



# **Market Study into the supply of automatic ticket gates and ticket vending machines**

**Update paper**

**September 2018**

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## Summary

1. We launched a market study into the supply of automatic ticket gates (“**ATGs**”) and ticket vending machines (“**TVMs**”) on 13 March 2018.<sup>1</sup>
2. ATGs and TVMs each play important roles in the retail of rail tickets. TVMs sell approximately 150 million tickets per year, whilst ATGs ensure the protection of industry’s revenue from fare evasion, which some train operating companies estimate may cost the industry over £200 million per year. ATGs and TVMs also have key roles to play in the safe flow of passengers through stations, and in the roll out of new smart ticketing solutions.
3. This update paper outlines our progress in this study and presents our emerging findings about the markets for the supply of ATGs and TVMs. It also sets out our decision not to make a market investigation reference (“**MIR**”) to the Competition and Markets Authority (“the **CMA**”). We instead propose to continue the market study and produce a package of remedies, to address the competition issues we have identified. These remedies will be set out in the market study final report.<sup>2</sup>
4. We welcome written responses on this update paper and on our emerging findings by **11 October 2018**. Chapter 7 sets out details of how to respond.

## Purpose

5. The purpose and scope of the study was set out in the Statement of Scope that we published in March 2018.<sup>3</sup>
6. Fundamentally, the purpose of the market study was to ascertain, for both ATGs and TVMs, whether: high barriers to entry and expansion were contributing to a lack of competition, and whether any such issues were in turn leading to poor market outcomes in terms of price, service quality and innovation.
7. In undertaking this study, we considered whether it would be appropriate to make an MIR, with reference to the applicable legal and policy framework.

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<sup>1</sup> ORR press release: <http://orr.gov.uk/news-and-media/press-releases/2018/orr-launches-market-study-into-ticket-vending-machines-and-automatic-ticket-gates>

<sup>2</sup> ORR intends to publish its final report on the market study by 13 March 2019, in accordance with section 131B(4) of the Enterprise Act 2002 (“**EA02**”)

<sup>3</sup>A definition of the products within scope of the market study is set out in paragraphs 2.1 to 2.10 of ORR’s Statement of Scope document, dated 14 March 2018: [http://orr.gov.uk/\\_data/assets/pdf\\_file/0016/27214/market-study-into-the-supply-of-ticket-vending-machines-and-ticket-gates-statement-of-scope-2018-03-14.pdf](http://orr.gov.uk/_data/assets/pdf_file/0016/27214/market-study-into-the-supply-of-ticket-vending-machines-and-ticket-gates-statement-of-scope-2018-03-14.pdf)

## Market overview and our approach

8. There are two types of buyers for ATGs and TVMs in Great Britain (“**GB**”):
  - Metro system operators, which use these machines on intra-urban rail networks (e.g. Transport for London (“**TfL**”)); and
  - Passenger train operating companies (“**TOCs**”). These companies have been awarded franchises by the Department for Transport (“the **DfT**”) and use ATGs and TVMs on the mainline infrastructure on which they operate.
9. There is more to ATGs and TVMs than simply the hardware that is visible to passengers at stations. Both ATGs and TVMs are complex systems that include back office software and interconnectivity with other systems.<sup>4</sup> The location of an ATG or TVM is important in terms of its required connectivity and functionality. For example, an ATG situated in an intra-urban metro station may only need to read or validate smart tickets for use on that ‘closed’ metro system. In contrast however, an ATG situated in a London station, may have to be interoperable with a wider range of mainline tickets, and possibly connecting metro systems. In our study, we took the ‘supply’ of ATGs and TVMs to encompass all of the activities that are typically carried out by suppliers, including manufacture, installation, and the provision of ongoing maintenance.
10. Metro systems and mainline TOCs take significantly different approaches to procuring ATGs and TVMs. For example, we found that metro system operators purchased both types of equipment together as part of wider revenue collection services, whereas TOCs procure ATGs and TVMs separately. As such, we found that the competitive conditions for the supply of equipment to the respective types of purchaser are different. Where appropriate, we looked at these market segments separately, (supply to metro operators and supply to TOCs), in order to identify any differences or similarities.

## Emerging findings

### Level of competition

11. For ATGs, concentration is high in relation to both metro and mainline services. The largest player, Cubic Transportation Systems Limited (“**Cubic**”), has an approximate share of 97% of all ATGs currently installed in GB. We understand this share has remained at this level for most, if not all of the post privatisation period. Analysis of recent procurement activity also suggested limited competition for the supply of

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<sup>4</sup> A report on the operation of ATG systems was prepared by ORR’s Railway Safety Directorate and contains more comprehensive detail on the operation of ATG systems. The report is attached to this update paper at Annex A

ATGs. Our emerging finding is therefore that competition is weak for the supply of ATGs.

12. For TVMs, whilst analysis of the number of installed machines and the market shares of participants point to a highly concentrated market, analysis of recent procurement competitions suggests moderate levels of competition between the three incumbent players: Scheidt and Bachmann (UK) Limited (“**S&B**”), Worldline IT Services UK Limited (“**Worldline**”), and Parkeon Limited (“**Parkeon**”) (recently renamed Flowbird Limited).

## Outcomes

13. For ATGs, our emerging finding is that their prices in GB may be higher than would otherwise prevail under more competitive market conditions. A second area of concern for us is that innovation appears to be driven through the passenger train franchise process, or through schemes organised and coordinated by the Railway Safety and Standards Board (“**RSSB**”) rather than by completion in the supply chain.
14. Set against these factors however, is that we observed very high levels of satisfaction with service quality as measured by reliability, availability and safety. This was particularly apparent for products supplied by Cubic.
15. For TVMs, evidence suggested that current prices are consistent with a reasonable degree of competition. The availability of alternative suppliers and increasingly, alternative methods of purchasing tickets, arguably provides an additional competitive restraint.
16. Evidence obtained on service quality produced mixed to negative results. However, stakeholders perceived innovation to be reasonable, highlighting the introduction of a number of new products.
17. In relation to both ATGs and TVMs, our view is that outcomes for the mainline rail network may be partly contrasted with, and differentiated from, those obtained by the largest metro operator, TfL. Our emerging finding is that TfL obtained better outcomes than mainline TOCs, in relation to:
  - Pricing;
  - Securing open book accounting arrangements to monitor profit levels;
  - Securing ownership of back office intellectual property to its revenue collection system; and,
  - Driving innovations such as Oyster, and latterly, contactless ticketing.

## Barriers to entry and expansion

18. As noted above, metro systems and TOCs take different approaches to procurement and therefore, the barriers to entry and expansion are different for each.

## Metro services

19. Metro operators<sup>5</sup> procure ATGs and TVMs together as part of a single service contract for their revenue collection systems. A key customer contract in this segment of the market is TfL's 'Revenue Collection Contract' ("**RCC**"), which, following a recent extension, is 10 years in duration. We noted that only two suppliers put in final bids in the tender process.
20. Our emerging findings are that we have some concerns that the approach adopted by metro operators, in particular regarding the aggregation and duration of supplier contracts, may limit opportunities for new or existing suppliers to supply metro operators, and, in turn, may restrict the number of suppliers in the GB TVM and ATG markets overall. TfL is a significant customer in both the ATG and TVM markets, operating more than half of all ATGs in GB. Its purchasing decisions therefore have a significant influence on the wider market.
21. We nonetheless note the significant efforts taken by TfL to drive better competition for its revenue collection demand including disaggregating its demand, where it considered it technically possible to do so.

## Mainline

22. Mainline TOCs typically purchase ATGs and TVMs separately (i.e. not as part of wider revenue collection services), often in response to franchise commitments, though procurement on commercial grounds is not uncommon.
23. Our emerging findings are that the TOC ATG market is characterised by a number of barriers to entry, of which the most important are:
- **Demand** – the potential market size is small when compared to the investment necessary to enter. Most stations that can be gated are already gated. We note however, that there is still potential for entry by disruptive new technology (for example if gates were replaced altogether), particularly if such a solution would better facilitate new forms of smart ticketing.
  - **Procurement** – due to the way the market is structured, demand is released to the market on a fragmented and inconsistent basis. This fragmentation, and lack of sufficient lead in time, means alternative suppliers<sup>6</sup> are dis-incentivised from investing in developing a product compatible with the GB network.

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<sup>5</sup> TfL, Glasgow Subway, and Tyne & Wear Metro

<sup>6</sup> Of which there are a number internationally

- **Compatibility and access to Oyster** – over 70% of mainline journeys start or finish in London. TOCs connecting to London therefore need gates that are interoperable with TfL’s Oyster back office systems, however, there is currently no option for a third party gate supplier to provide this. TfL have confirmed such an access solution would be technically possible, albeit no one has actually ever asked.
24. Our emerging findings are that the TOC TVM market is characterised by a number of barriers to entry, of which the most important are:
- **Demand** – again, the overall market size is small compared to the investment required. There is conflicting evidence about the future of TVMs, though the majority suggest that the machines will be marginalised with the increase of mobile ticketing.
  - **Procurement** – TOCs tend to aggregate the purchase of hardware and software, in general without purchasing intellectual property rights for the software, limiting opportunities for specialist suppliers to compete (e.g. innovative new software suppliers). However, a number of owning groups are now separating purchases of software and hardware.
  - **Rail Delivery Group accreditation** – the scope and process of accreditation may not adequately balance its legitimate objectives of ensuring accurate revenue allocation and accuracy, with stimulating new entry and innovation.<sup>7</sup>
  - **Access to Oyster (Pearl reader)** – TOCs connecting to London typically require TVMs to have the capability to retail Oyster products. All three incumbent suppliers achieve this through attaching a ‘Pearl’ device provided by TfL to their machines – however each cite delays, cost and lack of functionality as issues with this method of access.

## Summary of emerging findings

### ATGs

25. The overall level of competition is weak. Our emerging finding is that prices for ATGs in GB are higher than would prevail under competitive conditions. Purchasers appear to press for innovation, rather than it coming as a product of competition between suppliers. That said, ATGs in GB and notably those provided by Cubic, are perceived as high quality, reliable and safe.
26. Barriers to entry for the supply of ATGs are principally on the demand side. We consider that the structure and features of the markets for ATGs and TVMs has an impact on purchasers’ decision-making and incentives. Our view is that remedial

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<sup>7</sup> More information on accreditation processes and the impact they have on competition is set out at Annex B



action to influence the way ATGs are purchased, and to facilitate access to back office systems, could yield positive results for competition and market outcomes.

## TVMs

27. Our emerging thinking is that competition is moderate and to the extent poor outcomes are observed, we take the view that rivalry is delivering better products and efficiency, albeit slowly. As accreditation processes operate as a clear barrier for restricting innovation and new entry, we consider that regulatory intervention should focus on this area. The Rail Delivery Group (“**RDG**”) have proposed commitments to improve their accreditation process, and encourage new entry.<sup>8</sup>

## Potential remedies

28. We consider that there is a case for remedial action in order to address the issues we have identified. At this stage of the market study we are not required to identify specific remedies, rather, we want to work with industry to develop and refine a package of remedies to address the issues raised in this update paper. In order to do this we have proposed a broad direction of travel for further action.
29. We consider that the best course of action is for ORR to explore potential remedial action falling into two categories:
- The first category of remedies should aim to open the market by generating better incentives for new suppliers to invest, innovate, and, compete for GB demand. These could include recommendations about restructuring how customer demand is presented to the market and encouraging metro operators to work with smaller specialist suppliers; and
  - The second category of remedies should aim to ensure that alternative suppliers and new entrants are not deterred from entering these markets due to residual access issues. Working with key stakeholders, we will seek to improve mechanisms for new suppliers to connect with other operators' back offices where necessary, and to decrease the extent to which new entrants are deterred by the complexity of industry accreditation processes.

## Decision on market investigation reference

30. Market investigations are more detailed examinations into whether there is an adverse effect on competition in the market(s) for goods or services. ORR may make an MIR to the CMA<sup>9</sup> where it finds reasonable grounds to suspect that any feature, or

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<sup>8</sup> A set of commitments proposed by RDG is set out at Annex C

<sup>9</sup> Section 67(2)(C) of the Railways Act 1993 and section 131 of EA02 set out the powers of ORR to make a market investigation reference to the CMA

combination of features, of the market under scrutiny prevents restricts or distorts competition.<sup>10</sup> The CMA has a wide range of powers, not available to ORR, to implement legally enforceable remedies aimed at making the market(s) more competitive in the future. Before ORR exercises discretion on whether to make an MIR however, ORR must first consider whether a reference would be proportionate, and also have regard to its statutory duties.<sup>11</sup>

31. We consider that the ‘reasonable grounds to suspect’ test is met for the supply of ATGs and TVMs in GB. However, we do not consider that it would be proportionate to make an MIR to the CMA in this case. ORR has remedies available to it that will allow it to address the issues identified without having to make an MIR, which would lead to significant costs to taxpayers and industry.

## Next steps

32. We intend to continue the market study and to publish our market study report by 13 March 2019, in accordance with our statutory deadline.<sup>12</sup> The next phase of the study will primarily be directed at seeking to refine a package of remedies to address issues identified in this update paper. We will continue to engage with stakeholders and propose to hold a number of workshops for this purpose.

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<sup>10</sup> Section 131(2) of EA02 sets out what is to be construed as a feature for the purposes of Part 4 of EA02

<sup>11</sup> Section 4 of the Railways Act 1993 sets out ORR’s statutory duties

<sup>12</sup> Section 131B(4) of EA02, requires a market study report to be published within 12 months of the market study notice being published

# 1. Introduction

- 1.1 Both ATGs and TVMs are a familiar presence in GB railway stations. Whilst both manifest themselves to passengers as customer-facing hardware, their operation is reliant upon complex back-office functionality with significant software elements and a need for interconnectivity with other systems.
- 1.2 TVMs sell approximately £2.1 billion of tickets per year, almost 20% of the total value of tickets sold on the UK railway.
- 1.3 ATGs are crucial in ensuring protection of the industry's revenue from fare evasion, which some TOCs estimate may cost the industry over £200 million per year.<sup>13</sup> We estimate that annually there are approximately 4.4 billion passenger entries and exits through ATGs on mainline and metro networks.
- 1.4 Taking ATGs and TVMs together, there are currently fewer than 10,000 installed units in GB. Demand for equipment is not consistent and is “lumpy”. In some years, there is significant installation and investment, with very little in other years. Estimation of an annualised unit cost is not straightforward for either ATGs or TVMs. Additionally, as explained further throughout this document, ATGs and TVMs are often purchased as part of wider revenue collection services. Nonetheless, we consider that we can reasonably estimate that the annualised value of the markets for the supply of this equipment is £50-£100 million per year.
- 1.5 TVMs and ATGs constitute key interfaces in the wider rail retail sector in that their functionality and capability have a significant impact on ticket distribution. Both have an important role to play in facilitating the roll-out of smart ticketing solutions and/or any other future developments in how railway ticketing is organised. We consider it important that limitations in the supply chain, or in the functionality of either of these products does not hinder progress in delivering innovative new forms of ticketing.

## Purpose of study

- 1.6 Markets, including those in the railway sector, work well when businesses compete vigorously to win business. When markets work well, efficient businesses are rewarded, productivity growth is higher, and customers have confidence that the supply chain delivers good outcomes for them in terms of price, quality, variety, innovation and service. The demand side is also important - well-informed, active consumers can also play a key role in driving competition between firms.

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<sup>13</sup> For example, <https://www.northernrailway.co.uk/2016-03-18-16-08-49/corporate-season-tickets/122-fines-and-penalties/825-myth-busting>

- 1.7 Market studies are one of a number of tools at our disposal to examine possible competition issues and address them if appropriate. They are examinations into whether markets are working well, and possible causes of market failure. Market studies take into account regulatory and other economic drivers in a market, as well as patterns of consumer and business behaviour.
- 1.8 Market studies have a number of possible outcomes, including declaring a clean bill of health for the market, specifying consumer focused action, making recommendations to business or Government or taking competition enforcement action. A further possible outcome of a market study is for ORR to make an MIR to the CMA, where we find reasonable grounds to suspect that any feature, or combination of features, of the market under scrutiny prevents, restricts or distorts competition.<sup>14</sup>
- 1.9 At outlined in our Statement of Scope<sup>15</sup>, this study builds on work we have undertaken in the wider retail sector, notably our review into the supply chain for ticketing equipment and systems. In that review we identified as preliminary concerns that:
- The supply chains for the supply of TVMs and ATGs have few suppliers and limited new entry or churn;
  - There may be a number of barriers which make it difficult for new businesses or products to enter the market for the supply of TVMs and ATGs; and
  - A lack of effective competition may be resulting in consumer detriment in the form of higher prices, lower quality, and stifled innovation.
  - Possible causes of a high concentration and lack of effective competition appear to be:
    - The way in which demand is put out to tender which may be disincentivising new entry; and
    - The complexity of the accreditation process for bringing new retailing products/services to market.
- 1.10 Our study seeks to test these preliminary concerns and to understand more comprehensively the nature and strength of competition for the supply of ATGs and TVMs. Fundamentally, the theory of harm explored in our study is: ***whether high barriers to entry and expansion are contributing to high concentration and lack***

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<sup>14</sup> For further information on ORR's approach to undertaking market studies and on the criteria for making an MIR see: [http://orr.gov.uk/\\_data/assets/pdf\\_file/0007/23974/orr-approach-to-monitoring-and-reviewing-markets.pdf](http://orr.gov.uk/_data/assets/pdf_file/0007/23974/orr-approach-to-monitoring-and-reviewing-markets.pdf)

<sup>15</sup> [http://orr.gov.uk/\\_data/assets/pdf\\_file/0016/27214/market-study-into-the-supply-of-ticket-vending-machines-and-ticket-gates-statement-of-scope-2018-03-14.pdf](http://orr.gov.uk/_data/assets/pdf_file/0016/27214/market-study-into-the-supply-of-ticket-vending-machines-and-ticket-gates-statement-of-scope-2018-03-14.pdf)

*of competition, which, in turn is leading to poor market outcomes in terms of price, service quality and innovation.*

1.11 Through undertaking this study, we have determined that any remedial action we take should focus on bringing about **market conditions that facilitate fair, robust rivalry between suppliers and, importantly, promote innovation within the supply chain.**

## Themes and issues explored

1.12 As set out in our Statement of Scope, our study has sought to test the aforementioned issues by focussing on three themes in relation to each market for the supply of ATGs and TVMs, namely:

- Theme 1: Concentration<sup>16</sup> and market shares – see Chapter 3 of this document;
- Theme 2: Outcomes for customers, passengers and the wider railway sector - see Chapter 5 of this document;
- Theme 3: Drivers of market outcomes - see Chapter 4 of this document.

## Methodology

1.13 Since launching the study, we have consulted a large number of market participants and other interested stakeholders. We have gathered evidence, including significant volumes of confidential material from a range of sources, in many cases utilising our formal information gathering powers.<sup>17</sup>

1.14 We also met with stakeholders including suppliers of TVMs and ATGs in GB, potential entrants, TOCs, third party retailers, RDG, TfL, the DfT, and, Transport Scotland. We have been assisted by the CMA in undertaking this study and liaised with them throughout.

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<sup>16</sup> Concentration refers to the number and size distribution of businesses in a particular market

<sup>17</sup> Section 67(2C) of the Railways Act 1993 confers formal investigatory powers on ORR contained in section 174 EA02 in connection with deciding whether to make a reference under section 131 of EA02

**Figure 1.1: Methodology of market study**



## Structure of document

1.15 The remainder of this paper is structured as follows:

- **Chapter 2, Market overview and our approach.** This chapter sets out an overview of the products and how they are procured. It then goes onto explain how these factors have influenced our approach to analysis.
- **Chapter 3, Strength of competition.** In this chapter, we set out our findings on the strength of competition, which includes the number of suppliers in the market, levels of concentration and stakeholder views on the level of competition.
- **Chapter 4, Outcomes.** In this chapter, we set out our emerging findings on market outcomes and what they tell us about competition.
- **Chapter 5, Barriers to entry and expansion.** In this chapter, we set out our emerging findings on the key barriers for each of the markets, and their possible impact on competition.
- **Chapter 6, Proposed next steps.** In this chapter, we set out the case for intervention and the possible remedial actions that ORR could take
- **Chapter 7, Decision not to make a reference.** In this chapter, we set out the reasons for our decision not to make an MIR. .
- **Chapter 8, Invitation to comment.**

## 2. Market overview and our approach

- 2.1 In this chapter, we give an overview of the products that are the focus of this study, and, explain the importance of the location of equipment in terms of required functionality. We then list the buyers of this equipment, and the different approaches taken by different types of purchaser.
- 2.2 We proceed to explain how our consideration of these issues has informed our overall approach to analysing these markets.

### ATGs<sup>18</sup>

- 2.3 The core purpose of ATGs is revenue protection. They were first introduced on TfL's metro system in the late 1960s, followed later by the mainline network during the 1990s.
- 2.4 ATGs facilitate an automated ticket validation process. Data stored on tickets allows for the process of electronic verification. The process of automation also facilitates the collection of data on entry and exit, which can be used to monitor trends in station usage. An ancillary use of ATGs is for crowd control in certain circumstances.
- 2.5 The gates at stations are essentially only the end of a complex underlying system that facilitates the revenue protection process. The total system purchased by operators of ATGs typically consists of:
- The physical gates;
  - Reader equipment, capable of reading data on a ticket to determine whether it is valid;<sup>19</sup>
  - Local gate control units – usually a local based PC which can process very straightforward functionality;
  - A ticket logic back-office (software); and
  - A maintenance package.

### Hardware

- 2.6 A gate consists of a set of bi-directional 'paddles' or 'panels' attached to adjacent stanchions. It is powered by a motor that is programmed to open when sent a signal

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<sup>18</sup> More detailed information on the operation of gates is set out in the safety report prepared by ORR's Railway Safety Directorate, attached at Annex A

<sup>19</sup> Some readers (such as those on TfL's network), are capable of retailing through contactless technology

by the reader technology that a valid ticket has been presented. Early gates were powered pneumatically, whereas later versions use electronic motors.

- 2.7 As a passenger moves through an ATG, a series of laser sensors tracks their movement through the gate to ensure it does not close on them, but does close to prevent a second person tailgating. Wide aisle gates are configured with longer opening times to make them safer for passengers with disabilities, and those with small children or luggage.
- 2.8 ATGs are normally installed in a row referred to as a 'gateline'. Within any gateline there is a combination of gate types including those of 'standard' and 'wide aisle' width. The exact combination of gates depends on station needs and passenger flows.
- 2.9 Gatelines have a local control panel for station staff to undertake basic gate functionality. Local systems typically incorporate an emergency plunger to put all gates into the open position. In some stations, there may also be additional controls in ticket offices or centralised control rooms that have oversight of gatelines.<sup>20</sup>

## Back office systems

- 2.10 All gatelines are linked to back office computer systems, which feed data to gate readers to ensure that they correctly process tickets as valid or invalid. These systems also collect data on entries and exits. There are separate back office systems for TOCs mainline tickets (referred to as the central system), ITSO<sup>21</sup> smart tickets (referred to as HOPs<sup>22</sup>) and the Oyster back office. See figure 2.2 below.
- 2.11 Operators of ATGs are able to update validation data being pushed to gate readers through web-based access to back office systems e.g. to add new fares, new time restrictions or new railcards.
- 2.12 As set out in paragraphs 2.50 to 2.54, below, the type of back office system and its required interconnectivity with other systems, depends on the geographic location of the gates.

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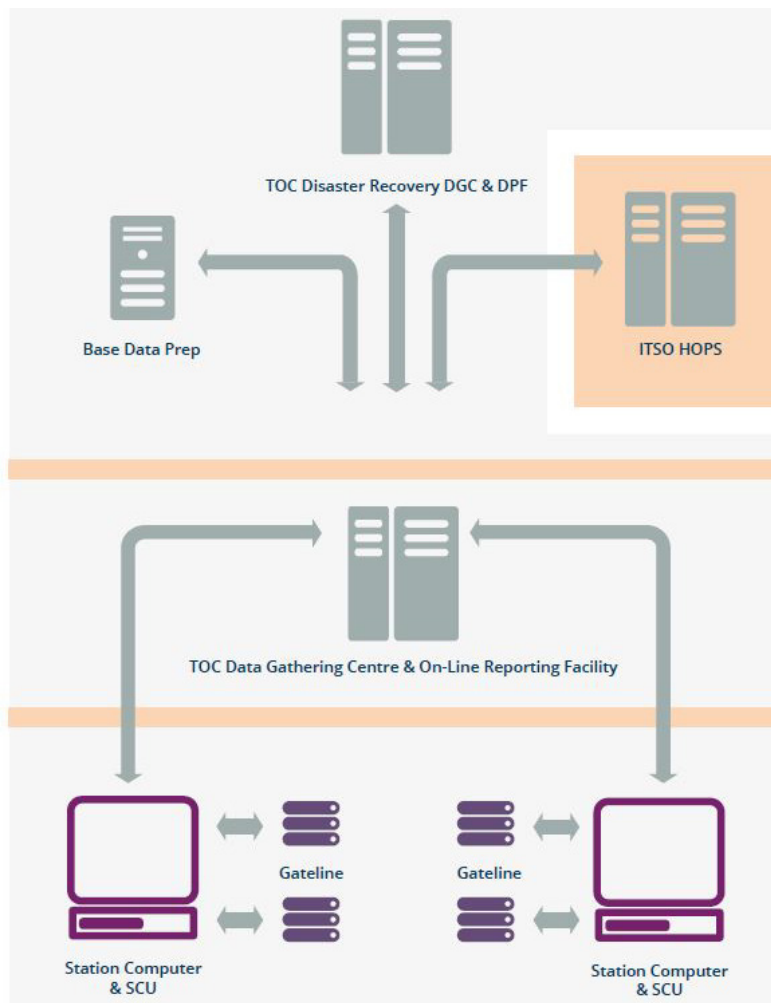
<sup>20</sup> In some instances, for instance in lightly used stations with secondary entrance points, gates have CCTV assistance points linking gates to a main station gateline to allow a member of staff to remotely open a gate

<sup>21</sup> Integrated Transport Smartcard Organisation

<sup>22</sup> Host or Operator Processing



**Figure 2.1: Example of an ATG system including back office**



## Safety and accessibility

2.13 ATGs have safety and accessibility implications. They have an impact both through their potential to harm individuals coming into contact with them and on passenger flows and crowding at stations. The management of the flow of passengers away from the concourse (the platform train interface) is particularly important. As regards accessibility, the design of gates has a direct impact on accessibility for disabled passengers.

2.14 We commissioned a report from ORR's Railway Safety Directorate regarding the operation and safety of ATGs. This is produced at Annex A to this update paper.

2.15 The design and operation of gates has largely been driven by safety considerations. For mass transit purposes, turnstile systems were not suitable given the need to process large numbers of people quickly. Equally, less robust 'bar' admission machines were not suitable given the limited amount of protection they afford against unauthorised access.

2.16 RSSB has produced guidance on gate design<sup>23</sup>, which focusses on:

- Appropriate closing forces which may be applied on passengers;
- Minimum flow rates; and
- Station planning and layout when installing gates.

2.17 In its publication “*Inclusive Mobility*”, the DfT, without suggesting any design specifications for ATGs, makes clear that availability of assistance at gatelines should be signposted, along with options for alternative accessible routes through the ticket clearing and checking area.<sup>24</sup>

## TVMs

2.18 TVMs are a self-service retail channel. They are a means by which TOCs can efficiently and cost effectively distribute tickets to passengers. The first mechanised, coin-operated, ticket machines came into use in GB during the early 20<sup>th</sup> century. They were first introduced in something close to their current form in the late 1980s as ‘queue busting’ devices. Today, expectations of TVMs are much higher, with devices expected to take on a much wider range of functionality.

2.19 As with ATGs, TVMs comprise complex systems with a hardware and software element.

2.20 The hardware element of a TVM typically consists of a durable, high security steel box, with some form of input screen. There are significant variations in what is present in terms of hardware components, depending on the overall functionality of the machine e.g. whether it is able to accept coins/vend smart cards/print barcodes etc. There is also significant variation between machines and manufacturers as to what is displayed on graphic user interfaces (“GUI”) screens. For example, on more basic ‘ticket on demand’ machines, the input screen can be very simple, allowing e.g. the input of purchase details via a code/card before tickets are printed.

2.21 The software element of a TVM is often referred to as a ticket issuing system (“**TIS**”). This is the ‘brain’ which informs the TVM of the full range of tickets and, if/when tickets are purchased, makes sure the correct ticket is issued in an acceptable format, and, ensures that ticket revenue is allocated to the correct TOC. The nature of a TVM’s connectivity to a TIS is variable depending on its functionality. For

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<sup>23</sup> <https://www.rssb.co.uk/rgs/standards/RIS-7701-INS%20Iss%201.pdf>

<sup>24</sup> <https://www.gov.uk/government/publications/inclusive-mobility>

example, a 'ticket on demand' machine<sup>25</sup> would only need to access certain elements of a back office TIS system.

2.22 TVM TIS have a data feed from a number of central systems hosted by RDG, which control revenue allocation and ensure fares and routes data is correct.

## Accreditation<sup>26</sup>

2.23 A TVM sales channel must, in order to retail tickets, operate software that connects with back office data feeds. This software has to be accredited before it can be used. The particular type of accreditation will depend on the ticket requirement of the customer. The types of accreditation relevant to TVM software are:

- **RDG accreditation** applies to suppliers delivering TVMs to retail tickets for the mainline network. The purpose is to ensure that the payment settlement process for travel on the mainline network is fulfilled correctly. This is managed by Rail Settlement Plan (RSP).
- **ITSO accreditation** applies to TVMs retailing tickets in the ITSO environment. The purpose is to ensure smart ticketing equipment and systems meet the ITSO Specification and provide security for ITSO payments and transactions. ITSO oversee this process.
- **Oyster accreditation** applies to suppliers using Pearl readers on TVMs to offer Oyster top up functionality. The purpose is primarily to assure that TVM equipment is connected to the Oyster system in a manner which maintains the integrity of the Oyster system. Oyster accreditation is a TfL requirement and the accreditation process is carried out by TfL's revenue collection supplier.

2.24 Further detail on accreditation is provided at Annex B.

2.25 The requirement for accreditation depends on customer's commercial needs and, to a certain degree, on the geographic location of the equipment. For example, a TVM selling national rail tickets will require suppliers to comply with RDG accreditation. If the journey goes through London, the supplier might need to comply also with Oyster accreditation.

## Purchasers

2.26 There are two distinct types of purchasers for ATGs and TVMs: urban metro systems and mainline TOCs.

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<sup>25</sup> A TVM which has the sole function of facilitating the pick-up of tickets purchased by another means

<sup>26</sup> Further details on accreditation are set out at Annex B

## Metro systems

2.27 For the purposes of this study, we define metro systems as integrated rail transport networks, confined to a particular urban locality.

2.28 There are currently three metro systems in the UK:

- The London Underground is operated by TfL. It has 11 lines covering 402km and serving 270 stations.<sup>27</sup>
- Glasgow Subway is operated by SPT. It has 15 stations including three park-and-ride stations.
- The Tyne & Wear Metro is operated by Nexus. It has 60 stations.<sup>28</sup>

## TOCs

2.29 TOCs operate trains on the mainline network. The majority of TOCs provide their services under a franchise agreement with the DfT. Other operators are open access – although these businesses do not purchase ATGs or TVMs.

2.30 Network Rail, notwithstanding that it operates 20 major stations on the GB network, does not purchase ATGs or TVMs. Network Rail applies a basic procedure to ensure the safe installation of equipment (including assessing their impact on passenger flows), but otherwise considers the purchase of these pieces of equipment to be retail activity to be undertaken by TOCs.

## Different approaches to procurement

### Metro systems

2.31 Metro systems have developed smart integrated transport systems. Each has decided to use one supplier to meet all of their needs:

- TfL has an end-to-end retail contract with a single supplier, with only certain aspects (such as Oyster card production) outside the scope of the contract.
- Glasgow Subway and Tyne & Wear Metro procured all of their TVMs and ATGs from a single supplier. Each also contracted with their supplier to provide

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<sup>27</sup> <https://tfl.gov.uk/corporate/about-tfl/what-we-do/london-underground>. We note that there are other rail transport links in London, for example, the London Overground operated by Arriva Rail London under a concession agreement with TfL, and mainline rail stations operated by TOCs or Network Rail. For the purposes of this paper, when we refer to TfL's metro system we are referring to the London Underground run by TfL under the RCC

<sup>28</sup> <https://www.nexus.org.uk/themes/custom/nexus/images/metro-map-large.jpg>

ongoing maintenance and support for the ticketing system, including TVMs and ATGs.

2.32 All three metro system operators expressed a preference for a single supplier, citing various operational advantages and economies of scale.

### Aggregation and length of contracts

2.33 Metro systems in GB tend to procure ATGs and TVM systems as part of a wider package of retail equipment. Metro system operators aggregate the purchase of both ATGs and TVMS and the management of back office systems. TfL describe what they purchase as “*a fully integrated service contract for the supply and management of TfL’s ticketing and fare collection system*”.

2.34 Metro systems need not be restricted by the requirement to be interoperable with the wider rail network, including the mainline. This enables them to integrate a smart ticketing option without dealing with the complexity of integrating with other systems. Namely:

- In 2003, TfL introduced smart ticketing in the form of plastic Oyster cards across its network (including rail and other transport options), this is referred to as the Oyster Network. This involved putting in place new ticket gates, TVMs, and accounting systems and computers across 270 Underground stations.<sup>29</sup>
- In 2012, Tyne & Wear Metro introduced smart ticketing, replacing its entire fleet of ATGs and TVMs.
- In 2013, Glasgow Subway implemented its smart ticketing system as part of the Subway Modernisation programme, gating all its stations.

2.35 Metro contracts for revenue collection services typically have long durations, meaning competition to supply demand is infrequent. For example, TfL’s current RCC contract is set to run for 10 years following a recent extension.<sup>30</sup> Tyne & Wear Metro and Glasgow Subway introduced their integrated ticketing systems in 2012 and 2013, and have not since retendered for a new supplier as of the date of this report.

## TOCs

2.36 Franchise commitments are the main driver for the procurement by TOCs of both ATGs and TVMs. TOCs tend to seek to procure early in a franchise term (including TVMs and ATGs) to meet specific franchise agreement commitments. When a TOC wins a franchise, its service offering includes the management of stations within the

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<sup>29</sup> NAO successful IT projects - <https://orr.app.box.com/file/254979230208>

<sup>30</sup> <http://content.tfl.gov.uk/20170927-finance-committee-item-3-rcc.pdf>

part of the network covered by the franchise agreement (other than those stations which are operated by Network Rail<sup>31</sup>). As explained earlier, Network Rail does not purchase ATGs or TVMs; its role is limited to overseeing their safe installation at stations.

2.37 TOCs also, however, described to us a number of equipment purchases which were driven by other commercial considerations.

2.38 In respect of ATGs, TOCs cited revenue protection as the primary use. TOCs also considered ATGs have wider benefits, such as the ability to deal with crowd control, improving the customer offering/ experience, improving security, and reducing anti-social behaviour. In addition, some TOCs noted the increasing role of ATGs in smart ticketing.

2.39 Commercial procurement of TVMs by TOCs is driven by a perception of value in providing a more cost efficient means of distributing tickets; or increasing (or maintaining, in the face of life expired equipment) retail capacity.

### **Aggregation and length of contracts**

2.40 Most TOCs told us, in relation to both ATGs and TVMs that they have a preference for a turnkey solution, that is, a supplier who is able to supply both hardware and software elements of a solution.

2.41 In relation to ATGs, we found no examples of separation of hardware from back office software or maintenance. The primary reasons for this that were cited to us were: greater value or term of the contract which provides the TOC with increased negotiating power; ease of dealing with one supplier when issues arise; and concerns around undermining warranties.

2.42 A similar picture emerged for TVMs. There is significant vertical integration in the supply of TVM TIS and the physical TVM hardware. Two out of the three main GB TVM suppliers only provide a product which integrates hardware and software.

2.43 Installation represents a key part of the initial outlay of procuring ATGs or TVMs. This cost can vary significantly between locations depending on the complexities of the station environment etc.

2.44 Maintenance packages of both hardware and software are also key elements in the procurement of ATGs or TVMs. In the case of TOCs these are usually relatively straightforward maintenance packages involving access to a call centre to report incidents which are then resolved within contractually agreed time frames.

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<sup>31</sup> <https://www.networkrail.co.uk/communities/passengers/our-stations/>

2.45 The majority of TOCs have a long-term relationship with their supplier. We saw examples of 10-year relationships with TVM suppliers, and up to 20-year relationships with ATG suppliers.

### **Role of group level procurement**

2.46 The majority of TOCs purchase ATGs and TVMs at a TOC, rather than group, level, despite most TOCs being part of larger company groups. We were told that the main reason for TOC level procurement is that the needs of TOCs differ, and therefore, local knowledge is required for procurement. There are a couple of exceptions. We understand that some TOCs see benefits in procuring at group level or consolidating procurement and would consider aggregating purchases in the future.

### **Single supplier**

2.47 Overall TOCs described to us a slight preference for a single supplier rather than a mix of suppliers.

2.48 For ATGs, only two TOCs stated that they would prefer to have a mix of ticket gate suppliers whereas seven said they would prefer to have a single supplier.

2.49 For TVMs, the evidence is mixed. Some TOCs prefer to have a single supplier, whereas others prefer a mix of suppliers.<sup>32</sup>

## **Importance of interconnectivity**

2.50 As noted above, metro systems are independent and not required to be interoperable with the wider mainline rail network. TOCs, on the other hand, have obligations to be interoperable with the rest of the mainline rail network so that customers can travel on an integrated mainline network.<sup>33</sup>

2.51 While TfL's metro system is not under an obligation to be interoperable with the mainline, where TOCs operate stations in London, they need to be able to offer interconnectivity with the London network as a commercial imperative. 70% of journeys start or finish in London, and 10 out of 16 national rail franchises include a London terminus. They therefore have a commercial imperative to be able to connect to TfL's back office systems.

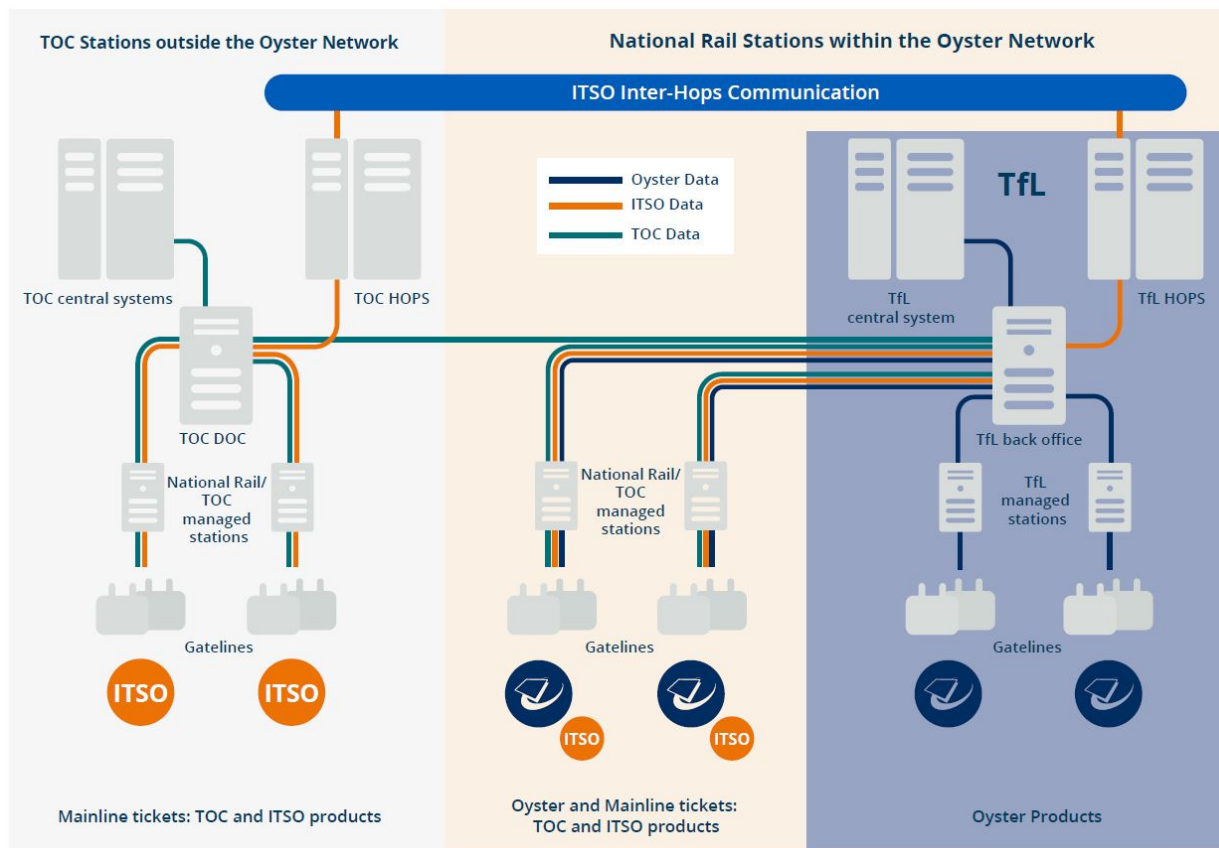
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<sup>32</sup> Responses to information requests

<sup>33</sup> TOCs are obliged, under the Ticketing and Settlement Agreement ([https://www.raildeliverygroup.com/files/Publications/services/rsp/TSA\\_V10.1\\_Main\\_Agreement\\_Volume\\_1.pdf](https://www.raildeliverygroup.com/files/Publications/services/rsp/TSA_V10.1_Main_Agreement_Volume_1.pdf)) to offer inter-available fares (this enables passengers to use the same ticket for different operators, flows and terminals) and through tickets (this enables passengers to travel across the network using only one ticket) for mainline tickets

2.52 As illustrated by Figure 2.2, below, depending on the geographical location of a gate and the needs of the customer, it may need to be connected to: TOC central system(s) for mainline ticket data; the ITSO central system for smart ticket data on the mainline network; and the TfL central system for Oyster ticket data

**Figure 2.2: ticketing systems on the mainline network**



2.53 Similar interoperability issues apply to TVMs. Metro operators typically need only retail tickets for their own 'closed' networks. TOCs however, who wish to retail mainline tickets and onward journeys/journeys that connect through London, have a commercial imperative to also be able to sell tickets for the TfL network.

2.54 In order to achieve this, TVMs both in terms of hardware and software, need to incorporate the functionality to retail Oyster products.

## Impact on our approach to reviewing these markets

2.55 As set out above, metro systems and TOCs take different approaches to purchasing. Metro systems tend to purchase ATGs and TVMs as part of a wider service package, whereas TOCs purchase ATGs and TVMs in isolation. In addition, their technical requirements are different. Metro systems are not restricted by the need to be interoperable with the wider rail network, unlike TOCs who often have a diverse range of requirements in terms of interconnectivity.



2.56 Suppliers perceive these as two distinct routes to market; either serving the total revenue collection needs of metro operators, or providing TVMs or ATGs separately for use by mainline. In short, the competitive conditions for serving the demand of metro operators and TOCs are different.

2.57 We have reflected this fact in our approach to analysing these markets. Whilst there are some similarities between the respective sources of demand, where appropriate, we have undertaken competition analysis separately for the following '**market segments**':

- ATGs – mainline TOC demand
- TVMs – mainline TOC demand
- ATGs and TVMs as part of revenue collection service metro demand.

## 3. Strength of competition

3.1 In this chapter, we describe our findings about how competition works, both historically and currently, in each of the three market segments. We also outline what we consider to be the strength of competition in each segment.

### Suppliers in GB

3.2 The active suppliers for ATGs in GB are:

- Cubic, owned by a listed US corporation which is a global provider of systems and services in transportation and defence markets; and
- S&B, owned by a German company which is active across a range of European markets, including rail, petrol stations, car parks, and leisure centres.

3.3 For TVMs, the suppliers currently active in GB are:

- S&B;
- Worldline, a firm owned by the French technology company ATOS;
- Parkeon (Flowbird), a French company that specialises in payment and ticketing systems, principally for car parks and public transport systems; and
- Cubic. However, Cubic only supplies TVMs to TfL, it does not currently supply TVMs to the mainline railway.

### How competition works

3.4 In GB, TVMs and ATGs are procured through structured tender competitions. Consideration of these tender exercises is key to understanding how competition currently works.

### Concentration and evidence from recent procurement exercises

3.5 Where competition takes place ‘for the market’<sup>34</sup>, static information on current volumes of business (for example in this case the number of units currently installed by each of GB’s current suppliers) only provides part of the picture. Winners of major contracts could potentially have high shares of the total base without this necessarily providing an accurate reflection of the level of competition, since it may be the case that competition at the time of bidding was strong.

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<sup>34</sup> e.g. see <https://www.dotecon.com/assets/images/biddingmarkets.pdf>

3.6 As such, for each of the market segments we have looked at static market shares (namely the share of units currently in operation of each supplier), and, information and data about recent procurement exercises.<sup>35</sup> We also consider stakeholder views on the level of competition.

## **Metro services**

3.7 As noted in the previous chapter, all three of GB's metro systems use a single supplier, for all of their revenue protection services, namely Cubic in the case of TfL, and S&B in the case of the Glasgow Subway and Tyne & Wear Metro.

3.8 We reviewed recent procurement evidence for all of these services, which showed in all cases that the metro operators have been successful in attracting multiple bidders to supply them.

### **History of TfL's procurement of revenue protection services**

3.9 TfL is a very significant player in the TVM and, particularly, ATG markets, given the scale of its demand for revenue collection services, of which this equipment forms an important part. Its most recent RCC contract was viewed as a major strategic contract with a value of £660m. TfL operates around half the ATGs in GB and also large numbers of TVMs, albeit most of these are not compatible with the mainline. For this reason, we considered the history of TfL's procurements for these services, given its role of this in determining the state of competition in these markets.

3.10 TfL have tendered for their revenue collection demand on two occasions, as follows:

- The first TfL contract to provide its end-to-end retailing solution was signed in 1998 (the 'Prestige' contract). The contract was awarded to TranSys (a consortium of Cubic UK, EDS International, International Computers and WS Atkins). This was a 17 year contract. In 2008 TfL gave notice to terminate the contract five years early in 2010;
- A bridging contract, the Future Ticketing Agreement (FTA), was provided to Cubic without a competitive tender. This was signed in 2008 and took effect in 2010. It covered the remaining five years intended to be covered by the Prestige contract;
- In April 2011, TfL and Cubic agreed that, under the FTA hand back provisions, the supply of smartcards and fixed wide area network services would be handed back to TfL in August 2013. These services are now being provided by specialist suppliers under separate contracts; and

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<sup>35</sup> All procurements dating back to January 2015

- The current contract (the RCC) was tendered competitively in 2014/15 and signed in August 2015. It has a duration of 7 years with an option to extend (which was taken in September 2017) for a further 3 years.

## Mainline services

3.11 This subsection discusses the available evidence on the shares of GB’s main players for supply to the mainline as of early 2018.

3.12 We note that a large proportion of the total spend on these products takes place within ‘after markets’ such as maintenance and the mid-life installation of barcode readers.

3.13 We understand that both Cubic and S&B have been GB’s largest supplier in their respective fields for most, if not all, of the post-privatisation period.

## ATGs

3.14 The following table sets out the share of ATGs on the basis of the number of installed units:

**Figure 3.1 – Mainline ATG shares, based on fleet as of January 2018**

Operator	Cubic	S&B
National rail	94%	6%

3.15 These figures show a high degree of concentration, with Cubic a near-monopolist for the supply of ATGs in GB.

3.16 We obtained data on 12 separate ATG procurements by mainline TOCs made since January 2015. This showed that:

- There were usually multiple bidders; and
- Cubic was the winning bidder in every instance.

3.17 None of these procurements involved ATGs within London’s Oyster Zone. Where available, evidence showed that contracts were awarded based on an assessment of both bid quality and price.

3.18 The reasonably large size of our sample was in our view sufficient to offer insights as to the meaningfulness of the concentration data summarised earlier in this chapter. In our view, it is consistent with Cubic enjoying a systematic competitive advantage for the supply of ATGs to the mainline rail network.

## TVMs

3.19 The following table sets out the market shares of TVMs on the basis of the number of installed units

**Figure 3.2 – Mainline TVM shares, based on fleet as of January 2018**

Operator	S&B	Worldline	Parkeon
National rail	69%	15%	16%

3.20 The figures in figure 3.2 above, show that S&B has a high share of the supply of TVMs.

3.21 We also reviewed data for 13 TVM procurement exercises conducted by mainline TOCs since January 2015.

3.22 This data showed that S&B was successful in fewer than half of these competitions, consistent with a downward trend in its overall market share.<sup>36</sup> Taken at face value, this suggests that market share estimates for S&B may tend to overstate the strength of its position in the market.

3.23 Within TVMs, Parkeon is a relatively new player, having entered the GB market after 2009, and has become relatively well established in the time since. One stakeholder told us that Parkeon “...shook up the market by introducing more TVM options.”

## Stakeholder views on current competition

3.24 We asked all stakeholders for their views on the level of competition, across GB. The similarity of response between metro and mainline operators was such that we have grouped their responses together here.

## ATGs

3.25 Similar opinions were provided by both metro and mainline operators. All suppliers who expressed clear views tended to characterise the supply of ATGs as a near-monopoly. For example, one stakeholder told us that: “...*There is currently only limited competition for gateline procurement, ... only Cubic can tender for the provision of or replacement of gatelines at a station which requires Oyster validation... the lack of competition in the ATG market in particular is of some concern...*”. Another purchaser stated: “...*There is currently no serious competition for gateline procurement...*”

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<sup>36</sup> Though we note that 13 competitions is a relatively small sample

## TVMs

3.26 The picture was more positive, with most respondents identifying three main competitors (with Cubic a possible fourth) in the market without identifying S&B (or anyone else) as holding a particular advantage within this group for the supply of TVMs on a standalone basis. For instance, one purchaser stated “...*The key suppliers are Scheidt and Bachmann, Parkeon and Worldline. There appears to be equal competition between these suppliers with numbers of TVMs supplied varying as new contracts are won and lost...*”.

## Emerging findings on the strength of competition

3.27 To date, TfL’s demand has been almost entirely served by Cubic, notwithstanding ongoing efforts by TfL to ensure that Cubic faces competition when it undertakes large procurement exercises. Other metro services, which are smaller in scale, have demonstrated that there is some competition for wider metro demand through their selection of an alternative supplier of bundled ATG, TVM, and other revenue management services.

3.28 For **mainline TOCs**, concentration data, intelligence from recent procurements, and stakeholder feedback suggest that:

- For ATGs, one supplier, Cubic, has a very strong position in this market both historically and in recent competitions. Other companies are active in competing for tenders, but have rarely been successful. Customer perceptions are of a monopoly or near-monopoly.
- For TVMs, the evidence is more mixed, in that:
  - There are relatively few suppliers in the GB market. One of these suppliers, S&B, has a persistently high share of installed machines;
  - There appears to be reasonably strong competition for tenders, which in recent years have been won by a number of players;
  - Customer perceptions are of a reasonably competitive marketplace; and
  - Overall, the evidence for TVMs points towards a moderate level of current competition.

## 4. Outcomes

### Introduction

- 4.1 In this chapter, we set out our emerging findings on market outcomes. Evidence on outcomes is key to understanding the extent to which our emerging findings on the strength of competition matter in terms of their implications for passengers and taxpayers. As such, it is key to our consideration of the merits of regulatory intervention, including whether it would be appropriate and/or proportionate for us to make an MIR to the CMA.
- 4.2 Unless otherwise specified, we primarily set out evidence on metro and mainline markets in aggregate. This approach reflects:
- Similarities in the identities of the suppliers for each market segment;
  - Limitations to data availability, whereby some information that we obtained from stakeholders, notably on the financial performance of suppliers, was not available for either metro or mainline market segment on a standalone basis; and
  - The need to maintain confidentiality when summarising stakeholder responses.

### Price

- 4.3 We gathered a range of evidence on the prices paid by GB customers. In doing this, our objective at the outset was to compare the prices paid by GB customers with at least a proxy for the prices that prevail for similar equipment under conditions of effective competition.<sup>37</sup>
- 4.4 In undertaking this analysis we noted and took account of the fact that ATGs and TVMs are rarely priced on a 'per unit' basis. Rather, customers tend to procure large numbers of gates/machines together with associated IT architecture, under a range of different order sizes, procurement models (i.e. leasing/ownership), and contract lengths for maintenance.
- 4.5 We asked customers and other interested stakeholders to supply us with their views on the prices that they pay for GB equipment. We were particularly interested in any comparisons that stakeholders were able to make between contract prices paid for GB rail equipment and any available benchmarks for equipment in other jurisdictions or, for example, the prices that they paid for similar equipment in other transport markets such as buses.

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<sup>37</sup> We engaged economic consultancy CEPA to assist with this element of the study

- 4.6 A number of responses from customers, whilst giving opinions on prices that were clear in qualitative terms, stated that due to the lack of competition and the absence of any reasonable international comparators, they could not articulate a fully evidenced understanding on what would represent good value in these markets.
- 4.7 Partly because of these limitations, we also carried out an analysis of profitability in the relevant markets. Using data supplied by stakeholders in response to our information gathering powers, we used a return on sales (“**ROS**”) measure of profitability to calculate the ratio of operating profits (also known as Earnings Before Interest and Tax/EBIT) to revenue. This approach has been relatively widely used in a recent competition policy context and was, in our view, appropriate for manufacturing/service businesses such as these.
- 4.8 We recognise the limitations of profitability data to draw firm conclusions in competition analysis.<sup>38</sup> High profits may reflect greater efficiency (i.e. low costs rather than necessarily high prices), or reflect an *ex post* return on *ex ante* risk. However, as part of a wider package of evidence, high, consistent profits may be indicative of a strong market position. We have accordingly adjusted the weight afforded to this evidence, and have principally used it as a means of ‘cross checking’ the veracity of stakeholder evidence, rather than as a means of drawing conclusions from it on a standalone basis.

## ATG pricing

### Stakeholder views

- 4.9 The balance of responses we received regarding the pricing of ATGs in GB was negative, in that customers did not appear convinced that they had been able to obtain a good deal on price. One told us that, “... *there are only a few manufacturers to choose from... [f]or ticket gates.... Cubic and S&B.... in [their] experience both are very expensive.*”
- 4.10 Another stakeholder described Cubic as “*eye wateringly expensive...*”; One stakeholder, arguing that the prices of GB ATGs are high, provided us with a comparison between prices it had paid for barcode readers and highlighted that the price of similar equipment in the UK bus industry was around 15-20% of the level prevailing in rail. Without providing specific details, the same stakeholder argued that maintenance was similarly expensive. The stakeholder drew a comparison with the TVM market, suggesting that value for money was better in this sector. They cited the

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<sup>38</sup> The relationship between market power and profit levels is straightforward in terms of both simple intuition and formal theoretical theory. However, in practice, competition authorities only use profitability data to draw firm conclusions when a number of conditions are satisfied e.g. see <https://www.oxera.com/agenda/profitability-analysis-and-competition-policy-revisited/>. In this case, we were particularly cognisant of, and sought where possible to mitigate for: the limited time span of the available data; and, issues with allocating common costs between products



greater number of players, and suggested that Parkeon had 'shaken up' the market by introducing more TVM options.

- 4.11 A potential new entrant supplied us with information showing us how it prices its ATGs in other jurisdictions, together with anecdotal evidence that in its view suggested that, on a like for like basis, its prices were significantly lower than those currently charged for ATGs in GB. We were, however, unable to make a direct comparison between this data and the prices currently paid by GB customers, due to a range of differences in the respective product offerings.
- 4.12 One stakeholder told us that there were significant differences in the prices of the two GB suppliers, with one charging "typically an additional 20-30%", when compared to the other.
- 4.13 Suppliers of ATGs described their pricing models to us and argued that they sought to ensure value for money for customers, both in GB and across global markets.

## **Profitability**

- 4.14 Using Bloomberg data sourced by the consulting firm CEPA, we compared data on the ROS earned by suppliers in the GB market, over the last 3-4 years, for ATGs with that of other UK companies. We drew one set of comparators from the manufacturing industry.<sup>39</sup> We also considered data on the returns of software companies and of the entire FTSE 350 (non-financial) index. Having taken into account stakeholder feedback and given the lumpy nature of demand in these markets we also made reference to longer term data sets in the form of public company accounts as a means of 'sense checking' our results for the shorter term data set. Given the need to take a proportionate approach to evidence gathering we relied on the companies providing information to arrive at an allocation of common costs and revenues to product groups.<sup>40</sup>
- 4.15 Having adopted this approach to profitability analysis and, in our view, appropriately adjusted the weight afforded to this class of evidence, overall we found that the evidence on profitability was in our view consistent with the concerns and other evidence supplied by stakeholders, i.e. that prices are higher than might prevail under effective competition. As noted above, important caveats apply to this finding,

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<sup>39</sup> Bloomberg - Industrial Machinery Manufacturing (IMM), Electrical Equipment Manufacturing (EEM), and Other Machinery Manufacturing (OMM)

<sup>40</sup> We noted that data was provided in response to a formal information request. We therefore consider, that the companies concerned are sufficiently incentivised to ensure that the data they provided, including on cost allocation, was reasonably accurate. Alternative approaches to cost allocation were subsequently highlighted that would have pointed towards lower profits than assumed in our analysis. However we consider the approach we adopted to be both plausible and reasonable, and, as stated below, was supportive of stakeholder views on high prices

however, and as such we afforded evidence on profitability only a modest weight in our overall decision making in this review.

4.16 We should be clear that we do not consider the evidence supports any suggestion that the prices charged in the GB ATG market are so high so as to raise a suspicion of illegality under competition law.

## TVM pricing

### Stakeholder views

4.17 We received a relatively limited and somewhat mixed response from stakeholders regarding TVM prices.

4.18 For example:

- One stakeholder told us: *"The cost to purchase TVMs has increased over time and this is primarily due to suppliers adding costs for project management, profiling machines, etc.... The unit costs haven't really increased."*; while
- Another stakeholder stated that its relationship with its TVM supplier had been *"financially advantageous"*.

### Profitability

4.19 We carried out a similar exercise to the analysis used for ATGs summarised above. Data supplied to us by market participants did not appear to show profits that were unusually high (or low) by comparator standards.

## Service quality

4.20 Concerns about service quality were an important driver of our decision to review these markets.

4.21 Service quality issues, for both ATGs and TVMs, have the potential to impact passenger waiting times, and as such give rise to significant harm given the very large<sup>41</sup> numbers of individuals whose passenger experience depends on this equipment and the high value of time typically attached to rail passengers in transport evaluations.

4.22 We asked stakeholders to supply us with their evidenced views on service quality, both from a 'static' perspective (e.g. in terms of the speed and efficacy of supplier responses to customer requirements and concerns, etc); and a more 'dynamic' perspective, e.g. in terms of new products and innovation. This section sets out our

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<sup>41</sup> e.g. for ATGs we estimate that there are around 4 billion combined passenger entries and exists per year

analysis of static service quality metrics. Dynamic metrics, principally innovation, are covered later in this chapter.

## ATGs – static service quality

### Reliability

- 4.23 Overall, we found that TOC customer satisfaction with reliability of ATGs was good on a consistent basis, with notable positive feedback attributed to the products supplied by Cubic.
- 4.24 One stakeholder told us that: *“Service quality is generally good from Cubic in most cases, they tend to react quickly to most things, though sometimes software issues can take them longer to address. Reliability is good, with them generally meeting their SLA’s...”*. Another stakeholder told us that it was: *“... generally satisfied with the value for money obtained from CUBIC ATGs maintenance, reliability, response to service issues and speed of action are acceptable.”*
- 4.25 Another stakeholder told us: *“The positive side of Cubic having the monopoly is the service and innovation are well supported with a good infrastructure when compared to similar Ticket Issuing System (TIS) suppliers. Examples are as follows: Good knowledge and experience for hardware and software. An ongoing hardware refresh programme. Good support for training. Support for all media types. Good understanding and support for ITSO. BAU/Service Management is good....”*
- 4.26 However, in relation to an alternative supplier one stakeholder told us the following: *“...Low degree of satisfaction - long delays in rectifying... software faults are common... Strong reliance on one or two technical experts so disruption during periods of leave / sickness. Seemingly low technical knowledge in relation to ITSO smart ticketing.”*

### Availability

- 4.27 Data on gate availability appeared to show that purchasers receive a good service from their ATG suppliers. Their service levels appeared to us to be high in absolute terms, and were objectively high when compared to the targets in their contracts.
- 4.28 We found that TfL often exercises contract penalties, whereas TOCs do not. However, the evidence is caveated by the lack of clarity around whether service parameters are attributable directly to gates or other aspects of wider revenue collection contracts.
- 4.29 In terms of negative feedback, one stakeholder raised issues with service delivery in relation to installation, and another raised issues about whether one supplier was sufficiently scaling its operations to meet increasing demand. Issues were also raised about correct attribution for service quality issues.

## Safety

4.30 Passenger safety represents a key aspect of service quality. We therefore carried out an analysis of Cubic's service quality, using RIDDOR<sup>42</sup> data spanning the last three years. We found that ATGs have a good safety record in GB, with an average of one ATG-related incident per year recorded on the RIDDOR database. This figure is not high relative to the more than 4 billion per year passenger entries and exits on GB's mainline. It is also low relative to the total number of recorded incidents on RIDDOR (over 20,000 in 2016/17 alone) per year, representing a negligible proportion (0.004% based on 2016/17 data) of all GB incidents.

## Accessibility

4.31 Train and station operators are required by their operating licences, to establish and comply with a disabled people's protection policy ('DPPP'), which must be approved by ORR.<sup>43</sup> A DPPP sets out, amongst other things, the arrangements and assistance that an operator will provide to protect the interests of disabled people using its services and to facilitate such use. ORR experience of, and data on, passenger complaints suggests that the ATGs are not one of the primary concerns facing passengers including those with accessibility needs.

## TVMs

4.32 Views on the service quality offered by TVMs were, overall, suggestive to us of reasonably widespread concerns, albeit not without a degree of positive feedback. We received 11 clear responses regarding TVM service quality. Of these, 3 were overall positive, with the remaining 8 being overall negative. We observed a marked tendency for customers of one supplier to provide more negative responses than customers of the other manufacturers.

4.33 One stakeholder referred to long lead times for new orders. Another stakeholder told us that its past experience with its supplier was "*poor*" regarding the provision of maintenance. Another stakeholder expressed fairly strong dissatisfaction with TVMs, describing a recent "*nightmare*" with its supplier. The stakeholder outlined issues with, in its view, the supplier failing to meet its SLA within the past two years, and described ways in which it thought TVM technology could be readily improved, including better information screens which provide more clarity around ticket restrictions.

4.34 However, one stakeholder told us that its supplier "*...has a great reputation*".

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<sup>42</sup> Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013, e.g. see <http://orr.gov.uk/rail/health-and-safety/reporting-riddor-incidents>

<sup>43</sup> e.g. see <http://orr.gov.uk/rail/licensing/licensing-the-railway/disabled-peoples-protection-policy>

## Availability

4.35 We gathered quantitative information on TVM availability, in the same format as for ATGs (see above). Manufacturers' performance against contractually agreed availability targets was mixed for the sample of contracts we looked at between January 2015 and March 2018. Overall, suppliers met or exceeded targets on 20 out of 27 (74%) contracts. The largest discrepancy between agreed target and out-turn performance was 1.6 percentage points. Taking a simple unweighted average across the entire sample of 27 contracts:

- Average availability was 99.0%; and
- Contractually agreed availability was 98.6%, in other words, performance was 0.4 percentage points better than agreed.

4.36 In summary, quantitative evidence on TVM service quality showed that between January 2015 and March 2018, availability was below agreed levels on some 26% of TVM contracts. The margin by which suppliers missed their targets was on average modest small and, in all cases, performance levels did not appear very low in absolute terms. We still, however, consider that the available evidence lends support to the negative qualitative feedback that we received regarding TVM service quality.

## Accessibility and customer complaints

4.37 During 2017/18, TOCs received 18,334 complaints about TVMs, amounting to 3.2% of all complaints received over this time period. Of the TVM complaints, 22% related to information provision by TOCs, and as such would appear not to relate to the quality of the equipment itself. We are aware of some concerns in the area of TVM accessibility.<sup>44</sup>

## Innovation

4.38 We asked stakeholders for their evidenced views on the level of innovation in the market for both ATGs and TVMs. Overall there was dissatisfaction with innovation, particularly around the time it takes for innovative products to come to market.

## ATGs

4.39 Stakeholder feedback regarding innovation was mixed.

4.40 In terms of positive feedback, by way of example, one stakeholder told us in relation to a development being brought forward in relation to smart ticketing, that its

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<sup>44</sup> e.g. see [https://twitter.com/Tanni\\_GT/status/1032739981083717632](https://twitter.com/Tanni_GT/status/1032739981083717632)

supplier's: “...assistance with the development of ITSO acceptance has been professional and has broadly delivered as required”.

4.41 However, positive feedback was overall outweighed by negative statements such as: “[i]nnovation has been extremely challenging for both the Cubic and S&B infrastructure. For S&B, we have found that their gates have not been developed to be as flexible as we would expect.

4.42 The balance of feedback indicated a slow pace of innovation in the market and slow response to attempts to introduce new functionality. TOCs also had concerns that new innovative ideas were not being put forward by suppliers but driven by buyers. For instance one purchaser stated: “Neither S&B nor Cubic have shown much proactivity to improve ATGs or offer new solutions. Any recent developments, for example Barcodes and eTVD, have been driven by RDG and through encouragement of the Secretary of State.”

## TVMs

4.43 On innovation, most stakeholder feedback that we received was negative. Stakeholders said that the incumbent TVM suppliers lack incentive to innovate independently in part due to the fragmented demand, and that issues with the accreditation process create a drag on new innovations.

4.44 Despite the above, one supplier did receive positive feedback from purchasers of TVMs due to its development and introduction of a number of new products to market.

## Partial contrast for TfL

4.45 A partial distinction can be drawn in relation to outcomes achieved by TfL in contrast to the rest of the market.<sup>45</sup>

4.46 The clear view of TfL was that, notwithstanding issues in generating competition for its RCC contract, it considered it had obtained a strong deal in relation to its ATGs and TVMs (as part of its wider revenue collection service demand). Indeed, we observe that TfL has obtained favourable terms in terms of securing rights to its back office intellectual property; putting in place a mechanism for price and profit transparency; and implementing a firm performance monitoring regime. Some evidence also indicates that TfL may have secured better outcomes than mainline TOCs, including in relation to price.

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<sup>45</sup> To be clear, these distinctions apply to TfL only, not other metro operators

4.47 We also note a general perception that TfL's revenue protection system is highly regarded internationally, and has been used as a vehicle to implement its innovative integrated smart ticketing solutions. This was firstly through the introduction of Oyster, and, more recently, the introduction of payment through contactless cards.

4.48 We note that TfL may be able to exercise buyer power in relation to securing its revenue collection demand, and may also be able to leverage efficiencies of scale.

## Emerging findings

4.49 In light of the above, our emerging findings in relation to outcomes for ATGs are that:

- We have encountered significant stakeholder concern about price. Analysis on profitability was consistent with this;
- On service quality, both stakeholder feedback and analysis of available data suggested positive outcomes; and
- The balance of evidence suggested that innovation is primarily driven by purchasers, or industry bodies such as RSSB rather than being delivered through natural competition in the supply chain.

4.50 In relation to TVMs, the evidence we found on price was mixed, with profitability analysis suggesting that current prices are consistent with a reasonable degree of competition. Service quality metrics in the round produced negative results. Broadly, evidence regarding innovation was positive, with stakeholders citing new products being brought to market, and alternative means to purchase tickets providing an additional competitive constraint and source of product development.

4.51 Outcomes for TfL may be partly contrasted in that evidence indicated slightly more positive outcomes when compared to mainline services and other metro operators.

## 5. Barriers to entry and expansion

### Introduction

- 5.1 Barriers to entry and expansion are a way of describing the challenges to new companies entering the market or for existing companies expanding their share of the market.
- 5.2 In this chapter, we set out our emerging findings on the key barriers to entry and expansion in these markets. The differences between metro and mainline services are such that we present our findings separately for each. For metro services, our primary (though not exclusive) focus is on TfL given the size of its procurement and, as discussed later in this chapter, the potential knock-on effects of its approach on the supply of ATGs and TVMs for TOCs on the mainline railway network.

### Barriers to supplying metro systems

- 5.3 There is some common ground in the barriers to entry that affect metro and mainline systems. Notably, market size is a key issue for the mainline and is also relevant to, in particular, the smaller Glasgow Subway and Tyne & Wear Metro systems, which each operate a relatively small number of devices.<sup>46</sup>
- 5.4 However, metro systems appear to be largely unaffected by some of the other key barriers to entry that, as explained later in this chapter, characterise the mainline network. As outlined above, ATGs and TVMs on metro systems are not subject to requirements to be interoperable with other parts of the rail network. This enables them to purchase equipment that only needs to facilitate their own smart ticketing solutions. Would-be suppliers to metro systems are, therefore, largely insulated from issues relating to both the complexity of fares and to RDG accreditation.
- 5.5 We nonetheless observe some entry barriers that are particularly applicable to metro systems, which are set out below.
- 5.6 We also note that TfL operates just over half of all gates in Great Britain (2,663 of 5,128). Its purchasing decisions, and role in generating new suppliers and competition, therefore have a significant impact on the wider market, including the market for the mainline rail network.

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<sup>46</sup> Glasgow Subway has 83 ATGs and 35 TVMs, and Tyne & Wear Metro has 86 ATGs and 60 TVMs



## Contract aggregation

- 5.7 As noted above, the current GB metro systems integrate the supply of their TVMs and ATGs, together with the running of their end-to-end retail back office systems, including sourcing ongoing maintenance from the same single supplier.
- 5.8 The use of a single supplier under an aggregated contract can provide efficiency benefits. For example, economies of scale provides greater negotiating power, ease of developing and monitoring a relationship and allows for a single point of contact for dealing with issues. We also note that there is a balance to be struck between generating sufficiently frequent and manageable opportunities for suppliers to compete, and, creating a procurement large enough (in size or duration) to attract interest and investment, and generate competition.
- 5.9 Contract aggregation can however, have a potentially adverse effect on competition and the wider supply chain. For example, it can prevent smaller or specialist suppliers from bidding for the contract thereby limiting the number of suppliers that are able to bid for the tender and thus enter the wider market to compete for other demand.<sup>47</sup>
- 5.10 When TfL scoped the RCC contract, it identified seven categories of service. It removed two of these from the scope of the RCC (Wide Area Network and smart card supply)<sup>48</sup> with a view to disaggregate the contract where possible. However, they retained core services all within the RCC. TfL told us that, whilst a greater degree of separation would be technically possible, its view is that an ‘all in one’ approach optimises value for money and is overall the best solution to meets its needs to supply a seamless integrated retail offering to its passengers.
- 5.11 TfL had received only one final bid for its previous retail contract (the Prestige Contract). TfL knew that few suppliers would be able to feasibly or successfully bid for the tender.<sup>49</sup>
- 5.12 We recognise that TfL took steps to stimulate competition, intensively engaging the supply chain. Six expressions of interest were received for the RCC contract. Of the three parties who ultimately pre-qualified to the ITT stage, only two entered final bids.
- 5.13 Whilst it is apparent that TfL did manage to secure some degree of competition, we note the extensive efforts it had to go to in order to achieve this.

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<sup>47</sup>[http://webarchive.nationalarchives.gov.uk/20140402182823/http://www.ofg.gov.uk/shared\\_ofg/reports/comp\\_policy/ofg742a.pdf](http://webarchive.nationalarchives.gov.uk/20140402182823/http://www.ofg.gov.uk/shared_ofg/reports/comp_policy/ofg742a.pdf)

<sup>48</sup> <http://content.tfl.gov.uk/ppp-20140226-item05-electra.pdf>

<sup>49</sup> <http://content.tfl.gov.uk/ppp-20140226-item05-electra.pdf>

- 5.14 Another risk of aggregation and long term sourcing from a single supplier is that the customer becomes tied or reliant on that supplier. TfL recognised this and has taken steps to reduce ties to Cubic, notably by securing intellectual property rights to its back office.
- 5.15 A related issue raised by stakeholders, is the incentive to award future deals to the current supplier. An example of this is TfL's decision to purchase Crossrail TVMs through a variation order in the RCC rather than through open competition.<sup>50</sup> One alternative TVM supplier was particularly unhappy that it was not able to bid for the 200 Crossrail TVMs, highlighting TfL's decision further limited opportunities to compete in an already limited market. However, TfL considered this the quickest, most affordable and least risky solution.

## Contract duration

- 5.16 Opportunities to tender for metro ticketing systems are limited. For the TfL metro system, in the past 20 years there have only been two opportunities for new suppliers to compete for TfL's revenue collection demand. When asked about the duration of the RCC contract, TfL explained that it was standard to have a 7-year contract as it takes two years to run the procurement process and two years to transition the vendor. TfL therefore needs to allow time to "bed in" a new provider
- 5.17 The Tyne & Wear Metro and Glasgow Subway introduced their integrated ticketing system in 2012 and 2013; they have not changed supplier as of the date of this report.
- 5.18 Long term contracts self-evidently limit the number of opportunities for new suppliers to enter the market. During our market study, one would-be supplier specifically described to us the way in which it is been deterred from attempting to enter the London market by a lack of public procurement opportunities.

## Barriers to supplying mainline TOCs

### ATGs

#### Demand

- 5.19 Most stakeholders told us that the limited size of GB markets for ATGs acts as an important barrier to entry in GB markets.<sup>51</sup> In respect of gates, there are two sources of demand:

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<sup>50</sup> Projects and Planning Panel Subject: Procurement of the Revenue Collection System and Services Date: 26 February 2014 <http://content.tfl.gov.uk/ppp-20140226-item05-electra.pdf>

<sup>51</sup> Although not all, e.g. one stakeholder described an instance of small-scale disruptive entry for similar equipment in the UK bus market

- Gating previously ungated stations. Whilst most stations in GB remain ungated, these tend on average to have lower passenger counts than those that are currently gated. This is significant for the following reasons:
  - From a TOC perspective, the revenue protection business case for adding new gates in a station can often be weak; and
  - From a supplier perspective, the relatively small number of gates that would require installation at these stations makes them unattractive as a business proposition.
- Replacing end of life gates. We have found that ATGs, if well maintained, can remain in service for more than 20 years. This means that there are limited opportunities for new suppliers.

5.20 Set against these considerations, we acknowledge the potential for disruptive new technology to replace existing infrastructure entirely. Key potential examples of this include ‘gateless gatelines’, gates using near-field communication (NFC) technology, and gates using biometric ticketing. In each of these cases, should a product be successfully developed and deployed, passenger flow rates could be markedly increased with corresponding significant economic benefits.

## Fragmentation

5.21 As noted in Chapter 2, most opportunities that arise to tender for the supply of ATGs to TOCs are linked to the franchise system. As a consequence, new sales opportunities typically arise at the point of a new franchise bid process and this is linked to the franchise calendar. One stakeholder argued to us that recent changes to the franchise programme further reduced the number of opportunities creating a ‘start/stop’ environment.

5.22 The most recent 12 contracts for gates varied in size (between less than 10 and over 400 gates). The size of these contracts correspondingly varied from less than £250,000 to over £9.5 million. This fragmentation and lack of sufficient lead in times for suppliers, means that alternative suppliers are dis-incentivised from investing in developing a product compatible with the GB network and capable of competing with the incumbent supplier.

5.23 A supplier/potential supplier of ATGs told us that *“Demand for new TOC ATGs is sporadic and difficult to predict. They often are included in a TOC’s franchise bid and the quantity/location will differ between different bidding TOCs. So, in these circumstances it is not clear what the demand will be until the successful TOC has been selected.”*

5.24 Stakeholders told us that it is difficult to invest in developing new products without guaranteed orders or an understanding of the future demand. Stakeholders also firmly suggested that the lack of a centralised or coordinated strategy on ATGs and the role in ticketing significantly reduced incentives to invest in innovation or new product development for use on the mainline.

## Aggregation

5.25 The majority of TOCs aggregate the purchase of hardware and software, via 'turnkey solutions'. This approach has the potential to close the markets and prevents smaller specialist providers i.e. those wishing to supply hardware or software only, from entering the UK market/ providing a competitive constraint on incumbents.

5.26 Similar to metro systems an aggregated approach has the potential to tie in TOCs to a particular supplier, particularly if the IP for the back office is not purchased, which we understand that the majority of TOCs do not do.

## Compatibility

5.27 As noted above, TfL's procurement decisions are able to influence the wider mainline market. This is because of London's significance to the remainder of the network.

5.28 TOCs whose networks include a London terminus require at least some of their ATGs to be compatible with Oyster. TOCs with stations within the Oyster Network described such compatibility as "*an absolute requirement*" or "*essential*".

5.29 Cubic is currently the only supplier that is able to supply ATGs which link up to the TfL network. Some TOCs told us that this means they have "*no option*" but to purchase Cubic ATGs, and one told us that its contractual requirements with TfL mandate them to purchase from Cubic. Given the strong preference of TOCs to have a single supplier of ATGs, the need to be interoperable with London has the potential to affect competition for the whole of a TOC's demand.

5.30 Suppliers told us that whilst a 'Pearl reader' is available for TVMs, Pearl readers (or an equivalent product) are not available for ATGs. Stakeholders told us that an equivalent reader available for ticket gates would create a more level playing field.

5.31 Notwithstanding the above, we did not find any evidence of an active 'refusal to supply' access to the TfL network for ATGs. It appeared to be the case that whilst potential new entrants view compatibility to be a key barrier to entry, no undertaking has pressed the case for access to TfL, perhaps due to the aforementioned lack of incentives to enter the market.

## Complexity

- 5.32 Whilst there are no strict regulations covering the construction of gates, there are RSSB guidelines (compliance with which is usually required by purchasers).<sup>52</sup> The guidance is (necessarily in our view), relatively prescriptive in terms of width of gates and required flow rate. Stakeholders suggest that the rationale for the guidance is to cope with station infrastructure in which gates are installed, that often dates from the Victorian era.
- 5.33 GB rail's retail market is complex, with some 55 million fares available to purchase at any one time. Its ticketing system is also complicated, with a wide range of available ticket types. In terms of 'format', there are five types of ticket on use in the railway, namely: magstripe; barcode; ITSO; Oyster; and, CPC.<sup>53</sup> ATGs may need to process any or all of these formats of ticket, depending on their location. This creates complexity for both hardware and software as follows:
- **Hardware:** Magstripe, in particular requires more complex mechanics for processing and associated machinery and is more likely to require maintenance. For example, one supplier told us: *"In terms of functionality, the main difference is the requirement to support magnetic media. This is always the most unreliable component in the gate. International deployments by and large use smart card or barcode based inspections. This does offer better reliability and therefore longer intervals between servicing."*
  - **Software:** ATGs require access to back office ticket logic software, and depending on location, need to connect to data feeds for other ticket types.

## TVMs

### Demand

- 5.34 Stakeholders told us that the monetary value of the GB market for TVMs acts as a barrier to entry.
- 5.35 We obtained conflicting evidence regarding the future of TVMs. A number of stakeholders told us that the future of ticketing is in mobile solutions, obviating the need for TVMs. However, others saw a continuing need for TVMs if not in their current form, then as part of a more interactive 'self-service retailing' solution.

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<sup>52</sup> <https://www.rssb.co.uk/rgs/standards/RIS-7701-INS%20Iss%201.pdf>

<sup>53</sup> Contactless Payment Card

## Aggregation

- 5.36 Similar to ATGs, TOCs aggregate the purchase of TVM hardware with back office software and maintenance resulting in the same risks as outlined for ATGs above. This was recognised by suppliers specialising in either TIS software.
- 5.37 We understand however, that some owning groups of TOCs are now vertically separating the procurement of back office software and hardware. This is to enable them to integrate various downstream sales channels (e.g. website, ticket office, mobile and TVMs), with one software solution.

## Compatibility

- 5.38 TOCs connecting to London have a commercial imperative to secure compatibility with TfL's Oyster Network for TVMs as well as ATGs. This issue is partly mitigated through the availability of the Pearl reader for use on third party TVMs. TOCs who want a TVM which sells Oyster products can therefore purchase a TVM from any supplier, which incorporates a Pearl reader from TfL, supplied by Cubic. Notably Cubic are not present in the market for the supply of TVMs to the mainline rail network.
- 5.39 The functionality of Pearl readers is, however, limited to the ability to top up an Oyster card. They lack the full functionality of TfL TVMs, e.g. to be able to issue refunds, accept payments, and view journey history.
- 5.40 Stakeholders have told us, that there are also issues with the supply of Pearl readers. The process for obtaining a reader is complex, involving TfL, Cubic, the TOC and the TVM supplier. The TVM supplier will also need to go through Oyster accreditation, which some stakeholders have described as expensive. We have also been informed of issues with delivery, for example, one stakeholder pointed to a 9-month wait for Pearl readers to be delivered.

## RDG accreditation<sup>54</sup>

- 5.41 RDG accreditation clearly fulfils a very important purpose. Firstly, it ensures that when a ticket is sold, the revenue collected is distributed to the correct operator (TOC). Secondly, it ensures that tickets are sold accurately (for the right price, time etc.). Thirdly, accreditation ensures the integrity of the core data feeds on ticketing supplied by RDG and protects this from corruption. Further information on RDG accreditation is set out at Annex B.

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<sup>54</sup> While this market study focuses on TVMs only, we note that any intervention to address this barrier to entry would have wider impacts on all sales channels that TIS are used for e.g. web, ticket office, handheld devices etc.

5.42 Stakeholders highlighted the importance of these objectives, noting the reputational and financial risks to industry should there be a significant error in retail systems due to inadequate superintendence of retailers.

5.43 Set against this however, is the need for an accreditation process not to be overly complex and burdensome as to disproportionately discourage new entry. Equally, requirements and standards should not be so prescriptive so as to prevent new or innovative approaches to retail.

5.44 Stakeholders identified the following issues:

- **The scope of RDG accreditation is too broad and extends beyond the ticketing and settlement purpose.** At a workshop on accreditation, the majority (9 of 15) of the stakeholders said that scope of RDG accreditation is not clear. There is some concern that RDG accreditation objectives, and associated standards, cover a wide range of areas that, in some cases, stray well outside of the core needs to protect ticketing and settlement processes and into the retailer's user interface design.
- **RDG accreditation standards are not clear.** 8 out of 15 stakeholders said that rules and standards regarding accreditation are not clear, inconsistent and generally difficult to understand by suppliers. One stakeholder told us: *"For new entrants, in particular, navigating around is not easy and would likely need to be guided by experienced users."*
- **Standards change too frequently.** There are currently 61 standards and since 2014 they have been revised around 250 times.<sup>55</sup> Suppliers have to be re-accredited to check compliance with the standards within a certain time period. One stakeholder said: *"RDG have produced reams of standards [...]. These standards are tweaked and updated frequently, requiring further tests and changes from suppliers/retailers"*.
- **Full accreditation every three years is unnecessary.** An accreditation certificate is valid for three years, at the end of which the full accreditation process has to be repeated. Stakeholders thought this was unnecessary, particularly as changes to the product are required to be re-accredited (referred to as interim accreditation).
- **The process of standards setting and governance is not clear.** The majority of workshop attendees agreed that it is not clear who is responsible for setting the standards, what the approach is, and the underlying process. In addition, suppliers are not given sufficient opportunity to input into standards setting.

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<sup>55</sup> For example, standard "RSPS3018: Ticketing Specification - CCST X", which ensures print formats to be used by TIS when operating with Credit Card Sized Ticket stock, has been revised five times since its introduction in 2013

Stakeholders noted that they were not ‘at the table’ when standards were being developed.

- **RDG accreditation process is not agile enough to support the introduction of new products.** Suppliers are required to re-accredit their TIS each time they make a small change. TIS suppliers told us that this was appropriate when companies tended to operate using large, infrequent, software releases. However, companies are now increasingly ‘agile’, often favouring multiple small releases that, they believe, do not always merit full accreditation.
- **Suppliers were concerned that the RDG accreditation process is often too lengthy.** Stakeholders have raised concerns about the length of time it takes to be fully accredited, which can vary from 2-3 months to two years. Similarly, time taken to complete an interim accreditation varies across companies depending on the scope of the changes: from a few days up to 11 weeks.<sup>56</sup>

5.45 We compared the RDG accreditation procedures with other similar accreditation processes, including Oyster accreditation, and the financial payments industry, given the similar purposes and objectives of these respective processes. We found examples of potentially more efficient processes, for example, a narrow scope of accreditation focused on technical aspects and involving all affected stakeholders in the development of standards (therefore reducing the number of times standards are amended).

5.46 Stakeholders argued that the accreditation regime in other European countries is less complex and costly than in GB. This in part reflects the, typically, lower complexity in these countries (resulting from, amongst other things, a typically smaller number of train companies per country). In addition, train companies in Europe have developed their own TIS system to which other retailers have connected via an application programming interface (an API).

5.47 In light of the above, our emerging finding is that we have concerns that the scope and process of accreditation may not adequately balance its legitimate objectives in a way that supports new entry. As a result, the RDG accreditation process renders innovation difficult, thereby preventing new entrants coming into the market.

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<sup>56</sup> We also looked into issues with slots booking, and potential discrimination i.e. whether some retailers were better able to secure time with RDG staff than others. However, our emerging analysis does not show significant concerns



## Complexity

- 5.48 Complexity for both hardware and software creates similar issues for TVMs as it does for ATGs.
- 5.49 TVMs face the additional barrier of the complexity of the GB fares system. This was noted as a key barrier to entry by the majority of stakeholders. It can significantly increase the time and expense to develop an accredited TIS product.
- 5.50 Stakeholders highlighted complexity in the market as a factor which is a deterrent to would-be new entrants.

## Innovation

- 5.51 Many of the barriers to entry and expansion are also barriers to innovation, in part due to preventing new and innovative entrants from entering the market. For example, stakeholders highlighted that the RSP accreditation process delays the delivery of new features and creates a drag on innovation. In addition, the complexity of the UK market as set out above makes it difficult to develop new and innovative products.

## Barriers to switching

- 5.52 We considered barriers to switching as part of the market study. High barriers to switching make it more difficult for customers to switch supplier thereby reducing the opportunities for new or disruptive suppliers to enter the market and increase competition. High barriers to switching will therefore contribute to concentration and a lack of competition.
- 5.53 TOCs tend to have a long term relationship with a single ATG or TVM supplier. In the case of TVMs, many TOCs have had a relationship for over 10 years. In the case of ATGs, we have seen examples of relationships between customers and suppliers dating back up to 30 years.
- 5.54 Stakeholders highlighted the key barriers to switching for both ATGs and TVMs as:
- **Building and civils work:** the cost of installation work is built into the cost of the bid. This is a particular issue for TVMs. We have been told the bases of TVMs differ, therefore, a potential new supplier will have to undertake building and civils work to install new TVMs. The cost of this work can be very high, which has the ability to make the new supplier's bid less competitive than the current supplier. In the case of ATGs, we are not aware of any TOC changing ATG supplier, however, if they were, it is likely the same issue would apply.
  - **Compatibility with back office systems:** as noted above, TVMs require a TIS product, therefore, changing TVM supplier means changing TVM TIS supplier.

The new supplier will have to ensure that its TVM TIS is compatible with the TOCs' current back office systems. This may require RDG accreditation. Similarly for ATGs, a new supplier will have to develop back office software for the TOC.

## Emerging findings on entry barriers

5.55 Our review of the available evidence has led us to an emerging view that the main barriers to entry and innovation in the supply of ATGs are as follows:

- Overall market size, which is exacerbated by;
  - The aggregation of contacts for supply to metro system operators (reducing opportunities for specialist suppliers) and infrequency of opportunities to compete;
  - On the mainline network, fragmented release of demand to the market generating insufficient incentives for alternative suppliers to invest in a GB compatible product and compete in TOC tenders; and
- Issues regarding accessibility to back office systems needed to deliver a product with the necessary interoperability with other systems, notably London.

5.56 For TVMs, barriers to entry appear to be on a lower scale than for ATGs and is consistent with the relatively greater progress being made by new entrants. That said, we consider an obviously identifiable barrier to entry to be issues with RSP accreditation.

5.57 Other barriers which we consider to be relevant to TVMs are:

- The fact that the market size is declining and the uncertainty as to future levels of demand;
- The commercial imperative for TOCs connected to London to retail Oyster products. We note, however, that the issue applicable to Oyster applies to a lesser extent than for ATGs (due to the ability to have Pearl readers), though there are some issues in practice regarding the supply of this essential product; and
- The complexity of the fares system.

## 6. Proposed next steps

6.1 This chapter sets out the case for regulatory intervention, and our corresponding proposals for remedial action, in light of our emerging findings set out above.

### The case for intervention

6.2 Our emerging view is that the markets for the supply of ATGs and TVMs are not functioning as well as they could be if barriers to entry were lower and competition between suppliers was stronger. We are particularly concerned that the market conditions do not facilitate fair and robust rivalry between suppliers. Further, they do not promote natural innovation from the supply chain to allow for the introduction of dynamic disruptive new entry.

6.3 We consider there to be a particularly strong case for intervention in relation to the market for the supply of ATGs where we note that evidence suggests weak competition and potential for improvement in relation to a number of market outcomes including price and innovation. As regards the market for the supply of TVMs, we consider the case is less clear as the process of rivalry does appear to be driving better outcomes (albeit slowly), though improvements could be made in relation to specific and obviously identifiable issues, notably accreditation processes.

### Available remedies

6.4 Given our view that there is a case to intervene, we have looked at possible remedies including making an MIR to the CMA (see Chapter 7, below). At this stage of the study, our aim is to propose a **broad direction** for further work, rather than to propose a specific set of remedies.

6.5 Market studies have a number of possible outcomes.<sup>57</sup> These include:

- A clean bill of health for the market;
- Consumer focused action;
- Recommendations to business or Government;
- Competition enforcement action;
- The use of regulatory powers where available; and/or
- An MIR to the CMA.

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<sup>57</sup> [http://orr.gov.uk/data/assets/pdf\\_file/0007/23974/orr-approach-to-monitoring-and-reviewing-markets.pdf](http://orr.gov.uk/data/assets/pdf_file/0007/23974/orr-approach-to-monitoring-and-reviewing-markets.pdf)

6.6 When choosing between these alternative courses of action we consider the following factors:<sup>58</sup>

- The tools available to us;
- How the remedy addresses the barriers and the detriment we have identified;
- How effective and proportionate the remedy, or package of remedies, would be;
- How the different remedies are effective as a package of interventions to help make competition work effectively; and
- How the remedy, or package of remedies, supports other ORR work in the ticketing sector.

## Possible remedial action

6.7 Whilst there are some limits to what regulatory intervention can achieve (for instance the overall size of the GB market faces natural constraints resulting from the size of the GB transport sector), we consider that in this case there are remedial options that can be pursued proportionately to improve the functioning of these markets.

6.8 We consider that the common thread identified in this study is that the key barrier to entry that needs to be addressed is the lack of incentives for alternative suppliers to enter, invest in, innovate and compete for demand in supplying ATGs and TVMs in GB. In summary, we consider some of the key issues that constitute barriers to entry are as follows:

- **Metro services:** opportunities to compete are infrequent, and tender opportunities, when they do arise, are for large aggregated demand for end-to-end revenue collection services;
- **ATG mainline tenders:** demand is released to market in a fragmented fashion and is dependant on the franchise timetable. There is little lead in time for suppliers; and
- **TVM demand on mainline network:** stakeholders cite the stifling effect of RDG accreditation processes.

6.9 In taking this view, we make no criticism of the competency of TOCs or metro system operators in how they purchase products. We consider that these are features of the market that have arisen by virtue of how the market is structured.

6.10 Our intention is to focus on the way in which demand is brought to the market, in order to generate better incentives for alternative suppliers (who do exist

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<sup>58</sup> e.g. see *ORR's approach to monitoring and reviewing markets*, January 2017, [http://orr.gov.uk/data/assets/pdf\\_file/0007/23974/orr-approach-to-monitoring-and-reviewing-markets.pdf](http://orr.gov.uk/data/assets/pdf_file/0007/23974/orr-approach-to-monitoring-and-reviewing-markets.pdf)

internationally) to compete in GB markets, and for all suppliers to have a greater incentive to invest in innovative products for use on GB infrastructure. For the reasons set out in further detail in Chapter 7, we consider that the most proportionate approach to pursuing this objective is for ORR to take action to develop a set of remedies itself, rather than to make an MIR to the CMA.

6.11 We have grouped possible remedies into two categories that are set out in more detail below.

## Market opening remedies

6.12 This category of remedy is designed to incentivise new entrants into the supply chain. Working with industry participants we intend to use the remaining duration of this market study to:

- Consider how the way mainline demand for ATGs is brought to market could be changed so that the current fragmented competitions are replaced with a managed release of demand. This could involve recommending some form of co-ordinated planning, to ensure demand is brought to tender in a way to optimise supply chain interest (e.g. ensuring sufficient scale of demand with forward planning and reasonable lead in times). Such a remedy could also harness the potential to leverage buyer power and achieve economies of scale where possible;
- Explore the advantages and practicalities of separating the purchase of back office software from hardware; and
- Work with TfL to explore options for more experimental approaches to introducing alternative smaller specialist suppliers within its RCC contract.

## Access remedies

6.13 We also recognise the need for remedies to address potential entry barriers imposed by compatibility and accreditation issues. On the basis that the aforementioned set of remedies generate the interest from alternative suppliers, we wish to ensure their ability to compete for and win demand is not restricted by difficulties in accessing necessary back office systems, or by the need to navigate complex accreditation processes.

6.14 In broad terms we therefore propose to explore remedies around:

- Working with TfL to further improve access to London back office systems; and
- In relation to TVMs specifically, work with RDG to improve accreditation processes. In particular, we wish to press for the dedication of resource to pro-actively encourage new entry. RDG has proposed a set of commitments

regarding improvements to accreditation processes which are attached to the update paper at Annex C.

## **Next steps**

- 6.15 Following the publication of this update paper, we will continue to develop and refine a package of remedies, broadly following the proposals set out above, to address the market issues we have identified to date.
- 6.16 We propose to develop these remedies through working with stakeholders and holding a number of remedy workshops.

## 7. Decision not to make a reference

- 7.1 This chapter sets out why we have decided, at this stage, not to consult on making an MIR to the CMA.
- 7.2 A market investigation is a more detailed investigation into whether there is an adverse effect on competition (“**AEC**”) in the market(s) for the goods and services referred. If any AECs are identified, the CMA would decide what remedial action, if any, would be appropriate. Following a market investigation, the CMA has a wide range of legally enforceable remedies (including legally binding orders), aimed at making the markets more competitive in the future.<sup>59</sup>
- 7.3 We have power to make an MIR to the CMA when the findings of a market study give rise to reasonable grounds for suspecting that a feature or combination of features of a market or markets<sup>60</sup> in GB prevents, restricts or distorts competition, and an MIR appears to be an appropriate and proportionate response.<sup>61</sup>
- 7.4 We received no representations arguing that an MIR should be made in response to our market study notice published on 13 March 2018. We are required to decide by 13 September 2018 whether to begin the process of consulting on making an MIR.<sup>62</sup>

### Legal framework

- 7.5 As set out above, the reference test is a ‘reasonable grounds to suspect’ test and does not require ORR to have concluded that there are, in fact, features of a market which prevent, restrict or distort competition.<sup>63</sup>
- 7.6 Where the reference test is met, ORR can exercise its discretion as to whether it makes an MIR. Guidance on how to exercise this discretion sets out four criteria to guide our decision making:

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<sup>59</sup> Section 134 of EA02 sets out the questions to be decided by the CMA on an MIR and section 138 of EA02 sets out the CMA’s duty to remedy adverse effects

<sup>60</sup> Section 131(2) of EA02 sets out what is to be construed as a feature for the purposes of Part 4 of EA02

<sup>61</sup> Section 67(2A) of the Railways Act 1993 and section 131 of EA02 set out the powers of ORR to make a market investigation reference to the CMA

<sup>62</sup> Under section 131B(3) of EA02, ORR must publish a notice of its decision not to make an MIR within 6 months beginning with the date on which it publishes the market study notice. Sections 131B(2)(a) - (c) of EA02 state that ORR may publish such notice under 131B(3)EA02, where: (i) ORR has published a market study notice; (ii) no representation has been made to ORR within the period specified in ORR’s market study notice that an MIR should be made under section 131 of EA02 in relation to the matter specified in the notice; and (iii) ORR has decided not to make an MIR

<sup>63</sup> This point was made clear by the Competition Appeal Tribunal in *Association of Convenience Stores v OFT, CAT 36 [2005]*, paragraph 7

- The scale of the suspected problem is such that a reference would be an appropriate response;
- There is a reasonable chance that appropriate remedies would be available;
- It would not be more appropriate to address the concerns through undertakings in lieu of a reference (UILs); and
- It would not be more appropriate to address the competition problems through alternative powers available to the CMA or through the powers of sectoral regulators.<sup>64</sup>

7.7 In considering these factors, we recognise the impact an MIR would have on the sector, including significant costs, both to participants in the markets under scrutiny, and to the CMA to whom the markets would be referred (and therefore the public purse).

## Exercise of discretion

7.8 For the reasons set out earlier in this document, we consider that we have identified areas in which we may have reasonable grounds for suspecting that a feature or combination of features prevents, restricts or distorts competition, such that the discretion to refer these markets to the CMA is open to us.

## Scale of problem

7.9 In determining how to exercise our discretion as to whether or not to make a reference we first considered the scale of the suspected problem. We then considered whether an MIR would be an appropriate response. We note that the size of the markets in question, when combined, is relatively limited in general terms (an estimated range of £50 million to £100 million per annum). Whilst we observed some poor outcomes in terms of price and service quality, the direct efficiencies that would be achieved by an MIR would be unlikely to outweigh its cost.

7.10 Set against this however, is the fact that these markets have significant ancillary impacts.

7.11 Small improvements in gateline technology which improve passenger flow could bring about very large wider economic benefits given the estimated 4 billion entries and exits per year, together with the high value of passenger time.<sup>65</sup> We also considered the positive impact improved passenger flow could have on deferred capital investment on upgrading stations for capacity issues.

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<sup>64</sup> Guidance about the making of references under Part 4 of EA02, OFT 511, paragraph 2.1

<sup>65</sup> See e.g. the Passenger Demand Forecast Handbook (PDFH)



7.12 Additionally we consider that improvements in competition and innovation in these markets could have a strong impact on developments in smart ticketing resulting in economic benefits as well as contributing to a better customer experience on the railways.

7.13 On balance therefore, we consider that the scale of the problems are such that a reference could be an appropriate response, though we note and have regard to the relatively limited size of the markets.

## Remedies

7.14 The next stage of our consideration was to consider the available remedies, and, more widely, to consider the most appropriate response to address the issues we identified. We also considered what options were available to ORR in addressing the issues identified, without having recourse to the cost of an MIR.

7.15 As set out in Chapter 6, above, we consider that the case for intervention and the barriers to entry primarily lie on the demand side of the market. There is therefore scope to improve the way in which demand is brought to the market in order to improve incentives for alternative suppliers to invest and compete. We therefore consider that the best option for tackling these issues, is one which is within ORR's remit, namely to work with industry to develop and refine a package of remedies aimed at restructuring how demand is brought to the market. Indeed, we consider that the issue we identified do not necessarily lend themselves to being dealt with by binding orders.

7.16 We therefore take the view that given the nature of the issues identified there is a more appropriate course of action than an MIR to seek to resolve the market issues we have identified.

## Other factors

7.17 In light of the above, we did not explore the option of UILs, though we note, and take account of the fact that the RDG has proposed a series of commitments to ORR regarding improvements to industry accreditation processes.<sup>66</sup>

## Conclusion

7.18 Whilst an MIR would undoubtedly further improve understanding of the operation and issues in these markets, and open the scope for legally enforceable remedies, we do

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<sup>66</sup> Attached at Annex C

not, on balance, consider that it would be proportionate for us to make an MIR in this case.

7.19 Instead, ORR will seek to rectify competition issues identified in this study, by working with industry to develop and refine a package of remedies primarily targeted at improving the way in which demand is brought to market.

## 8. Invitation to comment

- 8.1 As indicated in Chapter 7, we have decided not to make an MIR at the end of this market study.
- 8.2 This market study is therefore ongoing. The statutory deadline for completing this market study is 13 March 2019. The second stage of this study will focus on designing a set of remedies to address the key issues identified in this report.
- 8.3 Following the publication of this update paper, we will continue to engage with stakeholders through:
- Inviting submissions in response to this update paper;
  - Holding workshops to discuss our interim findings with a focus on developing and refining remedies; and
  - Holding bilateral meetings with key interested stakeholders to discuss our interim findings with a focus on developing and refining remedies

### Invitation to comment

- 8.4 Interested parties are invited to make submissions by **11 October 2018** on both the substance of this update paper and the proposed course of action proposed by ORR, outlined in Chapter 6.<sup>67</sup>
- 8.5 In commenting on this update paper, we ask stakeholders to set out their views on:
- The emerging findings set out in this paper, and, whether you support or disagree with them. You should provide relevant evidence where appropriate to support your arguments;
  - The proposed course of action of ORR as a means of addressing the issues we have identified;
  - The commitments offered by RDG in relation to improving accreditation processes;
  - Likely costs of possible remedies to you or industry in general; and
  - Any unintended consequences of any possible remedy.

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<sup>67</sup> For the avoidance of doubt, ORR has no duty under section 131B of EA02 to consult interested parties before making a decision not to refer, and are not inviting comments on this aspect of the update paper



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