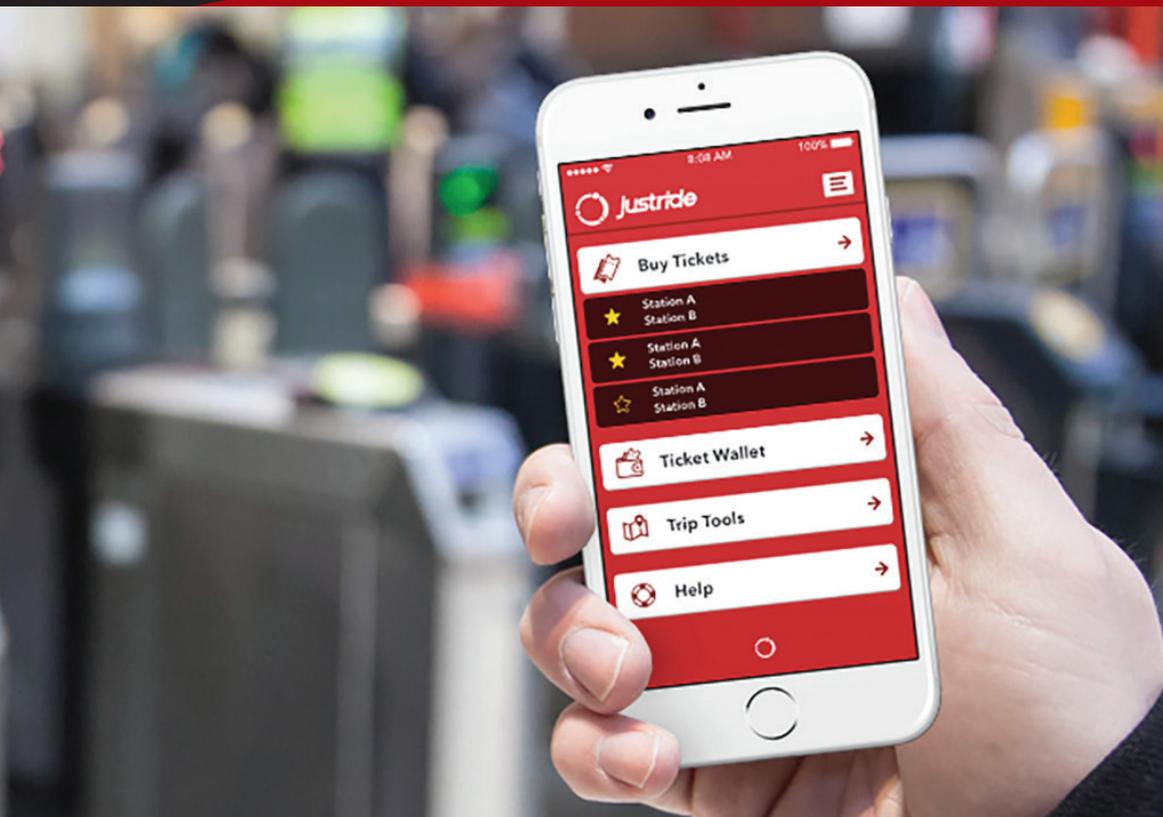

SMART TICKETING FOR THE BUS INDUSTRY

Report on a Transport Times survey in association with Masabi on bus fare collection and ticketing



INTRODUCTION

Smart ticketing, in which a smartcard, mobile phone or contactless payment card replaces the long-established paper ticket, is generally accepted to offer a wide range of benefits for bus passengers, transport operators and transport authorities.

For passengers, there is greater convenience, because there is no longer a need to have the correct change or buy a ticket from the driver. For operators, smart ticketing reduces the need for bus drivers to carry cash, allows a detailed data profile to be built up about the journeys passengers are making, reduces dwell times, and can help reduce the cost of fare collection. Transport and city authorities see the potential for interoperability between different operators and transport modes to encourage more people to use public transport by making it more convenient for passengers.

Transport for London has for many years been seen as a leader in smart ticketing in the UK and internationally since the introduction of the Oyster card. Comparable systems such as the Octopus card in Hong Kong have arguably been even more successful. However, there is a shift taking place due to three key market factors affecting how fare collection can be run:

1. Internet speeds have enabled allowed cloud computing to be adopted;
2. The proliferation of smartphones (in the UK 81% of people have smartphones, which is similar across northern Europe, America, Australia and parts of Asia);
3. The adoption and penetration of contactless credit cards (contactless EMV).

These technology changes have led to TfL and others around the world to shift towards “open loop account based” systems, enabling people to “bring your own ticket” (BYOT). This has two key benefits for transport authorities, operators and passengers;

1. It helps reduce the cost of fare collection, which under Oyster used to account for around 14p in every pound spent.
2. It provides greater convenience for passengers as there is no longer the need to queue to buy a ticket.

This is why TfL and others are looking at new ways of running fare collection, as has been seen with the introduction of EMV payment cards and mobile phones to access the TFL network.

Outside London, where bus services are deregulated, the introduction of smart ticketing is a decision for each individual operator, and they have taken this up on an individual basis. At the same time, over the last few years a proliferation of different technologies has entered the market. Many operators have adopted smartcard systems based on the ITSO specification, which is also used for concessionary travel cards for the over 65s and the disabled in England and Scotland. A number of large operators such as Arriva and National Express have adopted mobile ticketing, whereby tickets can be bought and downloaded to a mobile phone. The ticket can then be displayed on the phone, or as a barcode capable of being scanned by a reader. This has the advantage that tickets can be bought anywhere without the need for infrastructure such as ticket machines; for the user, the whole transaction from end to end requires only a mobile phone. Smartcards, by contrast, often have to be topped up or renewed at ticket machines.

Following the adoption of contactless by TfL, Reading Buses recently launched a system using contactless EMV cards, which avoids the need for the passenger to top up their card at all.

For small operators, the need to acquire a complex back office system for keeping track of transactions has been an inhibiting factor when looking at increasing ticketing options.

Some local authorities have procured back office systems for their area, which bus operators can then subscribe to, removing the need for the company itself to take the risk of procuring its own system. This is no longer the case with the adoption and acceptance of cloud computing, meaning central systems no longer require significant capital investment in server hardware and dedicated back office software.

Interoperability between different systems has been slow to grow, although following pressure from successive transport ministers the major bus operators undertook in 2015 to introduce multi-operator ticketing in major cities by the end of the following year, and this was achieved late last year.

Last year another factor emerged as a driver for the adoption of smart ticketing: congestion. In the report *The Impact of Congestion on Bus Passengers* for bus industry campaign group Greener Journeys, Prof David Begg (Transport Times chief executive) identified a link dating back to the 1960s between increasing bus journey times and declining patronage. Among his recommendations to reverse this trend was to speed up the adoption of smart ticketing, which has a demonstrable effect in reducing dwell times at bus stops, hence speeding up overall journey times.

For this white paper, Transport Times and Masabi collaborated to investigate industry attitudes to smart ticketing. A survey was sent out to the Transport Times's 12,500 strong database, comprising bus operators, transport planners, consultants in the private sector, local authority officers, and politicians and policymakers. The aim was to explore what they saw as the challenges facing the bus industry and its passengers and to what extent smart ticketing was seen as relevant to those challenges.

We sought to investigate attitudes to smart ticketing, including what respondents thought were the advantages of smart ticketing and what systems were preferred. For operators, the survey asked about their plans for smart ticketing, how far they had progressed.

A review of the results follows.

**FOR OPERATORS, SMART TICKETING
REDUCES THE NEED FOR BUS DRIVERS
TO CARRY CASH, ALLOWS A DETAILED
DATA PROFILE TO BE BUILT UP ABOUT
PASSENGERS' JOURNEYS, REDUCES
DWELL TIMES, AND CAN HELP REDUCE
THE COST OF FARE COLLECTION**

SURVEY RESULTS

The survey began by asking respondents what they thought the key challenges facing bus operators were.

Traffic congestion was the top concern, cited by over 80% of respondents, followed by declining patronage (66%), increasing journey/dwell times (48%), and declining revenue (36%). Speed of innovation was cited by 29%.

The cost of fare collection, one of the motivating factors behind TfL's introduction of smart ticketing, was only cited by 16%. Fare evasion and the cost of cash handling gained similar scores at around 14%.

Among transport operators, traffic congestion was cited by 90% as their most serious challenge, nearly 30 points ahead of the second most common response, declining patronage on 61%. Transport planners/consultants and local authority officers held the same view but by less emphatic margins, of 88% to 78% and 82% to 59% respectively.

We looked at how the answers varied for organisations of different sizes, measured by the number of employees, in bands of 0-500; 500-1000; 1000-5000; 5000-10,000; and above 10,000. Smaller organisations, of 1,000 employees or fewer, were more likely to be concerned about increasing journey times and also about the cost of fare collection, the cost of cash handling and fare evasion, which suggests that they would benefit from some form of smart system. However, firms of this size also tended to be more concerned about the speed of innovation than larger firms, suggesting they may be struggling to keep up with developments in the ticketing field.

The general trend in bus patronage since the 1960s has been one of decline, with (apart from London) exceptions in a few cities with particularly good bus provision and where operators and local authorities have been active in encouraging use of buses such as Nottingham, Brighton, and more recently Sheffield, for example.

To check respondents' perceptions we asked whether, in their view, bus passenger numbers were declining. Two-thirds (67%) agreed. The remainder, possibly answering on the basis of their local services rather than buses in general, were split equally between those who disagreed and those who thought numbers were static.

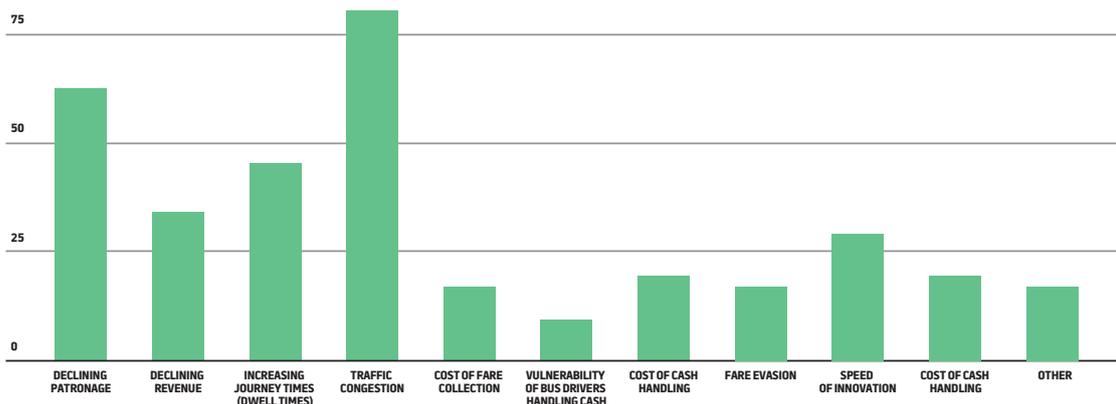
Asked for what they thought were the causes, among those who thought numbers were declining, the most common reason given was "car seen as more convenient" (89%), followed by slow journey times (66%); lack of regular bus services (61%) and "bus route not convenient" (50%). Of those who thought bus patronage was not declining, the most common reasons given were availability of regular bus services (83%); availability of real-time information for passengers (61%); and "bus route convenient" (48%). The next most common reason given was "car is more expensive" (30%).

Lack of availability of smart ticketing was given as a reason for declining passenger numbers by 25%, while 26% considered the availability of smart ticketing as factor in increasing numbers.

Analysing the results by respondents' area of work, bus operators exactly matched the sample as a whole, with 67% agreeing numbers were declining. Transport planners/consultants were more likely to think passenger numbers were declining (83%) and local authority officers less likely to do so (57.1%).

Operators most commonly gave slow journey times as the reason for decline (79%), followed by "car seen as more convenient" (64%). The latter answer was most common among planners/consultants (91%) and local authority officers (96%). 24% of planners/consultants and 18% of local authority officers cited "lack of smart ticketing" as a reason.

WHAT IN YOUR VIEW WHAT ARE CURRENTLY THE KEY CHALLENGES FACING BUS OPERATORS?



Organisations of 1,000 employees or fewer were more likely to think that passenger numbers were declining. They were less likely to think bus routes not being convenient was a factor in this, but more likely to consider a lack of regular services was a cause. Larger operators were more likely to cite competition from other public transport as a factor in declining numbers, while smaller operators appeared more likely to give "car seen as more convenient" as a cause.

Respondents were asked what passengers found most challenging about existing ticketing systems. Lack of interoperability with other operators/modes was the most common response, on 64%, followed by "understanding a complex fare structure" (61%). There is, however, clearly dissatisfaction with the system of buying a ticket on the bus. "Queueing to buy a ticket from the driver when the bus arrives" was cited by 47%, closely followed by "needing the correct change" (41.5%), while "paying with cash" also scored 32%. Conversely, "lack of understanding of smart ticketing" was cited as a challenge by a similar number (35%). Operators were slightly more likely than the sample as a whole to have this view, on 38%. "Carrying multiple fare media" was given as an answer by 32%, reflecting concerns that without coordination different operators could introduce a range of non-compatible smart ticket systems.

Transport planners/consultants were more likely to consider lack of interoperability a challenge for passengers (82%); this was also the joint most common response given by local authority officers, alongside "understanding a complex fare system", both mentioned by 65% of respondents: this reflects the fact that many local authorities would aspire to introduce interoperable, zonal fare systems if they had powers to do so.

Transport planners and local authority officers cited "lack of availability of smart ticketing" as a factor in similar numbers, 54% and 49% respectively, as well as "needing the correct change" (46%/47%). The most common response among bus operators was "understanding complex fare structure" (67%), perhaps surprisingly since simplifying fare structures is in operators' hands, followed by lack of interoperability (48%) – again, a factor in operators' hands – and queueing to buy a ticket (42.9%).

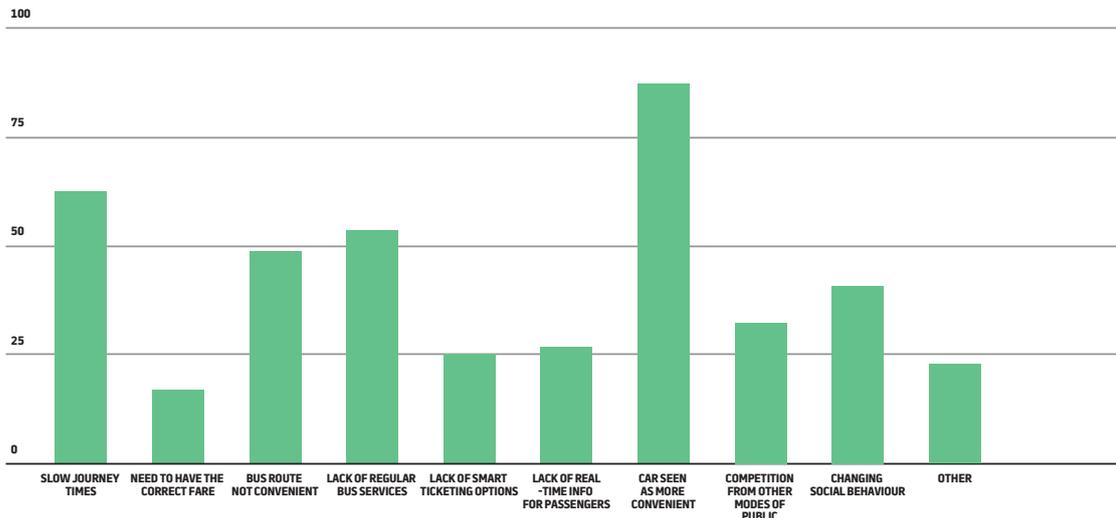
The Greener Journeys proposition that accelerating the adoption of smart ticketing was "an immediate way to speed up bus journeys by reducing boarding times" generally found favour, with 69% agreeing or strongly agreeing, and only 16% disagreeing.

Respondents were asked what they thought the advantages of smart ticketing were. The most common answers were reduced boarding/dwell times (77%); more convenient for passengers (75%); interoperability between different operators/transport modes and reduces the need for bus drivers to deal with and hold cash (both 71%). These were followed by "real-time data and analytics" (60%), "cuts cost of fare collection for operators (56%) and reduced operating costs of cash handling (53%).

There were different shades of opinion between different groups. The most popular advantage stated by bus operators was "more convenient for passengers" (86%), while reduced boarding times and reducing the need for bus drivers to deal with cash took joint second place (67%).

Transport planners/consultants most commonly cited reduced boarding times (83%), followed by reducing the need for drivers to deal with cash (80%). Local authority officers put reduced boarding times and interoperability joint first (on 71%), with "more convenient for passengers" next on 67%.

WHAT DO YOU THINK ARE THE CAUSES OF DECLINING PASSENGER NUMBERS?

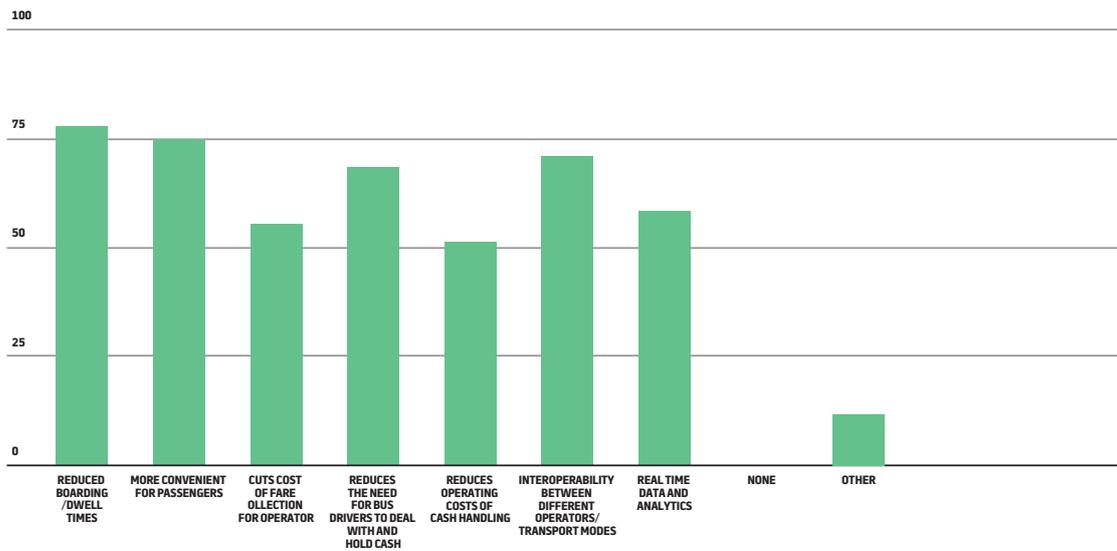


The second part of the survey was aimed operators and asked about their current ticket systems and plans. Asked what types of ticketing they currently employed, paper and smartcard were out in front on 79% and 73% respectively. The next most common answer was “mobile barcode/visual” on 27%. Contactless EMV and Mobile EMV/Apple Pay/ Android Pay both scored 15%. Mobile near-field communication scored only 6%.

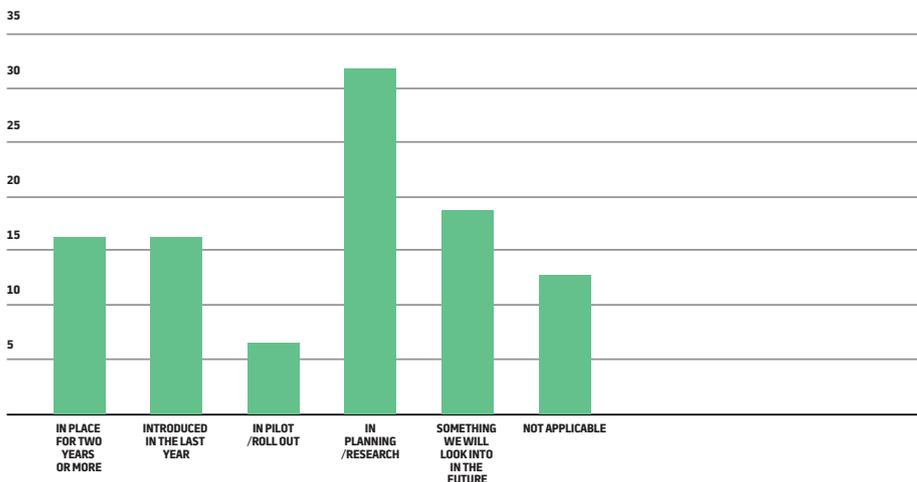
We analysed this question by the size of the organisation respondents told us they worked for. Perhaps surprisingly, the likelihood that an operator offered smartcard ticketing appeared broadly independent of size. The same applied to m-ticketing systems providing a barcode or visual ticket.

Finally, respondents were asked about their position specifically on mobile ticketing and what stage, if any, they had reached in introducing it. 31% said they were in the planning or research stage; 15% had had a system in place for two years or more, and a similar number had introduced a scheme in the last year. 6% were at the pilot or introductory stage, and 19% said it was something they would look into in the future. Smaller organisations were more likely to be at the planning/research stage or to say that they would look at the subject in the future. No respondent said their organisation had no plans to introduce mobile ticketing.

WHAT, IF ANY, DO YOU SEE AS THE ADVANTAGES OF SMART/MOBILE TICKETING?



WHICH ONE OF THE FOLLOWING BEST DESCRIBES YOUR ORGANISATION'S POSITION ON MOBILE TICKETING?



CONCLUSIONS

There is broad agreement that the biggest challenge currently facing bus operators is traffic congestion. In many ways this is at the root of concerns for bus companies, leading to slower and less reliable journeys, higher costs and declining revenue and passenger numbers.

Other factors – such as the cost of fare collection – are seen as concerns, especially for smaller operators, but at a somewhat lower level.

Bus operators also most commonly gave slow journey times as the reason for declining passenger numbers, though the convenience of the car was the most common response among respondents as a whole.

Turning to what might be putting passengers off using the bus; lack of interoperability and the complexity of fare structures were seen as factors. But significant numbers cited paying with cash, needing the correct change, or queueing to pay the driver. A lack of smart ticketing was thought to be a direct factor in declining numbers by a significant proportion of respondents – around one in four.

There was strong agreement with the idea that smart ticketing was an immediate way to speed up bus journeys. Reduced boarding/dwell times was most commonly given as an advantage of smart tickets, followed by greater convenience, interoperability and a reduced need to handle cash.

Interestingly, 81% of respondents have gone live with mobile ticketing, are implementing a solution, are researching, or will look into mobile ticketing in the future, showing a real appetite to bring the convenient to passengers and reduce journey times.

Overall, then, it appears that the introduction of smart ticketing would be beneficial in helping to address most of the key areas of concern for both bus operators and passengers, from speeding up journey times, increasing convenience and removing or reducing the need to handle cash.

For the future, mobile and contactless ticketing are expected to become much more widespread in the next few years. Yet a surprising number of operators still seem to lack definite plans for introducing such ticketing systems.

A LACK OF SMART TICKETING WAS THOUGHT TO BE A DIRECT FACTOR IN DECLINING PASSENGER NUMBERS BY A SIGNIFICANT PROPORTION OF RESPONDENTS

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