

# RETAIL IQ



## BUILDING A ROBUST IN-STORE MOBILE NETWORK

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## Maturity Ladder: In-store Mobile Network

The *RIS News Retail IQ Report Maturity Ladder* is a diagnostic measurement tool for a retailer's state of technology advancement in a specific category. There are four key phases: **1. Basic** – minimal capabilities, **2. Intermediate** – mostly basic with some advanced capabilities, **3. Advanced** – mostly advanced capabilities with some limitations, and **4. State-of-the-Art** – comprehensive capabilities are fully integrated and up to date. Note that it is possible to be on more than one step of the ladder simultaneously as specific technology components and processes are upgraded in phases.

# 04

### 4. STATE-OF-THE-ART

- Full mobility applications are available to employees and shoppers.
- Wi-Fi service is actively promoted to shoppers.
- Wi-Fi service is upgraded to offer consumers faster Internet service.
- Mobility services are available outside the store.
- Robust security protocols are leveraged.
- Beacons are used to enhance connections with shoppers.

# 03

### 3. ADVANCED

- Mobility is in place for most applications, including mobile POS and free Wi-Fi for shoppers.
- Most security protocols are used, including wireless intrusion prevention systems.
- Quality-of-service control over service is employed.
- Third-party services monitor the network and devices.

# 02

### 2. INTERMEDIATE

- Mobility used for inventory control and smart devices but not shopper Wi-Fi.
- Security meets PCI requirements.
- Devices are remotely managed from a central location.
- Site surveys conducted in preparation for shopper Wi-Fi.

# 01

### 1. BASIC

- Mobility supports only basic inventory functions.
- Little or no security protocols followed.
- Pilot projects are begun to show ROI for mobility.
- Mobile, web and store functions remain in silos.



It is abundantly evident that the digital revolution, which began on PCs and Macs in homes and offices, has migrated to mobile devices that can be used anywhere. For retailers, this development has ushered in nothing less than a sea change at their stores.

As they survey the shelves, consumers can now access a wide range of information on their smartphones, from prices to product information, all the while receiving offers tailored to their tastes or to their location in the store. Some are even using their phones to buy things or pay for them at the checkout.

Retailers' initial concerns about showrooming have given way to the recognition that mobile shoppers need to be courted, not feared. The best way to do this is to offer free access to the Internet through Wi-Fi, affording shoppers an alternative to using their smartphone's data plan. Free Wi-Fi can potentially engage a large portion of a retailer's customer base — 56% of American adults are smartphone owners according to Pew Research's "Smartphone Ownership 2013" report.

### Powerful Wi-Fi Signals Create a Competitive Advantage

Many retailers are now offering in-store Wi-Fi to shoppers, including Saks Fifth Avenue, Macy's, Target, Home Depot and Lowe's among many others, though not all stores actively promote Wi-Fi's availability.

Of course, it's not enough to just provide consumers wireless access — that access needs to be supported by a robust wireless network infrastructure. "The planning and implementation of a secure, reliable and high-speed mobile infrastructure is the foundation for mobile success," according to the "Mobile Retailing Blueprint," a document produced by the Association of Retail Technology Standards (ARTS), a division of the National Retail Federation. "No matter how enticing or innovative the application, consumers will not use it unless it is available on demand with reasonable response times."

77%

Retailers who believe stores will benefit from in-store mobile networks.

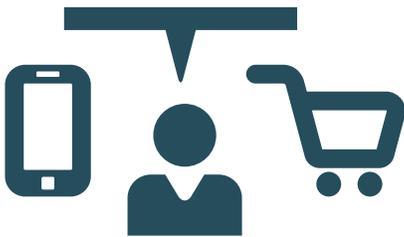
Source: EKN Research, "Mobility in Retail"



Some companies have already started carving out a competitive advantage based on the strength of their Wi-Fi local area networks (LANs). For example, Starbucks — perhaps the retailer best known for offering free Wi-Fi — last year replaced AT&T with Google as its Wi-Fi provider, with a rollout extending through 2014. Google is reportedly promising that Starbucks customers will be able to surf the Internet at speeds up to 10 times faster than before. In 2011, Lowe’s revamped its wireless network infrastructure at more than 1,700 stores, accelerating Wi-Fi speeds by as much as eight times.

25%

Of retailers provide smart devices to their store associates.



Source: EKN Research, “Mobility in Retail 2014”

The benefits of the in-store mobility revolution are most fully felt by store associates armed with mobile tablets and phones, who are able to assist shoppers in a myriad of ways, from clienteling to inventory look-up to checkout, anywhere in the store.

Employees have long used wireless handheld scanners to receive and order inventory, validate shelf pricing and conduct cycle counts. Mobile devices free store managers from office duties and allow them to circulate through the brick-and-mortar environment while maintaining access to store performance data.

For both associates and customers, mobility expands the store experience to areas that have traditionally been on the outside looking in such as the parking lot, fueling station and garden center.

### Capitalizing on Mobile

Realizing that their stores are facing a tsunami of digitally empowered shoppers, many retailers are furiously moving to batten down the hatches with the necessary technology investments.

Seventy one percent of retailers believe that their current store technology is not capable of enabling the mobile shopping experience they envision for their customers and stores according to RSR Research’s “The Relevant Store in the Digital Age.” Retailers admit that a big part of the challenge has to do with the in-store Wi-Fi infrastructure and its inability to provide adequate load times to meet current digital media requirements.



**SREEKANTH KANNAN**

Senior Solutions  
Marketing Manager  
Aerohive Networks

# Optimizing the In-Store Network

**Q: What are the key points retailers should think about when they set up and manage an in-store Wi-Fi network?**

**SREEKANTH KANNAN:** Retailers seeking to modernize their store network should strike a balance between a wired and wireless network infrastructure. Integrating and rightsizing the network for efficient utilization, optimum capacity and balanced planning of wired ports versus wireless access. Instead of a Wi-Fi controller, retailers need the right distributed network architecture that is cloud-managed, has deep visibility into users and applications in the network, is monitored centrally and optimized for operational efficiency. This makes for an elegantly designed retail network that embraces mobile users and employees.

Optimizing the retail network for mobility is key to servicing tech-savvy shoppers and meeting the influx of devices and applications into the network. This essentially means implementing a network that takes into account the context of devices, the user and privileges, location, applications and duration. In other words, make your network elastic to respond to the varying conditions of context in the network based on the day of the week, seasonality, major retail events and store-based promotions.

**Q: How can retailers ensure bullet-proof security and PCI-compliance for an in-store wireless network?**

**KANNAN:** User identity and privileges are central to network access and security. Users and user groups help define quality-of-service policies for traffic management and determine the service-level at different parts of the network, which helps shape the overall security policy framework. This paradigm stems from the fact that a given user, especially a store employee or staff member, is no longer restricted to a single device or location in the store or to network access confined by SSID and VLAN IDs. Enforcing security, and thus meeting PCI-DSS compliance, entirely hinges on the network edge where the users connect.

**Q: How can retailers properly maintain and manage an in-store Wi-Fi network post installation?**

**KANNAN:** When retailers adopt a centralized, cloud-managed solution, maintenance and management are much easier. Automatic provisioning, consistent policy deployment, and centralized management of network resources all enable an IT administrator to manage thousands of devices as easily as one. Device security management helps ensure that devices are able to access the right content, collect inventory information, and monitor device utilization and licensing.

**Q: How can retailers convert Wi-Fi connectivity into a tool that drives store sales and productivity?**

**KANNAN:** The most successful retailers realize the value of in-store Wi-Fi for providing comprehensive coverage and Internet access for customers. By deploying a Wi-Fi guest-access solution, retailers give customers the ability to check product details, the gift registry and availability in the aisle.

Mobile's greatest asset is perhaps the anytime, anywhere model. But when it comes to retail, there is no location more important than right by the customer's side. An increasing number of retailers are focused on providing constant shopper attention using Wi-Fi enabled mobile devices to attend to questions, provide customer service and complete the purchase transaction. The customer shopping experience is vastly improved when the transaction is completed with a mobile point-of-sale device over a Wi-Fi network that meets privacy and PCI compliance mandates and eliminates the time that is generally wasted standing in line.

Depending on store and customer demographics, typically 40% to 70% of all visitors are carrying a phone with Wi-Fi. The right wireless network and analytics software can use Wi-Fi signals to accurately represent total foot traffic inside and around the store. With analytics software, retailers can transform the in-store Wi-Fi into a consumer analytics tool for optimizing retail operations and maximizing per-store revenue.

“Optimizing the retail network for mobility is key to servicing tech-savvy shoppers and meeting the influx of devices and applications into the network.”



Retailers rely on the right wireless network to meet the requirements of today's customers empowered with smartphones. Aerohive Networks reduces the cost and complexity of today's networks for retailers with cloud-enabled Wi-Fi and routing solutions for in-store mobility, warehouse operations, and guest Wi-Fi. Aerohive also provides Retail Analytics in all their access points and routers which provides actionable customer behavior analysis to improve the shopping experience and optimize business operations. Aerohive's cooperative control Wi-Fi architecture, public or private cloud-enabled network management, routing and VPN solutions, eliminate costly controllers and single points of failure and meet the stringent compliance requirements of the Payment Card Industry Data Security Standard (PCI DSS).



In fact, 27% of retailers still have no Wi-Fi network in stores and rely on wired connectivity to support a digital shopping experience, and of those with Wi-Fi, 28% say they use it only for receiving and other inventory control tasks, according to RSR.

Existing store networks are often unable to meet the growing demand of in-store WiFi usage. “That means retailers could be missing a valuable opportunity to interact with shoppers who are literally right under their noses,” says Allison Paul, vice chairman and U.S. retail and distribution leader, Deloitte.

Seventy seven percent of retailers believe store operations will benefit the most from mobility strategies, according to EKN’s “Mobility in Retail” report. Retailers’ current adoption rate is at odds with those sentiments, with only one in 10 retailers reporting wide-ranging mobility adoption across the enterprise and only 25% of retailers providing smart devices to store associates.

### Benefits of Free Wi-Fi Outweigh Capital Investment

Cost remains a huge concern in the margin-challenged retail industry — developing store mobility strategies requires a considerable infusion of capi-

#### WI-FI DEPLOYMENTS IN STORES



Source: RSR Research, “The Relevant Store in the Digital Age”



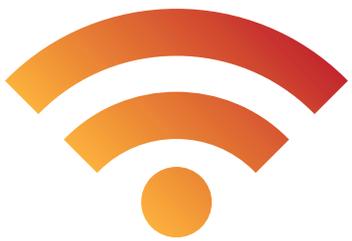
tal investment. “Retailers will need to demonstrate ROI of pilot projects to develop a value justification framework for large-scale investments,” says the EKN report. Retailers need to explore areas where mobility can help save dollars, such as replacing full system POS units with mobile devices.

In addition to cost, there are a host of other challenges posed by mobilizing the enterprise from device management to data security to compliance. Smart devices require always-on Wi-Fi Internet, cloud-based storage and applications. Nonetheless, the business case for mobility is such that EKN sees “mobility adoption in retail an area of tremendous growth, with the focus in 2014 being on “establishing ROI and building an executional model to manage a larger scale deployment.”

Wi-Fi access is a difference maker — 50% of smartphone shoppers would feel more confident making a major purchase if there was Wi-Fi connectivity in the store, according to Acquity Group’s study “Desktop vs. Smart Phone: Technology’s Impact on Omnichannel Behavior.” The study reports that 30% of customers would be more likely to browse additional items not on their list and 20% would spend more time in the store. Moreover, 59% have been influenced to make an in-store purchase decision after browsing product images and information on a smartphone.

“In-store Wi-Fi not only allows retailers to keep consumers in-store longer, making them more likely to purchase, but also helps tie in the consistent user experience across channels that today’s consumers expect,” says Chip Knicker, vice president of eCommerce at Acquity Group.

Retailers with innovative mobile strategies are able to capitalize on the high level of correlation between using a mobile shopping app inside a store and purchases made on the same day. Savvy retailers can capture valuable business intelligence that can help fine-tune sales staffing, merchandising and inventory composition, while simultaneously creating a new revenue stream by delivering mobile ads to shopper smartphones and tablets.



50%

**Smartphone shoppers would feel more confident making a major purchase if there was Wi-Fi connectivity in the store.**

Source: Acquity Group, “Desktop vs. Smart Phone: Technology’s Impact on Omnichannel Behavior”



**RICARDO BELMAR**

Director, Product Management and Marketing, Hughes

# Finding the Right Connectivity

“If access time is not appropriately provisioned, retailers will frustrate their customers with frequent disconnect errors and stubborn content that refuses to load properly.”



Hughes Network Systems, LLC (Hughes) is the world's leading provider of satellite broadband for home and office, delivering innovative network technologies, managed services, and solutions for enterprises and governments globally. To date, Hughes has shipped more than 4 million systems to customers in over 100 countries, representing approximately 50 percent market share. Its products employ global standards approved by the TIA, ETSI and ITU organizations, including IPoS/DVB-S2, RSM-A, and GMR-1. Headquartered outside Washington, D.C., in Germantown, Maryland, USA, Hughes operates sales and support offices worldwide, and is a wholly owned subsidiary of EchoStar Corporation (NASDAQ: SATS), a premier global provider of satellite operations and digital TV solutions.

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## Q: What connectivity solutions are best suited to providing retailers with reliability and high bandwidth?

**RICARDO BELMAR:** Given connectivity coverage variability, retailers need the flexibility to choose the best network access for each store. Where some locations may enjoy options for cable, fiber, and high-speed DSL, others may only have low-speed DSL. Fortunately technologies exist to bond multiple lines into a single virtual high-speed connection. In any scenario, in-store mobility initiatives will likely exceed the available bandwidth. As a result, strong Quality of Service (QoS) and advanced compression should be employed to augment the last-mile bottleneck with intelligent, virtual bandwidth for faster connections.

In-store mobility offers an opportunity to leverage cloud-based resources; however, any network outage will result in a loss of access to critical customer-facing applications. To increase network reliability, wireless backup options (e.g., 3G/4G, or satellite) should be employed to maintain connectivity.

## Q: How can retailers keep their network costs low while supporting high-bandwidth applications?

**BELMAR:** Today, a T1 line is not fast enough. Yet, adding Wi-Fi T1's is too expensive an investment for an insufficient amount of capacity. While broadband solutions are faster and more cost effective, their best-efforts nature does not always meet enterprise requirements.

A new paradigm is required: leveraging advanced QoS and compression technologies to upgrade broadband solutions to enterprise-grade performance. New intelligent solutions can transform broadband solutions into highly reliable, high-performance, and affordable enterprise solutions.

## Q: What network solutions are best suited to supporting in-store mobility?

**BELMAR:** In-store mobility requires more than just Wi-Fi access points (APs). Popular promotions create peak periods of high-density customer access requirements. If access time is not appropriately provisioned, retailers will frustrate their customers with frequent disconnect errors and stubborn content that refuses to load properly.

New technologies bring advanced QoS and compression capabilities to in-store mobility just as with the WAN. The ideal solution should offer end-to-end QoS over the Wi-Fi and across the WAN. APs need to intelligently manage, load and balance shoppers searching for relevant deals as well as store associates accessing back-office apps. Connectivity to the store Wi-Fi network must be proactively managed with even distribution of Wi-Fi access to all potential users, and priority given to critical applications that impact the customer experience. This means dynamically prioritizing store-associate applications and devices over guest devices.

## Q: What are the best ways for retailers to achieve security and centralized management for their networks?

**BELMAR:** A simple, private network designed to support back-office applications and credit card transactions is no longer sufficient. Now the store network must also provide in-store access to the Internet to support cloud apps and customer-facing mobile applications. These applications must be able to query in-store systems for product availability and pricing as well as access the data center.

In-store mobility increases security requirements and demands comprehensive unified threat management (UTM) solutions. Customer-facing applications must be protected by content filtering or the retailer may face liabilities associated with inappropriate content. Mobile POS systems must demonstrate PCI compliance or retailers will be forced to forfeit the advantages of 1:1 customer engagements on the sales floor. In an age where network security breaches destroy brands, retailers must validate the integrity of their store networks. To mitigate these risks, retailers would be wise to partner with an experienced and reputable managed security service provider.



## Coverage and Security

To achieve the multitude of customer-facing benefits — and to bring advanced mobility options to employees — retailers need to ensure the network has comprehensive in-store coverage and unimpeachable security. “Retailers will need to reimagine the enterprise network as being a high-availability, high-bandwidth and primarily wireless network” according to the EKN study.

In addition, retailers need to ensure that their external networks, which are delivering data to the store networks, are extremely reliable. Merchants using DSL and other terrestrial wide area networks (WANs) are backing up these connections with satellite technology or the 4G cellular network.

While there is no one-size-fits-all model for in-store mobility, Wi-Fi, used by most in-store wireless networks, is a good starting point. Wi-Fi, which is supported by the Wi-Fi Alliance, a global nonprofit association, “enables secure, reliable wireless connectivity to a local network and to the Internet,” says ARTS’ “Mobile Retailing Blueprint.”

To ensure comprehensive coverage and avoid overlapping with nearby networks — such as in a mall setting — retailers should conduct pre-de-

## REASONS TO INVEST IN MOBILITY



Source: EKN Research, “Mobility in Retail 2014”



ployment site surveys before installing Wi-Fi access points. Site surveys can also identify challenging areas and potential sources of interference. Retailers can also invest in new antenna technology that can help mitigate interference problems. Post-deployment surveys can be employed to ensure that the network meets the retailer's coverage requirements.

### Supporting an In-Store Mobile Network

An in-store mobile network should have the following capabilities: seamless roaming without experiencing connection issues, Quality of Service (QoS) control over service quality for selected network traffic, and "self-healing" in the event of a malfunction in a piece of equipment in the wireless infrastructure.

Merchants face the additional challenge of managing all of the wireless devices used by employees, especially consumer-oriented tablets and phones that are not generally "retail-hardened" and emphasize usability over security and manageability.

Mobile devices should be integrated with existing IT systems that monitor, update and maintain desktops, laptops and servers. Retailers should employ centralized and remote management of mobile devices to ensure seamless operation, enabling remote staging and provisioning. In addition, savvy retailers are employing centralized monitoring for user and device authentication, the ability to remotely disable and re-provision software, and for security policies such as the ability to remote wipe and lock.

Many retailers use third-party managed services to monitor networks and devices for security, availability and performance. Some retailers are employing cloud-based centralization of data, applications and security to manage all mobile devices.

### Creating a Safe and Secure Network

It is, of course, essential to design a mobile environment that prevents unauthorized access to data and devices, permitting only secure, encrypted,

**3X**

**Retailers using mobile devices for POS is expected to triple in the next year.**

Source: RIS News, "Store Systems Study, 2014"

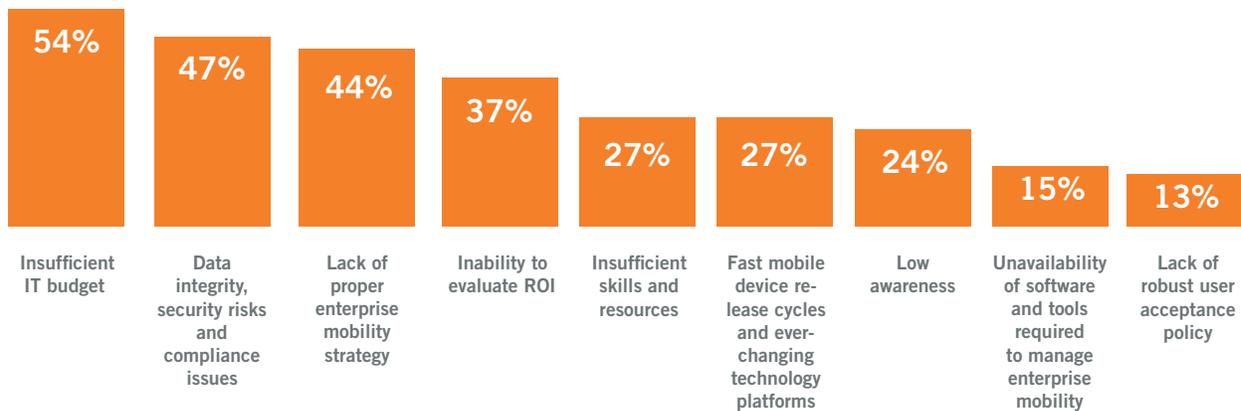


and authorized communications. Retailers need strong security standards and credential-based access to battle advanced malware and viruses.

In addition, networks must be secure from unauthorized, unsecured or “rogue” wireless access points. Retailers should continuously monitor their networks for security threats, using enhanced security services such as a wireless LAN Intrusion Prevention System (IPS) and Intrusion Detection System (IDS). Retailers offering both public Wi-Fi and internal Wi-Fi applications for associates should employ firewalls to separate public and private areas of the network.

A host of other security policies and controls are necessary to ensure device safety, including end-to-end encryption of data and tokenization. Retailers should employ “an automated system of alerts based on security breaches and user policy violations,” as well as “develop security breach and threat scenarios and codify responses to those,” recommends the EKN report. Compliance to the PCI Data Security Standard is necessary for any in-store mobility operation. The PCI Security Standards Council recommends the use of WIPS (wireless intrusion prevention system) to automate wireless scanning for large organizations.

**CHALLENGES PREVENTING ADOPTION OF ENTERPRISE MOBILITY**



Source: EKN Research, “Mobility in Retail 2014”



Retailers using mobile POS need to integrate mobile POS security solutions that adhere to the PCI Data Security Standard, with software and hardware certified as compliant.

### Wi-Fi Is Not the Only Tool in the Wireless Toolbox

Wi-Fi is not the only in-store wireless platform available to retailers, and some merchants are beginning to explore alternatives that can supplement or even replace Wi-Fi.

For example, the latest mobile communication standard, 4G LTE, is beginning to be adopted by retailers as an alternative to Wi-Fi. 4G LTE offers higher bandwidth, faster response times and improved spectrum efficiency (increasing overall network capacity) according to a report by business consultancy Arthur D. Little, “The Business Benefits Of 4G LTE.”

These advantages potentially allow more applications to be used on mobile devices, faster or real-time sharing of large files and streaming media, and near-immediate delivery of time-sensitive data, such as for real-time interactions or transactions, the Little report said. In addition, 4G LTE offers improved security — there is no need to authenticate onto another, possibly public, network.

In retail, 4G LTE is being used in new store formats, especially “pop-up” stores and retail kiosks. It facilitates targeting shoppers with “rich, engaging and often location-specific content,” says the report, and eliminates the need for customers to find and log into store Wi-Fi.

Another alternative wireless technology is near field communications (NFC), which employs short-range radio frequency identification (RFID) in such applications as payment and product identification. It will be used in chip-based credit and debit cards being rolled out in the U.S. market (and already used throughout the world).



**56%**  
Of American adults are smartphone owners.

Source: Pew Research, “Smartphone Ownership 2013”



A more promising alternative is beacon technology, such as the iBeacon developed by Apple. Each beacon is low-cost, easy-to-deploy and about the size of quarter that require very little power. iBeacons communicate with iPhones and many Android phones through the use of low-energy Bluetooth technology.

Beacons are regarded as having more granularity than Wi-Fi when it comes to identifying a smartphone. They can pinpoint locations within a few feet. Beacons can serve as tracking devices and facilitate messaging to smartphones equipped with an app and Bluetooth. They can also enable payments at the point of sale allowing shoppers to make a payment without having to take out their wallet or card.

A number of retailers on the cutting edge have already introduced iBeacon technology in-store. In December 2013, Apple launched the technology at its 254 retail stores. This year Safeway and Giant Eagle are rolling out iBeacons at their stores.

Wi-Fi sensors and beacons can anonymously track shoppers as well as offer targeted mobile offers to shoppers based on location and shopping history. At the most basic level, the technology detects and follows the movement of Wi-Fi enabled mobile devices throughout the store to accumulate actionable data. At the advanced level customers that opt-in can be targeted with location-specific marketing messages in-store to help close a sale.

Data collected from Wi-Fi and beacons include trip timing, duration and dwell times at various store locations; overall traffic, by time of day, and by department; and whether customers are new, repeat or frequent shoppers. Retailers can use the data for display positioning, merchandising and labor scheduling, as well as the timing of promotions.

**“In December 2013 Apple launched iBeacon technology in its 254 stores. Safeway and Giant Eagle are currently rolling it out.”**



## Conclusion

The widespread and increasing use of smart devices completely changes the nature of retailing and forces retailers to equip their stores to accommodate the vast swath of the American public that will walk in armed with a smartphone.

In order to capitalize on the growing mobile opportunity, retailers have to invest in highly sophisticated wireless technology that supports a seamless and secure mobile experience. Anything less will leave their stores at risk of losing relevancy to the majority of their shoppers.



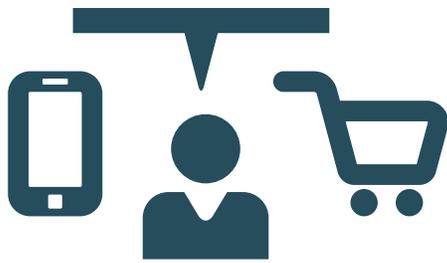
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Of smartphone shoppers use their devices to help them shop while in a store.

Source: Google Marketing Council, "Mobile In-store Research"

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REASONS TO INVEST IN MOBILITY



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