases, more than one change may have been made to services such as an improved routing and a better frequency.

7.2 Frequency improvements

7.2.1 For the purpose of assessing service frequencies to achieve the objectives, Table 2 shows the frequency guidelines that were used:

Table 2: Frequency guidelines

Network element	Minimum headways and comments
Radial corridors from Regional Centre	Daytime- 10 mins Evenings/Sundays – 15 mins
Key links between district centres (and other key destinations)	Daytime – 15 mins Evenings/Sundays – 30 mins
Key local urban services	Daytime – 15 mins Evenings/Sundays – 30 mins
Secondary urban services (usually serving areas with lower population density or serving specific groups of residents who may find it difficult to reach higher frequency routes)	Daytime – 60 mins Evening/Sundays – subject to demand

7.2.2 The proposed changes provided better co-ordination of services on shared sections of route, an increase in evening and Sunday services, and some improvements to daytime frequencies.

7.3 Network simplification

7.3.1 The potential for simplifying the network is greatest in locations with more than one operator running commercial services, particularly where these are interspersed with daytime services run with subsidised support. The review of services in these areas, such as Wythenshawe, sought to consolidate the links provided into fewer services with improved frequencies where appropriate. At a Greater Manchester level this resulted in the number of general service route numbers reducing.

7.4 Improved integration with rail and Metrolink services

7.4.1 The extent to which bus services integrate with rail and Metrolink services varies significantly across Greater Manchester. Generally, where new Metrolink lines have commenced operation, few changes have been made to parallel bus services resulting in duplication and a lack of co-ordination.

Changes were identified to improve coordinated provision between bus and Metrolink in selected locations with some reinvestment of resource to strengthen service frequencies in adjacent areas with poor access to Metrolink stops. In other locations, reviews of local bus services identified opportunities to improve the scope for interchanging between bus and Metrolink or rail services.

7.5 More direct bus services

- 7.5.1 Some areas of Greater Manchester are relatively distant from Metrolink or rail services and connectivity to the Regional Centre is relatively poor. In some instances, opportunities exist to improve interchange with fixed track services but, in some circumstances, connectivity was addressed by making services more direct or through the introduction of express services, particularly during the peak periods.

7.6 Strengthened orbital services

- 7.6.1 Whilst radial services play a key role in meeting demand for journeys into the Regional Centre and district centres, journey to work patterns have become complex and dispersed due to the geographic distribution of residential areas and employment sites which is linked with the growth in car travel over recent decades. Whilst there are some high frequency orbital bus services in Greater Manchester, other orbital services are relatively infrequent and the pattern of services has not evolved significantly in response to changing travel patterns and the growth of non-city centre areas of employment such as the universities, Salford Quays and Central Park.
- 7.6.2 The review of orbital services sought to reduce the number of individual services and strengthen frequencies, thereby making interchange with radial services a more attractive proposition to users. It also sought to improve reliability by mitigating the delays that can result from longer services having to cross numerous radial corridors. Opportunities were also explored to use orbital services to strengthen selected sections of radial routes where appropriate.

7.7 Rationalisation of excess capacity

- 7.7.1 The analysis of CPS data and cordon data on the corridors provided insight into the patronage characteristics and loading profiles from which analysis against supply was undertaken. This demonstrated that services could be rationalised and service headways be better co-ordinated to free up resources for re-use elsewhere on the network.

8 Review of the proposed changes

- 8.1.1 Following the identification of the proposed changes for franchising a review of each was undertaken to determine those that would potentially be possible to deliver under different partnership options.
- 8.1.2 The process of categorising changes involved making judgements about the expected commercial responses of operators based on experience of their previous network changes in Greater Manchester. The following criteria were used which are listed in no particular order of priority or weighting:

Table 3: Criteria for Categorising Proposed Changes

Criterion	Comments
The number of commercial operators running services within a proposed change.	Commercial operation by multiple operators would have a bearing on the nature and ease of negotiations. The more operators that are involved, the more difficult it is to reach an agreement under any partnership.
Requirement for agreement between different operators to deliver the proposed changes.	This would be where the proposed changes would require an operator to accept a significant reduction in their market share in an area. The greater the market share change the more difficult it will be for an operator to agree to the proposed change under any partnership.
Extent of direct competition between incumbent operators	Where operators are in direct competition it will be more difficult to reach an agreement under any partnership than where direct competition does not exist.
Impact on revenue, patronage and margin for the affected operators	There are greater revenue and patronage risks for the bus operators where proposals involve changes to the existing network links, introduce new destinations and have significant changes to service frequencies. This will make it more difficult to reach an agreement under any partnership.
Level of existing supported service mileage (particularly daytime)	The operation of a significant proportion of daytime services on a supported service would make it easier to reach a partnership agreement. This is because TfGM already controls the specification of supported services, but it is subject to TfGM's funding constraints.
Interface with fixed-track modes	In selected areas of Greater Manchester, the bus network competes with the fixed track modes, particularly Metrolink. If the bus operators are unwilling to change this stance it will make achieving these changes more difficult under any partnership.
Potential to implement changes with resource savings.	If all resource savings have to be re-invested elsewhere in the network, rather than the operators being able to take some of the savings this is likely to make the changes more difficult to achieve under any partnership.

- 8.1.3 Using the criteria above, each proposed change was placed into one of the following categories, bearing in mind that the partnership could have different levels of ambition:

- Where an entire proposed change could potentially be delivered through a partnership without requiring extensive trading off between operators);
- Where some parts of the proposed change could potentially be delivered without extensive trade-offs but would be more difficult to achieve under a partnership; and
- Where the proposed changes would be extremely unlikely to be delivered under partnership.

8.1.4 Examples of the proposed interventions for franchising are shown in the Appendix linked to their respective network planning principle.

9 Discussions with bus operators regarding the proposed partnership option

9.1.1 Partnership discussions on the network with bus operators commenced in early 2018 with major operators represented and Greater Manchester Bus Operators Association (later renamed OneBus) representing their other members. This included work to determine how network reviews would be undertaken through a partnership-based approach using a sample area.

9.1.2 A working group was set-up to discuss what changes would be possible using the same network planning principles set out above. The group held around 10 meetings trying to jointly develop proposals between TfGM and the bus operators, but could not reach agreement on any changes required for the initial area. They did, however, develop a methodology that is now being tested on a second area in Greater Manchester. As a “Proof of Concept” exercise, this involves TfGM leading the analysis of an area of the network and developing initial proposals which would then be shared with the wider group involving the bus operators for further development and refinement.

9.1.3 Given the limited outcomes from the partnership network group, it was felt that, for the purposes of modelling the benefits that may be achieved, the categorisation set out in Section 8 had been validated for the Operator Proposed Partnership.

10 Modelling and appraisal

10.1.1 The modelling of the franchised network, the Ambitious Partnership network and the Operator Proposed Partnership network was undertaken using the Greater Manchester Public Transport Route Assignment model which showed generalised cost change for each. The outputs of the model were then input to the Demand and Revenue Model.

- 10.1.2 The modelling of the network is set out in the Economic Case Supporting Paper.
- 10.1.3 Since 2015, when the network was baselined, there have been significant changes to the commercial network in particular due to frequency reductions and the cessation of services. Given these changes, it was necessary to review how the resources that were taken as being capable of being redistributed have changed to date and what they are estimated to be in 2021.
- 10.1.4 The total resources across all services identified as available for redistribution in 2015 were 114 Peak Vehicle Requirement (PVR). These were redistributed as follows:
- 83 were redistributed as PVR elsewhere in the network; and
 - The value equivalent of the remaining 31 PVR was redistributed into enhanced or new daytime, evening and Sunday services, i.e. at other times when additional hours or mileage related costs are incurred, but additional peak vehicle costs are not.
- 10.1.5 The actual level of changes to the bus network since 2015 is reflected in mileage table 3. This shows an overall reduction in mileage, but with an increased market share for the operators other than First Manchester and Stagecoach Manchester.

Table 4: Changes to bus mileage between 2014/15 and 2018/19

Detail by Operator	14/15-15/16	15/16-16/17	16/17-17/18	17/18-18/19
	(May-Mar)	(Apr-Mar)	(Apr-Mar)	(Apr-Jan)*
	(from AS400)	(from EGIS)		
Stagecoach	1.7%	-1.7%	-5.7%	-0.3%
First	-6.1%	-5.2%	-2.3%	-7.2%
Other	-3.0%	1.5%	0.5%	6.7%
Total	-2.4%	-2.3%	-3.0%	-1.2%

**Note – this is part year data only.*

- 10.1.6 To assess the reduction in original resources available for redistribution from the original 114 PVR available in 2015 each of the proposed changes was reviewed to see what actual changes had been made by the operators. This showed equivalent numbers of PVR available for redistribution were 96 as at February 2017 and 61 as at November 2018.

10.1.7 To be prudent an estimate was then made of the level of further reduction in the resources that would be available for redistribution at the start of any franchising implementation. This review took into consideration:

- That the bus market is operating in a position of declining patronage, declining margins and increasing costs. Hence, if the level of these changes has been greater in the area concerned it would be more likely that a service would be subject to further change;
- The Reference Case EBIT target level and mileage reductions (linked to demand) in the overall market. Hence if the level of profitability of a particular operator was lower than the EBIT target it would be more likely that a service would be subject to further change;
- The likelihood that the reductions will not be evenly distributed across Greater Manchester as operators start from different financial positions in terms of costs and current margins and the level of mileage reductions to achieve the same EBIT target could vary significantly;
- The approach of different operators to ongoing competition with other bus operators and the likelihood of the competitive activity continuing;
- The approach of different operators to ongoing competition with Metrolink and the likelihood of the competitive activity continuing; and
- The mileage reductions that have already occurred in these areas since 2015.

10.1.8 Options considered were that there would be no change to those resources, that they would all have disappeared or that they would have reduced, and if so to what extent.

10.1.9 From the 61 PVR still available as at November 2018, it is estimated that 30 PVR will still be available for redistribution in 2021. This is compared to the 114 from the original work. It was, therefore, agreed to use this estimate for the factoring on network benefits in proportion to the original work, meaning that the original network benefits were reduced by 30/114 even though this reduced benefits more than the general service reductions.

10.1.10 The types of areas where it is expected that resource will still be available are:

- Competitive corridors with Metrolink;

- Corridors where operators have been reluctant to reduce services, despite previous demand reductions; and
- Corridors where operators will seek to retain their market share against other bus operators.

10.1.11 The factoring to 2021 was applied to each of the franchising network, the Operator Proposed Partnership network and the Ambitious Partnership network benefits.

10.2 Network inefficiency under franchising and partnership

10.2.1 The benefits reflected the network inefficiencies at one moment in time. TfGM understand that the scale of this inefficiency will vary over time but the underlying causes of the inefficiency in terms of the bus network and the overall transport network remain.

10.2.2 One cause of decreased inefficiency has been the reduction in overall network scale as operators rationalise services. This may have the effect of reducing some competition and making the network become, through an unintended consequence, more efficient. Consequently, TfGM projected a reduction of services into the future which reduced the benefits derived from the franchising and partnership options. The result of this is a conservative estimate compared with the 3% overall efficiency gain estimated by DfT for a franchised network in its impact assessment on the Bus Services Act 2017 (DfT, 2015).

10.2.3 Over the period for which the projections have been made, there are other potential factors that might make the network less efficient. These could include market disruption as new operators take over small parts of the network and potentially adding further complexity. Under franchising, the GMCA would have better capabilities to maintain an efficient network including better integration with other modes.

11 Post Mayoral Decision

11.1.1 In the event that a decision is taken to proceed with any proposed franchising scheme or other options, there will be a need to review and refresh the work on the proposed network changes based on the then current bus network along with a reassessment of demand and travel characteristics in order to develop a detailed proposal for implementation.

11.1.2 There would also need to be a managed approach to the implementation of either franchising or partnership. This would:

- Avoid significant customer confusion or potential service disruption;
- Allow time to gather up-to-date data to validate the proposed changes;
- Allow for where the proposed changes are linked to services that would be in later franchises; or
- Allow for a phased approach to the development of partnership proposals and their implementation across the whole of Greater Manchester.

12 Bibliography

1. DfT (2015). Impact Assessments Bus Services Bill.
2. TfGM (2015). *Transport Statistics Greater Manchester 2014 - Key Centres Section*.

13 Appendix – Illustration of the franchise network with examples of interventions against each network planning principle



