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Dear Caroline

Bus services in London

In May the Mayor sent you our response to the Committee's Report on 'Bus services in London'. In that response TfL made four key commitments. "We will:

- Continue to develop affordable, cost-effective plans to increase capacity where needed.
- Strengthen links with stakeholders, with a new approach to engagement by autumn 2014.
- Build on the report's welcome and strong support for increased bus priority. Engagement will commence with boroughs from autumn 2014.
- Add to the wide range of information we already publish on performance, extending it to journey volumes and occupancy. Update to be provided by December 2014."

To deliver against the four key commitments, the response included an appendix with 17 specific actions. The remainder of this letter provides an update on each of these specific actions.

Review the strategic balance of capacity and demand in preparing for the next issue of the Business Plan

We have reviewed the strategic balance between capacity and demand as part of developing the 2014 Business Plan and as a result have been able to provide extra funding in the period to 2020/21 for additional mileage. This will mean that between 2014/15 and 2020/21 operated mileage will increase by around 5 per cent and passenger journeys are forecast to rise by around 6 per cent, allowing us to meet additional demand. Additionally, the 2014 Business Plan provides £25 million of extra funding for customer-focussed driver training.

The Plan also gives continued support to the £200 million Bus Priority Programme and confirms that 95 per cent of bus stops will be accessible by the end of 2016.

Continue to make the case for overall investment in London's bus network

The 2014 Business Plan puts the bus network at the heart of our strategic plans over the next seven years to 2020/21. London's buses are central to growth and economic development in the Capital. Our case for investment to Central Government, stakeholders and the public will continue to emphasise this.

Publish the number of passenger journeys and the level of bus-kilometres operated on each route

We published data this summer on the TfL website of the number of passenger journeys and the level of bus-kilometres operated for each route for the years 2010/11 to 2013/14. This is provided as a spreadsheet accessible under the heading 'Bus passenger usage data' at https://www.tfl.gov.uk/corporate/publications-and-reports/buses. Data for 2014/15 will be published in summer 2015.

Review whether the new process for estimating passenger alighting points using Oyster card data yields a sufficient sample in terms of network coverage to permit the construction of a robust indicator of 'busyness'

We have reviewed the process for estimating passenger alighting points using Oyster card data and have appended the feasibility report that outlines our findings to this letter.

The inherent limitations of the process for estimating passenger alighting points make it difficult to create a reliable performance indicator of crowding; however work is ongoing to address a number of these limitations. We expect this next stage to take at least a further 12 months to complete.

We are also investigating the potential for using social media to supplement existing methods of determining where there are issues on the network, such as poor reliability or crowding. This includes getting expert advice on ways to extract potentially relevant data.

Replace the current borough engagement programme with a process designed to develop a shared list of development issues from both the borough and the TfL perspective, such as forthcoming planning approvals or potential bus priority schemes

We launched the next stage in developing our engagement on bus service planning and bus priority with local authorities at a Bus Network and Priority Seminar on 8 October. This seminar was attended by over 60 borough members and officers from all 33 London boroughs as well as representatives from local authorities that border London. Our new approach was well received based on feedback we have had from borough colleagues.

The main focus of this development is a series of strategic meetings with each London borough (and local authorities that border London). These meetings will provide an additional opportunity for senior local authority officers and cabinet members to pass on intelligence about developing issues within their borough, including land use developments, the outlook for education and healthcare, and other borough initiatives. Senior representatives from TfL will attend. The meetings should thus be a useful way for us and the boroughs to mutually consider how buses can best support such change in ways that are worthwhile, affordable and sustainable. Equally it will also be an opportunity to discuss ways that the local authorities can use their powers (e.g. in development control or on their highways) to assist in maintaining and developing what is one of the most extensive bus networks in the world.

These meetings will complement the existing Public Transport Liaison Meetings which most boroughs hold, and which will continue to have a wider role in discussing all public transport issues.

We will also continue to formally consult on all proposals to change the bus network. All consultations to bus services can be found at https://consultations.tfl.gov.uk/. We will continue to notify local authorities and other key stakeholders by email about any service change that directly affects them. Where the proposal involves a significant change in routeing, serving new roads or the removal of a service, the consultations will continue to be promoted widely using a variety of channels, such as emails, notices at bus stops, leaflet drops and public drop in sessions.

We wrote to all local authorities on 24 November setting out the new approach and will contact them all over the next few weeks to arrange a date and time for their strategic meeting; the first two meetings have already taken place with Croydon and Hackney and we will aim to complete the first round of these meetings with every local authority by October 2015.

The new meetings will be a focus for discussion and engagement on bus service planning and engagement. At the same time all stakeholders will still be able, at any time, to raise any issue or concern with the TfL Consultation Team or with their contact from the Borough Engagement Team.

Introduce a forum with London TravelWatch where aspirations for the bus network can be discussed alongside feedback from the borough meetings

We introduced the forum meetings with London TravelWatch on 10 April and now plan to continue these at roughly quarterly rather than six monthly intervals. The feedback from the first two meetings has been very positive.

Publish a statement on the work areas which need to be prioritised overall

We indicated in our response in May that we would publish a statement on the work areas to be prioritised in summer 2015.

We now plan to publish this in autumn 2015 to coincide with the completion of the strategic meetings with the boroughs by October 2015 so that we can incorporate the outcome of those discussions in the statement. We will then keep this statement under review as discussions develop with the boroughs and other key stakeholders over subsequent months and years.

Continue to participate fully in all of the active working groups planning health service reconfigurations. Ensure that each reconfiguration project is aware of the scope of data required for consideration of changes to public transport services

We held a workshop on healthcare reconfiguration with colleagues from the NHS on 3 November 2014. Healthcare reconfigurations are happening across London and experience has shown that transport is an important consideration in this process for patients, visitors and NHS staff. The purpose of the workshop was to give NHS colleagues up to date information on how TfL can help decision-makers who are dealing with the transport impacts of healthcare reconfiguration. The workshop was well attended by 30 participants across London NHS practitioners, Trusts and Clinical Commissioning Groups (CCGs). Feedback from the workshop will help shape future engagement events with our NHS colleagues.

Consider the value of presenting adjustments for bus network capital investment and revenue foregone in relevant publications. Determine whether it is possible to present the information in a way that is comparable with rail and other modes

We have included a table on Bus Subsidy in the 2014 Business Plan (Table 9 on page 79) which separates the bus operators' capital investment from general operating expenditure, more akin to the way financial information is presented in the rail modes. This also adjusts for the revenue forgone for passengers qualifying for free or subsidised travel under TfL schemes. This shows that bus revenue (adjusted for all concessionary travel) more than covers operational expenditure (i.e. adjusted for capital investment) throughout all the years of the Business Plan. We will investigate the appropriateness of producing this table for other modes in future Business Plans.

Publish the current gross cost per passenger kilometre for the bus network in a suitable document, for example the Annual Report or the Budget document

The Committee's report used total 2012/13 gross operating expenditure per passenger kilometre to compare the cost effectiveness of TfL's modes. This includes all operating expenditure, but excludes capital purchases. Income is also excluded as Mayoral policy means that buses carry more passengers on concessionary fares than the other modes. Therefore using gross operating cost excludes the misleading effect of concessionary travel. The table below shows this data updated for 2013/14.

We will publish the latest gross cost per passenger kilometre, for all modes, in the 2015/16 Budget document and in each year thereafter.

Gross expenditure of each mode in 2013/14			
2013/14	**Passenger kilometres (millions)**	**Gross expenditure (£m)**	**Gross expenditure per passenger (£)**
London Buses	8,420	2051.4	0.24
London Underground	10,423	2541.6	0.24
Docklands Light Railway (DLR)	537	152.5	0.28
London Trams	162	38.0	0.23
London Overground	840	231.0	0.27
All above modes	20,383	5014.5	0.25

Find new ways to meet the needs of part-time workers with a view to introducing a part-time Travelcard

The Mayor announced on 11 November plans, from January 2015, to reduce the daily cap for 'Pay As You Go' (PAYG) Oyster card and contactless payment card users to become one fifth of the cost of a 7 Day Travelcard to Zone 1. This will produce a much fairer commuting cost for many part-time workers and will benefit those with unpredictable working patterns. We estimate that over 600,000 customers will pay lower fares over the course of a typical week.

Commence engagement with boroughs to present analysis and seek views on how the bus priority funding should be allocated. This will then be followed by wider engagement with all other stakeholders

We commenced stakeholder engagement on the Bus Priority Programme in June and July with high level presentations to the Local Government Technical Officers Group (LoTAG), London TravelWatch and the five Sub-Regional Panels. Bus priority was also a key part of the Bus Network and Priority Seminar we held with local authorities on 8 October. Individual borough engagement on potential bus priority schemes started in August.

So far we have visited 28 boroughs to discuss opportunities for new bus priority and should have visited the remaining 5 boroughs before the end of the year.

Consider expansion of TfL staff resource dedicated to bus priority as part of our wider work to ensure the efficient and timely delivery of the Mayor's roads programme

We have increased the number of staff dedicated to developing bus priority schemes and have also put in place a governance process of senior staff that is meeting monthly to progress the Bus Priority Programme.

Bring the entire London bus fleet up to at least Euro 4 engine emission standard for oxides of nitrogen (NOx) and particulate matter (PM)

We had just over 3,400 Euro II and Euro III buses in the fleet in April 2013 and by the end of March 2015 this number will have reduced to approximately 1,000 unmodified Euro III buses following the retrofit of 1,400 buses with filters to remove NOx and the withdrawal of over 1,000 vehicles. We are on course to have withdrawn or retrofitted all the remaining Euro III buses by the end of 2015.

Publish details of the fuel consumption of the New Routemaster compared to the conventional diesel buses that they replace

We published details of the fuel economy of the New Routemasters (NRMs) on 2 October. This showed the results for the first six routes which use NRMs and indicated a significant increase in the average miles per gallon (MPG) of NRMs compared with the vehicles previously used:

- Route 11 - from 4.7 MPG to 7.4 MPG (57 per cent increase);
- Routes 24 and 390 (combined) - from 5.4 MPG to 7.4 MPG (37 per cent increase);
- Route 9 – from 3.9 MPG to 6.2 MPG (59 per cent increase);
- Route 148 – from 5 MPG to 6.9 MPG (38 per cent increase);
- Route 10 – from 4.4 MPG to 6.5 MPG (48 per cent increase).

Introduce 1,700 hybrid buses in service, making up broadly 20 per cent of the bus fleet

We now have over 1,000 hybrid buses in the bus fleet and, with orders already placed, are on course to have over 1,250 in service by the end of March 2015. This will increase to 1,700 by 2016 and we expect to have over 3,250 hybrid buses in the London bus fleet by the time the proposed Ultra Low Emission Zone (ULEZ) is introduced in 2020.

Trial wireless charging infrastructure and range-extended diesel-electric hybrid double-deck buses

We are part of the EUs ZeEUS (Zero Emission Urban Bus System) project which is testing innovative electric bus technologies with different charging infrastructure solutions in eight demonstration sites across six European countries.

In London our trial is progressing well and has seen a number of key milestones being fully met. Contracts have been signed with Alexander Dennis (ADL) for the supply of three range-extended diesel-electric hybrid double-deck buses with wireless charging capabilities. The first specially adapted chassis is due to be completed during March 2015, with the first bus being completed during July/August.

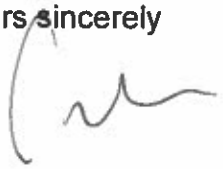
ADL will also lead a consortium of several partners to supply and install the wireless ground charging infrastructure and monitoring equipment. Route 69, operating between Canning Town and Walthamstow, is the selected route on which the two year technology demonstration trial is to be conducted.

We are also preparing for the proposed Ultra Low Emission Zone (ULEZ) which would require zero-emission at tailpipe single deck buses in central London. The eight pure electric buses we currently have on four routes (312, 507, 521 and H98) are helping us to establish how the technology can be cost effectively and reliably introduced more widely. We are specifying an option for electric vehicles in some tenders for single deck routes which we will evaluate against options for Euro VI diesel vehicles ahead of the first tender for routes that enter the ULEZ.

Conclusion

In conclusion, I hope that you will agree that TfL has made considerable progress in answering the issues your Committee raised in its report. Leon Daniels and his team would also be happy to meet you and/or your Committee early in the New Year to answer any questions you may have about the progress we have made.

Yours sincerely



Sir Peter Hendy CBE

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Appendix: Report on the feasibility of using Oyster data to measure bus loadings

Introduction

Monitoring usage is a critical element of bus service planning. Proposals for network changes are developed in response to strategic challenges, land use development, and aspirations and suggestions from passengers and stakeholders by analysis of survey data, Oyster card boarding data, and stakeholder correspondence. Service changes are made regularly to ensure the network is continuously updated to reflect changes in travel demand.

The increase in funding in the 2014 Business Plan has enabled a higher growth in operated mileage of 5 per cent between 2014/15 and 2020/21. This additional service will be targeted at the busiest parts of the network to best cater for the forecast increase in demand (6 per cent to 2020/21).

Further exploitation of Oyster data has the potential to complement the above approach and enhance the network planning process. This note summarises work to date on the feasibility of using the data in this way.

Requirements

Occupancy data is currently sourced through surveys, undertaken on all routes on a rolling basis, with 200 fixed locations and as many ad-hoc locations as are necessary to respond to emerging issues.

Oyster data has not been used in this way up to now because passengers are not required to 'tap out' on alighting the bus. Therefore we do not know when they get off and hence cannot use this data to measure loads. A fundamental requirement is therefore that we develop a robust process for estimating passenger alighting points.

With this in place, any measure must be capable of identifying bus loadings on individual buses. To allow aggregations and comparisons of crowding between routes with different size buses, some means of providing the information in a consistent manner is required. This is achieved by dividing the occupancy on board by the capacity of the bus to give the loading.

Potential data sources considered

To provide network-wide occupancy data that can be applied to the planning process, data is required consistently over time to enable trend analysis and avoid bias induced by 'spikes' in demand or seasonal impacts. This requires the need for an automatically-generated dataset. Three main sources were considered: vehicle weighing; automatic passenger counting; and using Oyster data.

Vehicle weighing techniques to estimate loadings are used extensively for rail networks, including on 'London Tramlink'. However, investigation into bus-weighing to measure occupancy shows that the technology is less well-proven, particularly in the context of a large, complex network. It would likely require significant additional investment, particularly if a large sample of buses were needed on each route to be measured, and would take a long time to roll out.

Automatic passenger counting uses CCTV cameras and image recognition software, and in some cases equipment at doors to count boardings and alightings. Automatic passenger counting is more obtainable due to the hardware already on board (CCTV cameras). A prototype trial as part of the 'Year of the Bus' has been conducted providing an 'upper deck occupancy' data screen next to the entrance to inform passengers of the number of seats available on the upper deck. The aim is to encourage more passengers to use the upper deck (when possible), thus improving the flow of passengers on board.

The next stage of the trial will expand the number of buses with the screens, evaluate customer feedback, validate the data through surveys, and investigate its potential to provide meaningful occupancy data. The trial will be extended to 21 buses, taking place throughout the first part of 2015. Counting people on the lower deck is much more difficult (the technology works by recognising distinct shapes in specific locations, i.e. bodies on chairs). This will be investigated further as part of the trial.

To tackle the lack of alighting point information in **Oyster data**, a technique which estimates passenger alighting points has been developed. This combines Oyster and iBus data to geographically locate bus boardings and estimate alighting points based on individual passenger journey characteristics (such as interchange and return journeys). Approximately 87 per cent of journeys on the bus network are currently made using Oyster cards on a typical day; destinations can be inferred through this technique for around three quarters of these journeys, though this varies route by route.

Using Oyster data is considered to be the best of the three approaches currently available to infer bus loadings, although the trials of counting using CCTV will continue.

Review

Having selected a preferred technique, analysis of the Oyster-based data has been conducted to determine its accuracy and robustness. Anecdotal evaluations of accuracy have been conducted on a route-by-route basis by comparing output with surveyed data. A more comprehensive, structured evaluation of accuracy will be undertaken once data is available and used on a regular basis. To evaluate how robust the technique is, we have identified areas and times when it is less

successful. School routes, for example, are particularly affected, with the technique able to infer destinations for only half of all journeys. Night routes and routes with hail and ride sections are also adversely affected.

Forensic analysis is possible with this dataset, enabling identification of times and locations with consistently high or very high occupancy that are potentially in need of intervention. Caution must naturally be applied when interpreting output, as routes with high occupancy might not necessarily have crowding or capacity issues. Some routes are consistently busy along their entire length but without any significant crowding issues. While these routes would return high occupancy, another route with crowding issues in one specific location, but low occupancy elsewhere may return a lower overall occupancy rate.

Whilst this technique provides a significant step forward in data availability and regularity, there are a number of limitations which affect its robustness. As previously described only Oyster journeys are included in this technique. Approximately 87 per cent of journeys on the bus network are made using Oyster cards on a typical day (the remaining 13 per cent use contactless payment cards, paper tickets, etc). Plans are in place to extend the technique to include contactless payment cards, but a residual element of around 10% of journeys that cannot be included in this technique due to the non-structured format of the ticketing data will remain for the foreseeable future.

Of all Oyster journeys, the technique is able to infer the likely alighting stop of approximately three quarters of journeys. The network average of destination-inferred journeys is therefore around 60 per cent to 70 per cent of all journeys. Whilst there is some variance of this rate (most notably with school routes and night buses) it is generally consistent across the network. Work is ongoing to develop a method for scaling journeys to take into account both the journeys that cannot be destination-inferred and the non-Oyster journeys. The factor is however unproven at the detailed level required for this calculation.

A further limitation is that data extracted through this technique is not available in real time, taking around four days for post-processing to take place.

The capacity data used in this investigation is the actual capacity of each bus, as defined by the manufacturer. Of particular importance is making sure this data is up to date. Currently the fleet capacity numbers are refreshed on an annual basis. A project to increase the frequency of refresh is underway.

Conclusion

The new technique for estimating passenger alighting points using Oyster and iBus data is a significant step towards automatic loadings data, making possible a range of enhanced and new analyses.

The inherent limitation of this technique is the exclusion of over 30 per cent of passenger journeys, whose destinations cannot be inferred. This makes it difficult to create a reliable performance indicator of crowding. However, work is ongoing to address this limitation. Full automation of the process for estimating alighting points is being implemented and work to use this data alongside bus capacity inputs is underway.

We expect these pieces of work to take around 12 months after which a final conclusion on its use for capacity and performance management will be made.