# Transit Agency Research Report: The State of Fare Collection


masabi

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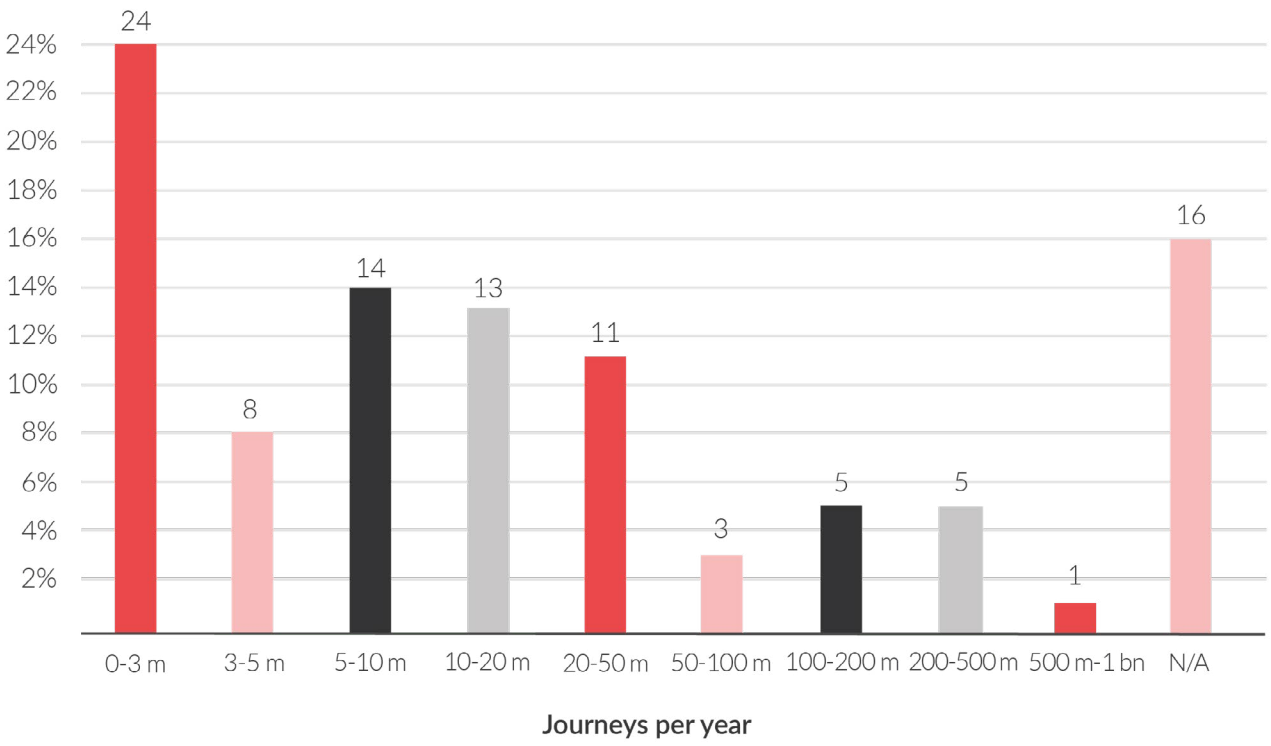
# Methodology

Masabi issued a survey in the late summer/fall of 2019 to professionals working for transit agencies and operators around the globe, with a particular focus on fare collection teams. We wanted to better understand the fare collection market, the challenges agencies and operators are facing, and gain an understanding of where the fare collection industry is heading.

The survey had a specific focus on agencies' and operators' "Core" Automatic Fare Collection (AFC) system (the primary back-office solution or sales channel with the highest percentage of sales) and was designed to try to understand some of the fundamental characteristics of these systems.

The survey was completed by 63 transit professionals from 60 agencies and operators. The majority of respondents were from agencies based in North America and, as the chart below shows, drawn from a cross-section of agencies and operators of all sizes.



# Executive Summary

Masabi issued a survey in the late summer/fall of 2019 to professionals working for transit agencies and operators around the globe, with a particular focus on fare collection teams. The survey had a specific focus on agencies and operators "Core" Automatic Fare Collection (AFC) system (the primary back-office solution or sales channel with the highest percentage of sales).

## Key Findings Include:

- 43% of agencies have been operating their "Core" Automatic Fare Collection (AFC) systems for over a decade
- Most "Core" Automatic Fare Collection (AFC) systems take 1 to 2 years to go live (30%), with a further 11% taking over three years
- 59% of agencies stated any updates to their system was either 'Hard' or 'Very Hard' with updates occasionally or hardly ever happening
- 34% of agencies declared that they are paying under 10% of their fare revenue to run their AFC system, with 35% paying between 10%-20%
- 62% of agencies have either deployed or will deploy an Account-Based Ticketing system for their riders
- 24% of agencies are looking into deploying Account-Based MaaS while 22% are interested in Practical MaaS

# Introduction

The way transit agencies and operators purchase and run ticketing (fare collection) systems has not dramatically changed in decades. Of course, new ticketing channels have come onto the market and had a significant impact on how fare collection systems are run/operated, like mobile ticketing for example. And now agencies are looking to introduce Account-Based ticketing systems, so passengers no longer even need a ticket or to understand fares. Instead, they simply tap and ride using a contactless bank card, mobile phone or smartcard.

The "Core" Automatic Fare Collection (AFC) system (the primary back-office solution or sales channel with the highest percentage of sales) used by agencies is still dominated by AFC providers offering bespoke and customized solutions which agencies purchase and operate for years (even decades) using a Design, Build, Operate, Maintain (DBOM) model.

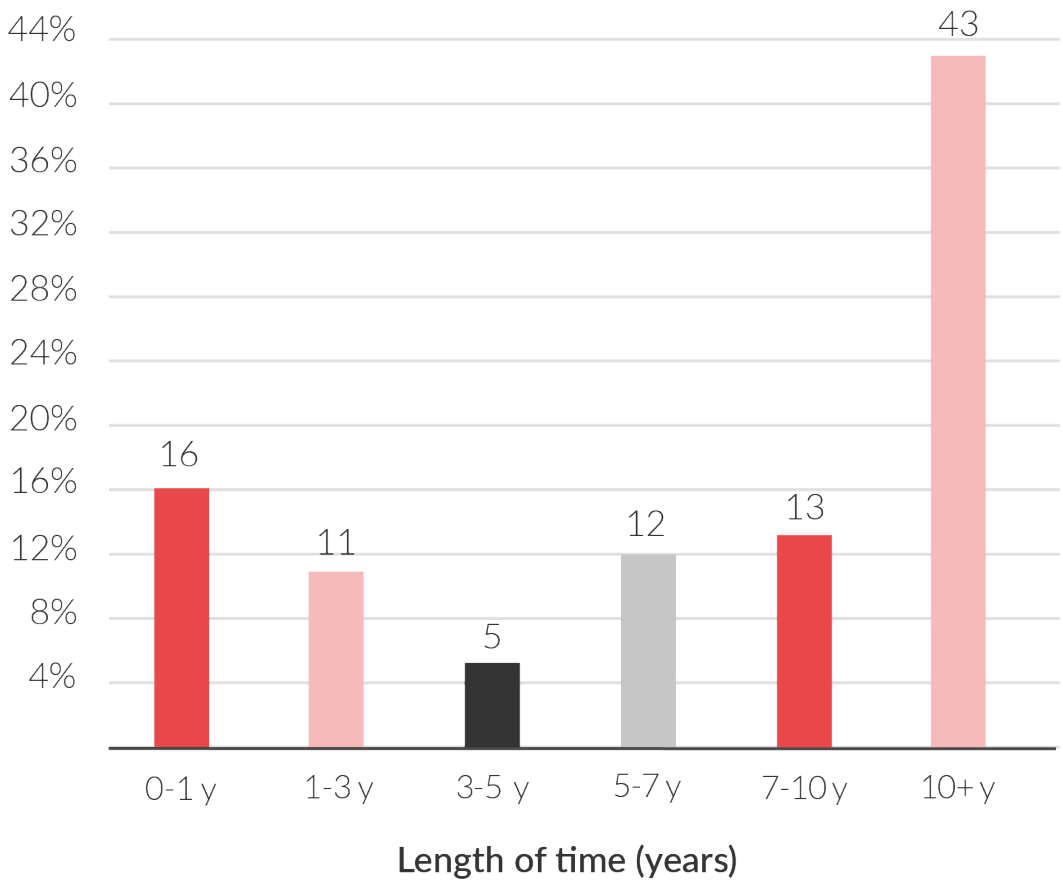
A Design Build Operate Maintain approach to delivering a new ticketing system for an agency means each agency has to invest time and money developing what they need when they procure for a new system. They then engage a supplier to build that system for them, in order to meet strict and detailed specifications set out in the agency's RFP. Then the system needs to be operated and maintained, usually for a significant amount of time.

With a Design Build Operate Maintain model for system delivery, each agency purchases its own solution to fit bespoke specifications, usually using bespoke software and hardware. The research hypothesis was that the result of this approach would mean these systems are overly expensive to build and maintain as well as taking a significant amount of time to get up and running. The research also sought to uncover how long these systems were usually in place for, as well as how easy they were to update to provide passengers and agencies with new functionality.

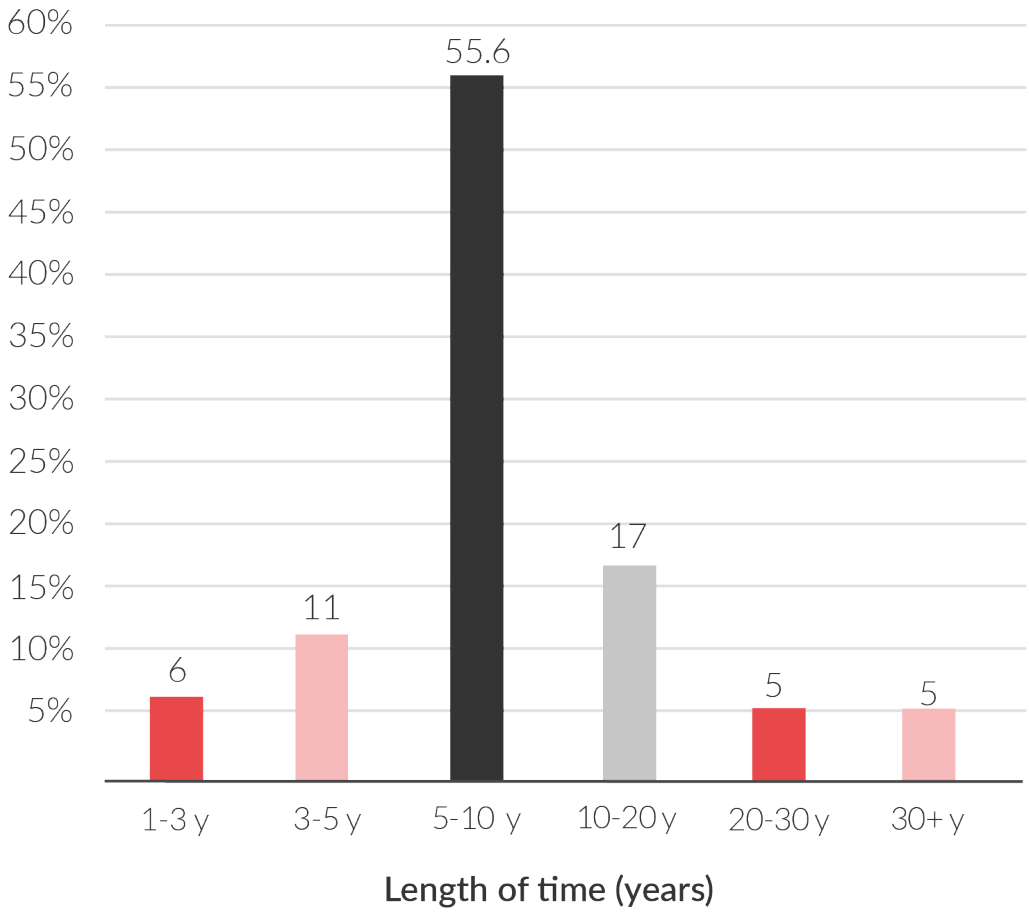
# Findings

## System Overview

The first question focused on the state of systems implementation. Respondents were asked "How long has your "Core" Automatic Fare Collection (AFC) system (the primary back-office solution or sales channel with the highest percentage of sales) been live?". Interestingly, 43 percent have been operating their system for over a decade, with 56 percent over seven years. It is perhaps worth noting for context that around a decade ago, smartphones became a mainstream user device and app mania had just taken hold; technology has changed considerably since then.

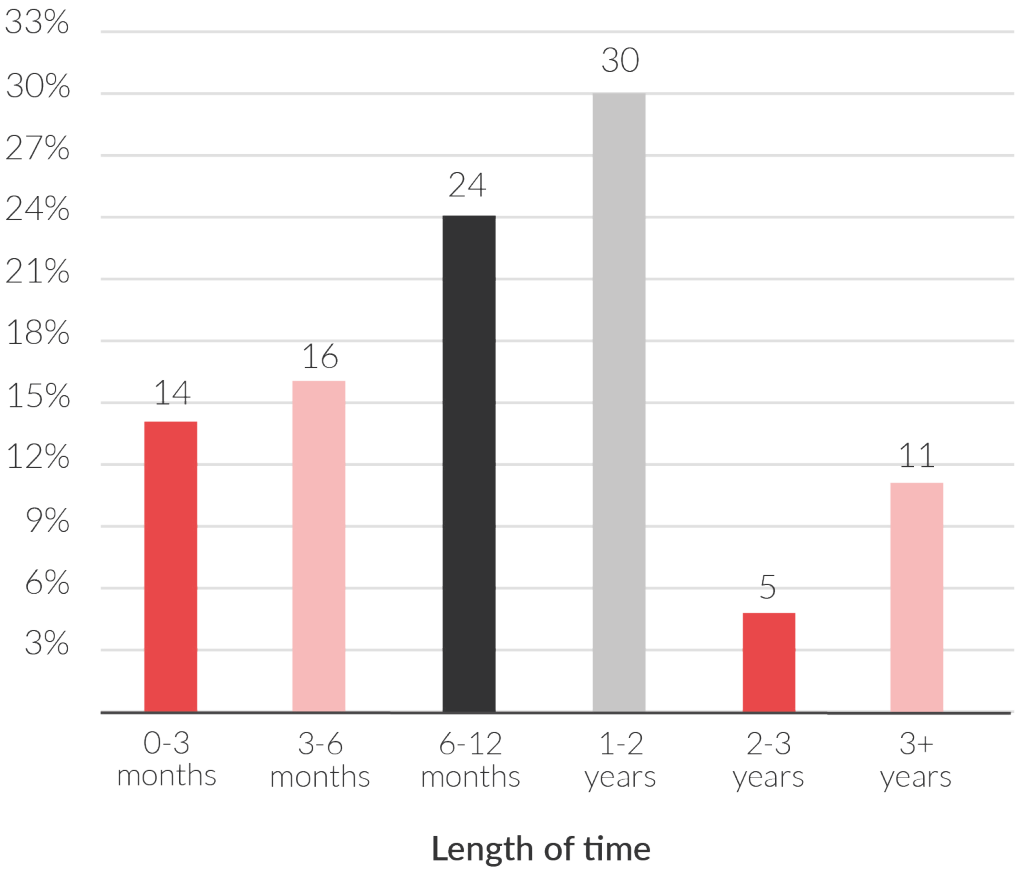



However, when asked, "How long will your Core AFC system be in place for (estimate total length)?" the results were markedly different. It is clear that, despite the continued reliance on old bespoke systems, agencies and operators believe their system, or a new system, should ideally be in place for around 5-10 years (55.6 percent).




Based on the results obtained, it can then be concluded that these systems are usually in place for several years and often for over a decade. There seems to be a view that these fare collection solutions should be delivering services to agencies for up to a decade, but in reality they are being used for far longer.

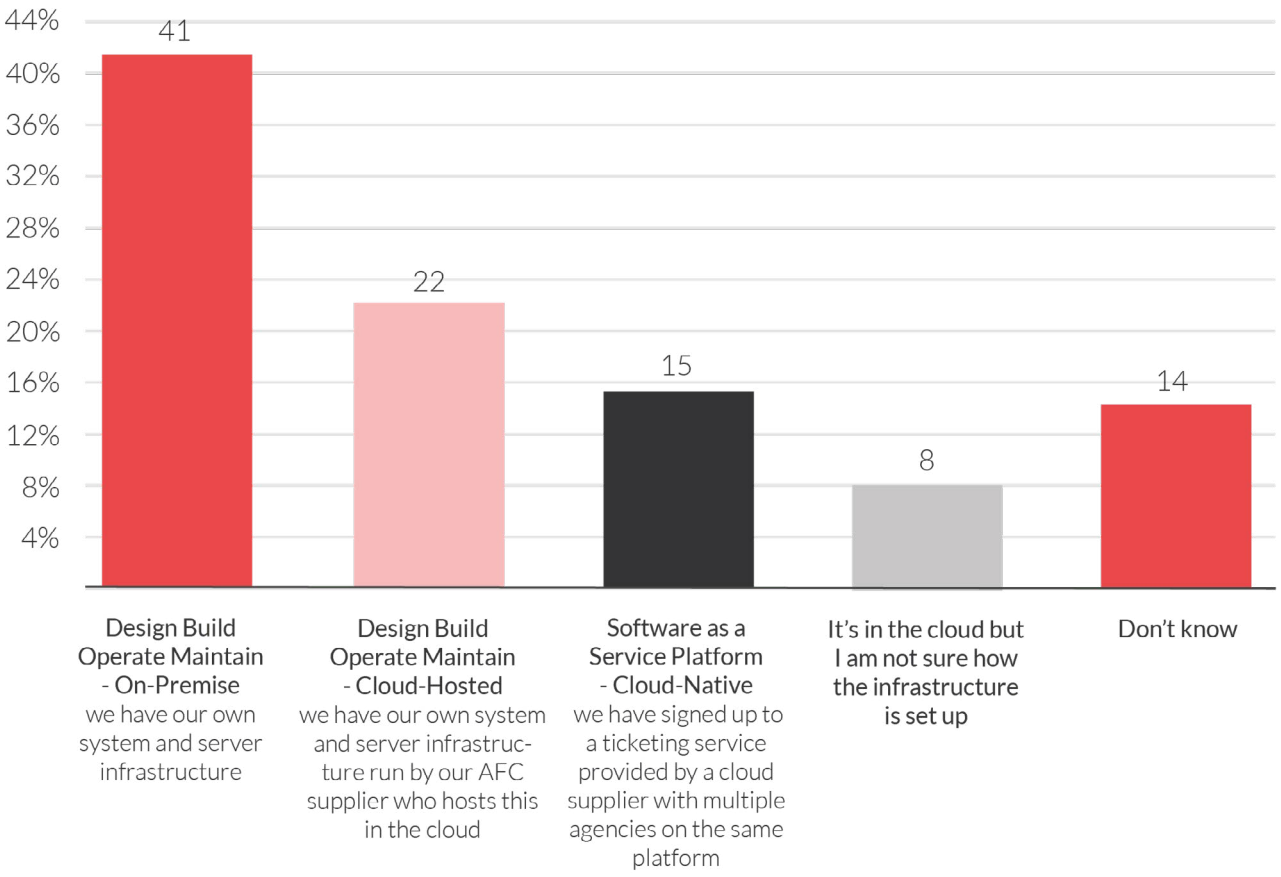
DBOM bespoke systems are built specifically for the purchasing agency. To dig further into this, the survey asked "How long did your "Core" Automatic Fare Collection (AFC) system take to get up and running from the contract award?". Although the time deployments took was split fairly evenly, the more popular answer was "1 to 2 years" with 30 percent of respondents selecting this answer. It is also interesting to see that 46 percent of systems took over a year to go live with an astonishing 11 percent taking over three years.




So what was taking agencies so long to get live, and was it down to their choice of AFC system?

## System Infrastructure and Hosting

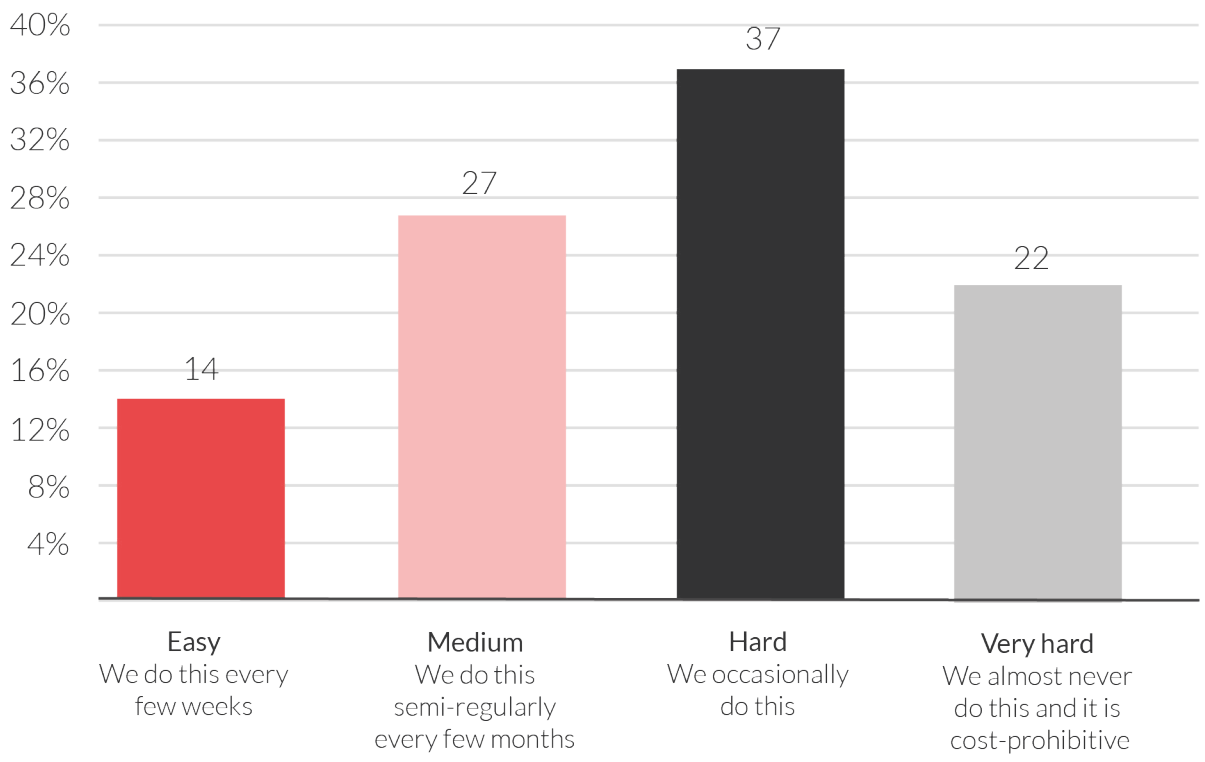
There are now a few different ways agencies can host and run their core system. When asked the question “How is your “Core” Automatic Fare Collection (AFC) system infrastructure deployed?”, the results were telling.




41 percent of respondents still have their own Design Build Operate Maintain On-premise bespoke system and server infrastructure, while 22 percent have their own system run and hosted in the cloud through their AFC provider. These models for delivering technology will always take a considerable amount of time to set up before they start providing services for passengers.

## Updates

To continue to offer passengers the best experience, it is essential that agencies can update their systems with new features. However, when asked "How easy would it be to deploy new ticketing features and functionality for your "Core" Automatic Fare Collection (AFC) system?", the results were shocking with 59 percent stating any updates to their system was either 'Hard' or 'Very Hard' with updates occasionally or hardly ever happening. In a world where Software as a Service (SaaS) solutions are the norm, having systems which hardly ever improve or upgrade, providing users with new functionality, is very surprising and should no longer be necessary. It's also worth noting that the number of people who marked this as "Easy" correlates with the number of people using a "Software as a Service Platform" for their AFC infrastructure.

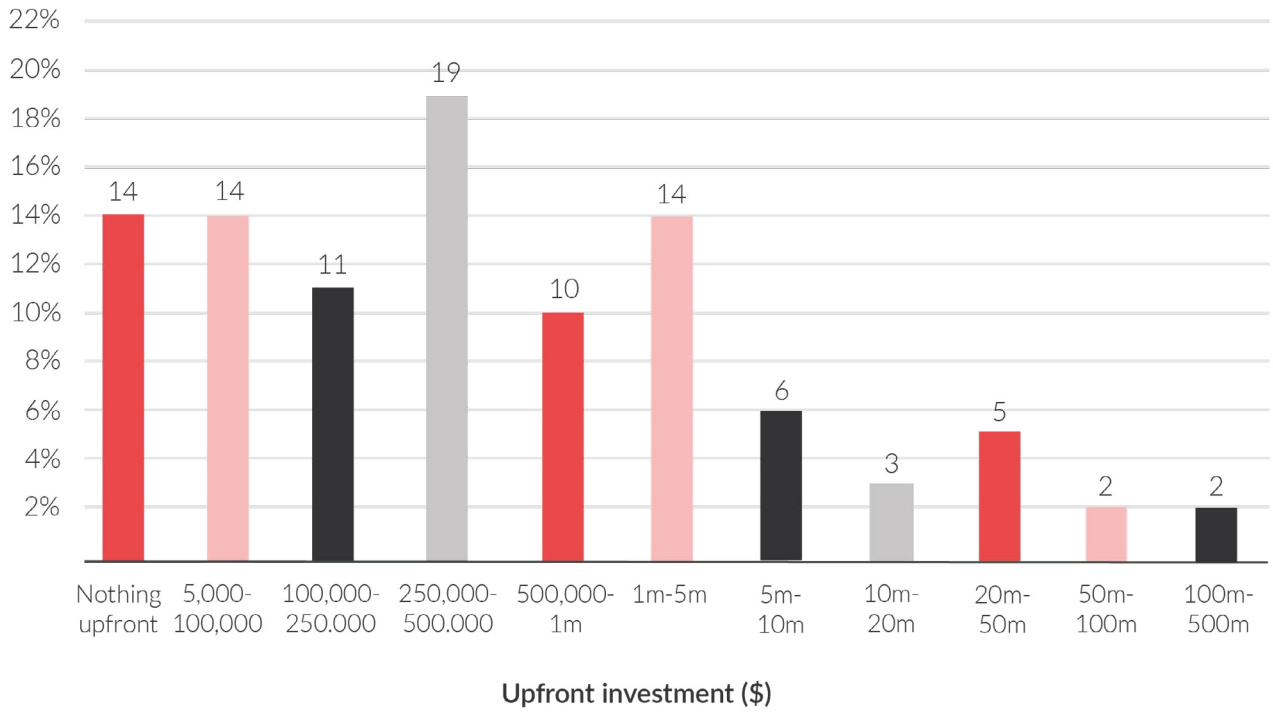


## Investment

The subject of costs is a tricky one, but clearly an important one to investigate. Tricky because there are multiple ways costs can be bundled up, making a true comparison between systems hard to measure and figure out.

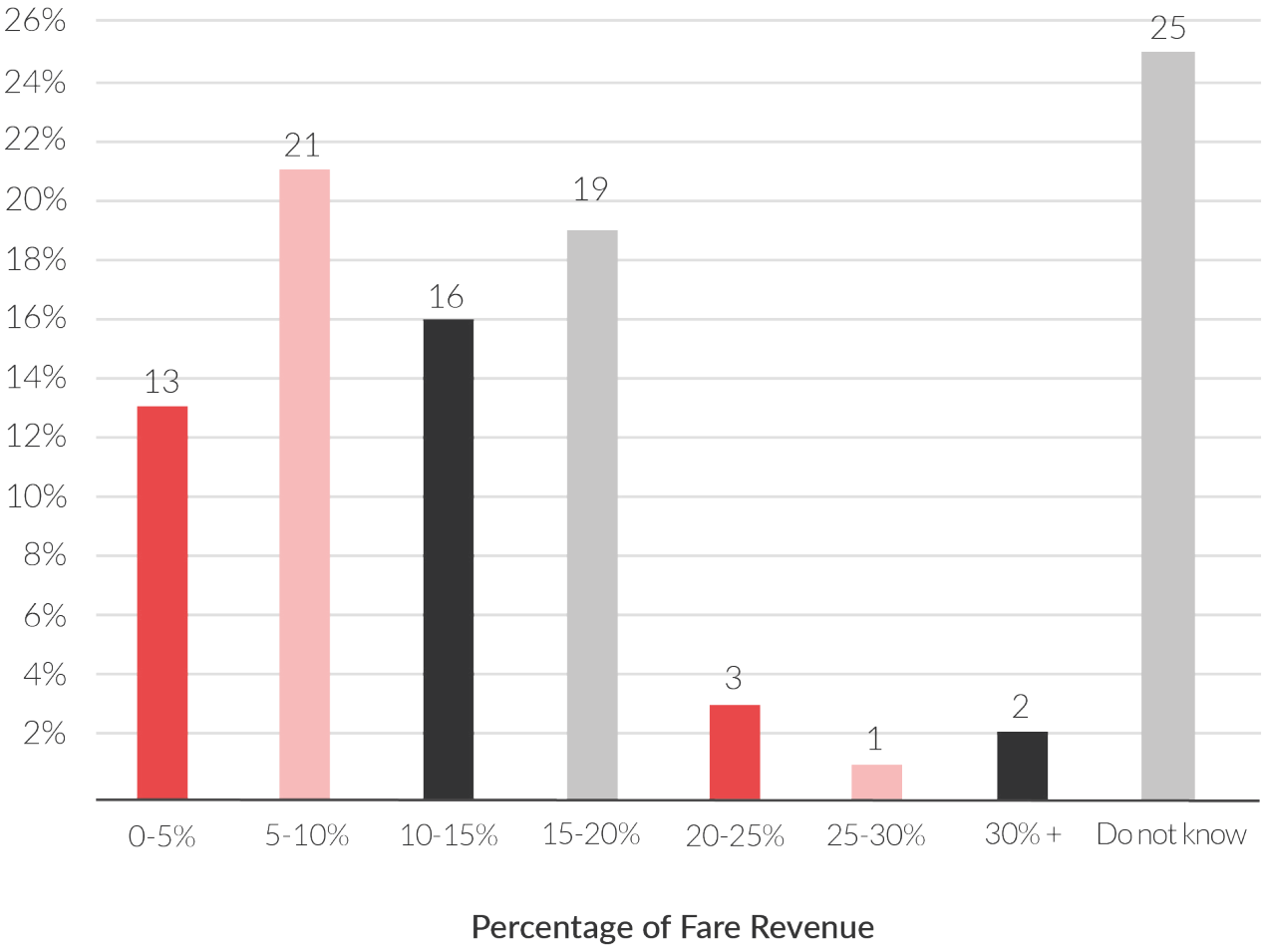
When answering the question "Did your "Core" Automatic Fare Collection (AFC) system require an upfront investment?" 14 percent replied "Nothing Upfront" which again aligns with the number of people using a SaaS platform. Costs for other respondents, as expected, are considerably different. It will come as no surprise that a new system requires significant upfront capital expenditure and often (especially in North America) those new systems are so cost-prohibitive for medium and smaller sized agencies that they are only able to invest in a new fare collection system with a grant provided by the government.

A logical next step would be to compare agency sizes with the level of upfront costs for comparison; however as the segment size is relatively small, it was decided not to do so as the results may not be entirely reliable. A full study into costs will be conducted later in the year to unpack this, so watch out for that.

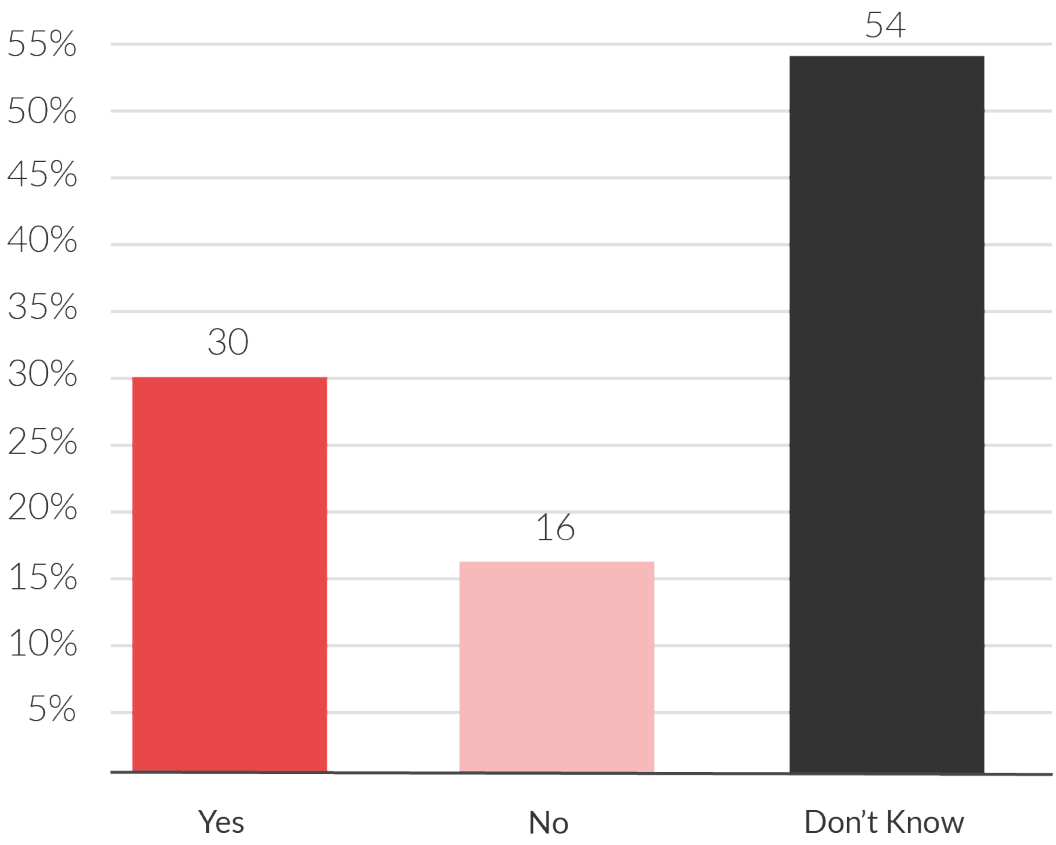


## Costs

When respondents were asked "How much does your 'Core' Automatic Fare Collection (AFC) system cost to run as a percentage of fare revenue?" the results obtained were really interesting as the ongoing maintenance of systems has historically been significant. On a positive note, around a third (34 percent) of agencies declared that they are paying under 10 percent of their fare revenue or ($0.1 in every dollar or equivalent currency) to run their system. However again around a third (35 percent) are paying between 10%-20% ($0.1-$0.2 in every dollar or equivalent currency) while a surprising 25 percent of respondents were simply unaware.



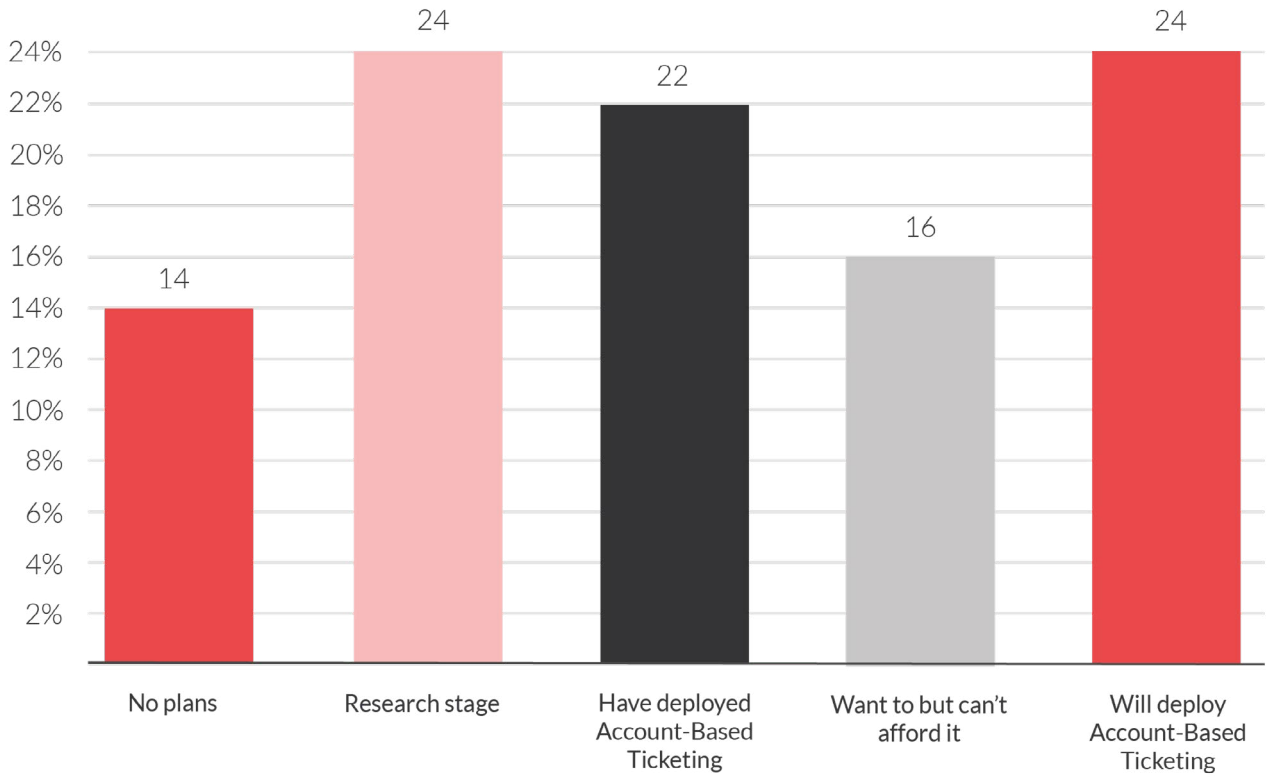
In a world where there is really only one option widely utilized for how to deploy your core ticketing system, it was important to uncover the extent to which agencies are being well served by their AFC suppliers. When asked “Do you think your agency has received value for money?”, only 30 percent believed they had, while 70 percent either did not know or did not think they were getting a good deal.



## The future of Fare Payments

So where are agencies standing when it comes to offering new functionalities to passengers? It is clear there are two hot topics at the forefront of every event in the industry: Account-Based Ticketing and Mobility as a Service (MaaS).

Account-Based Ticketing is a ticketless way of allowing people to travel, meaning riders simply tap or scan using a secure token (usually a contactless bank card, smartcard or mobile device), linked to an account in the back office, to make a journey. The amount of taps and location of these taps calculates the fare, which is charged to the passenger post journey. This means riders do not need to buy a ticket or understand fares and can benefit from best fare policies.




When asked "What are your plans for Account-Based Ticketing?", it comes as no surprise that 62 percent of them declared that they have either deployed or will deploy an Account-Based Ticketing system for their riders. A further 24 percent of respondents are still doing some research around it, meaning the true number of respondents that might want to deploy Account-Based Ticketing could realistically be closer to 85 percent.

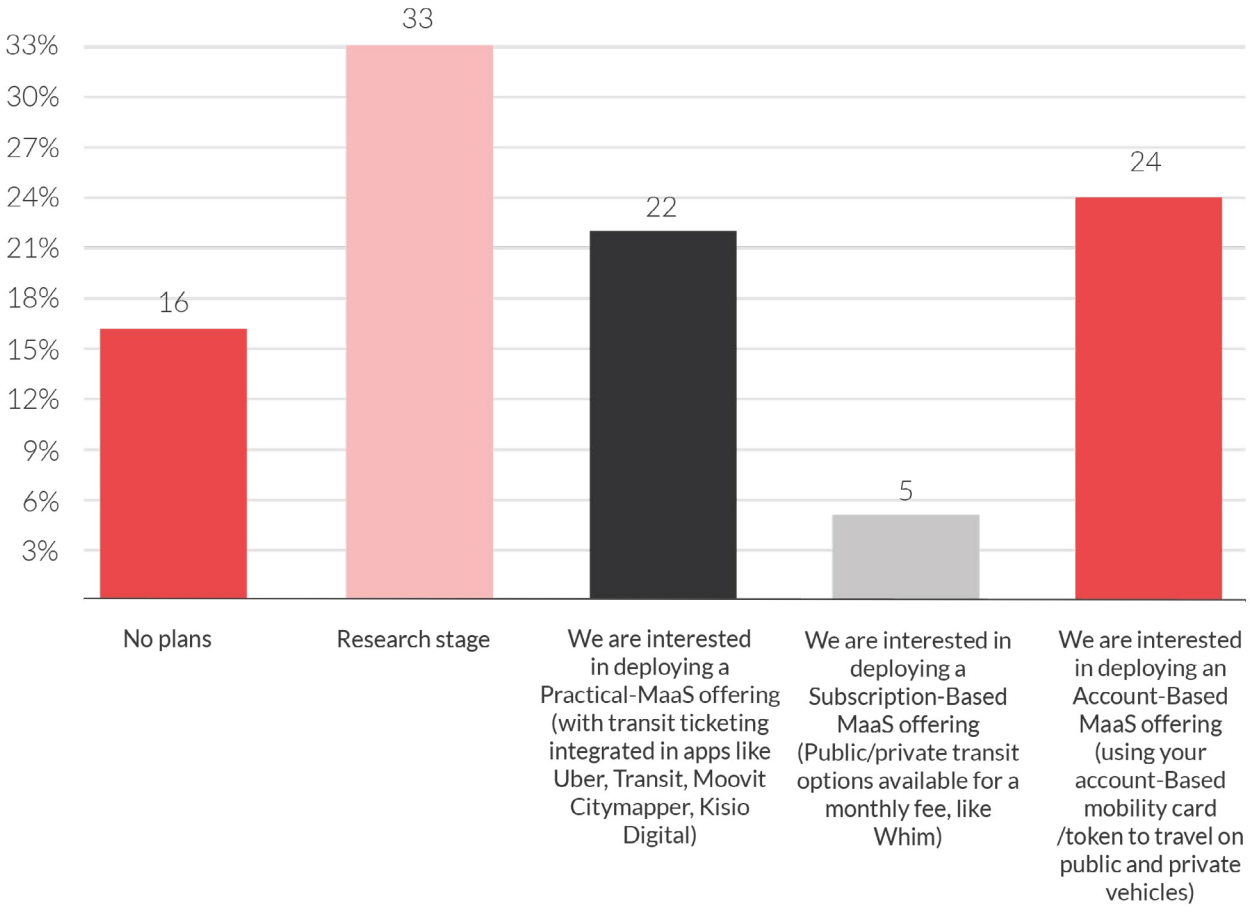
Mobility as a Service is a much more complex topic as it's a concept that's relatively new and the parameters of what it means are still currently being defined. In Masabi's view, there are currently three approaches to enabling MaaS which are not mutually exclusive.

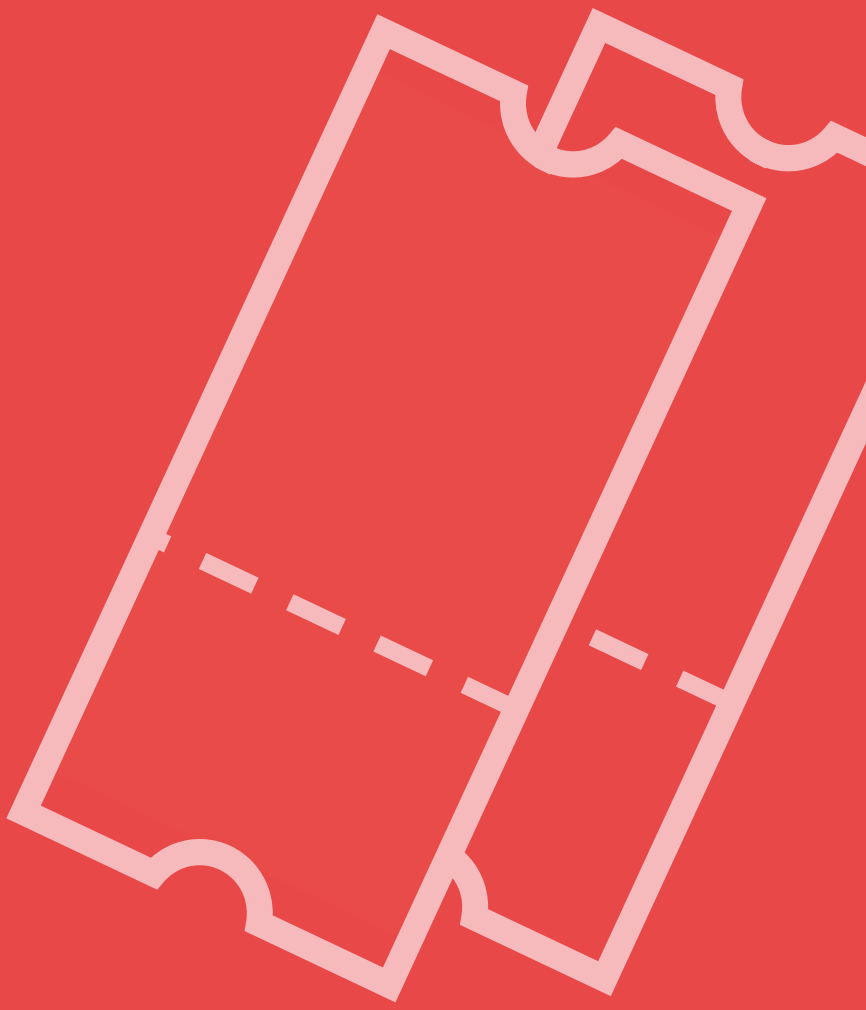
1. **Practical MaaS** (delivering public transit ticketing within apps like Uber, Transit, Moovit, Citymapper, Kisio Digital - connecting public and private transit services)
2. **Account-Based MaaS** (using an Account-Based mobility card/token to travel via tapping on public and private vehicles)
3. **Subscription-Based MaaS** (public/private transit options available via an app for a monthly fee)

All these approaches have their pros and cons, but we have put them in the order we believe makes the most sense to deploy (although we would advocate Practical and Account-Based MaaS make the most sense for cities and agencies in order to provide social equity and facilitate demand-based pricing and better policy control levers).

A staged approach to MaaS can be achieved by introducing Practical MaaS in a cost-effective way today. Agencies can then enable Account-Based MaaS once the right Account-Based infrastructure and partnerships are in place, and layer in Subscription-Based MaaS to serve the more affluent ridership base who may be persuaded to switch from private car usage through corporate schemes.

Looking towards this future, the final question asked "What are your plans for Mobility as a Service (MaaS)?". One of the most popular answers was Account-Based MaaS (24 percent) which we believe is a positive city-centric approach to enabling MaaS, while Practical MaaS was of interest to 22 percent of respondents. Subscription-Based MaaS was only of interest to 5 percent of agencies. It is worth noting that we would expect these results to be different if we had more European agencies responding to the survey, due to the fact that the European MaaS debate has been focused around the Subscription-Based model.





# Conclusion

The ticketing industry is changing as more agencies move away from physically needing to issue tickets, to the convenience of using mobile phones and contactless bank cards, allowing riders to simply tap and ride to travel. The future of ticketing is not about tickets anymore, it's about fares and payments using an account-based back office and extending services to seamlessly connect public and private transit options to enable full first/last mile journeys.

Agencies' core AFC systems are currently stuck in a DBOM approach and delivering bespoke technology which takes too long to go live, costs too much to deploy, maintain and update and are in place far too long, often failing to keep up with the pace of technology change.

The truth is, until recently,  there has never been a real alternative to this approach.

**Until now...**

# Introducing Fare Payments-as-a-Service (FPaaS)

Fare Payments-as-a-Service (FPaaS) offers a better approach to underserved agencies wanting to provide fare payment services for passengers. Instead of needing to run a DBOM project, agencies and operators can sign up to a Fare Payments platform and pay for services on a pay as you go/ subscription basis. This enables agencies to deliver the latest 'tap and ride' innovations to riders extremely quickly and grow capabilities as they get released onto the platform.

There are a number of Fare Payments platform characteristics which are important to mention;

## Subscribe, Go and Grow

Agencies can subscribe to a fare payments platform taking the complexity out of buying, managing and updating their fare collection system. Agencies can be live with a proven platform in weeks and grow capabilities as the service expands.

## Software as a Service Platform

Each agency uses the same platform configured in different ways for different agencies needs, meaning the system is far more cost-effective, as well as being quick to deploy and constantly being updated.

## Reduced Risk

When deploying a platform you know it will work as the code is proven and the infrastructure delivered through world class cloud-native suppliers.

## Needs/Outcome-based Procurement

By buying technology based on the outcomes not prescribing the solution or asking transit agencies to be a system designer, you can leave this to the vendor and purchase technology that helps you achieve the results you are after, holding vendors to outcomes using KPIs.

## Off the Shelf

By using off the shelf hardware agencies are able to operate a rip and replace maintenance model which means validation purchase and maintenance costs are reduced.

Fare Payments-as-a-Service holds a number of significant benefits for cities and agencies, these include:

## Cost-effective

Agencies are able to reduce the overall cost of fare collection as the cost of supplying the service are less as everyone is on the same platform. Services are usually available on a percentage of ticket sales basis with reduced capital, maintenance and update costs.

## Speedy

Once functionality is added to a Fare Payments platform, existing subscribers can use it after their next update. It also means new deployments or significant capability module improvements can be live in weeks instead of years.

## Constant Updates

With a Fare Payments platform, new updates are delivered regularly, meaning all agencies on the platform get shiny new functionality enabling them to keep up with the pace of technology change.

## Mobility as a Service Enabled

Fare Payments platforms help enable Mobility as a Service (MaaS) for public transit through SDKs and APIs linking tickets, fares and payments with other best-of-breed MaaS services. Agencies can also deploy Account-Based MaaS via Account-Based Ticketing capabilities. This enables passengers to use a stored value account, or contactless bank card, to tap across multiple operators with passengers charged 'best fare' after their journeys.

## Open Integrations

An open API centric architecture means Fare Payments platforms can link to existing (or new) systems and connect with other best of breed services. This helps make deploying FPaaS easier and allows the platform to connect with existing or new services, as required.

## Future-Proof Roadmap

With a roadmap of new features and capabilities a platform approach removes complexity and allows the Fare Payments experts to guide agencies on their ticketing journey, allowing them to concentrate on what they do best, providing safe, reliable and convenient journeys for riders.

## Dematerialization

Fare Payments platforms help move agencies away from legacy hardware and proprietary ticket issuance and riders from cash to digital channels using a mobile phone and contactless bank card, helping to reduce costs and increase convenience.

## Cash Digitization

Making sure passengers can easily exchange cash for digital credit is a crucial requirement for agencies. This can be achieved in a cost-effective way using a digital-first philosophy. For example; retail outlets can be enabled to turn cash into digital credit allowing riders to tap their tokens and travel around a transport network.

## Community Connections

Riders who pay for fares are only one section of a city's ridership. A Fare Payments platform helps enable all citizens to travel by facilitating entitlements and corporate programs, but doing this with a digital-first philosophy.