



Department
for Transport

Bus Services Act 2017: Bus Open Data Consultation Response

Moving Britain Ahead



March 2019

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Executive summary

Introduction

- 1 Over sixty percent of public transport journeys are on buses, yet the availability and quality of information available to passengers when planning their trips, waiting at bus stops, or travelling to their destinations varies considerably across the country.
- 2 Research conducted by Transport Focus, the independent passenger watchdog, has found a strong desire amongst bus passengers for more centralised sources of information about bus times, routes and fares.
- 3 The consultation sought views on how best to deliver this step change in data provision in a timely manner, whilst ensuring that data quality is delivered to the highest standard and data ownership remains with bus operators.
- 4 The Department for Transport was pleased to receive 130 responses to the Bus Open Data consultation. We are grateful to organisations and individuals taking the time to participate.

Overview of consultation findings

- 5 Responses to the consultation provided a rich source of data, opinions and views from a wide range of interested parties and stakeholders from different groups across the bus industry.
- 6 A clear majority of respondents supported a distributed data model and the Department intends to continue to pursue this approach. However, to address concerns about smaller operators ability to host their own data, the Department will offer some hosting.
- 7 Mandating TransXchange¹ was supported by over a third of respondents, whilst over half of respondents were unsure. The reasons stated for uncertainty were, primarily, the limitations of the current version of TransXchange, which will need to be addressed.
- 8 Awareness of the Network-Timetable Exchange data standard (NeTEx), the proposed standard for opening up fares and tickets data, was low amongst respondents. However, there was broad agreement that there is a need for an agreed industry standard and respondents supported a phased approach to its implementation.

¹ TransXchange is the UK nationwide standard for exchanging bus schedules and related data, used primarily for bus service registration and creation of journey planning information.

- 9 Respondents reinforced the importance of providing Real Time Passenger Information (RTPI)², rather than simply Automatic Vehicle Location (AVL)³ information and there was broad agreement that local transport authorities would be well placed to provide real time information. Nevertheless, local transport authorities were also acutely aware of the barriers that they faced in providing real time information - often cost or skills based.
- 10 The two most frequently cited forms of additional data about the operations of bus services that would be useful for bus passengers included accessibility information for both bus stops/stations and also the vehicle as well as vehicle attribute data (Wi-Fi, leather seats, USB compatible sockets). Both forms of accessibility data are in scope for the legislation and so we have actively considered implementation options and whether it is feasible to require operators and/or local authorities to provide this information, however at this stage we feel that this would be too great an implementation burden for bus operators and so have opted to not include accessibility data in the requirements at this time.
- 11 Respondents broadly supported the policy proposal to create a statutory requirement for local transport authorities to be responsible for the maintenance of the National Public Transport Access Nodes (NaPTAN⁴) dataset, covering all bus stops across England. Respondents were also very clear in their view that the quality of NaPTAN data was instrumental to the success of the broader bus open data requirements.
- 12 Respondents clearly indicated that any training and tools must be easily accessible and easy to use and cited training topics that were most important to them as: explanation of the requirements, roles, responsibilities and portal functionality. The top cited requirements included provision of guidance, provision of training and access to software for data creation.
- 13 A third of respondents agreed that data should be open without restrictions on its use and disclosure however bus operators remain of the view that commercial information should be out of scope, in line with the original policy intent. Bus operators frequently cited fair use policies as a measure allowing them to seek recourse where data has been misused. Whilst we have considered the development of a fair use policy, generally this has been met with scepticism during testing and therefore we remain of the view that it would be dissonant with the original policy intent.
- 14 Many respondents highlighted that the quality of data is of fundamental importance and more consideration needs to be given to quality assurance mechanisms. Local transport authorities remain more sceptical of bus operators' ability to quality assure their own data, however, broadly operators and developers agreed that operators should be responsible for the quality assurance of their own data. The inclusion of automatic data validation mechanisms and basic quality reporting was welcomed, however given the strength of opinion for this subject, we are continuing to consider options to incentivise the provision of high quality data.

² Real Time Passenger Information (RTPI): Live information about the arrival of services at bus stops.

³ Automatic Vehicle Location (AVL): Automatic vehicle location is a means for automatically determining and transmitting the geographic location of a vehicle.

⁴ NaPTAN: National Public Transport Access Node dataset which is a GB system for uniquely identifying all points of access to public transport, including bus stops as well as railway stations, coach stations, ferry terminals, airports and taxi ranks.

1. Introduction

Background

- 1.1 The Bus Services Act, which received Royal Assent during April 2017, provided powers for the Secretary of State to make regulations and legislate, through Parliament, to require the provision of information about bus routes and timetables, stopping places, fares and tickets, location information and more broadly the operation of services. Our overall ambition is to improve the information available to bus passengers, making it easier for them to make informed travel decisions based on complete, accurate and timely data.

During the summer of 2018, we consulted on a series of policy proposals which outline how we intend to open data across the bus industry. It was proposed that bus operators be required to provide information on routes, timetables, fares and tickets, and that both bus operators and local transport authorities will be required to provide real time information. Local authorities' obligations also included the management of bus stop data held on the National Public Transport Access Node (NaPTAN) database; a database that covers all points of access to public transport across England.

- 1.2 Alongside creating these obligations, we also shared our intentions to both develop new standards and mandate existing standards to facilitate data publishing; create a central index to reference data; and support bus operators to digitally upskill their staff and, where required, to upgrade their systems and process.
- 1.3 Once the data is open, the technology sector will be able to create end user applications and digital products or services. Bus operators will also, if they wish, be able to provide websites and applications as well as on-board signage and displays. Local transport authorities will also be able to provide real time signage and displays at bus stations and stops, if budgets permit. However, it is not intended that this will be mandated.
- 1.4 During the public consultation, we sought the views of key stakeholders on the policy proposals, to help us determine how best to implement the policy and bring about the required changes. Key stakeholder groups included bus operators, local transport authorities, industry and passenger representative groups, technologists and bus passengers.
- 1.5 The consultation document outlined the aims of the policy, the background to current processes and the principles and proposals for change.

Response formats

- 1.6 The consultation document and supporting information were made available online via GOV.UK. During the consultation, participants were both invited to attend consultation events and/or to read the consultation documents online and then

share their views by either completing an online survey (also available in word format for those requiring alternative formats) or submit written responses by email or on paper. Accessible formats were available to participants, if requested.

- 1.7 During the public consultation, the Department for Transport (DfT), in partnership with the Open Data Institute Leeds (ODI Leeds), delivered four consultation events which took place in Leeds, Milton Keynes, Birmingham and Bristol. Each of the events could host up to fifty attendees and stakeholders were invited from across the wider bus industry. Each of the events were fully subscribed.
- 1.8 The Department for Transport also delivered a communications campaign to support the launch of the consultation, raise awareness amongst the stakeholder community and encourage responses. This included a Ministerial visit, publishing an announcement, putting articles in trade publications, running a Twitter campaign, delivering a series of stakeholder calls and running an email campaign to remind potential participants to read the document and complete the online survey.

Respondents

- 1.9 In total 130 responses were received, consisting of 86 responses to the online survey and 44 responses by email on either an MS Word pro forma or by free text submission.
- 1.10 It is worth noting the Bus Open Data community is a niche community, where many organisations have a small number of individuals involved in processing bus data. This is reflected in the overall response rate to the public consultation.
- 1.11 Respondents were categorized into 8 main groups. The groups reflected the industry sector that respondents belonged to and whether they were producers of data, consumers of data, or fell into both categories.
- 1.12 A table outlining the different respondent groups is provided.









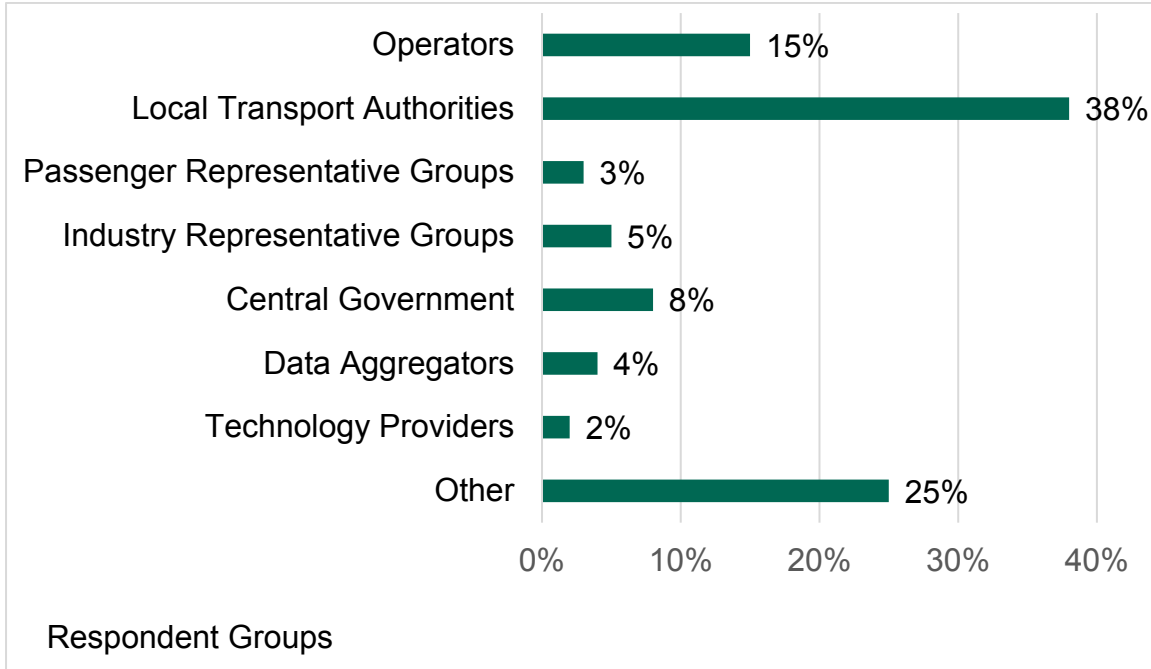
	Bus and Coach Bus operators		Central Government (DVSA)
	Local Transport Authorities and representative groups		Data Aggregators
	Passenger representative groups		Technology Providers
	Industry representative groups		Other (app developers, think tanks, academia, campaigns, travel consultancy)

Table 1: Consultation respondent groups.

- 1.13 The highest proportion of respondents to the public consultation (38%) came from local transport authorities and their representative groups, as seen in Graph 1 below.
- 1.14 A similar trend was observed in terms of attendance at the public consultation events, though attendance figures for consultation workshops are not included in Graph 1.



Graph 1: Consultation respondent numbers by respondent groups.

- 1.15 The bus industry, including both senior managers and data staff from bus and coach operating companies, represented the highest proportion of respondents during the public consultation, in terms of both attendance at the public consultation events and also in terms of formal responses submitted through formal channels.
- 1.16 An additional set of questions was posed to bus operators specifically through the online questionnaire, in order to determine their views in relation to some of the more technical details included in the policy proposals. Operator specific responses are indicated in each section.

Analysis methodology

- 1.17 The consultation document, online survey and pro forma set out a number of questions covering the following topics:
- the distributed data model;
 - route and timetable information;
 - fares and ticketing;
 - real time information;
 - information about the operation of services;
 - information about bus stops;
 - tools and training;

- the use and disclosure of information;
- quality assurance; and
- compliance and enforcement.

1.18 The topics above were selected as it is in these areas where we expect the industry to realise change and, ultimately benefit as a result of the bus open data regulations.

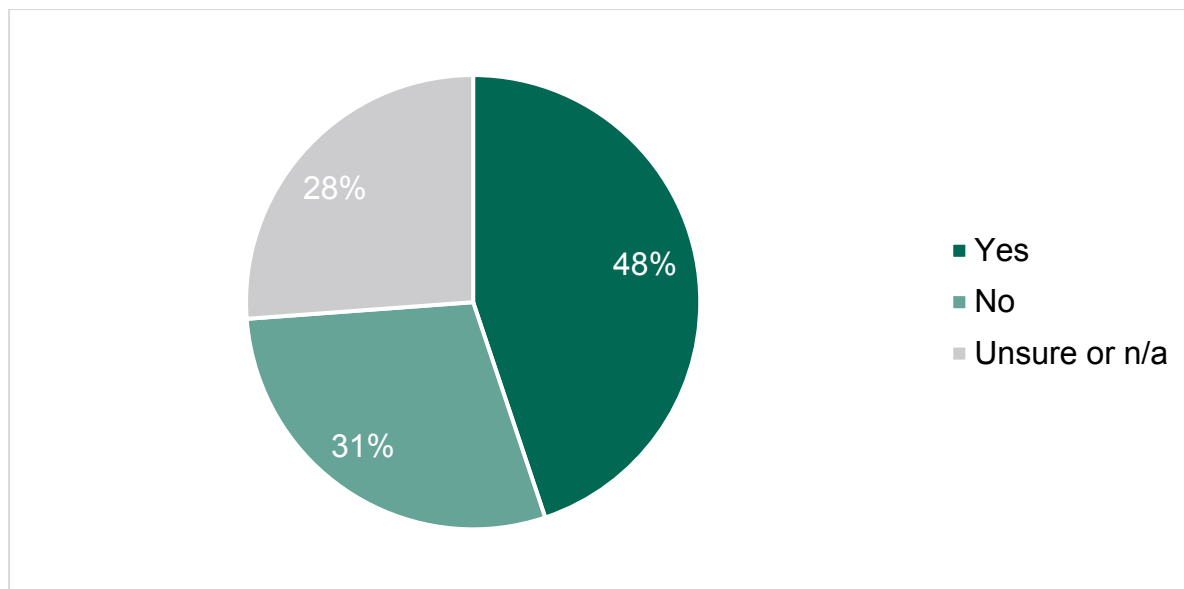
2. Distributed Data Model

Introduction

- 2.1 From November 2017 until February 2018, the Department oversaw a Discovery project to consider a range of models for providing open data across the bus industry. Consequently, we proposed that a distributed model⁵ was the best approach to open data across the bus industry, with bus operators publishing data at source and the Department creating a machine-readable index, where all data could be discovered by application developers or anyone wishing to use the data.
- 2.2 The onus for publishing bus data would remain with bus operators, who would be best placed to preserve the integrity, quality and provenance of that data. Many responses gathered during the public consultation supported this proposal and therefore the Department's intention is for this policy proposal to remain unchanged.
- 2.3 However, some smaller bus operators expressed concerns about their ability to host their own data, which was a key assumption within a distributed data model. Certain additional features will therefore be made available as part of the model, including the offer of hosting data for smaller bus operators.
- 2.4 This will support smaller bus operators to comply with the regulations by removing the burden of establishing data hosting mechanisms.
- 2.5 The majority of respondents supported in principle, the concept of data being published directly from source, and cited the quality and reliability of the data to be of utmost importance. Many indicated that unified standards and formatting must also be required.
- 2.6 *'Adoption of a distributed data model should make it easier for bus passengers to make informed travel decision's* (Abellio UK Bus)
- 2.7 For bus operators the key concerns of a distributed data model related to the responsibility being placed upon them to acquire and maintain software to produce data. Additionally, there were concerns around the responsibility to check and cleanse the data, which is a service currently offered by many local authorities.

⁵ Distributed Data Model: Refers to a model that enables the storage of data across multiple computers which improves performance at end-user worksites by allowing transactions to be processed on many machines, instead of being limited to one.

Response to consultation



Graph 2: Do you believe a distributed data model is the right approach for the bus industry?

Bus operators said:	
Benefits of open data to passengers	<ul style="list-style-type: none"> • Open data will improve information consistency and transparency for passengers and better route planning • Access to applications that have consistent data across a range of providers and tailored to individual needs
The impact of a distributed data model on bus operators	<ul style="list-style-type: none"> • Cost implication of digital upskilling in terms of staff and systems along with dedicated time to ensure data cleanliness, accuracy and timeliness • Minimal impact on larger bus operators • Need to employ and agent • It will increased scrutiny from local authorities
Portal features and functionalities beneficial to data users	<ul style="list-style-type: none"> • Users should be able to access all information • Portal should aim to support a dynamic self-sufficient community • It should have a registration process for users • Should hold geo-spatial data • Facilitate and encourage a way for developers to help bus operators clean their data
Portal features and functionalities beneficial to data publishers	<ul style="list-style-type: none"> • Facility to notify bus operators of delays, road closures and diversions • Dedicated FAQs relating to individual operator and developer • Automated API to avoid bus operators manually updating revised data • Ability to monitor usage of data

Table 2: Key messages from bus operators relating to a distributed data model and suggested features and functionalities for a digital service.

2.8 The main concern of local authorities was that data quality would suffer if local authorities were to be omitted from the data quality assurance process without their function being replaced, as many local authorities currently provide data cleansing services, which are particularly valuable for smaller operators. Local authority-based respondents noted that the proposal did not outline a plan to support operators who felt that they were unable to comply with the policy. There were also concerns about relying on a model in which bus operators were solely responsible for the publication of data, despite potential obstacles such as lack of human resource, lack of digital skills, and financial constraints preventing investment in new software and equipment.

Local Transport Authorities said:	
Benefits of open data to passengers	<ul style="list-style-type: none"> • More information delivery channels
Benefits of an distributed data model	<ul style="list-style-type: none"> • It has the potential to drive improvements in the quality and accuracy of data provided by operators and Local Authorities • Access to more accurate and current information which is beneficial to attracting new customers, also improving the information for current customers
The impact of a distributed data model on bus operators	<ul style="list-style-type: none"> • The Biggest impact will be on smaller operators • Operator will need to acquire appropriate software and have skilled staff to operate it • There is a data security concern of allowing party computer access to live systems
Portal features and functionalities beneficial to data users (for example application developers)	<ul style="list-style-type: none"> • Portal should be simple and logical to use • Enable easy management of user credentials • Enable easy management of user credentials • Semi-automated data validation • Should make data sets available
Portal features and functionalities beneficial to data publishers	<ul style="list-style-type: none"> • Mechanism to avoid users duplicating data supplied by more than one source • Identifying errors in source data • Allow application of additional data from existing data aggregators (such as Traveline) • Include mapping that relates to base data and wider environment • Date stamping of information

Table 3: Key messages from local transport authorities relating to a distributed data model.

2.9 Passenger representative organisations noted that the focus for passengers is reliable, accurate and comprehensive information, irrespective of whether a distributed or centralised model is implemented.

2.10 Industry representative groups supported a single source of data approach. However, they also believed bus operators should have the option of nominating a third party to create and publish data on their behalf.

'We don't agree that operators should always have to create and publish the data themselves, but that they should have the option of a third party doing it on their behalf' (combined response from Traveline and CPT)

2.11 Application developers indicated that a single standardised application programming interface (API)⁶ would allow them to programme once and implement it nationally, as opposed to bus operators creating their own open data APIs, which will result in developers having to redesign several data feeds.

Others said:	
Benefits of open data to passengers	<ul style="list-style-type: none"> • Data aggregators would be enabled to blend and add value to data from different bus operators, to provide a passenger focussed view of travel options (Trapeze Group))
Benefits of an distributed data model	<ul style="list-style-type: none"> • It can allow the generation of new and innovative apps & programs which can aid passengers on making travel decision • Continuity and multimodal improvement
The impact of a distributed data model on bus operators	<ul style="list-style-type: none"> • It will highlight poorly operating services • Better journey planning data will increase bus popularity, usage and therefore also revenue
Portal features and functionalities beneficial to data users	<ul style="list-style-type: none"> • It should have stable URLs that points to the latest data file • Provide automated quality assurance checks • Provide an archive of previous data sets
Portal features and functionalities beneficial to data publishers	<ul style="list-style-type: none"> • Ability to use a local authority or regional consolidator as a bureau service • Direct integration with the operator's own operations system • Automated quality assurance • Data needs to be easy to find • Have an interactive catalogue to allow access to other data sets • Easy and basic upload feature • Stop and infrastructure mapping • API that would allow easy integration of data • Upload quality checking tools • Functionality to guide publishers through the process or link to companies that could assist them

Table 4: Key messages from consultation respondents who were not bus operators or local transport authorities, relating to a distributed data model and suggested features and functionalities for a digital service.

2.12 Where bus operators have specified that data must be shared in a format that can be validated, indexed, searched, aggregated and analysed, it is important to note that the Department intends to specify formats and build in automated validation checks to ensure that data is provided in the correct format and that mandatory fields have been populated.

⁶ Application Programming Interface (API): An API is a software intermediary that allows two applications or systems to talk to one another and share data.

Next Steps

- 2.13 The Department believes that it is important for data to be published as close to source as possible, in line with the distributed model approach, and ensure that bus operators are responsible for the quality of their own data in order to protect the provenance and integrity of that data.
- 2.14 The numerous responses from bus operators, local transport authorities and application developers validated previous messages from the industry calling for support for the bus sector to improve data availability, quality and coverage.
- 2.15 It is the Department's intention to deliver a bus open data digital service supporting data creation, publishing, indexing and quality assuring of data about local bus services upstream by bus operators. Further downstream, the service will allow access to data through a user interface which will offer validation checks, to support downstream innovation and creation of applications, products and services by application developers for existing and prospective bus passengers. This digital service is currently in prototype and has been tested with local authorities, bus operators and application developers across England.
- 2.16 In developing the bus open data digital service, Department Officials are also undertaking work to understand the accessibility challenges, assisted digital requirements and user needs as well as seeking to understand and address data creation and data quality assurance issues with a view to offering appropriate and proportionate solutions as part of the wider service offer.
- 2.17 In response to the suggestion that data population to a central repository should be undertaken in parallel to registration, the Department is currently considering options for aligning registration and bus open data however this will not be included in the regulations at this stage in time.

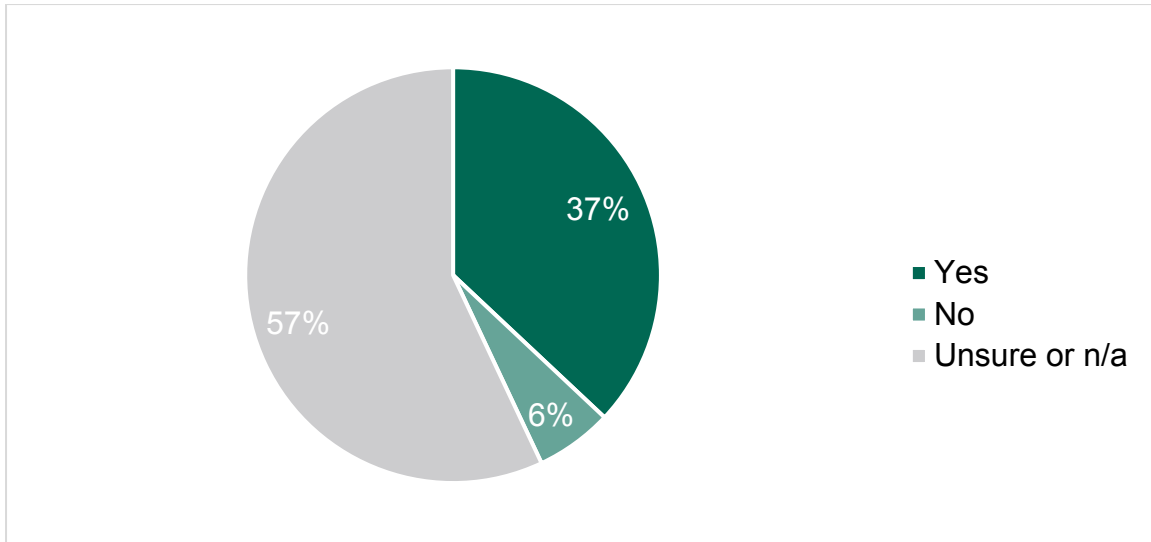
3. Route and timetable information

Introduction

- 3.1 The Bus Services Act (2017) includes provisions for regulations to require bus operators to provide information about their routes and timetables. We have considered how best to achieve open data for routes and timetables with options ranging from using the Electronic Bus Service Registration (EBSR) system to building an entirely new system for the provision of data.
- 3.2 Policy proposals put forward in the consultation document suggested that route and timetable data be published in the TransXchange format using software that is either owned by bus operators, or provided to bus operators by local transport authorities or data aggregators.
- 3.3 The statutory requirement to provide a TransXchange file for each service as a Unique Resource Locator (URL) indexed on the Bus Open Data Digital Service, would sit with bus operators although the function could be performed by local authorities or a third party agent, on behalf of the operator, although the statutory requirement would remain with the bus operator.
- 3.4 It was also proposed that the TransXchange data standard be mandated. The reasons for selecting the TransXchange standard included that it is currently widely adopted across the bus industry as the preferred standard for provision of routes and timetables data, it is compatible with the NaPTAN and NeTEx standards and it is generally regarded as being a well-designed standard that can handle the full complexity of bus data required by passengers to enable effective journey planning.
- 3.5 It was also proposed to decouple bus open data provision and bus service registration due to the significance of the work involved to re-align incentives to encourage greater uptake of the use of Electronic Bus Service Registration (EBSR), which may delay the introduction of a comprehensive bus open dataset.

Responses to consultation

- 3.6 The majority of bus operators and local authorities who responded were aware of TransXchange and confirmed that it is in operation in some areas. Respondents either agreed that TransXchange was the preferred standard for publishing route and timetable data (37%) or stated that they were unsure (57%), with only 6% of respondents disagreeing that mandating TransXchange was the right approach.



Graph 5: Do you think TransXchange is the right approach to opening up routes and timetable data?

- 3.7 The uncertainty regarding TransXchange can be understood in terms of the reservations expressed by some bus operators and local authorities who noted that, in their opinion, the shortcomings which prevents TransXchange from being a single source of data include the inability to provide information about running days, for example, during school holidays, as well as challenges with integration of other services where they operate as through routes (guaranteed connections).

'From our experience of using TransXchange, there are a number of issues that need to be ironed out in order (for it) to work for all bus operators' (Essex County Council)

- 3.8 Some respondents suggested that an optional or additional feature of providing data in the General Transit Feed Specification (GTFS)⁷ standard would be beneficial.

'Whilst not covering 100% of the intricacies of UK bus timetables, GTFS provides a simpler model that is more adaptable to future modes of transport and, as TXC is a UK format, better worldwide interoperability' (Passenger Technology Group Ltd.)

'The DfT should consider opening up the data into another alternative, and less onerous formats, such as GTFS' (21st Century Technology plc)

- 3.9 Bus operators suggested that mandatory data fields required when creating the TransXchange route and timetable file should include operator identification, route identification and description, destination as shown on the bus, all NaPTAN points, timetable showing times for all stops used by each journey, special timetables such as public and school holidays, connection information for split and circular routes and information about vehicle failures.

- 3.10 When asked about the impact on bus operators to publish route and timetable data from 2020, most local authorities and bus operators agreed that small bus operators would be most affected and that it would have a significant cost and workload implication if they are required to provide data directly rather than via an agent or local authority.

⁷ General Transit Feed Specification (GTFS) standard: A common format for exchanging public transportation schedules and can handle fares data. This standard is developed by Google.

- 3.11 To support bus operators to meet requirements, some suggestions included an implementation group consisting of peers, experts and central government, who could advise the industry on matters such as standards and quality assurance.

Next steps

- 3.12 The Bus Open Data policy proposals that bus operators would be required to provide routes and timetable data in the TransXchange format (the current industry standard for publishing route and timetable data), received some support throughout the public consultation and therefore this proposal remains unchanged following the public consultation.
- 3.13 It is however acknowledged that both bus operators and local transport authorities have expressed some reservations about TransXchange illustrating a number of issues that require 'ironing out' before the bus open data regulations come into effect. It is our intention to create a specific TransXchange profile for the Bus Open Data digital service which will specify mandatory and non-mandatory fields to ensure greater consistency across TransXchange files created by bus operators and local transport authorities.
- 3.14 Issues relating to guaranteed connections and school term time dates will not be addressed as part of this work however these issues have been considered. It is our view that these issues could only be effectively addressed in the next version of TransXchange, which would not be released as part of the launch of the Bus Open Data digital service and commencement of route and timetable requirements, during 2020.
- 3.15 The General Transit Specification Format (GTFS) and its ease of use was mentioned several times throughout the public consultation and consequently, as part of the bus open data alpha project, we have considered whether this would be a viable option either in addition to, or instead of TransXchange. However, the original assumption that GTFS is not a rich enough standard in terms of data fields included was supported and it is also incompatible with NaPTAN data and so this option has been discarded as a data publishing standard however we acknowledge some data consumers will wish to forward convert data into the GTFS format to support consumption.
- 3.16 Views were also expressed that the Department should consider moving to NeTEx for the full range of bus open data requirements in the future including routes and timetables data. It is therefore proposed that any future versions of TransXchange potentially be developed as part of move to NeTEx. This will however be considered as part of the Bus Open Data Post Implementation Review in 2023/24.

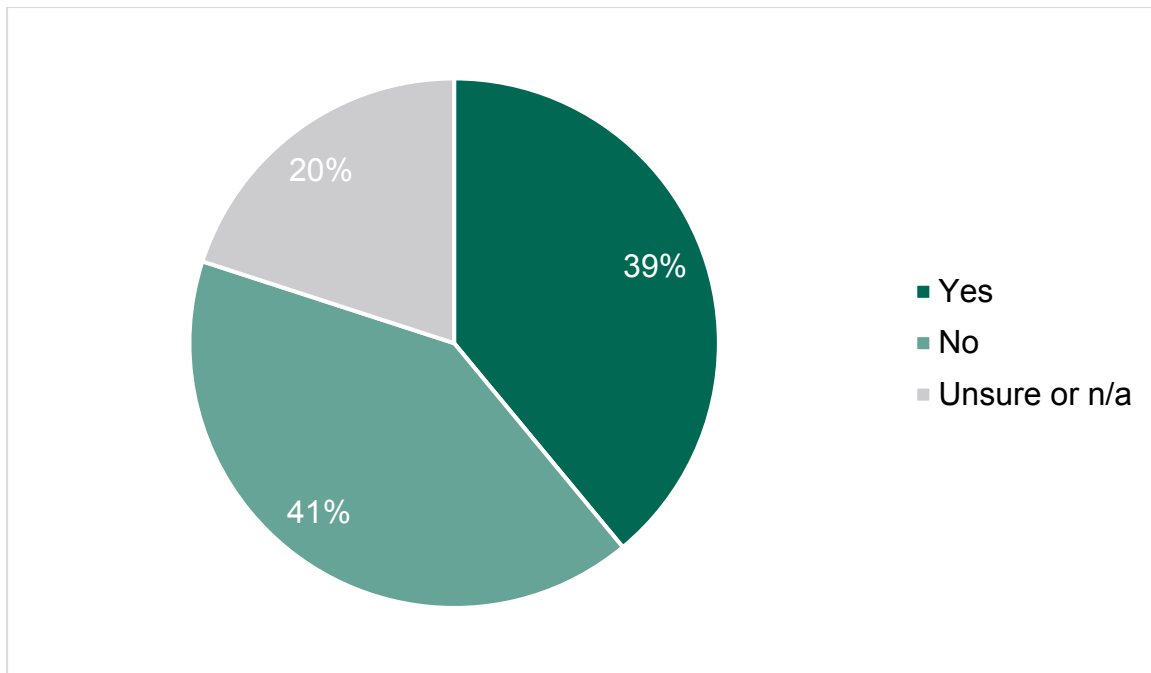
4. Fares and ticketing

Introduction

- 4.1 Publicly available fares information is currently quite limited and often difficult to locate. Outside London, fares and ticketing information is very complex with operators having a variety of fares/tickets available. Currently in the UK, including England, there is no agreed standard for publishing fares and tickets information.
- 4.2 In addition, there is no requirement in the registration process to provide information about fares. However, there is a requirement⁸ for every vehicle, when it is being used in service, to display or have available on request a fare table containing sufficient information to enable any passenger to ascertain the fare for their journey.
- 4.3 Some operators have previously been reluctant to release data voluntarily about fares, citing issues of commercial confidentiality. However, today's consumers expect to be able to make informed choices based on easily available data mainly through websites or apps on smartphones. Recent industry reports confirm that publically available fares information being difficult to locate is a barrier deterring people from using the bus.
- 4.4 The Bus Open Data policy proposals included a proposal to create a UK profile for Network Timetable Exchange (NeTEx) followed by a two-part implementation stage focussing initially on basic fares and tickets (also known as high demand fares and tickets), which would be required by the beginning of 2021 and later followed by a requirement for bus operators to provide complex fares and ticket data by the start of 2023. NeTEx would serve as the single data publishing standard and data would be discoverable in the Bus Open Data digital service by application developers and other data users wishing to innovate with the data.

⁸ Regulation 13(2)(a) of the Public Service Vehicles (Registration of Local Services) Regulations 1986, S.I. No. 1671.

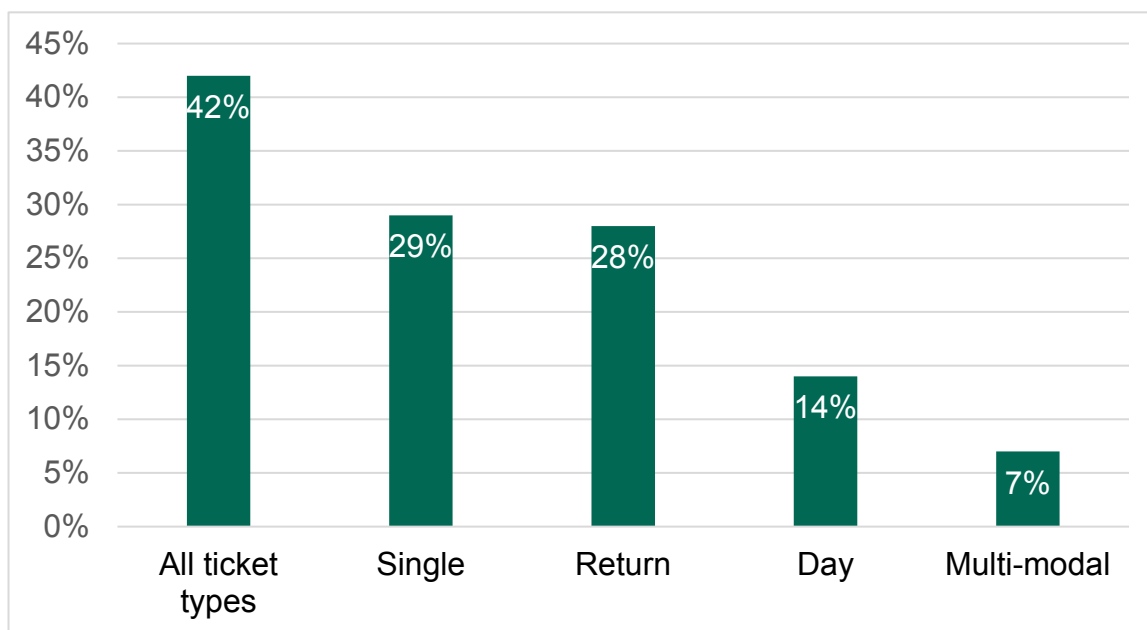
Responses to consultation



Graph 6: Have you heard of NeTEx before today?

- 4.5 Although consultation responses to the question regarding awareness of NeTEx were mixed with the majority of respondents (41%) being unaware of NeTEx as a multi modal transport data standard, there was overall agreement on the complexity of fares and ticket data and a shared recognition of the need for a suitable standard to enable effective data publishing and sharing.
- 4.6 Bus operators and local authorities who were aware of NeTEx suggested that consideration be given to it also incorporating the remaining requirements of the open data regulations and to develop the Bus Open Data Digital Service to develop it into a one-stop data input tool for all elements of bus service operation, allowing bus operators to use a single tool for the registration, amendment and cancellation of services, as well as having the functionality to provide additional data for journey planners and online tools, including fares and tickets data and location data.

4.7 Coach services are not in scope for the bus open data regulations, but in their response, a large operator (National Express) which also operates local bus services noted that they operate as a commercial enterprise and highlighted the complexity of their route planning and fare data, as their data exists in various formats across systems, which would cause compatibility issues with NeTEx.



Graph 7: What types of fares and ticket information would be the most beneficial for customers?

4.8 All fares and ticket information were cited as most beneficial to passengers with key information being the cost of a ticket and method of payment. It was noted that single, return and day tickets remain the most popular.

4.9 Bus operators are of the view that most useful for passengers is basic information about how to pay for fares for example; whether you can buy your ticket in advance, whether you could use contactless payments or whether drivers gave change.

4.10 Bus operators and local transport authorities agreed that a phased approach to openly publishing fares and tickets data, focusing on basic fares and ticket data initially would offer greatest benefit for passengers, who can compare different ticket types across routes and operators.

Next steps

4.11 The Department for Transport welcomes the comments suggesting that NeTEx be the preferred standard for fares and tickets data and also that the scope be extended to include route and timetable data and real-time information.

4.12 The NeTEx fares and tickets project is however, not yet complete and we are of the view that NeTEx as a standard should be phased in beginning with fares and tickets data and only then consider expanding the scope. The Department for Transport will deliver a Post Implementation Review (PIR) to consider the outcomes realised following implementation of the regulations. As part of this review in 2023/24, we will

then consider whether to extend the scope of NeTEx to include the additional requirements of the bus open data regulations.

- 4.13 The NeTEx profile for fares and tickets data, for the bus industry will be developed in full by mid-2019 and implementation of the profile and requirements to publish fares and tickets data will be phased in, starting with basic fares data from early 2021 and then progressing to complex fares from early 2023 to give bus operators time to upgrade their systems and upskill their staff.
- 4.14 The Department for Transport can also confirm that Transport for the North and Traveline will collaborate with the Department for Transport to deliver a fare data build tool for the industry enabling bus operators to quickly and easily create fares data files, in the required NeTEx standard, at low or no cost to the industry.

5. Real time information

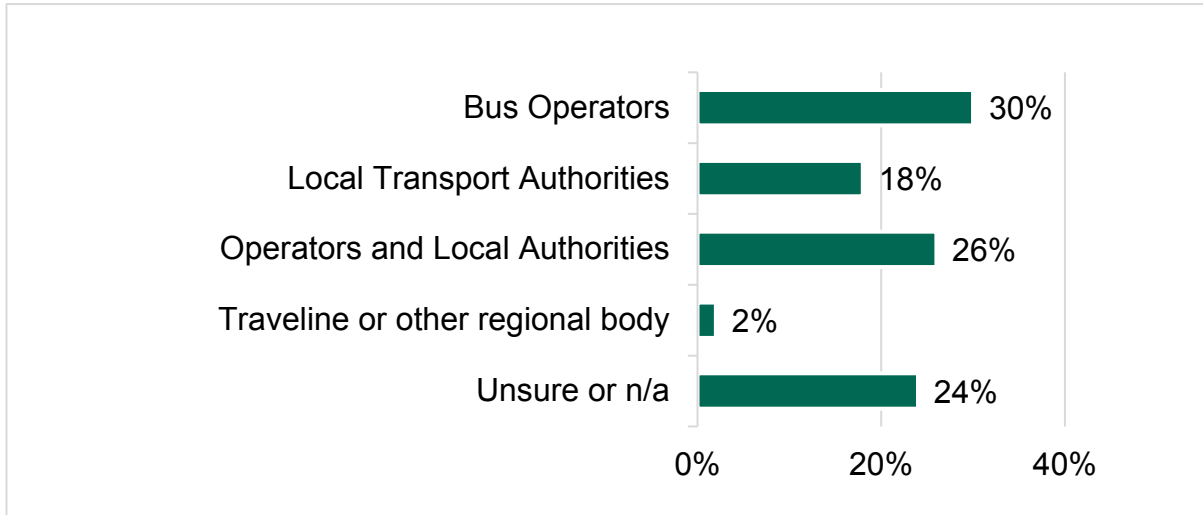
Introduction

- 5.1 The consultation document set out the policy proposal of requiring bus operators to make available real-time information about their service, using the SIRI⁹ Stop Monitoring (SM) standard/format, to the Bus Open Data Digital Service, which represents a long-term ambition for 100% coverage of real time information across England.
- 5.2 The consultation document explained that most real-time information relies on automatic vehicle location (AVL) and Global Positioning Systems (GPS) to provide information to be contextualised within a back-office system, to provide information which is useful for passengers.
- 5.3 The policy proposals set out a requirement on all bus operators to open their vehicle location data to local transport authorities, who would then transform the location data into meaningful real-time information. It was proposed that local transport authorities provide either an API or live data feed for their real-time information to the Bus Open Data Digital Service.

Response to consultation

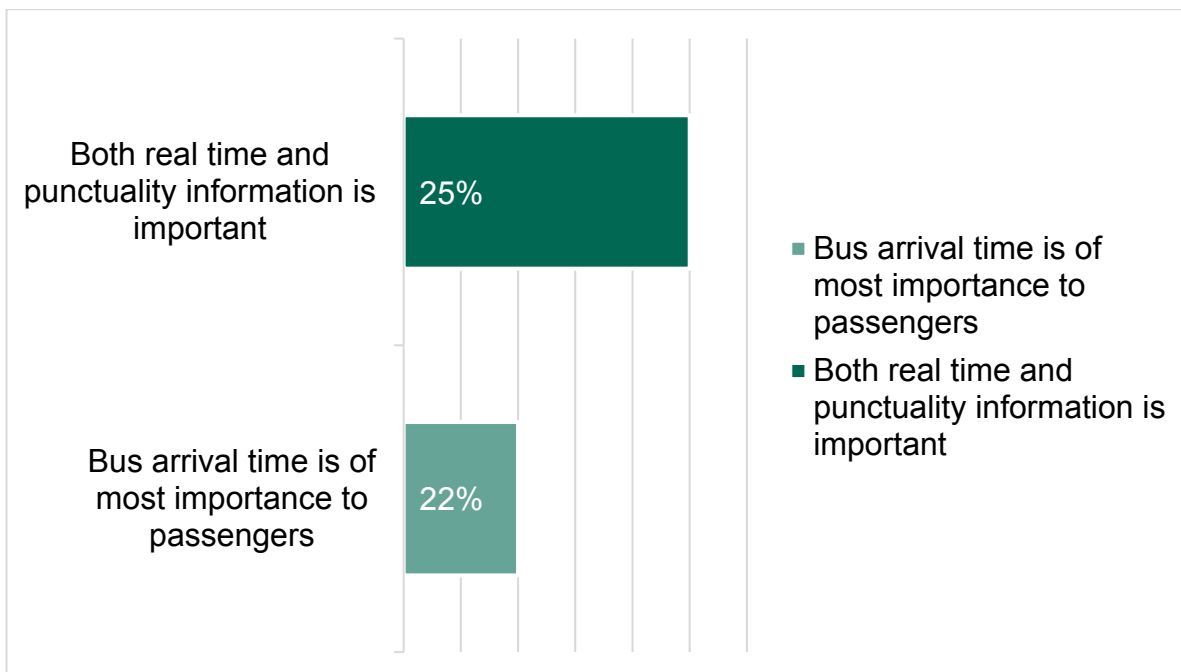
- 5.4 The majority of respondents agreed that real time information will allow passengers to better plan their journeys, or re-plan their journeys if buses are delayed. It was cited that application developers and journey planning solutions can use real time information alongside traffic flow and disruption data to inform passengers and allow them to make timely travel choices.

⁹ Siri: Standard Interface for Real-time Information (SIRI) is a European technical standard for exchanging information about the planned, current or projected performance of real-time public transport operations between different computer systems.



Graph 8: Where do you think the requirement to provide real time information belongs?

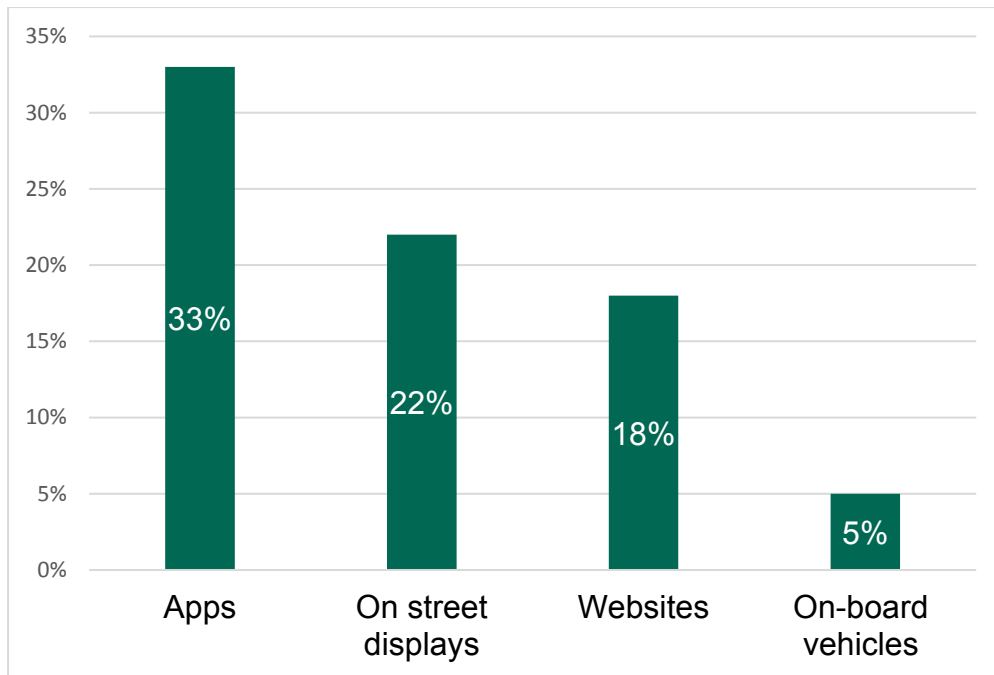
5.5 Local authorities and bus operators indicated that it is important for passengers to know when the next bus will actually arrive, regardless of whether or not it is on time, however, in areas where buses travel longer distances or services operate less frequently, punctuality information is also important for advance planning purposes.



Graph 9: In providing information to bus passengers about the operation of services, do you agree that the focus should be on providing real time information (how many minutes away the bus is) rather than bus punctuality information (how late the bus is)?

5.6 Some bus operators noted that there are areas where real time information systems have already been developed in partnership with local transport authorities through shared investment. In some areas, bus operators have independently invested in making real time information available for their customers.

- 5.7 Other recommendations from respondents, when asked how best to incentivise the industry to move to a position of 100% real time information coverage across England, included an enhancement to existing grants such as the Bus Service Operators Grant (BSOG) for example that incentivised provision of real time passenger information rather than simply automatic vehicle location data alone.
- 5.8 Some bus operators noted a preference for the responsibility for the provision of real time information data to remain with them, but providing information at bus stops should however, remain a local transport authority responsibility. Some bus operators suggested that the responsibility to provide real time information should be a joint venture between bus operators and local transport authorities to avoid a big cost implication.
- 5.9 Some operators noted that to provide the most value to passengers, real time information needs to reflect the entire mainstream network, which puts local transport authorities in the best position to do this. This will also allow local bus operators to conduct punctuality analysis to highlight problems, specifically where there is a lack of bus priority which can cause route delays.
- 'Local authorities are in a better position to consolidate the data from multiple operators and provide RTI for the whole area'* (HCT Group)
- 5.10 It was noted that barriers preventing local transport authorities in providing a real-time information service to bus passengers included: cost in terms of staffing, costs of required infrastructure, set up and ongoing maintenance and lack of expertise. Other barriers cited included not being able to provide their data feeds centrally to a back-office system due to the lack of the required infrastructure and not having the resources to support such a service.
- 5.11 Local transport authorities noted that provision of on-street displays will have a significant cost implication and suggested that the requirements could instead refer to statutory provision of information for use on applications or websites, which is consistent with the policy intent.
- 5.12 To provide real time information to passengers, the main channels cited as preferable included applications, websites and on-street displays. Some local transport authorities suggested that bus operators should provide real time data through either a direct feed or an Application Programming Interface (API) which could share information between bus operators and either local authorities' systems or a national back office processing system.
- 5.13 Many respondents noted the cost implication of having to acquire and maintain the necessary back office processing systems, often required to provide real time information for bus passengers could potentially be passed on to passengers.



Graph 10: How do you think bus operators should provide real time information for bus passengers?

Next steps

- 5.14 Local transport authorities supported the proposal for a statutory requirement to provide real time information to be placed with the local transport authorities however were also acutely aware of the cost burden this would place upon them, at a time when their budgets are under significant pressure.
- 5.15 Throughout the consultation process, the Department for Transport has also become increasingly aware of application developers who believe that opening up Automatic Vehicle Location data alone would enable effective innovation and potentially cost-effective provision of real time information for passengers.
- 5.16 In considering these messages from various user groups, we have revised the original proposal and instead now propose that a requirement be made to bus operators to provide Automatic Vehicle Location (AVL) data only, which would provide the opportunities required for the market to innovate and create applications that could produce Real Time Passenger Information (RTPI) using AVL and timetable information whilst avoiding placing a disproportionate burden on either bus operators or local transport authorities.
- 5.17 As part of the Post Implementation Review (PIR) in 2023/24, we will consider whether the implementation approach has allowed us to deliver the policy intent of passengers across England being consistently able to access Real Time Passenger Information (RTPI) regardless of where they live, work or travel. If at that time, we believe the policy intent has not been realised, we may then reconsider our approach.

6. Information about the operation of the service

Introduction

- 6.1 In the consultation document respondents were given the opportunity to indicate other types of information about the operation of services that could be indexed in the Bus Open Data Digital Service.
- 6.2 Respondents were also asked whether a focus should be on the provision of real time information, rather than punctuality information and the usefulness of the different types of data.

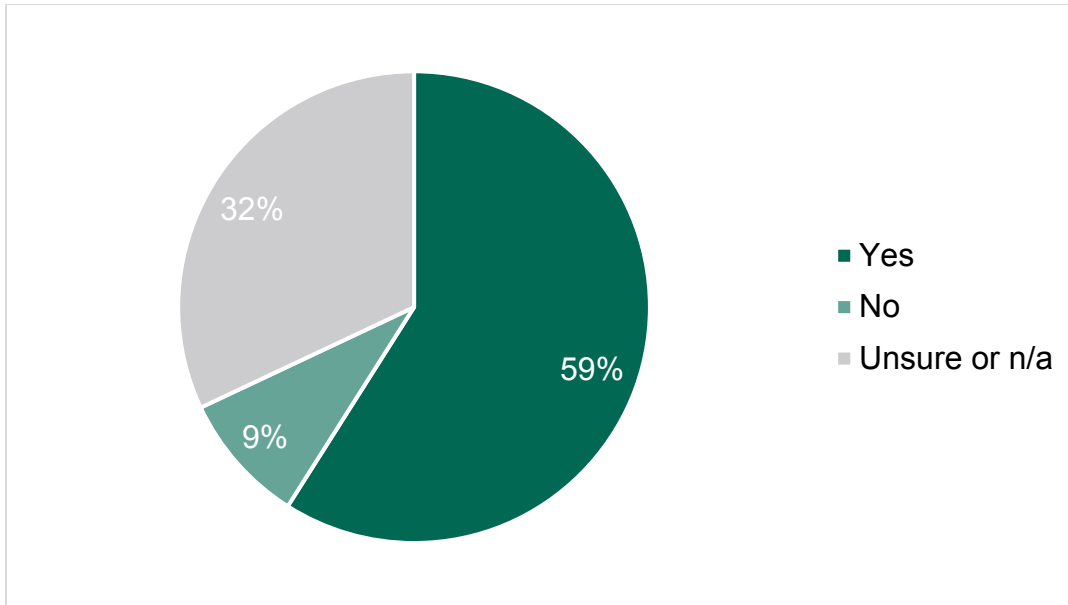
Response to consultation

- 6.3 In this section of the consultation document, respondents were asked to share their views on other types of information about the operation of bus services that might be useful to be provided to the Bus Open Data Digital Service.
- 6.4 Consultation respondents strongly suggested that real time information such as bus arrival times are most valuable to passengers (rather than punctuality data) but that both real time and punctuality information could be important in different contexts, for example when services are more frequent, the arrival data is of more use to passengers however in areas where services operating are less frequent punctuality data has an important role in helping passengers make informed decisions about transport modes that can be relied upon. Graph 11, on the next page, illustrates the overall response rate for this question.
- 6.5 Analysis of the free text comments illustrated that punctuality data is potentially useful for local authorities and data aggregators in helping to pinpoint network issues, optimise routes and data provision in local areas.

'...when I'm at the bus stop I want to know when the next bus will arrive. But in general, I want to know how reliable the service is' (Passenger)

'In areas where buses travel longer distances or operate less frequently, punctuality information is also important for advance planning purposes' (HCT Group)

- 6.6 Respondents noted that other features of a Bus Open Data Digital Service could include the capturing of vehicle accessibility data, such as number of wheelchair spaces, and vehicle attribute data, such as the availability of Wi-Fi, USB and charging points and air conditioning. Other suggestions included the capturing of information about bus stops, such as accessible kerbs, shelters and real time displays.



Graph 11: Do you agree that the focus should be on providing real time information (how many minutes away the bus is) rather than bus punctuality information (how late the bus is)?

- 6.7 Suggestions from application developers about other types of data that might be useful for bus passengers include the ability to publish real time fault information such as broken audio-visual kit on board buses and the ability to track instances, for example when a wheelchair user has been left behind.

Next steps

- 6.8 During the public consultation, the two most frequently cited forms of data in addition to punctuality information that would be useful for bus passengers included accessibility information (vehicles and stops/stations) and vehicle attribute data (Wi-Fi, leather seats, usb compatible sockets).
- 6.9 In the context of local authority responsibility for updating accessibility data, consideration has since been given to include in the secondary legislation, a requirement for bus operators to provide vehicle accessibility data and for local authorities to provide accessibility data for stops and stations (which does currently exist in open formats although requires some updating). The Department has also since investigated whether this is technologically feasible for this data to be provided through the Bus Open Data Digital Service.
- 6.10 Accessibility data is legally, in scope for the secondary legislation, however is not the primary focus of the bus open data regulations and some consideration is required as to how this would be implemented and the additional burden it might place on bus operators and local authorities.
- 6.11 Whilst we have now, following the consultation, discounted the option to legislate for the provision of accessibility data about either vehicles or bus stops/stations, we will fully explore other options such as facilitating a voluntary process for operators and local transport authorities to open up vehicle attribute accessibility data through the Bus Open Data Digital Service and as outlined in the Non-Statutory Guidance which will be published alongside the regulations.

7. Information about bus stops

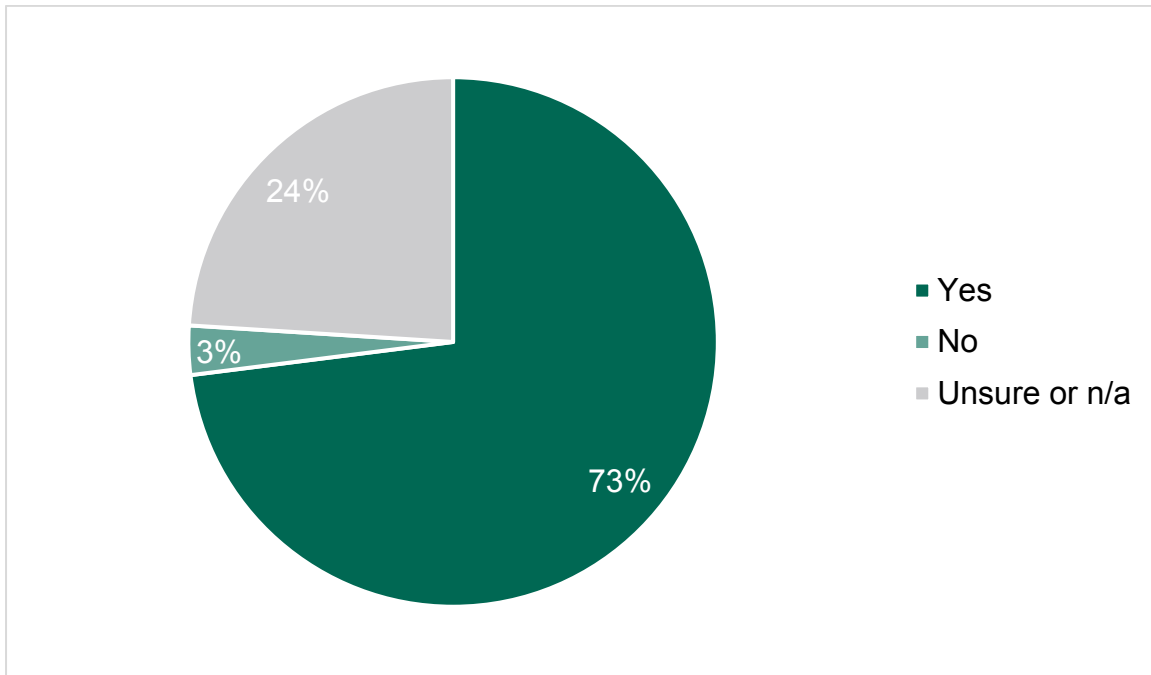
Introduction

- 7.1 The consultation document emphasised the importance of accurate information about bus stops and that the current maintenance of the National Public Transport Access Node (NaPTAN) dataset is performed by local transport authorities on a voluntary basis.
- 7.2 As bus stops and stations are owned and maintained by local authorities, it was proposed that a statutory requirement to maintain the NaPTAN and NPTG¹⁰ datasets be placed on local authorities, for bus data only and that these updates are enabled through the Bus Open Data Digital Service.

Response to consultation

- 7.3 When asked the question during the public consultation, regarding whether local transport authorities should be legally required to maintain data relating to NaPTAN data, the majority of respondents suggested that local transport authorities should be legally required to maintain NaPTAN data (73%). Graph 12 on the following page illustrates the overall response.
- 7.4 It is worth noting that many local transport authorities manage the locations of bus stops along with the facilities associated with them. However, at present, there is no statutory requirement for local authorities to maintain this data. Currently data is maintained on a voluntary basis and consequently there is variability across England regarding the updating, maintenance and resulting quality of NaPTAN data.
- 7.5 Local Transport Authorities broadly agreed that the statutory requirement to maintain NaPTAN data should be placed upon local transport authorities. Further detailed analysis illustrated that both the local transport authority and bus operators overwhelmingly agreed that this requirement should belong to local transport authorities.
'We believe local transport authorities are best placed to update this information as they have the local knowledge' (Bracknell Forest Council)
- 7.6 Nevertheless, local transport authorities were also acutely aware of the main barriers preventing them from maintaining NaPTAN data, citing funding constraints and lack of staff resource amongst other reasons for the current variability across England in the maintenance of NaPTAN data and the resulting quality and accuracy of data.

¹⁰ NPTG: National Public Transport Gazetteer provides a topographic database of towns and settlements in the UK. It provides a common frame of reference for the National Public Access Nodes (NaPTAN) schema and other UK Public Transport Information schemas such as JourneyWeb.



Graph 12: Do you agree that a statutory requirement should be placed upon local transport authorities to maintain the NaPTAN datasets?

- 7.7 Bus operators expressed views that a failure to maintain NaPTAN will compromise the provision of open data and also, separately, next stop announcements and that without a statutory requirement, NaPTAN maintenance will be deprioritised by local transport authorities.
- 7.8 Other respondents suggested that new technologies could be developed to automate NaPTAN maintenance. In fact, it is worth noting that at time of writing the consultation response, the Department for Transport is already aware of application developers developing tools to support quality checking and maintenance of NaPTAN data that will be free to access for local authorities and can support the maintenance of NaPTAN data in a cost effective and dynamic manner.

Next steps

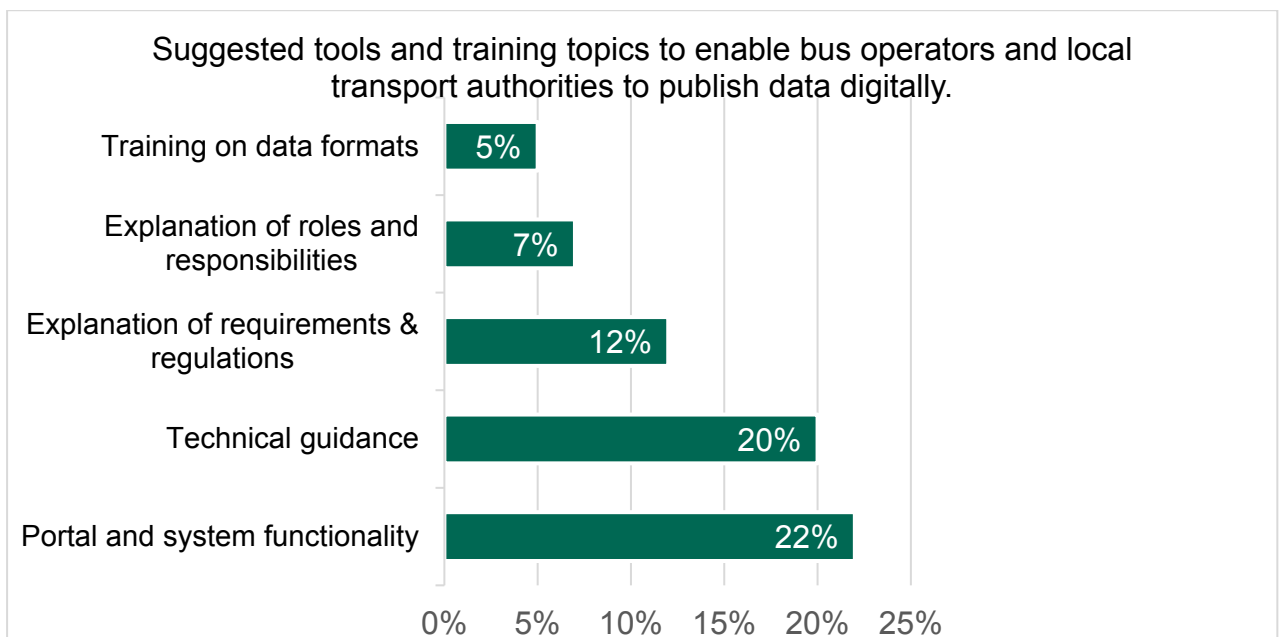
- 7.9 During the public consultation, the policy proposal to create a statutory requirement for local authorities to be responsible for the maintenance of NaPTAN data was broadly accepted by both local transport authorities and bus operators.
- 7.10 Local transport authorities confirmed that such a statutory requirement aligns with their responsibility to maintain bus stops and stations. It is therefore intended that this policy proposal be maintained.
- 7.11 During the beta phase of the project to build the Bus Open Data digital service, the project team will consider required functionality to enable the discovery and maintenance of NaPTAN data via the Bus Open Data Digital Service and the supporting processes for local transport authorities to follow. We will also consider options for improving the quality of NaPTAN data, which we believe to be a pre-condition for the success of the bus open data programme.

8. Tools and Training

Introduction

- 8.1 To meet the requirements as part of the Bus Open Data regulations, operators and local transport authorities providing local and municipal bus services will need to invest in or arrange access to appropriate data creation software to generate the required data files according to the specified standard and create digital and data capabilities within their organisations.
- 8.2 The cost of meeting these requirements will vary by operator, depending on current readiness position including; whether they already have some software capability and can generate some digital data; and available employees and their skills
- 8.3 The policy proposals and primary legislation did not envisage a specific statutory requirement be included in the regulations for the Department for Transport to provide tools and training to support the bus industry to comply with the regulations.
- 8.4 However, we do recognise that the sector may need support in overcoming existing publishing barriers and so have proposed to offer Non Statutory Guidance, tools and training to help operators understand the requirements and how to meet them.

Response to consultation



Graph 13: Suggested tools and training topics to enable bus operators and local transport authorities to publish data digitally.

- 8.5 Respondents indicated overwhelmingly that any training and guidance made available, should have clear and unambiguous explanations and take the form of step by step 'how to' guides.
- 8.6 Suggested topics to be included in training and guidance included a clear explanation for each of the requirements about the roles of bus operators and local transport authorities, how to meet the requirements and technical assistance available especially for smaller bus operators.
- 8.7 Respondents noted support and assistance should be offered and that support will be required in three main areas namely; financially to ensure the software and hardware are obtainable, technical and helpdesk assistance which would include toolkits and guidance on standards, and help with data quality monitoring.
- 8.8 Respondents noted that the Bus Open Data Digital Service should enable easy data input from any personal or public device and should provide real time, interactive help and guidance to the user whilst submitting data.
- 8.9 Local transport authorities noted that frequent and ongoing training will be required on all new data formats and standards. Training should be offered online and in person and in different regional locations. Also noted was that smaller operators will need the most encouragement and training; they may also require assistance on a bureau basis offered by local transport authorities.

Next steps

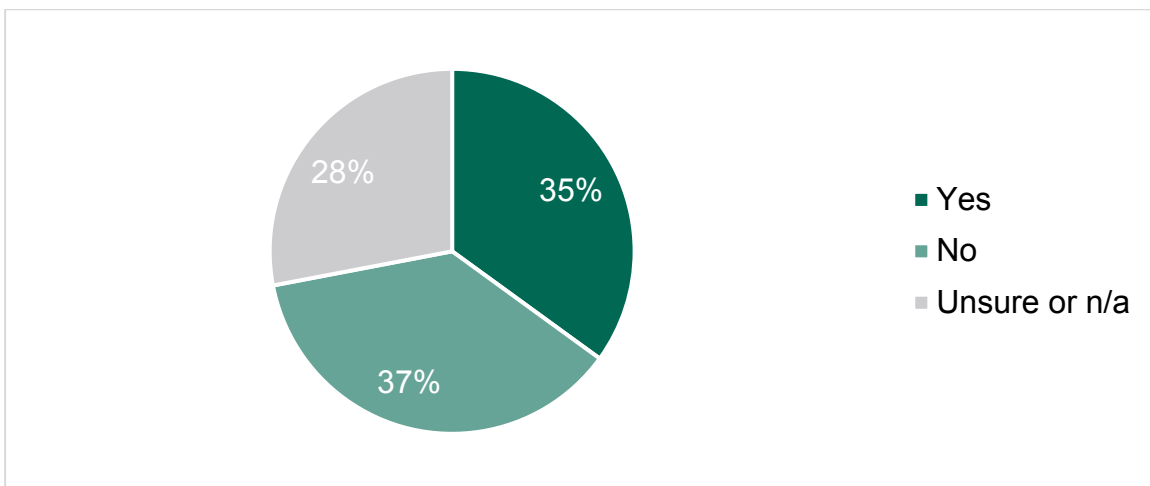
- 8.10 It is intended that both bus operators and local transport authorities will be invited to participate in the private and public beta phases of the project to build the Bus Open Data Digital Service which will enable the Department for Transport to gather useful feedback but will also support the industry to become early adopters of the technology and learn in a practical and supported manner how to use the new system.
- 8.11 The Department for Transport is also working with Transport for the North and Traveline to deliver a fare data build tool to support creation and open publishing of NeTEx data files. Options are being explored for the provision of TransXchange data and will be trialled during the private and public beta phases of the project during 2019. Both sets of software will be made available to the industry at either low or no cost.
- 8.12 Non-statutory guidance will be published alongside the regulations during Summer 2019 and will be updated at key stages of the programme, to align with the requirements for the different data types coming into effect. It is intended that a series of events will be delivered from autumn 2019 to upskill the industry and prepare bus operators and local transport authorities to use the new Bus Open Data Digital Service and publish bus data.

9. Use and Disclosure of Information

Introduction

- 9.1 The policy proposals included in the consultation document proposed that data be made freely available and without restrictions on its use and disclosure, thereby enabling the creation of useful end products, services and applications.
- 9.2 The consultation document did however, also recognise the risk of information being misused and suggested that the Government might restrict the information so that it could primarily be disclosed for the purpose of making information about relevant local bus services available to users of those services.
- 9.3 The Government wants to ensure that third parties or data users can access the information described in the consultation paper, to aid them in developing new innovative journey planning applications and services for passenger use.
- 9.4 Therefore, we outlined our intention to make all journey planning information public to those wishing to use it for the primary purpose of helping passengers plan their journeys more effectively. The original policy intent was to do this without placing restrictions on its use and disclosure.

Response to consultation



Graph 14: Do you agree that open data should only be used for the purposes of making information about relevant local bus services available to bus passengers?

- 9.5 When asked the question whether bus open data should *only* be used for the purposes of making journey planning information available to bus passengers, respondents views were mixed with approximately a third broadly agreeing (35%), a third disagreeing (37%) and a third stating that they were unsure (28%).

- 9.6 In the free text comments, some respondents indicated overall agreement that data should be made freely available and without restrictions on its use and disclosure.
'Open data should not have any restrictions on its use' (application developer)
- 9.7 Bus operators stated that they would expect to see a facility for restrictions on what material is associated with the data, for example advertising. Bus operators further noted their concern that making data available which is not essential for passengers or prospective passengers, could potentially undermine the commercial viability of bus operators by exposing their data and commercially sensitive data to potential or actual competitors.
- 9.8 Bus operators felt strongly that some mechanism should be in place to hold data users to account if outdated information is used about their services and emphasised a need for a requirement that app developers should access live data feeds only.

Next steps

- 9.9 During the public consultation, the Department for Transport restated its position as one requiring bus operators and local transport authorities to only openly publish data that is required for the purposes of journey planning and that commercial data remains out of scope.
- 9.10 As part of the public consultation, it was expressed that the Department for Transport's preferred position was to place no restrictions on use and disclosure, in line with the primary legislation and the intent behind open data.
- 9.11 However, during the consultation, bus operators and local transport authorities did express some concerns and a desire for restrictions to be placed upon use of their data by third party application developers, therefore going forward we will require data consumers to comply with some basic terms and conditions.
- 9.12 These terms and conditions include seeking to acknowledge the source of the data, to accurately represent the data and for static files to include the date the file was created. Furthermore, we have now updated the proposals to include provision for the Secretary of State to restrict access to data where misuse or nefarious use is suspected.
- 9.13 It will also be a requirement for data consumers, to register for an account to access data in The Bus Open Data Digital Service which will in turn, provide a route for traceability and recourse should any significant problems occur.
- 9.14 In 2023/24, the Department for Transport will commence a Post Implementation Review (PIR) to consider whether the policy intent has been realised. As part of the PIR, consideration may be given to changes to the terms and conditions of use at that time, if evidence suggests this would support the original policy intent.

10. Quality Assurance

Introduction

- 10.1 The consultation proposals recommended that the responsibility of data assurance be repositioned with bus operators ultimately making bus operators accountable for the task of providing high quality, up to date and accurate bus open data.
- 10.2 It was proposed, for route and timetable or for fares and tickets data, that the operator must put any new data or changes into the required file format and onto the Bus Open Data Digital Service before the change to the route or fare becomes effective.
- 10.3 During the implementation period, local transport authorities may choose to offer data publishing bureaus which may include support with data assurance activities however, the decision to offer a bureau type service will be a decision for local transport authorities.

Response to consultation

- 10.4 Bus operators suggested that open data tools could include simple checks such as ensuring that bus stops follow in a logical sequence and that times between stops, as well as registered timing points, are realistic.
- 10.5 Overall, respondents cited data quality and consistency as a major concern and some bus operators agreed with the policy proposals of building in validation checks into the functionality of a digital service.
- 10.6 Many respondents suggested that feedback on data inaccuracies is important to enable bus operators to identify errors.
'The portal should provide clear feedback on errors and queries' (Arriva UK Bus)
- 10.7 Bus operators suggested that open data should be subjected to spot checks, possibly by the Office of the Traffic Commissioner, or peer reviews prior to publication.

Next steps

- 10.8 In the original policy proposals, it was stated that as a minimum the Department for Transport would build in automated data validation checks into the Bus Open Data digital service and consider other options for assuring the quality of data provided to the service.
- 10.9 Throughout the consultation, quality assurance was one of the most frequently cited concerns raised by bus operators, local transport authorities and application developers. Consequently the Department for Transport is considering options for

both assuring the quality of data and also helping data publishers to improve the quality of their data over time.

- 10.10 The original policy proposals remain unchanged, with automated data validation checks being built into the bus open data digital service, however it is also our intention to provide complex quality assurance reports to data publishers informing publishers about the quality of the data published and key issues to resolve.

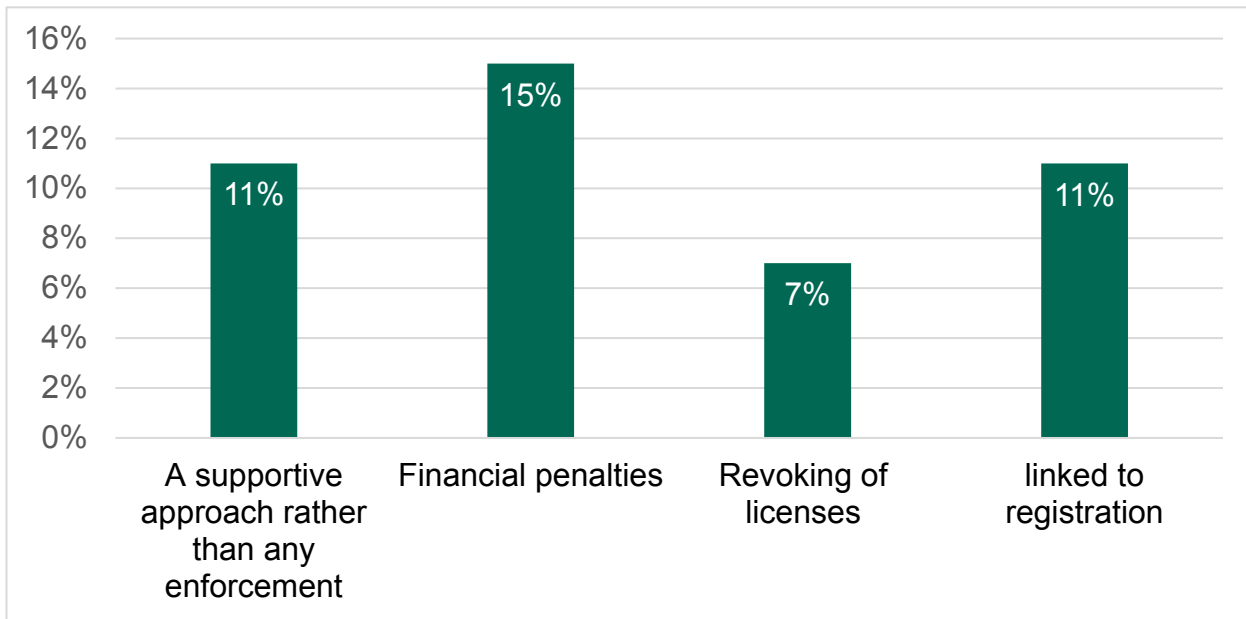
11. Compliance and enforcement

Introduction

- 11.1 In addition to supporting the industry by offering tools and training to make data available, the Department recognises the need to incentivise the industry to publish good quality data, by sharing information that illustrates how bus operators are performing in openly publishing data.
- 11.2 It was recognised in the policy proposals that in some circumstances, enforcement action may be required to ensure operators meet their requirements and that enforcement will remain with the Traffic Commissioners and that failure to comply with these regulations will be dealt with by fines and in the most extreme cases, by the permanent or temporary removal of the operator's licence.

Response to consultation

- 11.3 Bus operators felt that decoupling the provision of open data from Electronic Bus Service Registration (EBSR) would have an impact on data quality. Bus operators also cited that sanctions must be applied fairly
- 11.4 Some respondents suggested that linking open data to EBSR will assist with compliance monitoring and that changing or creating new routes should only be granted once data has been provided digitally.
- 11.5 Some respondents suggested the Department for Transport should be responsible for data assurance and that guidance should be provided for contingency services where bus operators are unable to comply within the two-week deadline.
- 11.6 Local transport authorities did not see themselves as suitably placed to enforce the regulations and suggested that the only suitable location for oversight of the system would be the Office of the Traffic Commissioner (OTC) and Driver and Vehicles Standards Agency (DVSA). Local transport authorities did however, see themselves as ideally placed for quality assurance as they have local knowledge and significant interest in the data.
- 11.7 Some respondents suggested that there was potentially a gap in the enforcement powers, which are largely focused upon bus operators and local transport authorities. The need for a route for recourse against application developers was suggested for example, revoking their access to the portal if they misused an operator's data.



Graph 15: Suggested approaches to ensuring compliance with bus open data requirements.

Next steps

- 11.8 As proposed in the consultation paper and largely supported by consultation respondents, compliance and enforcement activity would remain with the Driver and Vehicles Standards Agency (DVSA) and the Office of the Traffic Commissioner (OTC) who would undertake monitoring and enforcement respectively.
- 11.9 We remain of the view that operators should be supported to comply with the requirements and where an operator can demonstrate an intent to comply, we will work with operators to help them fulfil their duties. Enforcement activity will be focused upon those operators who show no regard for the regulations.
- 11.10 The scope of existing sanctions remains unchanged with the focus largely being placed upon bus operators and sanctions ranging from fines to ordering an operator to compensate passengers. In the most extreme of cases, it can result in the loss of repute and removal of the operators' licence.
- 11.11 Application developers remain out of scope for compliance and enforcement activity. However the regulations will include a provision for the Secretary of State to restrict access to application developers specifically in scenarios associated with data misuse or nefarious use.

Annex A: Glossary of Terms

Application Programming Interface (API): An API is a software intermediary that allows two applications or systems to talk to one another and share data.

Automatic Vehicle Location (AVL): Automatic vehicle location is a means for automatically determining and transmitting the geographic location of a vehicle.

Bus Open Data Regulations: The regulations which we intend to make under section 141A of the Transport Act 2000 which is inserted by section 18 of the Bus Services Act (2017) in order to require the provision of information by operators and to provide related exemptions.

Bus: Except where indicated, refers to a bus providing a local bus service.

Data Aggregator: Data aggregation is a process in which, for the purposes of this document, transport data is collated and presented in a summary form such as national dataset.

Data Feed: This refers to a mechanism for data users to receive updated data from data sources. It is commonly used by real time applications.

Data re-distribution is the process of moving data from one database or site to another for the purposes of meeting business, market or industry needs.

Data User: A data user is a person or organisation that takes open data and uses it to create applications, products or services for consumption by end users or passengers.

Distributed Data Model: Refers to a model that enables the storage of data across multiple computers which improves performance at end-user worksites by allowing transactions to be processed on many machines, instead of being limited to one.

Diversion: A section of route which is not part of the scheduled route registered with the Traffic Commissioner or a local authority.

End User: An end user is a passenger or consumer of open data through applications, products or services offered by data users, usually for the purposes of journey planning (in this document).

General Transit Feed Specification (GTFS) standard: A common format for exchanging public transportation schedules and can handle fares data. This standard is developed by Google.

Local Service: A local service refers to a bus service that uses public service vehicles to carry passengers who pay separate fares over short distances - usually less than 15 miles from the point of boarding.

Metadata: Metadata is a set of data that describes and gives information about other data and can be used for the purposes of discovery and identification.

NaPTAN: National Public Transport Access Node dataset which is a GB system for uniquely identifying all points of access to public transport, including bus stops as well as railway stations, coach stations, ferry terminals, airports and taxi ranks.

NeTEx: The multimodal data standard that can be used to transmit bus information including routes and timetables, fares and tickets and real time information.

NPTG: National Public Transport Gazetteer provides a topographic database of towns and settlements in the UK. It provides a common frame of reference for the National Public Access Nodes (NaPTAN) schema and other UK Public Transport Information schemas such as JourneyWeb.

Open Data: Data that is accessible in a machine readable format and can be used by those who need it to create digital applications, products and services.

Operator: An operator is a person or organisation who runs local bus services.

Public Service Vehicle (PSV): This refers to a bus or coach used by members of the public to travel to and from places on a particular route or in a catchment area.

Real Time Passenger Information (RTPI): Live information about the arrival of services at bus stops.

Siri: Standard Interface for Real-time Information (SIRI) is a European technical standard for exchanging information about the planned, current or projected performance of real-time public transport operations between different computer systems.

Static File: A static file refers to any content that can be delivered to end users without being generated, modified or processed by a data user e.g. images, PDF documents.

Stop or stopping place: A location at which a service is scheduled to call.

TransXchange is the UK nationwide standard for exchanging bus schedules and related data, used primarily for bus service registration and creation of journey planning information

URL: URL refers to Uniform Resource Locator and is used to specify addresses on the World Wide Web.

Annex B: Full list of consultation questions

BOD01: Do you support a distributed data publishing model? Please explain your response?

BOD02: What benefits do you perceive a distributed data publishing model could bring for passengers?

BOD03: What impact would the implementation of a distributed data publishing model have upon:

- a) Larger bus operators**
- b) Small to medium sized operators**
- c) Local transport authorities**
- d) Data aggregators**
- e) Passengers**

BOD04: A distributed data publishing model brings with it a requirement for bus operators to host their own data files. What impact would this have upon you/your business?

BOD05: What features or functionality would help a) data users and b) data publishers to use the Bus Open Data portal?

BOD06: For operators, do you currently provide route and timetable data digitally? If you do, how do you do this?

BOD07: If the answer to the above question is no, what are the barriers that prevent you from providing route and timetable data digitally?

BOD08: For smaller and medium sized operators, what impact would the proposed requirements to create provide route and timetable (using the TransXchange format) have upon your business?

BOD09: What tools or support would assist your business to meet the requirements?

BOD10: What data do you think would need to be mandatory in the TransXchange file schema for it to be useful to passengers for the purposes of journey planning?

BOD11: What types of fares and ticket information would be the most beneficial for passengers? e.g. singles and returns or multi operator etc.

BOD12: Do you provide fare information currently? If yes, what fare information do you provide and how (format)?

BOD13: If you answered no to the above question, what currently prevents you from providing fare and ticket information for passengers?

BOD14: What impact would the need to provide fares data from 2020, have upon your business?

BOD15: What implementation approach would assist you to meet the requirements?

BOD16: What information do you think would be more useful for passengers - the location of the bus (on a map) or how far away the bus is from the bus stop (minutes)?

BOD17: What would be your preferred method for the provision of real time information for bus passengers? Please explain your response.

BOD18: What are the barriers currently preventing local transport authorities or bus operators providing a real time information service to bus passengers?

BOD19: What impact would the need to provide real time information, by 2020, have upon:

- a) Larger bus operators
- b) Small to medium sized operators
- c) Local transport authorities
- d) Data aggregators
- e) Passengers

BOD20: What do you think are the benefits of real time information provision for bus passengers?

BOD21: Do you agree that the focus should be on real time information (how far away the bus is) rather than punctuality information (whether the bus arrived on time)? Please explain your reasons.

BOD22: What other types of information do you think should be included in the Bus Open Data portal? (for example vehicle attributes, accessibility). Please explain your response

BOD24: Do you agree that a statutory requirement should be placed upon local transport authorities to maintain the NaPTAN and NPTG datasets? Please explain your reasons.

BOD25: What are the current reasons for local transport authorities not maintaining NaPTAN data?

BOD26: What topics and content would you like to see included in the guidance? Please explain your answer, providing examples of potential content where appropriate.

BOD27: What tools and training would you require to enable you/your organisation to publish data digitally? Please explain your response.

BOD28: What are the barriers to you/your organisation accessing these tools and training independently?

BOD29: Do you agree that the prescribed information should only be disclosed for the purposes of making information about local bus services available to bus passengers? Please explain your response.

BOD30: Who do you think should be responsible for enforcement if a developer were to misuse an operators data? Please explain your response.

BOD31: For operators, how do you currently quality assure bus data? Please explain your response.

BOD32: If you do not currently quality assure data, what prevents you from doing so? Please explain your response.

BOD33: In the future, how do you think bus open data should be quality assured? Please explain your response.

BOD34: What approaches would you like to see the Department for Transport use to monitor and encourage compliance and ensure all operators are providing required data digitally?

BOD35: What support processes should be in place to assist operators who are struggling to meet the requirements?