



**46%** of U.S. adults have used a credit or debit card at unattended car parking meters, kiosks or exit barriers.

**9.7%**



Approximately 223,000 parking kiosks were shipped to the U.S. in 2013, **NEARLY 296,000 IN 2016.**



Parking kiosk shipments are expected to **INCREASE BY 8.62 PERCENT** from 2017 to 2021.



The total volume of shipped kiosks is expected to grow by **9.7 percent between 2017 and 2021.**



# KIOSK & RETAIL | REPORT

PYMNTS.com

**PARKING  
EDITION**

**30%**

Studies have found that approximately 30 percent of traffic in cities is generated by people looking for free parking spaces.

A May 2017 Visa survey found 75 percent of drivers **OVERFEED THEIR PARKING METERS**, while only 1 percent pays for less than the time needed.



Parking kiosks represented **4.97 PERCENT** of the total kiosk market in 2016.

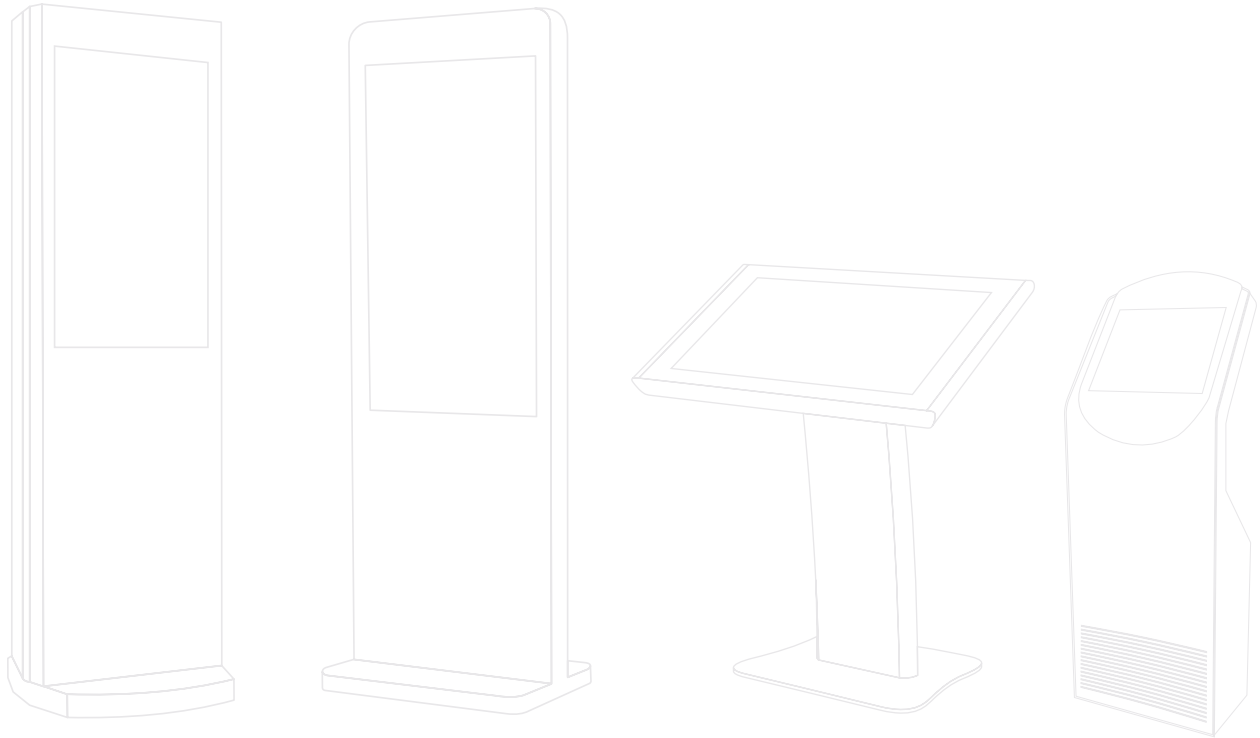


# KIOSK&RETAIL | REPORT

## ACKNOWLEDGMENT

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# TABLE OF CONTENTS



## 04 INTRODUCTION

## 10 SMARTER PARKING

- 10 What Smarter Parking Looks Like: Madrid
- 11 Powering Smarter Parking

## 07 THE DATA BEHIND THE INDUSTRY

## 12 PARKING APPLICATIONS

## 09 PAYING FOR PARKING

## 14 CONNECTED AND DRIVERLESS CARS: REVOLUTION AROUND THE CORNER



# INTRODUCTION

# SUMMARY STATISTIC

- The total volume of shipped kiosks is expected to grow by 9.7 percent between 2017 and 2021.<sup>1</sup>
- Parking kiosks represented 4.97 percent of the total kiosk market in 2016.
- Approximately 223,000 parking kiosks were shipped to the U.S. in 2013, nearly 296,000 in 2016.
- Parking kiosk shipments are expected to increase by 8.62 percent from 2017 to 2021.<sup>2</sup>
- Forty-six percent of U.S. adults have used a credit or debit card at unattended car parking meters, kiosks or exit barriers, according to a survey commissioned by Transaction Network Services.<sup>3</sup>
- A May 2017 Visa survey found 75 percent of drivers overfed their parking meters, while only 1 percent pays for less than the time needed.<sup>4</sup>
- Studies have found that approximately 30 percent of traffic in cities is generated by people looking for free parking spaces.<sup>5</sup>

In 1935, Oklahoma City, Oklahoma, unveiled a device that would eventually become a global phenomenon: the parking meter.<sup>6</sup> The brainchild of lawyer and newspaper editor Carl C. Magee, the first parking meter accepted coins and had a timer with a flag to signal when the driver's allotted window had expired. Magee's invention remained unchanged for approximately 40 years,<sup>7</sup> clearing up parking problems in Oklahoma City, but saddling drivers with two major problems for decades: finding enough of the right coins to pay, and keeping track of time. In fact, 75 percent of drivers overfed their meters so they wouldn't have to worry about the latter.<sup>8</sup>

Parking meters have since received a facelift. Those that can accept cash or credit cards are common, and some

now accept contactless cards and mobile wallets, too. The arrival of the smartphone has meant a slew of parking apps by companies like Parkmobile, a firm which offers solutions in Australia, the U.K., and the U.S. Meanwhile, companies like IPS Group and Visa are using smartphones to develop more efficient systems such as PARK SMARTER™, allowing drivers to "pay, receive real-time expiration notifications and extend a parking session remotely from the convenience of their smartphone[s]."<sup>9</sup>

The parking meter industry — or parking kiosks, as we refer to them in this report — is growing. Approximately 223,000 parking kiosks were shipped to the U.S. in 2013, and that number grew to 296,000 by 2016 — a growth rate of nearly 10 percent per year. Overall, parking kiosks represented

<sup>1</sup> USA interactive kiosk market. (2017). BisReport Electronic Research Center.

<sup>2</sup> USA interactive kiosk market. (2017). BisReport Electronic Research Center.

<sup>3</sup> Author unknown. US want to use cards at unattended terminals. Transaction Network Services. 2017. <https://www.tnsi.com/resource-center/infographic-page?mediaId=3466>. Accessed February 2018.

<sup>4</sup> Author unknown. Visa and IPS pair up to take the pain out of parking. PYMNTS. 2017. <https://www.pymnts.com/visa/2017/visa-and-ips-pair-up-to-take-the-pain-out-of-parking-bill-dobbins/>. Accessed February 2018.

<sup>5</sup> Clark, Justin. How self-driving cars can transform Los Angeles, starting with its parking. Los Angeles Times. 2015. <http://www.latimes.com/opinion/livable-city/la-ol-automated-cars-mobility-plan-2035-parking-20151202-story.html>. Accessed February 2018.

<sup>6</sup> Borroz, Tony. May 13, 1935: enter the parking meter. Wired. 2010. <https://www.wired.com/2010/05/0513parking-meter-patent/>. Accessed February 2018.

<sup>7</sup> Borroz, Tony. May 13, 1935: enter the parking meter. Wired. 2010. <https://www.wired.com/2010/05/0513parking-meter-patent/>. Accessed February 2018.

<sup>8</sup> Author unknown. Visa and IPS pair up to take the pain out of parking. PYMNTS. 2017. <https://www.pymnts.com/visa/2017/visa-and-ips-pair-up-to-take-the-pain-out-of-parking-bill-dobbins/>. Accessed February 2018.

<sup>9</sup> Author unknown. Visa and IPS pair up to take the pain out of parking. PYMNTS. 2017. <https://www.pymnts.com/visa/2017/visa-and-ips-pair-up-to-take-the-pain-out-of-parking-bill-dobbins/>. Accessed February 2018.



4.97 percent of the entire kiosk industry,<sup>10</sup> a space that is expected to continue its growth through 2021 at a rate of 8.62 percent per year.<sup>11</sup>

But even as high growth rates and technological innovations continue in the field, new technology like connected cars means eventually drivers may not need a kiosk or even a phone to pay for parking. They will simply drive up to the spot and leave the rest up to their vehicles. This could force a change in trajectory for the parking kiosk industry, given that an estimated 82 percent of all cars shipped in 2021 will be connected.<sup>12</sup> That said, any such shift would be decades in the making.

As if that's not enough, there's the self-driving car with which to contend. While its future is more uncertain and its technology is still illegal in several countries, what use is there for parking kiosks if a car can drop you off at the office, drive itself to a parking spot and then pay for its own parking?

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<sup>10</sup> USA interactive kiosk market. (2017). BisReport Electronic Research Center.

<sup>11</sup> USA interactive kiosk market. (2017). BisReport Electronic Research Center.

<sup>12</sup> Meola, Andrew. Automotive industry trends: IoT connected smart cars & vehicles. Business Insider. 2016. <http://www.businessinsider.com/internet-of-things-connected-smart-cars-2016-10>. Accessed February 2018.

We are interested in your feedback on this report. Please send us your thoughts, comments, suggestions or questions to [unattendedretail@pymnts.com](mailto:unattendedretail@pymnts.com).



# THE DATA

## BEHIND THE INDUSTRY

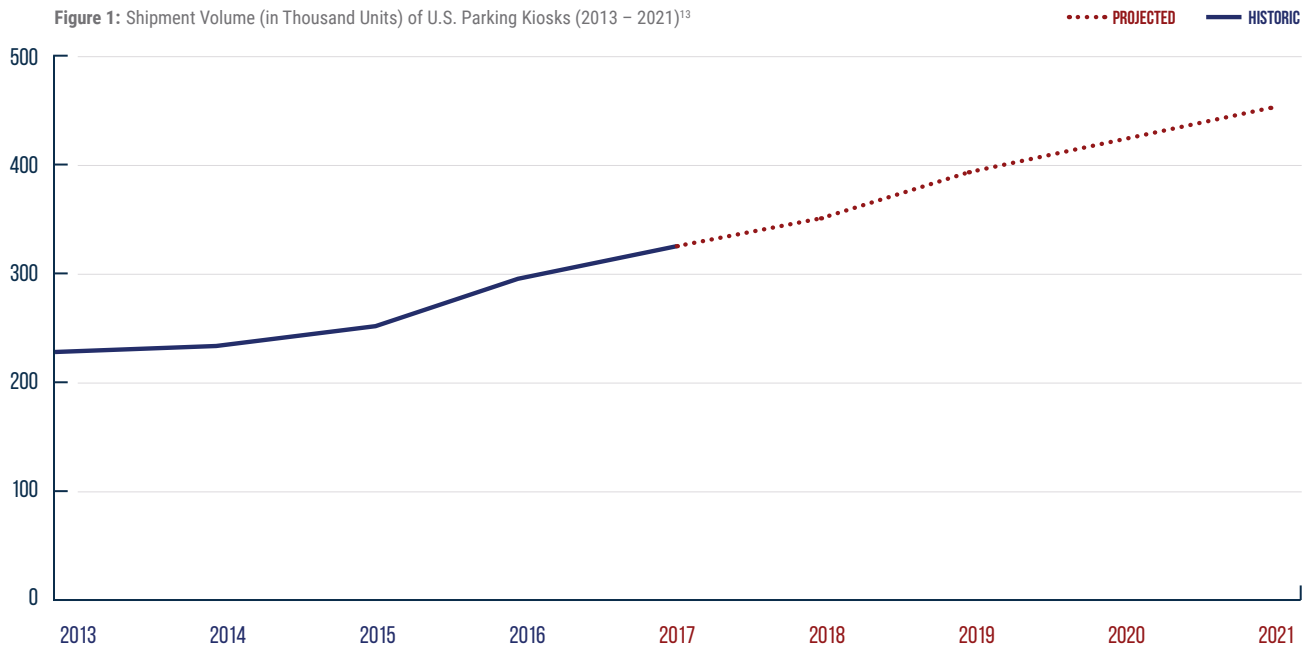
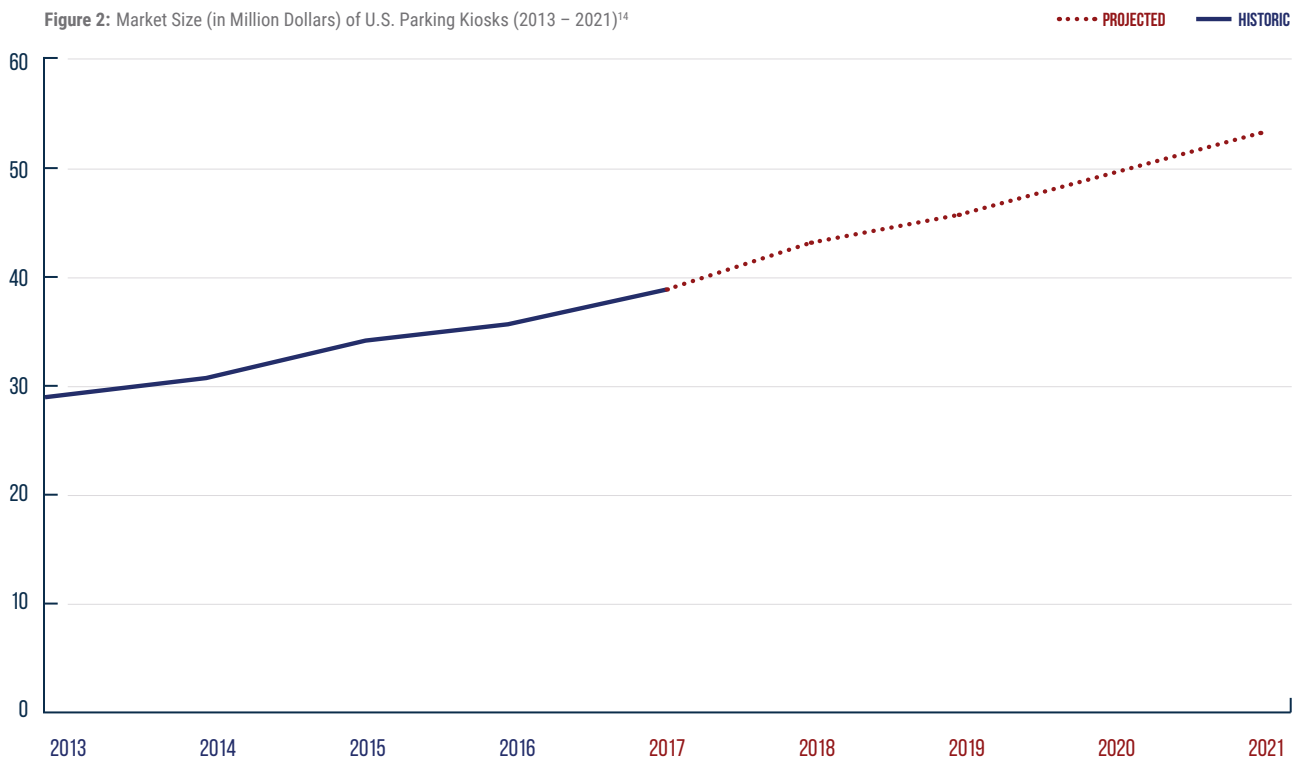
### INDUSTRY DATA

Nearly 223,000 kiosks were shipped to the U.S. in 2013. That number had grown to 296,000 by 2016, representing approximately 4.97 percent of the entire kiosk market. An overview of the kiosk industry can be found at the end of this report.

Figure 1 shows the growth from 2013 to 2016 as well as the projected growth from 2017 to 2021. Overall, the number of parking kiosks shipped grew 9.89 percent annually from 2013 to 2016. By comparison, the entire interactive kiosk industry grew 12.34 percent each year. Growth is projected

to slow slightly to 8.62 percent from 2017 to 2021, though, leading to an overall growth of 9.3 percent between 2013 and 2021.

As displayed in Figure 2, the industry saw a strong 7.53 percent dollar growth from \$29.23 million in 2013 to \$36.25 million in 2016. While the parking kiosk industry represents 4.97 percent of all kiosks shipped, it accounts for 5.07 percent of its total dollars. The graph also shows an estimate of the market size for 2017 to 2021, including a predicted growth of 7.71 percent.

**Figure 1: Shipment Volume (in Thousand Units) of U.S. Parking Kiosks (2013 – 2021)<sup>13</sup>****Figure 2: Market Size (in Million Dollars) of U.S. Parking Kiosks (2013 – 2021)<sup>14</sup>**

<sup>13</sup> USA interactive kiosk market. (2017). BisReport Electronic Research Center.

<sup>14</sup> USA interactive kiosk market. (2017). BisReport Electronic Research Center.





# PAYING FOR PARKING

**P**arking meters have long been associated with cash, particularly a mad scramble to find enough coins. This image isn't quite accurate anymore, however, as parking meters have evolved to accept several additional payment types. According to the 2015 "Diary of Consumer Payment Choice," 40 percent of parking payments were paid with cash in 2012, but this dropped to 32 percent in 2014.<sup>15</sup>

Meanwhile, debit and credit cards made up 48 percent of parking transactions in 2015, an increase from 42 percent in 2012. According to a survey commissioned by data communications and interoperability solutions provider Transaction Network Services, "46 percent of U.S. adults have used a credit or debit card at unattended car parking meters, kiosks or exit barriers."<sup>16</sup> The same report found card usage is more prevalent among 25- to 34-year-olds, with 56 percent of them using cards as a parking payment method. For the 55-and-over crowd, however, just 34 percent have used cards. Geography appears to matter, too, with 54 percent of West Coast dwellers using cards at unattended parking terminals, while only 38 percent did so in the South.

What about other forms of payment, though? By September 2017, approximately 25 percent of people had tried Apple Pay, 14 percent Samsung Pay, 23 percent Walmart Pay and 11 percent Android Pay, according to PYMNTS data.<sup>17</sup> While these numbers are still small, they are growing and the parking industry is figuring out how to integrate the most cutting-edge payment methods into its technology. Cities like New York are already working with companies to develop smart parking programs that allow users to reserve, pay and extend their parking right from their phones.

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<sup>15</sup> Matheny, W; O'Brien, S and Wang, C. The state of cash: preliminary findings from the 2015 Diary of Consumer Payment Choice. Cash Product Office, Federal Reserve System. 2016. <http://www.frbsf.org/cash/files/FedNotes-The-State-of-Cash-Preliminary-Findings-2015-Diary-of-Consumer-Payment-Choice.pdf>. Accessed February 2018.

<sup>16</sup> Author unknown. US want to use cards at unattended terminals. Transaction Network Services. 2017. <https://www.tnsi.com/resource-center/infographic-page?mediaId=3466>. Accessed February 2018.

<sup>17</sup> Author unknown. Mobile wallet adoption: where are we almost 3 years in? PYMNTS. 2017. <http://www.pymnts.com/mobile-wallet-adoption-2017/>. Accessed February 2018.

# SMARTER PARKING



## WHAT SMARTER PARKING LOOKS LIKE: **MADRID**

Smart parking meters emerged on the streets of Madrid, Spain, on July 1, 2014. The meters accepted cash, cards and mobile app payments, and offered a virtual wallet associated with a car's license plate number that saved change from previous transactions.<sup>18</sup> The smart meters could do far more than accept payments, though. They could also track demand for parking in various areas and increase fees by as much as 20 percent if demand was high, or punish cars that were damaging the environment.

Spain's smart parking meters required drivers to input their license plates into a machine.<sup>19</sup> The machine

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<sup>18</sup> Barroso, Javier. El gran sudoku de los parquímetros. El País. 2014. [https://elpais.com/ccaa/2014/06/30/madrid/1404149140\\_306853.html](https://elpais.com/ccaa/2014/06/30/madrid/1404149140_306853.html). Accessed February 2018.

<sup>19</sup> Cosco, Joey. Madrid's new smart parking meters know what you drive and punish gas guzzlers. Business Insider. 2014. <http://www.businessinsider.com/madrids-new-smart-parking-meters-2014-7>. Accessed February 2018.

verified which car the person was using based on the license plate and then calculated a parking fee. Cars that were more efficient and used clean energy could see up to 20 percent off, while older cars or those that used diesel could be charged 20 percent more than the baseline parking price. In other words, cars damaging the environment could be charged up to 40 percent more than their cleaner counterparts. In addition, electric cars got to park for free.<sup>20</sup>

Madrid had high hopes for the program, believing the fees would reduce overall pollution levels. “We thought it would be fair if the cars that pollute more pay more, and [if we] compensate those who use more efficient vehicles,” noted Elisa Barahona, head of the city’s sustainability division.<sup>21</sup>

## POWERING SMARTER PARKING

But what does it take to power a system like Madrid’s? As it turns out, it’s not all that easy. One example of a company that can power such a system is San Diego, California-based parking solutions provider IPS Group. In a nutshell, the company designs, engineers and manufactures low-power wireless telecommunications, parking technologies, software-as-a-service (SaaS) management solutions and payment processing systems.<sup>22</sup> Its offerings include parking meters, vehicle detection sensors and data management systems.

IPS’ meters range from those that can be assigned to a single parking spot to kiosks that handle multiple locations. The kiosks are solar powered, can wirelessly connect to IPS’ data management system and accept multiple payment types — including coins, cards, smart cards, EMV and mobile options.<sup>23</sup>

In addition, IPS builds sensors that can generate parking data by tracking when cars arrive and leave to observe traffic patterns.<sup>24</sup> It can then combine data from these feeds into a data management system, creating a visual representation of how the parking lot is used.<sup>25</sup> IPS also produces solutions for enforcement and in-vehicle payments, and has a meter monitoring mobile app.

The business model is shared by unattended retail service provider USA Technologies (USAT), which is built on connecting vending machines for payment and operational intelligence. The company has been expanding into similar markets — like commercial laundromats, retail kiosks, amusement games and self-service car washes — viewing parking kiosks as a natural step to connect B2B Internet of Things (IoT) machines in traditionally cash-based businesses.

Meanwhile, Colorado-based ParkPlus is creating an automated parking garage with a robot valet to parks cars. An automated dolly lifts cars and transfers them to storage racks, and the system’s efficiency means four times as many cars can be parked in one garage.<sup>26</sup>

Furthermore, Somerville, Massachusetts, is partnering with carmaker Audi to create self-driving and self-parking cars — an offering set to be deployed in 2018. The hope is that the partnership will improve traffic through automated cars that can drop riders off at their destinations, then go park themselves.

While it’s impossible to say which companies will end up going the way of the dodo and which solutions will become the new normal, what is for certain is that several better options for parking and traffic control are emerging — and at least one of them will stick.

<sup>20</sup> Barroso, Javier. El gran sudoku de los parquímetros. El País. 2014. [https://elpais.com/ccaa/2014/06/30/madrid/1404149140\\_306853.html](https://elpais.com/ccaa/2014/06/30/madrid/1404149140_306853.html). Accessed February 2018.

<sup>21</sup> Kassam, Ashifa. Madrid’s smart parking meters to charge more for most polluting cars. The Guardian. 2014. <https://www.theguardian.com/world/2014/apr/30/madrid-smart-parking-metres-polluting-cars>. Accessed February 2018.

<sup>22</sup> Author unknown. About IPS Group, Inc. IPS Group, Inc. <http://www.ipsgroupinc.com/about-us-ips-group/company-profile/>. Accessed February 2018.

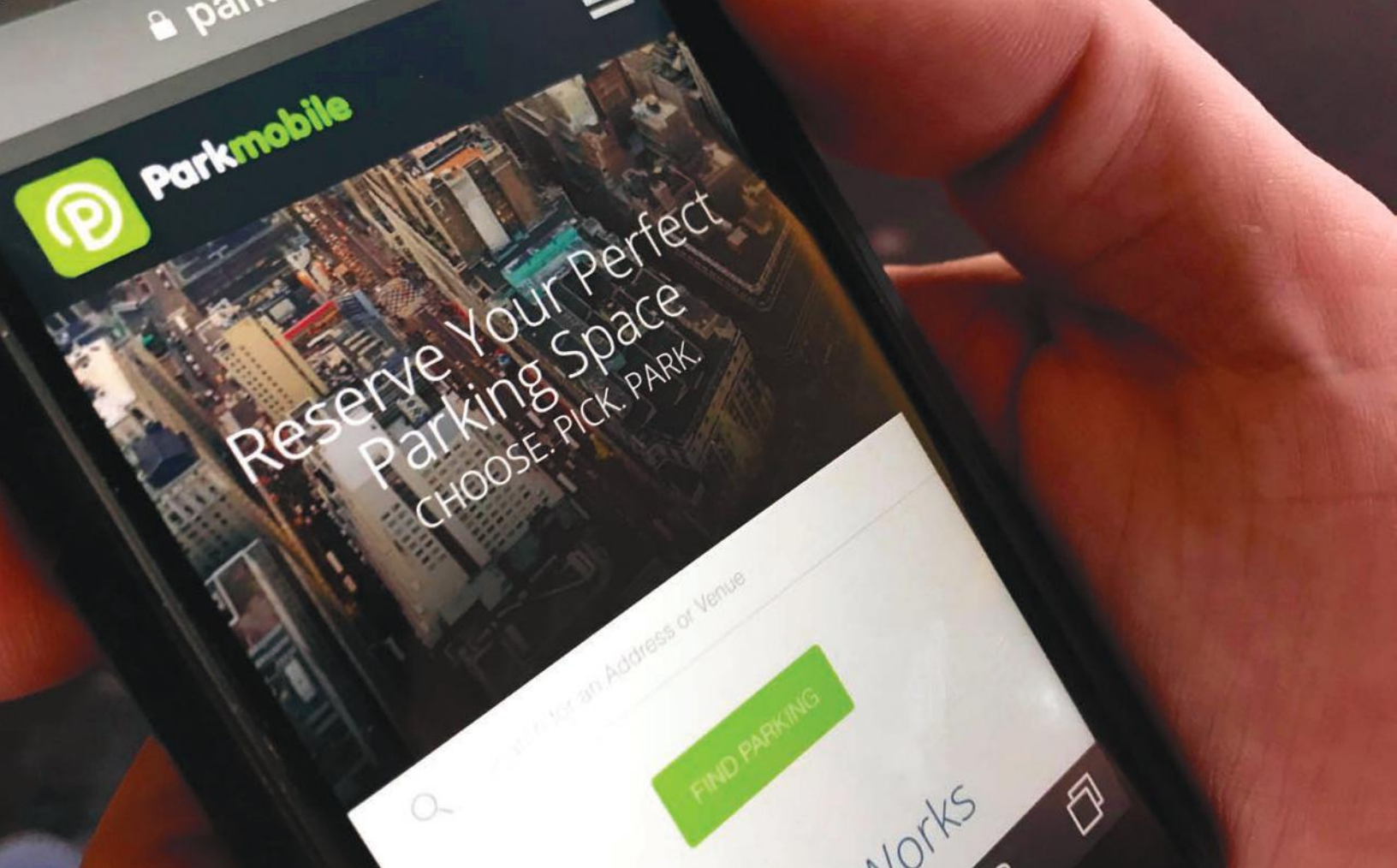
<sup>23</sup> Author unknown. MS1™ Multi-Space Pay Station. IPS Group, Inc. <http://www.ipsgroupinc.com/products/ms1/>. Accessed February 2018.

<sup>24</sup> Author unknown. Vehicle Detection Sensors. IPS Group, Inc. <http://www.ipsgroupinc.com/products/vehicle-detection/>. Accessed February 2018.

<sup>25</sup> Author unknown. Web-Based Data Management System (DMS). IPS Group, Inc. <http://www.ipsgroupinc.com/products/data-management-system/>. Accessed February 2018.

<sup>26</sup> Citron, Ryan. The future of smart parking is integration with automated technology. Forbes. 2017. <https://www.forbes.com/sites/pikerresearch/2017/01/26/smart-parking/#30dc53862f6>. Accessed February 2018.





PARKING

APPLICATIONS

As parking kiosks adapt to new payments technologies, another trend is growing, too: apps. They're sprouting up in response to the inconvenience of meter feeding, which requires drivers to keep an eye on the clock or risk getting a ticket. In fact, a May 2017 survey commissioned by Visa showed three out of four drivers overfed their parking meters to avoid such problems, while only 1 percent pays for less than the time needed.<sup>28</sup>

Some companies are looking at this as a business opportunity, IPS Group among them. As such, the firm developed PARK SMARTER™, an app allowing users to “pay, receive real-time expiration notifications and extend a parking session remotely from the convenience of their smartphone[s]” in partnership with Visa.<sup>29</sup>

Bill Dobbins, Visa's head of North American business development, feels the app provides an opportunity to improve customer experience. “Our May '17 survey unveiled that ... more than 80 percent of respondents said they were either likely or highly likely to use [apps] for payment if given the chance,” he said.

The system is simple. Users register for the app, search for available parking spaces through information provided by IPS' sensor technology, choose one and pay for it. The app will later notify the user if the paid parking time is about to expire and allow him to extend it. It also serves as a promotional platform for local merchants, allowing them to engage directly with customers.

Another player in the parking app market is Parkmobile, a company founded in 2000 and headquartered in the Netherlands. Its solutions can be found in its home country,

Australia, the U.K., and the U.S., offering services in more than 2,000 U.S. locations to millions of registered users.<sup>30</sup> It serves municipalities, private operators, universities and transit authorities, among other customer bases.<sup>31</sup>

Parkmobile's mobile payments solutions allow users to turn to their smartphones and skip the visit to a parking meter. Drivers can choose to pay with the app's mobile wallet or with Mastercard, PayPal, Visa Checkout and Chase Pay. To use the service, customers provide their parking zone number, choose a duration and select a payment method. The app will then remind users when their parking session is about to finish and allow them to pay for additional time.

Parkmobile's services extend beyond mobile payment, though. Its Gated Parking solution enables drivers to access parking facilities via QR code, parking ticket scanning or beacon technology. In addition, the company developed a connected car solution that helps users with Ford or Volvo connected cars locate and pay for a parking slot from inside their cars without using their phones. Parkmobile has also developed an electric vehicle charging solution so drivers can pay for charging through their phones.<sup>32</sup>

Not all parking app experiments go as planned, however. Parking apps MonkeyParking and Haystack came up with ideas like letting people bid for parking spaces that others were using. There was one major flaw with that plan, though: You can't sell something that doesn't belong to you, and parking slots are a public good. Both apps were eventually banned.<sup>33</sup> Haystack was declared illegal in Boston and MonkeyParking was outlawed in San Francisco. The Golden Gate City also banned other two apps — Sweetch and ParkModo — which wanted to pay drivers to sit in and hold parking slots until they were requested.

<sup>28</sup> Author unknown. Visa and IPS pair up to take the pain out of parking. PYMNTS. 2017. <https://www.pymnts.com/visa/2017/visa-and-ips-pair-up-to-take-the-pain-out-of-parking-bill-dobbins/>. Accessed February 2018.

<sup>29</sup> Author unknown. Visa and IPS pair up to take the pain out of parking. PYMNTS. 2017. <https://www.pymnts.com/visa/2017/visa-and-ips-pair-up-to-take-the-pain-out-of-parking-bill-dobbins/>. Accessed February 2018.

<sup>30</sup> Author unknown. About Parkmobile. Parkmobile. <http://us.parkmobile.com/about>. Accessed February 2018.

<sup>31</sup> Author unknown. Parking provider solutions. Parkmobile. <http://us.parkmobile.com/parking-providers>. Accessed February 2018.

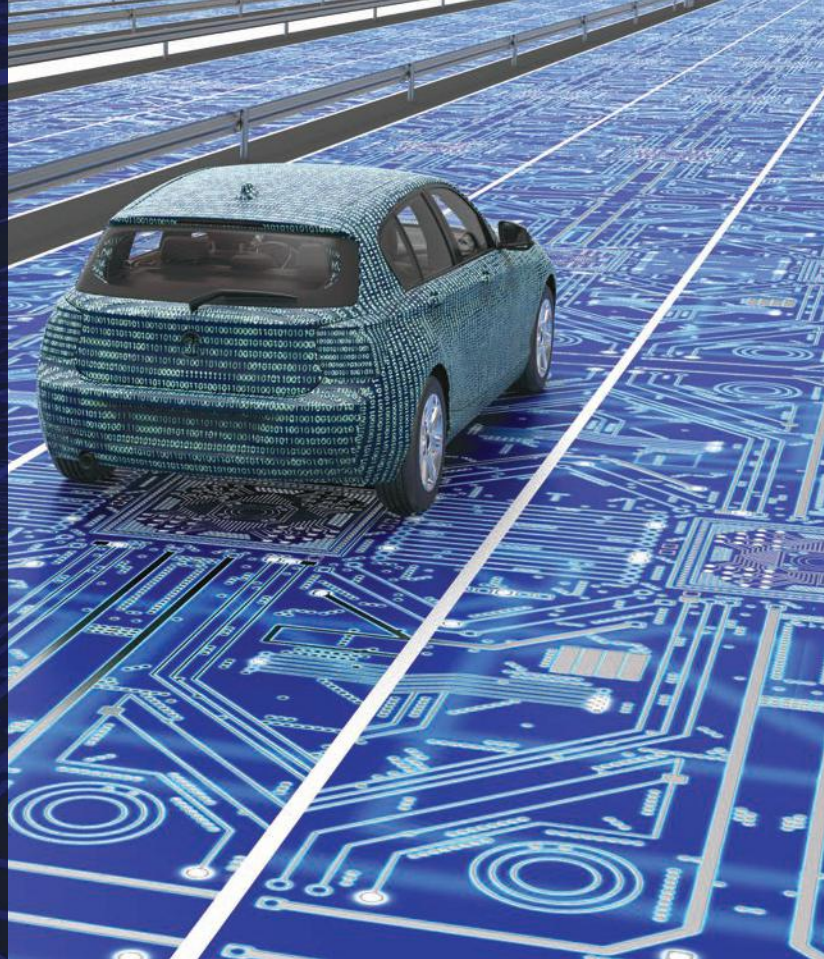
<sup>32</sup> Author unknown. Our simple solutions. Parkmobile. <http://us.parkmobile.com/offerings>. Accessed February 2018.

<sup>33</sup> Streitfeld, David. Parking apps face obstacles at every turn. The New York Times. 2015. <https://bits.blogs.nytimes.com/2015/06/10/parking-apps-face-obstacles-at-every-turn/?ref=technology&r=0>. Accessed February 2018.



CONNECTED  
AND DRIVERLESS CARS:

# REVOLUTION AROUND THE CORNER



**A**s we look toward the parking meter's future, we can surmise that an industry disruption could be right around the corner. That disruption would come from connected and driverless cars.

Connected cars have turned vehicles into communication hubs, offering developers an excellent platform for new service ideas. They allow drivers to start vehicles from their smartphones, manage data on their car usage and, of course, park. Connected cars mean a driver doesn't have to make a parking payment, but can instead simply drive away from the parking spot and be charged what he owes. This isn't just pie-in-the-sky, either. Business Insider's BI Intelligence research service has estimated that 94 million connected cars will be shipped by 2021, comprising approximately 82 percent of all cars that ship that year.<sup>34</sup>

Alibaba is one of many companies participating in the race to develop connected cars. It has built the OS'Car RX5 SUV, a car that runs on its YunOS operating system, in collaboration with automaker SAIC.<sup>35</sup> The car offers many features, including driver recognition, personalized music recommendations and, thanks to Alipay, the ability to reserve and pay for parking or fuel from within its system.

Another software developer/automaker collaboration can be found in the integration of ParkNow with BMW.<sup>36</sup> The partnership allows BMW drivers to access ParkNow from their dashboards. When a driver parks, the software uses GPS technology to detect if the parking space is subject to a charge and allows the user to begin the parking session. When the car is driven away, the driver is automatically charged for the time he spent in the parking space.

<sup>34</sup> Meola, Andrew. Automotive industry trends: IoT connected smart cars & vehicles. Business Insider. 2016. <http://www.businessinsider.com/internet-of-things-connected-smart-cars-2016-10>. Accessed February 2018.

<sup>35</sup> Golson, Jordan. This connected car lets owners pay for parking, gas, and coffee — and take selfies. The Verge. 2016. <https://www.theverge.com/2016/7/11/12149650/alibaba-saic-rx5-suv-yunos-smart-car-connected>. Accessed February 2018.

<sup>36</sup> Author unknown. Unique integration of parking payments in BMW cars with ParkNow. ParkNow. 2017. <https://de.park-now.com/en/2017/03/07/unique-integration-of-parking-payments-in-bmw-cars/>. Accessed February 2018.

Despite the changes connected cars could generate in the parking industry, their impact would be miniscule compared to that of a self-driving one. Studies have found approximately 30 percent of traffic in cities is generated by people looking for free parking spaces.<sup>37</sup> Driverless cars could eliminate that friction altogether. A user could be dropped off at her desired destination and the car could find its own way to a parking space.<sup>38</sup> That would make parking not only easier, but also much more efficient for a city's infrastructure.

In addition, self-driving cars would substantially decrease the space needed for parking as smart cars could be more efficient about it. According to Amy Korte, principal designer at architectural firm Arrowstreet Inc., this could result in a 21-square-foot reduction per parking space.<sup>39</sup> Combined with an increase in subscription-based car services and a reduction in car ownership, much of the space in cities that is currently used for parking could be reallocated to other urban requirements.

It is difficult to predict how self-driving and connected cars will impact the parking industry. On one hand, connected cars handling parking payments on their own might diminish kiosks' prevalence. On the other, the need for paid parking could disappear as driverless technology deeply impacts parking space requirements. Smart companies in the space are already examining how to leverage this new business model rather than resist it.

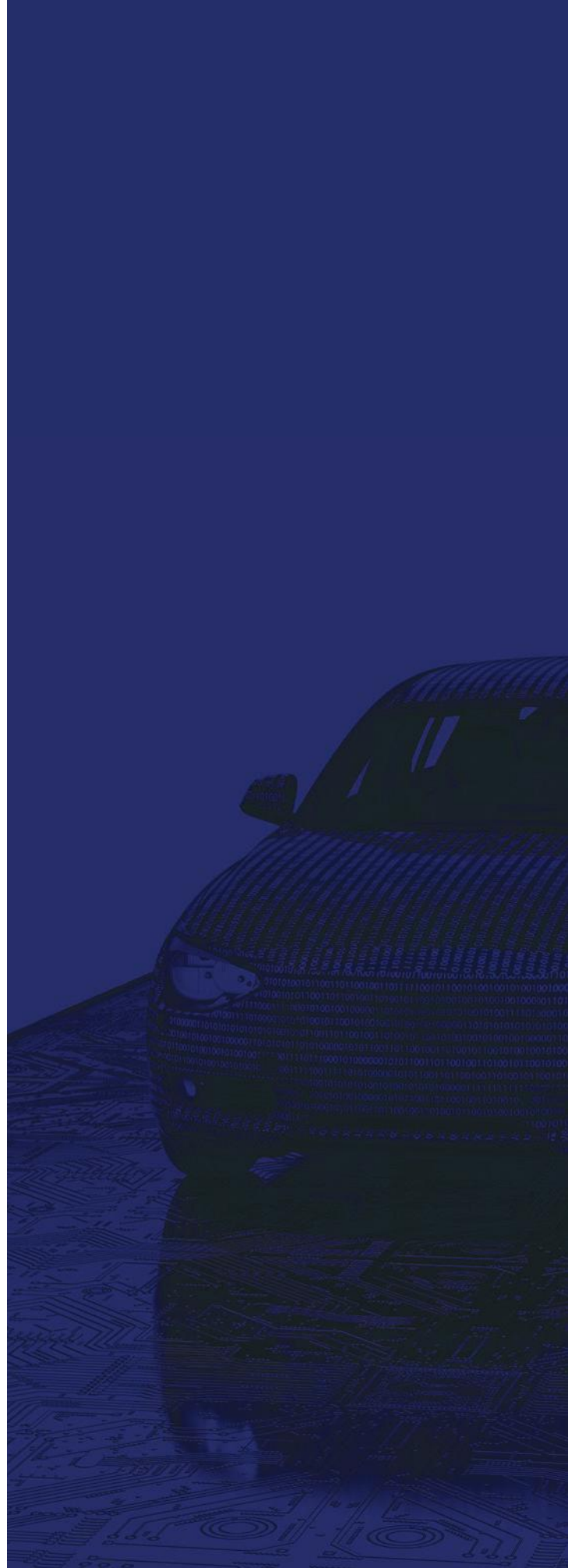
But, in the end, there's a long runway before the last unconnected car models are rolled off the assembly line. Until then, demand for parking kiosks is positioned to stay strong.

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<sup>37</sup> Clark, Justin. How self-driving cars can transform Los Angeles, starting with its parking. Los Angeles Times. 2015. <http://www.latimes.com/opinion/livable-city/la-ol-automated-cars-mobility-plan-2035-parking-20151202-story.html>. Accessed February 2018.

<sup>38</sup> Clark, Justin. How self-driving cars can transform Los Angeles, starting with its parking. Los Angeles Times. 2015. <http://www.latimes.com/opinion/livable-city/la-ol-automated-cars-mobility-plan-2035-parking-20151202-story.html>. Accessed February 2018.

<sup>39</sup> Salomon, Sanjay. How the self-driving car could eliminate the parking garage in Boston. Boston.com. 2016. <https://www.boston.com/cars/news-and-reviews/2016/02/23/how-the-self-driving-car-could-eliminate-the-parking-garage-in-boston>. Accessed February 2018.







# CONCLUSION

**T**ime and technology have shaped and reshaped the parking meter since its introduction in 1935. The days of scrounging around for coins to feed a parking meter are slowly vanishing, though, as contactless cards and EMV quietly replace coin meters. But the changes go far beyond just paying for parking. Cities like Madrid now have parking meters that charge fees based on how environmentally friendly a driver's car is, while others run programs enabling them to locate and reserve a parking slot from their smartphones.

The parking kiosk industry has shown growth over the last years, too, with the number of units shipped up 9.89 percent between 2013 and 2016. This may not stop, either, as growth is estimated at 8.62 percent between 2017 and 2021.<sup>40</sup> The future presents some

serious challenges for parking kiosks, though, as the automobile industry — and, consequently, the parking industry — could change forever.

The introduction of connected cars may be the first obstacle the parking kiosk will face. A connected car driver doesn't need to use a kiosk or a phone to pay. Instead the vehicle, which "talks" to the parking system, would handle that transaction for him. As more connected cars join the roads, parking kiosks may become less and less useful as they are replaced by a network of connected cars.

Farther off on the horizon is the driverless vehicles revolution, and it presents all sorts of parking kiosk challenges. First, cars could park themselves and payment for the usage of a parking space would be done through the car's operating system — not the driver — presenting the same problem connected cars would create. Secondly, driverless vehicles would be far more efficient than human drivers when it comes to parking, drastically reducing the amount of space needed. Lastly, expansion in the use of driverless taxis may impact car ownership rates and the need for parking in the first place.

While the future of the parking kiosk is not particularly clear, we can say with confidence that it will be a while before connected and driverless cars become mainstream. In the meantime, we will still need to pay for parking through kiosk offerings. Based on growth seen in the retail kiosk space, though, it is difficult to predict how parking kiosks will evolve and could potentially be cross-utilized in the future.

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<sup>40</sup> USA interactive kiosk market. (2017). BisReport Electronic Research Center.

## KIOSK DATA

The total volume of shipped interactive kiosks is expected to grow at an average rate of 9.7 percent between 2017 and 2021. That number represents the whole interactive kiosk industry, but different markets have different growth rates. Table 1 details the expected volume of items shipped separated by the market in which they are going to be used. For example, kiosks for airway and roadway transportation are expected to grow in shipment volume at a compound annual growth rate (CAGR) of 13.7 percent and 12.9 percent, respectively. A higher growth is expected for kiosks used in the health-related industries, with shipment growth reaching 14.8 percent in hospital management and 17.5 percent in medical reports.

**Table 1.** Estimated Shipment Volume (in Thousand Units) of U.S. Interactive Kiosks (2017 – 2021) Per Market Segmentation<sup>42</sup>

VOLUME (K UNIT)	2017	2018	2019	2020	2021	CAGR 2017-21
Retail	2138.38	2254.55	2397.64	2516.38	2629.65	5.3%
Airway Transport	98.87	111.7	126.57	145.16	165.44	13.7%
Roadway Transport	239.82	271.16	309.58	351.39	389.9	12.9%
Railway Transport	410.17	435.77	471.63	470.88	505.03	5.3%
Government	401.49	439.45	474.05	509.83	552.44	8.3%
Banking and Finance	285.92	306.44	326.51	351.39	378.29	7.2%
Entertainment	1152.45	1313.62	1453.13	1624.91	1808.24	11.9%
Healthcare	342.03	390.94	424.06	455.83	481.81	8.9%
Hospital Management	398.15	444.59	536.12	559.39	692.73	14.8%
Medicines	237.82	263.81	280.56	349.62	336.69	9.1%
Medical Reports	144.3	180.78	228.96	261.11	274.77	17.5%
Other	830.94	935.79	1033.2	1255.25	1459.96	15.1%
<b>TOTAL</b>	<b>6680.34</b>	<b>7348.6</b>	<b>8062.01</b>	<b>8851.14</b>	<b>9674.95</b>	<b>9.7%</b>

Similarly, the market size of the kiosk industry is expected to grow from \$778.68 million USD to \$1,073.54 million USD by 2021, representing a growth rate of 8.4 percent.<sup>43</sup> The values for estimated market size aggregated by market segmentation are shown in Table 2, and the data has a pattern

<sup>42</sup> USA interactive kiosk market. (2017). BisReport Electronic Research Center.

<sup>43</sup> USA interactive kiosk market. (2017). BisReport Electronic Research Center.

like that seen in shipment volume. The airway, roadway transport, hospital management and medical reports markets all have a higher-than-average expected growth rate. The kiosk industry's market size growth is lower than its expected growth for shipment volume, however. Roadway transport is the only segment in which shipment volume's expected growth is lower than the market size's expected growth. This trend would imply a reduction in kiosks' unit price over time.

**Table 2.** Estimated Market Size (in Million Dollars) of U.S. Interactive Kiosks (2017 – 2021) Per Market Segmentation<sup>44</sup>

MARKET SIZE (VALUE)	2017	2018	2019	2020	2021	CAGR 2017-21
Retail	208.44	219.62	231.57	239.57	252.07	4.9%
Airway Transport	15.03	17	18.74	20.45	22.65	10.8%
Roadway Transport	26.01	30.51	33.6	38.42	42.62	13.1%
Railway Transport	42.44	45.21	44.21	52.42	50.46	4.4%
Government	55.21	54.49	64.33	67.81	73.11	7.3%
Banking and Finance	36.99	39.95	42.64	45.47	48.42	7.0%
Entertainment	135.81	150	169.27	183.56	201.27	10.3%
Healthcare	44.07	46.57	51.87	53.12	58.83	7.5%
Hospital Management	54.66	61.7	61.65	69.6	80.62	10.2%
Medicines	27.88	29.58	36.46	38.22	37.14	7.4%
Medical Reports	22.97	25.67	30.55	32.27	36.61	12.4%
Other	109.17	124.6	138.08	151.92	169.74	11.7%
<b>TOTAL</b>	<b>778.68</b>	<b>844.9</b>	<b>922.97</b>	<b>992.83</b>	<b>1073.54</b>	<b>8.4%</b>

<sup>44</sup> USA interactive kiosk market. (2017). BisReport Electronic Research Center.

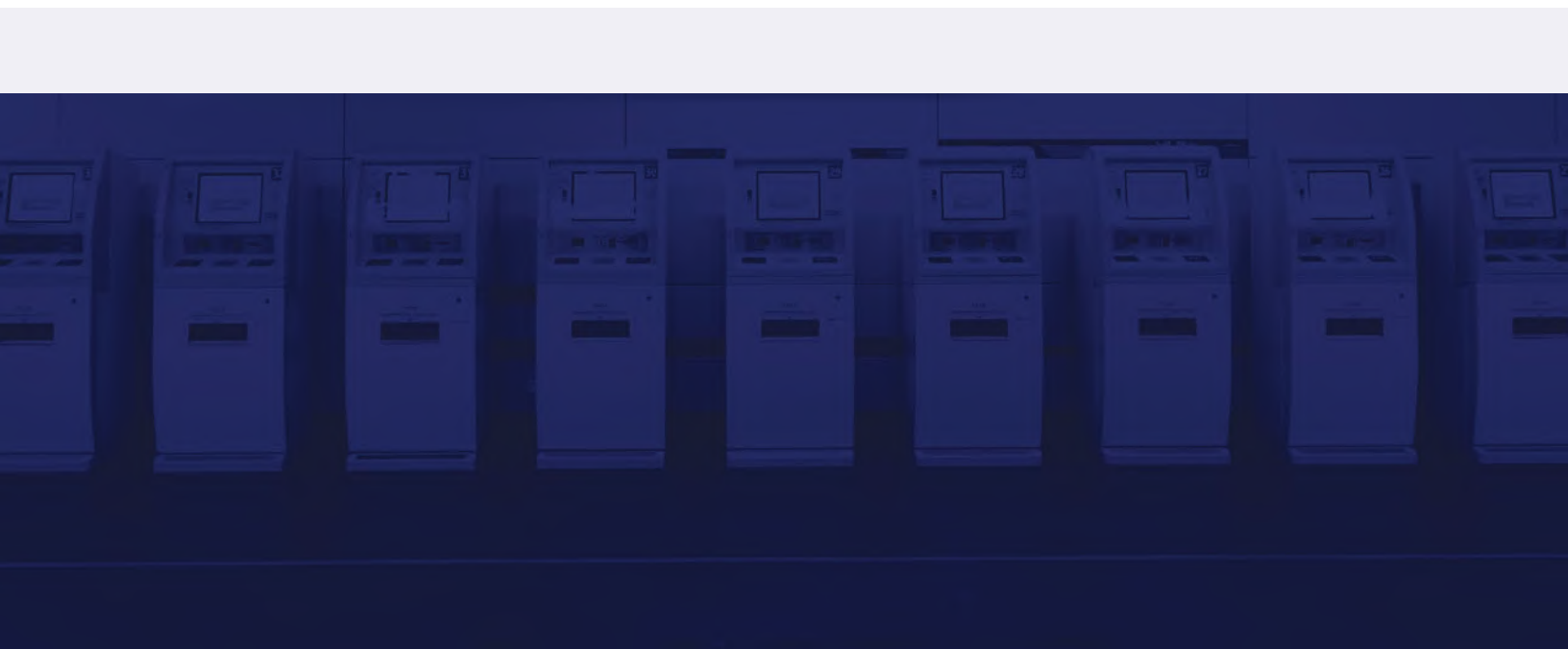






Table 3 shows each market segment's relative size in total shipment volume and market size for the interactive kiosk industry as a whole, including how it is estimated to change between 2017 and 2021.<sup>45</sup> In terms of shipment volume, retail accounts for 32 percent of kiosk production for 2017 and 27.2 percent for 2021. Unsurprisingly, the space is also expected to have the largest market size.

**Table 3.** Estimated Market Segment Share of Shipment Volume and Market Size of Total Interactive Kiosk Industry for 2021<sup>46</sup>

MARKET SEGMENT	VOLUME (K UNIT)		MARKET SIZE (VALUE)	
	2017	2021	2017	2021
Retail	32.0%	27.2%	26.8%	23.5%
Airway Transport	1.5%	1.7%	1.9%	2.1%
Roadway Transport	3.6%	4.0%	3.3%	4.0%
Railway Transport	6.1%	5.2%	5.5%	4.7%
Government	6.0%	5.7%	7.1%	6.8%
Banking and Finance	4.3%	3.9%	4.8%	4.5%
Entertainment	17.3%	18.7%	17.4%	18.7%
Healthcare	5.1%	5.0%	5.7%	5.5%
Hospital Management	6.0%	7.2%	7.0%	7.5%
Medicines	3.6%	3.5%	3.6%	3.5%
Medical Reports	2.2%	2.8%	2.9%	3.4%
Other	12.4%	15.1%	14.0%	15.8%

<sup>45</sup> USA interactive kiosk market. (2017). BisReport Electronic Research Center.

<sup>46</sup> USA interactive kiosk market. (2017). BisReport Electronic Research Center.

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