

THE RACE FOR IN-VEHICLE PAYMENTS



Whitepaper

1.1 Introduction

Over the last ten years, much of the technological change around cars has been focused on internal systems, but this has transitioned to include connected cars. Connected cars is where the vehicle has Internet access; enabling several different use cases.

In terms of the automotive industry, the IoT has enabled the creation of applications that can be integrated with cars and trucks. This has led to the development of the concept of the IoV (Internet of Vehicles). IoV can be used to collect, transfer, manage information, and integrate data from car/trucks. This is widely used in the haulage, trucking, freight delivery and shipping sectors. These business sectors need time identification, tracking, management software applications. It is within these sectors that IoV has significant applications and business uses.

A key new development is the introduction of payments to the connected vehicles concept. This whitepaper will analyse in depth what the development and integration of payments in the connected cars landscape means for the wider automotive and payments industries, and how vendors need to operate, in order to maximise the opportunities this market presents.

1.2 Definition of Terms

Juniper Research defines a connected car as ‘a vehicle that is equipped with Internet access.’ The connected car needs a data connection to communicate with its external surroundings. This is currently achieved

through mechanisms such as data connections via 4G or 5G, Bluetooth, Wi-Fi, or GPS navigation systems. The connection of the vehicle to its surroundings is established by in-vehicle receivers or transmitters. In most cases, the vehicle is equipped with this, or it is established via a third-party network/system.

Juniper Research defines an in-vehicle payment as ‘a payment that is made by the vehicle, without requiring the use of a connected smartphone or other devices to handle the transaction.’ Generally, the payment is triggered by the infotainment system within the vehicle, either through the screen or via a built-in voice assistant.

In-vehicle payments enable a number of different use cases, the three largest of which we outline below.

- **Automated Toll Collection:** A system of collecting tolls or fees which is capable of charging an account holder the appropriate amount by transmission of information from the vehicle to the toll lane.
- **Smart Parking:** Utilises sensors to ascertain the occupancy of a parking structure or level. It is accomplished by sensors embedded in the pavement of individual parking spaces, and utilities at the entrances or gates of parking structures. This can then be paid for via an in-vehicle payment.
- **Pay-at-the-pump:** A fuel payment service where you can pay for fuel on your mobile or in-vehicle quickly and easily; giving drivers the option to pay via various methods. This is increasingly available via the infotainment system, but is more widely available via mobile app.

1.2.1 In-vehicle Payments: Market Landscape

In-vehicle payment services crucially enable automobile drivers to purchase from their car dashboards without utilising smartphones or other devices: the vehicle will facilitate the payment itself.

The high cost of embedded systems, as compared with integrated systems, is hindering the in-vehicle payment services market. Integrated systems are popular, with both Android Auto and CarPlay widely in service, and these both including wallets (Google Pay and Apple Pay), meaning that there is reduced impetus to introduce these services directly into the vehicle.

The in-vehicle payments landscape faces several security and vulnerability issues, which could put at risk personal data and financial information such as card number, PIN, and CVV (Card Verification Value). As this is a relatively unknown area for payments, this risk is highly important. This inherent risk aspect is likely to play an important factor in limiting or affecting the development and growth of in-vehicle payments. As such, this is why automotive manufacturers need the involvement of established payments companies like Visa and Mastercard, which are experienced in dealing with payment security and can introduce features such as tokenisation.

North America is expected to see a large growth in terms of in-vehicle payments services, primarily due to the presence and cross industry collaboration of the two largest payment providers, Visa and Mastercard, and also to the presence of three large automobile companies, GM, Ford and FCA. These vendors are all already exploring in-vehicle payments; demonstrating that, despite the challenges, there is strong potential for in-vehicle payments services.

i. The Need for Industry Collaboration

In order to fully capture this revenue opportunity and develop in-vehicle payments use cases, industry participants need to provide automobile drivers/owners with a secure and seamless payment infrastructure by developing advanced in-vehicle payments technologies. This requires firm industry collaboration to explore fully.

The market landscape for in-vehicle payments has begun to develop, with major collaboration between car manufacturers, credit card payment companies and IT companies. For example, as early as 2016, Mastercard partnered with General Motors and IBM to integrate payments into OnStar Go, an AI-powered version of the General Motors' OnStar system. This allows drivers/passengers to make payments for goods and services using credit and debit cards within their Masterpass wallet. In the in-vehicle payment industry, there have been several collaborations over the last few years in terms of actual in-vehicle payment services. In the current market landscape, main payment providers Visa and Mastercard, as part of their corporate strategy within IoT, have started to implement this process by forming extensive partnerships.

A major aspect of the main payment providers business strategy within connected cars payments is to integrate or create a more standardised in-vehicle payment infrastructure/system, as there is presently many different infrastructure systems available.

ii. Evolving Payment Models in Automotive

The automotive payment industry has been evolving over the last five years, with a significant number of major petrol stations enabling consumers to pay for fuel with a mobile device while in their vehicle. An early pioneer of the above was developed by Shell in 2015, called Shell

Fill Up & Go or Shell Pay at Pump, a mobile fuel payment service where drivers can pay for fuel on their mobile quickly and easily from inside their car. We should note that these developments cited above are not within in-vehicle payments, as most transactions are undertaken using a mobile device. However, they show that payment models within the automotive industry are changing, and further evolution towards in-vehicle payments is highly likely. Additionally, transitioning from a mobile app system to an in-vehicle one is largely dependent on merely changing APIs, which is not highly complex.

iii. Current Industry Partnerships

There are currently several industry collaborations within the in-vehicle payments landscape to expand or develop new technologies into other forms of in-vehicle payment services. An example of one such collaboration in 2019 was between Visa and SiriusXM Connected Vehicles Services. The collaboration's objective is to enhance the way customers spend their time in-vehicle. This included an in-vehicle payment solution, SiriusXM e-wallet, which is designed to integrate into the dashboard and allow drivers and their passengers to shop and pay for coffee, find and pre-pay for gas, locate and pay for parking, purchase movie tickets, pay tolls. Users activate and authenticate payments with their Visa account using biometric authentication, which helps in eliminating driver distractions. This collaboration is being marketed to major automobile manufacturers within the connected car market, primarily in North America.

The current in-vehicle payments landscape is also bringing in other industry participants within an area that appears to be the most commercially viable, which is pay-at-the-pump. An example is the Honda and Visa partnership, which includes other firms such as Gilbarco

Veeder-Root (a fuel pump manufacturer) and IPS Group (a parking products provider) to install beacons that will communicate with an equipped Honda vehicle via Bluetooth, in order to complete payments through a Visa Checkout integration or smart dashboard.

Figure 1: In-vehicle Payments – Industry Collaborations

Industry Collaboration	Product & Services Description
Honda and Visa (2018)	In-vehicle fuel and parking payment solutions
GM and Shell (2018)	In-vehicle fuel payment
	Pre-purchase drinks
	Pre-book restaurant reservations
Hyundai and Xevo (2018) (Signed on Merchants for this include Chevron, Texaco, ParkWhiz, and Applebee's)	In-vehicle fuel payment
	In-vehicle parking
	In-vehicle purchase of drinks
Mastercard & HERE Technologies (2019)	Develop next generation of connected vehicle services
Honda & Connected Travel (2019)	Integrated services vehicle dashboard - Dream Drive
Visa & SiriusXM Connected Vehicles Service (2019)	In-vehicle payments solutions - allow drivers and their passengers to shop and pay for coffee, find and pre-pay for gas, locate and pay for parking, purchase movie tickets, pay tolls.
Mastercard & Daimler (2020) - Investment in Fintech Thinxnet subsidiary of Ryder	In-vehicle marketplace for fuel, tolling and others.

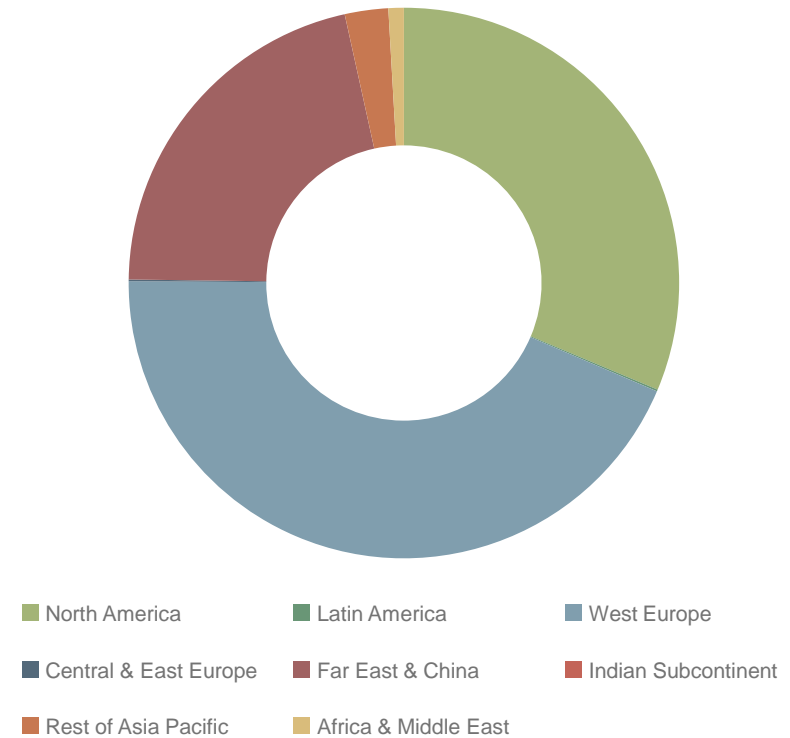
Source: Juniper Research

1.3 Forecast Summary

The value of in-vehicle payments, where a payment is made via embedded vehicle systems, will reach \$86 billion in 2025, up from just \$543 million in 2020. In-vehicle payments automate and simplify several existing payment processes via the vehicle's onboard systems; providing increasing convenience for drivers. This dramatic growth will be driven by increased partnerships which are improving the availability of services, particularly in the fuel and smart parking segments.

- In order to support this rapid growth, established payments vendors must be included within collaborative ecosystems, to ensure that requirements such as security via tokenisation and integration with digital wallets are achieved effectively. These elements will be critical in establishing in-vehicle payments as a viable channel and, if ignored, will likely see initiatives fail to achieve widespread adoption.
- Fuel and electric vehicle charging payments will be the leading area for in-vehicle payments adoption; accounting for 77% of payments by value in 2025. This will be largely due to the high number of anticipated future partnerships in this area, as well as the ease of migrating existing mobile payment solutions into in-vehicle systems.
- Voice commerce will be a major supporting factor in the in-vehicle payments market. The increasing integration of voice assistants within the vehicle's systems, not just via smartphone mirroring, will enable drivers to make eCommerce purchases from behind the wheel in a seamless way. This will drive other in-vehicle payments, including eCommerce, food and drinks to over \$11 billion in 2025, from just \$12 million in 2020.

Figure 1: Global In-vehicle Payment Spend in 2025: \$86 Billion



Source: Juniper Research

Order the Full Research

In-vehicle Payments' new research delivers an in-depth evaluation of how this nascent market is developing. Featuring an analysis of use cases that establishes potential and best practice for the implementation of payments in both consumer and commercial vehicles, this new report also contains Juniper Research's Positioning Index. This index of in-vehicle payments vendors provides a key resource when considering the emerging in-vehicle payments market.

The report focuses on strategies required to drive the connected car commerce market forward, as well as providing an extensive forecast suite, which outlines the future rate of adoption for in-vehicle payment solutions. The forecast and use case analysis focus on the following segments:

- Automated toll road payments
- Fuel/electric vehicle charging payments
- Smart parking payments
- Other in-vehicle payments

Key Features

- **In-vehicle Payments Market Dynamics:** Detailed analysis of the current state of evolution of the in-vehicle payments market; analysing the supporting technologies in place, the wider connected car ecosystem and considerations for deployments for vendors throughout the value chain.
- **In-vehicle Payments Use Case Analysis:** Extensive analysis of the main use cases for the adoption of in-vehicle payments,

including the current partnerships in place, the challenges involved and future outlook.

- **Juniper Research In-vehicle Payments Vendor Positioning Index:** Key player capability and capacity assessment for 15 in-vehicle payments vendors including Amazon, Google and Visa.
- **Benchmark Industry Forecasts:** Forecasts for vehicles making payments, transaction volumes and value, split by consumer and commercial, provided across our key use cases.

What's in this Research?

1. **Market Trends & Opportunities:** Detailed analysis and strategic recommendations for the expansion of in-vehicle payments, including evaluation of elements such as the wider connected car ecosystem and the role of payment providers. This also includes analysis of the potential of in-vehicle payments across four key segments.
2. **Strategic Analysis of In-vehicle Payments Vendors:** Evaluation of 15 in-vehicle payments vendors with accompanying analysis, via the Juniper Research Vendor Positioning Index.
3. **Interactive Forecast Excel:** Highly granular dataset comprising of over 19,000 datapoints; allied to regional and sector analysis tools. Includes regional and key country-level analysis, together with five-year forecasts for in-vehicle payments market.

4. **harvest Digital Markets Intelligence Centre:** Visualises all the data in easy to use and exportable graphs, tables and charts, and features continuous data updates for 12 months.

Download a summary of the table of contents and forecasts above, or request a detailed list of every table and chart via info@juniperresearch.com.

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