

Presence cells: a new wave of enterprise small cell solutions



A white paper for ip.access

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Executive Summary

Small cells have become an established solution for all kinds of enterprises seeking improved mobile coverage and capacity indoors, and those key drivers will lead to significant growth in uptake from 2014. For mobile operators (MNOs), this technology represents an important way to increase their presence in enterprises, boosting revenues and reducing churn in a segment where they have traditionally just been providers of minutes and megabytes.

However, the business case for enterprise small cells is evolving rapidly. Many enterprises, particularly those which are consumer-facing, such as retailers and financial institutions, are looking for additional benefits, beyond coverage and capacity, when they implement a wireless solution. MNOs can differentiate their proposition significantly if their small cell solutions support key business goals for vertical sectors like retail – most importantly, the enterprises' need to understand their customers better, deliver personalized services, and enable secure transactions.

The inherent presence and location awareness of a small cell, combined with the unparalleled accuracy of the SIM card in tracking and authenticating subscribers, can support powerful solutions for enterprises, with a high degree of security and contextual accuracy to support new added-value services. Such solutions will increase the value of the small cells to the enterprises, and therefore the strategic importance of the MNO relationship.

However, current solutions are still geared to the core requirements of coverage and capacity. A new wave of small cells, optimized to support secure presence-based services, is required to spur a new wave of investment by segments such as retail, and to differentiate from over-the-top alternatives. This paper examines the case for this new breed of product, as epitomized by the new presenceCell from ip.access.

Introduction:

Small cells are poised for volume uptake in 2014 onwards, with especially strong growth in enterprise markets. As highlighted by the Small Cell Forum's Release program, there have been important developments in the economics, performance and ease of deployment of small cells, as well as the introduction of LTE and 3G/4G platforms.

However, while enterprise deployments can often be justified by improved indoor coverage (especially for voice) and capacity, there is also a rising tide of operators and enterprises seeking additional benefits on top of those core advantages. This trend is particularly seen in consumer-facing enterprises such as retail stores or banks, which see the opportunity to harness small cells to deliver personalized services to customers; to understand their consumers better; and to support moves towards secure mobile commerce.

Small cells have inherent capabilities, particularly their precise location and presence awareness, which can support value added applications such as targeted marketing or 'big data' collection. However, these features have, to date, been less prominent in the business case than coverage and capacity improvements, and limited work has been done to develop optimized services for key enterprise sectors, which go beyond basic presence awareness.

This paper analyzes how an optimized use of small cell presence and location capabilities can improve the business case for consumer facing verticals, especially in retail and banking, and therefore open up a new market opportunity for mobile network operators (MNOs). It assesses the scale of the demand for a 'presence cell'; the key attributes it would need to meet the business requirements of the deployers; and its position against alternative solutions.

The survey:

A survey of 20 tier one mobile network operators was conducted in May 2014 by Maravedis-Rethink. All were intending to deploy small cells before 2017. This was accompanied by a survey of 20 organizations considering new technologies for retail or banking premises. The latter group included retailers, banks, integrators specialized in these verticals, and vertical applications developers. All respondents were located in North America, Europe and eastern Asia-Pacific.

Note: this study adopts the Small Cell Forum's definition of 'enterprise', which is broader than the traditional definition focused mainly on office buildings. It includes:

- Small and medium enterprises
- Large enterprises/corporate campuses
- Retail shops and malls
- Medical facilities and hospitals
- Factories and warehouses (industrial)
- Government and municipal buildings
- Hotels and hospitality
- Public venues

1. Enterprise small cells – more than coverage and capacity

The non-residential small cell market is set to experience significant growth from 2014 onwards, with the enterprise market being a particularly strong driver. By 2019, the installed base of enterprise small cells will almost reach seven million, a compound annual growth rate of over 83% from 2013.

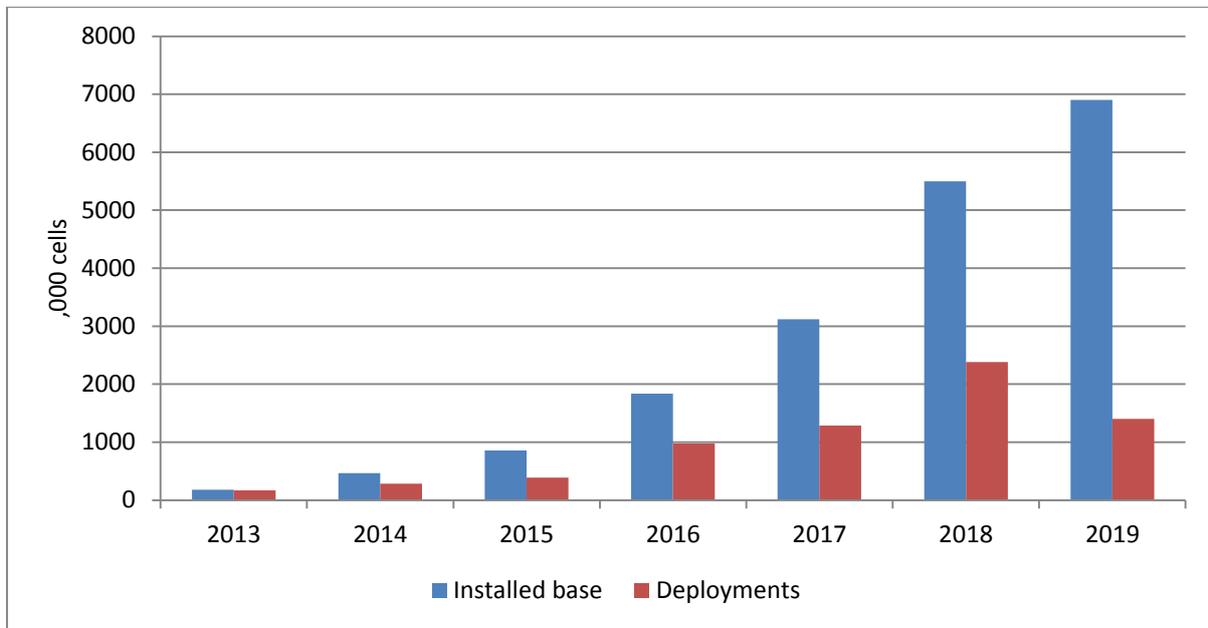


Figure 1. Enterprise small cell deployments and installed base growth to 2019. While the installed base grows throughout the period, new roll-outs drop off after 2018 as major markets complete their instalments and start to assess next generation technologies.

Source: Maravedis-Rethink RAN Service May 2014

Enterprise interest in small cells will be driven by improvements in the cost, performance and ease of deployment of the equipment; by integration with other enterprise systems such as WiFi; and by the rising need for high quality voice and data services indoors, as communications shift rapidly to a mobile-first pattern, which gains cost benefits as desktop phones are replaced or even removed.

Enhanced capacity and coverage have notable benefits for enterprises such as

- improving productivity and business process efficiency
- improving customer and employee loyalty
- supporting new ways of working such as hot-desking
- reducing landline costs

However, some businesses increasingly regard these benefits as table stakes, and are keen to explore additional drivers for deploying small cells. Indeed, some will delay investing in small cells until the mobile network operator (MNO) can offer returns beyond those delivered by coverage and capacity alone.

This is particularly apparent in consumer facing enterprises such as stores and malls, and retail banks or financial institutions, which are always looking for new ways to attract customers and increase their loyalty and their spending. Such deployments often involve several parties, including the MNO, the retailer and the premises owner, all of which will want to maximize their ROI. In the MNO's case,

small cells can be a powerful way to increase market share in enterprise sectors and increase the value of their proposition there. Increasingly, they expect to be more successful in the retail and finance sectors if they offer added value.

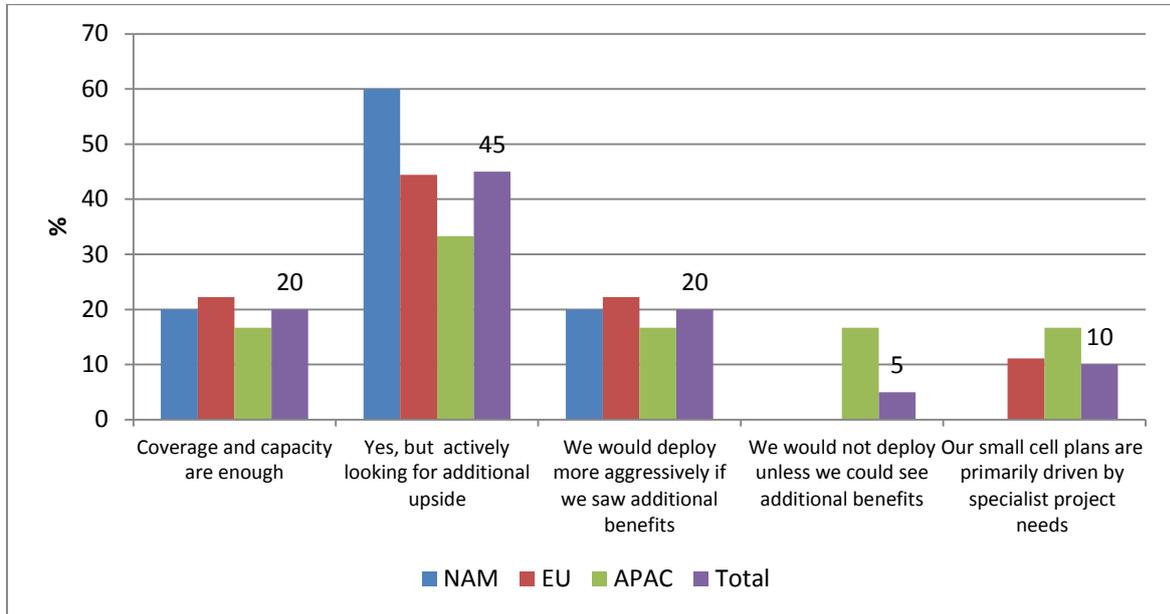


Figure 2. MNO responses to the question: 'Are coverage and capacity enough to drive small cell uptake among enterprises?'

As Figure 2 shows, mobile operators are actively looking for additional benefits to improve their proposition for certain enterprise and vertical markets. On a global basis, 70% are looking for such added value, and while only 5% say they would not deploy at all without additional benefits, one-fifth would be more aggressive if they could look beyond capacity and coverage, because that would improve uptake in key segments.

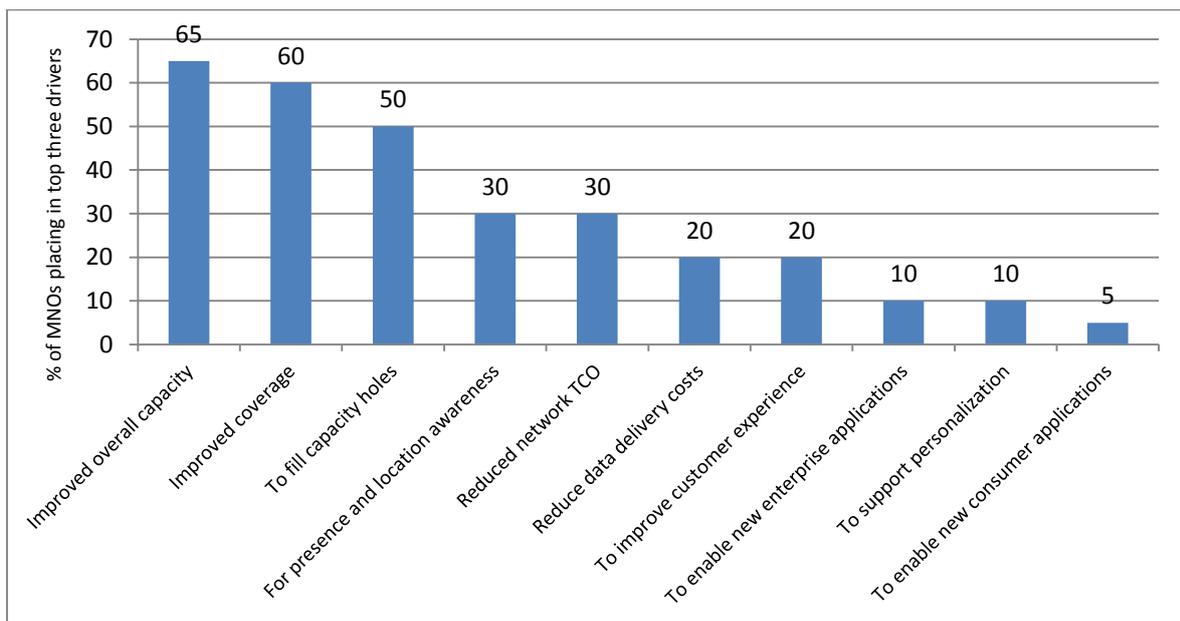


Figure 3. MNOs' key drivers to deploy small cell solutions for enterprises (% placing each driver in their top three).

This is not to say that capacity and coverage are unimportant. They remain the core drivers of small cell roll-out (see Figure 3). In the survey, MNOs were asked for their top three reasons to deploy enterprise small cells, and two-thirds said that they, and their enterprise customers, were looking for additional capacity, while 60% placed improved coverage in their top three. However, as the market gets more competitive, it is hard to differentiate their solution with these advantages alone.

It means that MNOs are looking for new ways to differentiate themselves and take an added-value role in the enterprise customer's business plan. In this context, it emerged that taking advantage of presence and location capabilities was the next most important driver for small cells, cited by almost one-third of MNOs, while one-fifth said improved user experience and new customer applications were primary factors.

2. The importance of presence in the enterprise small cell business case

The previous section indicated the need for enterprises and their MNO partners to gain additional benefits from small cell deployments, beyond improved mobile capacity and coverage. Among those potential additional returns, presence and location awareness feature highly in any consumer facing enterprise segment.

That is because these capabilities support some of the most important ways in which businesses such as retailers are seeking to improve their market share, customer loyalty and competitive edge. These are enabled or enhanced by awareness of a specific user's presence, and include:

- Increasingly precisely targeted promotions and advertising, offering relevant offers to customers and boosting revenues from marketers. These rely on presence awareness tied into big data and analytics, which provide a profile of the users' preferences and behaviors.
- Added value in the shopping experience, such as delivering more information about the products customers are viewing, via the smartphone
- New and secure ways to pay for goods, using the smartphone to improve shopper experience
- Creating a unified experience between online and physical stores or bank branches.

For the enterprises, such capabilities can

- attract new customers and encourage more engagement and purchasing by existing ones
- offer better services to advertisers with improved targeting of customers in the store and increased response to promotions
- reduce costs by converting more in-store processes to self-service
- improve security and reduce fraud by offering a new level of authentication.

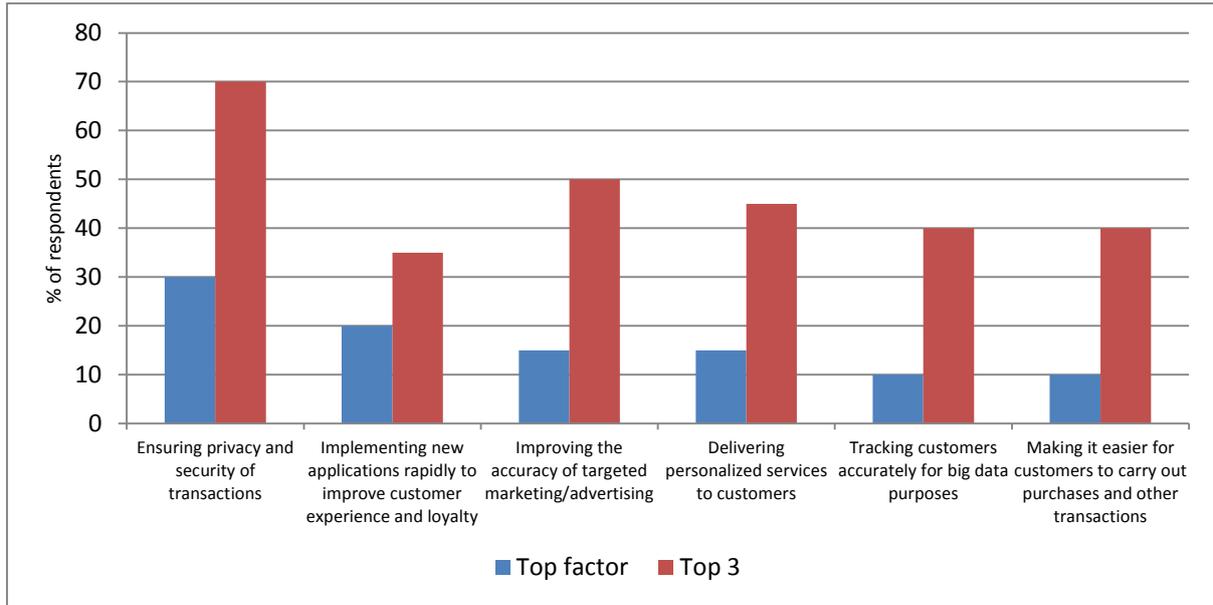


Figure 4. Key business challenges facing retail and banking sectors in the next three years (respondents were asked to name their top three challenges in order of seriousness).

These capabilities of a presence-enabled solution feed directly into the critical business challenges facing retailers and banks. As Figure 4 shows, their top business concerns revolve around security and privacy; collecting accurate customer for analytics and marketing purposes; and improving the customer experience through new services and purchasing options.

These business concerns are helping to drive a significant level of interest in small cells in these segment. One-quarter have plans to adopt small cells, 20% of those within the next 18 months, while a further 25% are actively trialling the technology – Asia-Pacific leading in this respect.

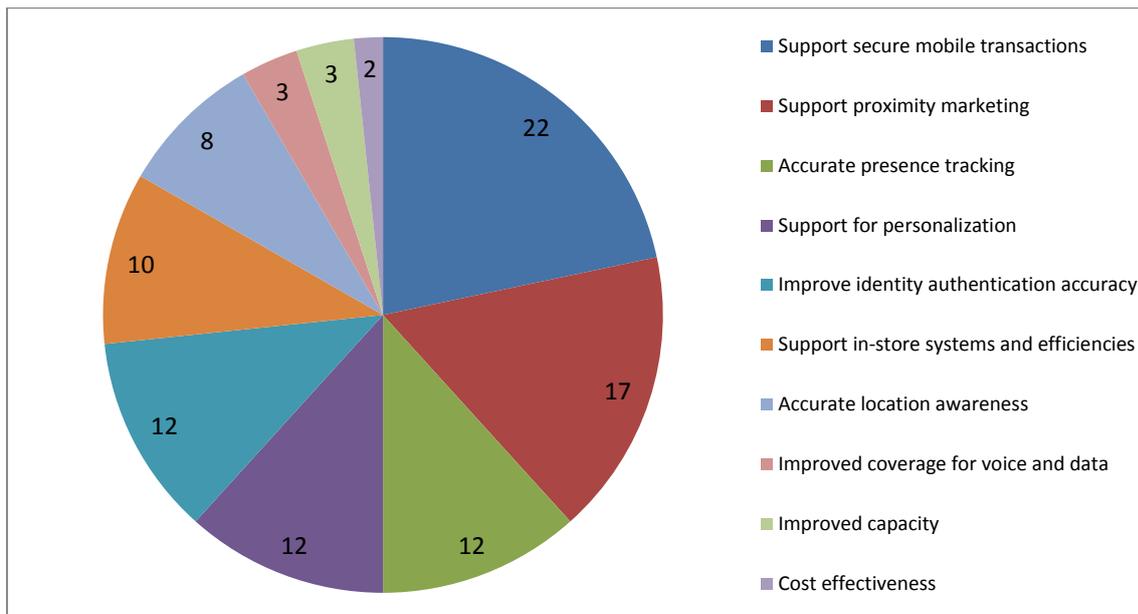


Figure 5. Factors cited by vertical market respondents as key drivers for interest in small cell services (percentage of respondents placing each factor in their top three).

In most cases, however, the survey supports the view that most enterprises are looking for more than just coverage and capacity improvements, and that advantages enabled by presence and location awareness are important.

The potential for small cells to help increase transaction security is the driver most commonly placed in the top three by vertical market players (Figure 5). Over one-fifth did so, with support for proximity marketing the second most commonly cited. This was followed by three benefits which were all equally rated - accurate awareness of which customers are in-store; the ability to deliver personalized services to them; and improved authentication of a customer’s identity, especially when purchasing. Coverage, capacity, efficiency and cost effectiveness came lower in terms of being key drivers, indicating that these are taken for granted, but may not be enough on their own to make the case.

3. Retail and finance in the MNO small cell model

These capabilities are important to the MNO’s business case for deploying small cells in enterprises too. Section 1 indicated how key verticals such as retail will provide a significant portion of the growth in small cells over the coming 5-6 years.

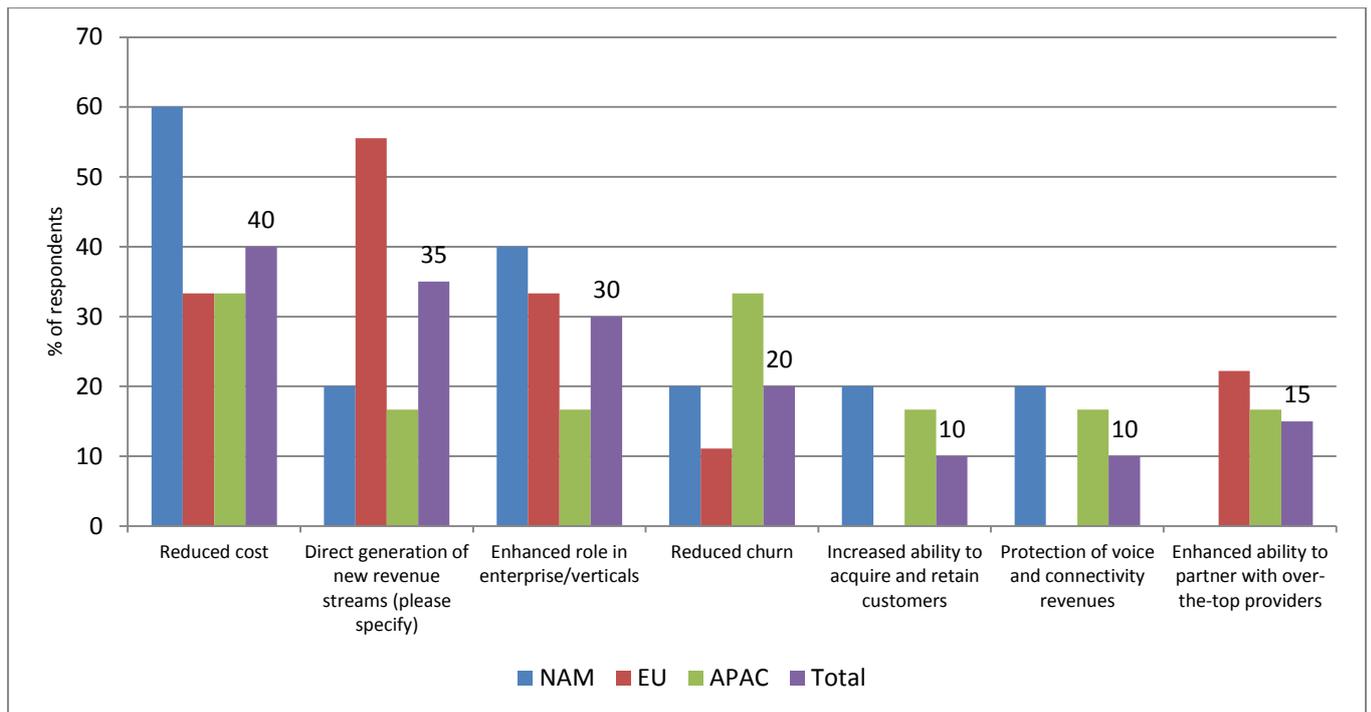


Figure 6. Key business impact targeted by MNOs when deploying enterprise small cells (respondents could tick all that applied)

Figure 6 illustrates the main business benefits which MNOs are targeting when they invest in enterprise small cell platforms. While the ability to deliver capacity and coverage at lower cost is important, cited by 40% of the sample as one of their considerations, it is rarely the single most significant priority. When asked to select just one impact, new revenue streams – with big data particularly mentioned – and an enhanced role in enterprises and verticals emerged as key drivers.

On a regional basis, new revenues were particularly important to European operators, and increased vertical presence to North American players.

Adding value to those cells in terms of new capabilities not only gives the MNO a competitive edge, but can also deliver:

- an enhanced, and more profitable, relationship with the enterprise, since the operator is now delivering a strategic business benefit, not just minutes and megabytes
- improved data on mobile customers, which can enable the MNO to offer new analytics to vertical partners and advertisers.

By working with vertical market integrators and service providers to create new applications which ride on top of small cell location and presence capabilities, MNOs can increase their revenues, and their presence in the coveted enterprise space, particularly in segments such as retail.

Retail is the second most targeted enterprise segment by MNOs, according to the survey (Figure 7). Half the respondents said that retail was one of the sectors they planned to target actively with small cell services over the coming few years, second only to corporate premises such as office deployments. Hospitality was also cited by half the operators surveyed, while almost one-third will target the banking sector. Interest in retail and banking is particularly high in North America, where 60% and 40% of operators, respectively, plan to target these areas.

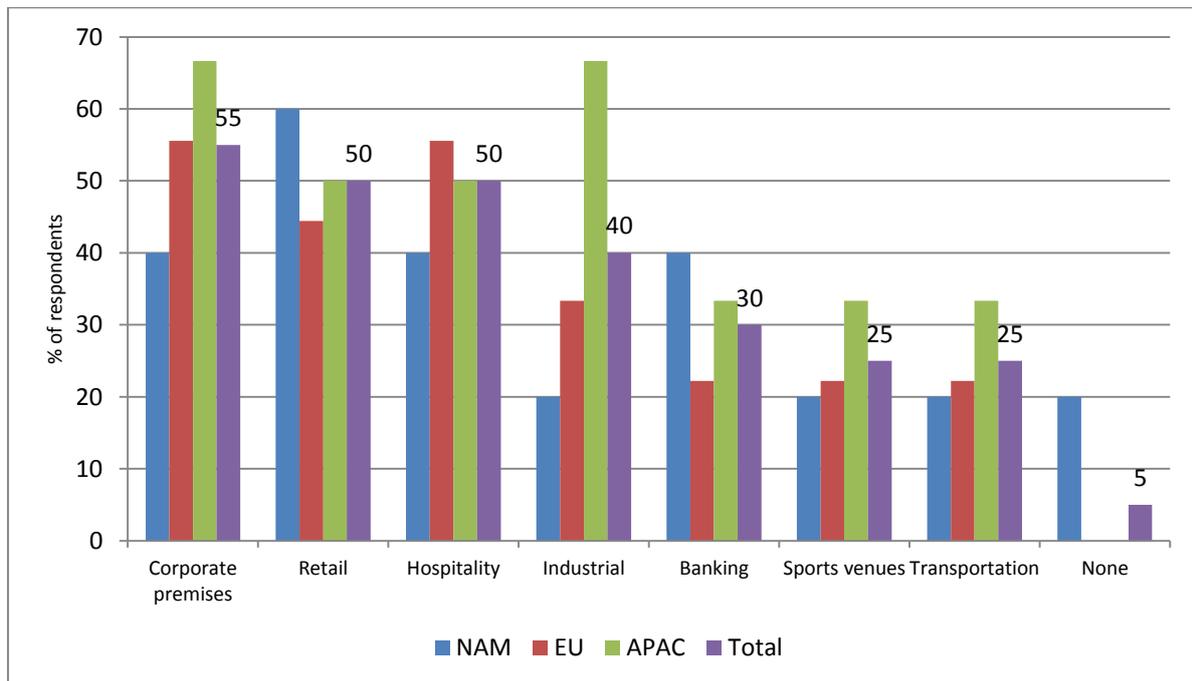


Figure 7. Sectors actively targeted by MNOs for enterprise small cell deployments (respondents could tick all that applied)

Among MNOs actively targeting the retail and banking sectors, a range of business propositions was being considered to add value to their small cell offering and tempt customers in these segments (Figure 8). On a global basis, the most popular is to tap into the high wave of interest in personalized mobile services, such as delivering individually relevant special offers or adverts. After this came

support for location-based services, and for new ways of carrying out transactions. At least half the respondents plan to focus on at least one of these three applications, though there are significant regional variations, with North American operators the most convinced by presence and location applications, and their Asia-Pacific counterparts the most enthusiastic about payments. While offering simple capacity improvements cannot be ignored, MNOs are concerned that, on its own, these will not provide clear differentiation and value-add, hence the emphasis on presence and location solutions.

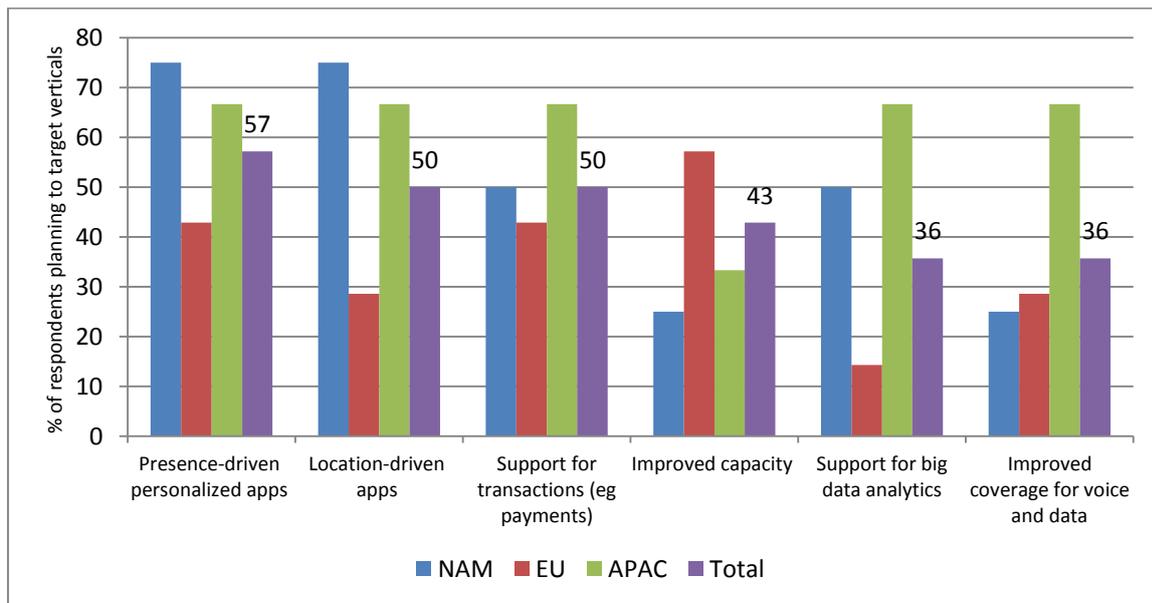


Figure 8. Key small cell proposition which MNOs targeting retail and banking would offer customers(respondents could tick all that applied)

Among all the MNOs sampled, 35% said presence would be important, very important or essential to their business proposition for vertical markets, though clearly this is a market at the early stages of awareness, since a similar percentage said they were unsure at this juncture.

4. [The market opportunity for presence cells](#)

It is clear that small cells are becoming important to enterprises in general, and to retail and banking in particular, and therefore to the MNOs targeting these sectors. It is also clear that many of the advantages of small cells in these markets revolve around their presence and location awareness, creating a significant opportunity.

However, that opportunity will be best met by products which are specifically optimized for presence –based applications, and for the retail and banking sectors’ requirements. While presence and location awareness are inherent to small cells, to deliver the kind of benefits outlined in section 2, these basic capabilities will need to be built upon to create a full solution.

In particular, a presence cell needs to be able to:

- support rigorous security, privacy and authentication mechanisms
- integrate flexibly with big data and analytics services, whether inhouse or in the cloud
- work with all kinds of mobile devices
- support ease of use for consumers and staff

This is reflected in the views of the MNOs and the vertical market players, as seen in Figures 9 and 10. Both were asked what features a solution would need to have, to support the key applications of presence-based personalization, authentication and big data.

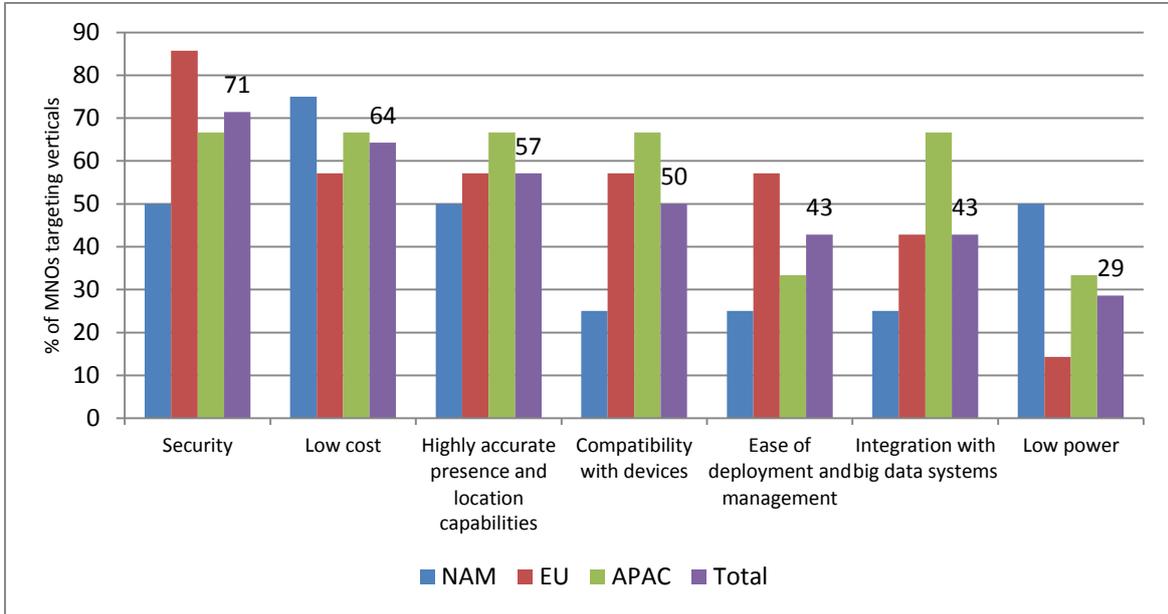


Figure 9. Essential features of a small cell solution, for MNOs targeting retail and banking (respondents could tick as many as applied)

Among mobile operators planning to target retail and/or banking verticals, the most critical feature is strong security, which was cited as essential by over 70% of respondents. Other important elements, all selected by 50% or more of the base, were affordability, a high degree of accuracy for presence and location, and compatibility with any user mobile device to maximize usage.

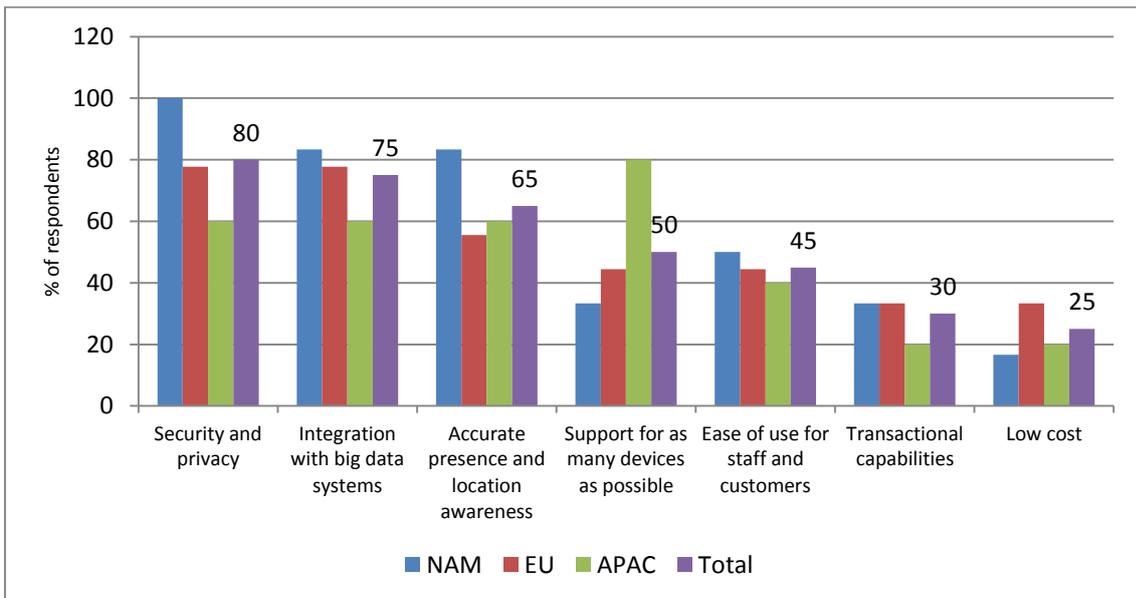


Figure 10. Essential features of a wireless solution for retailers and banks(respondents could tick all that applied)

In the case of the vertical market players, cost was far less of an issue if the solution could deliver business benefits, with only 25% citing it as an essential feature, while there was greater emphasis on big data integration, named by three-quarters and particularly important in North America. As with the MNOs, trusted security and privacy emerged as the number one required element, with presence and location accuracy, and support for most devices, also being selected by 50% or more. This shows that the enterprises and their MNOs are in sync in some key areas but operators are sometimes lagging behind the businesses in shifting their attention from cost to business value.

The vertical market respondents' answers referred to any wireless solution with presence capabilities, not just small cells. Other approaches may rely on the macro network only, using GPS; or on unlicensed spectrum, including WiFi systems, and the emerging technology of beacons (as seen in Apple iBeacons, Qualcomm Gimbal and others). In addition, retailers may use an over-the-top service relying on device-based applications.

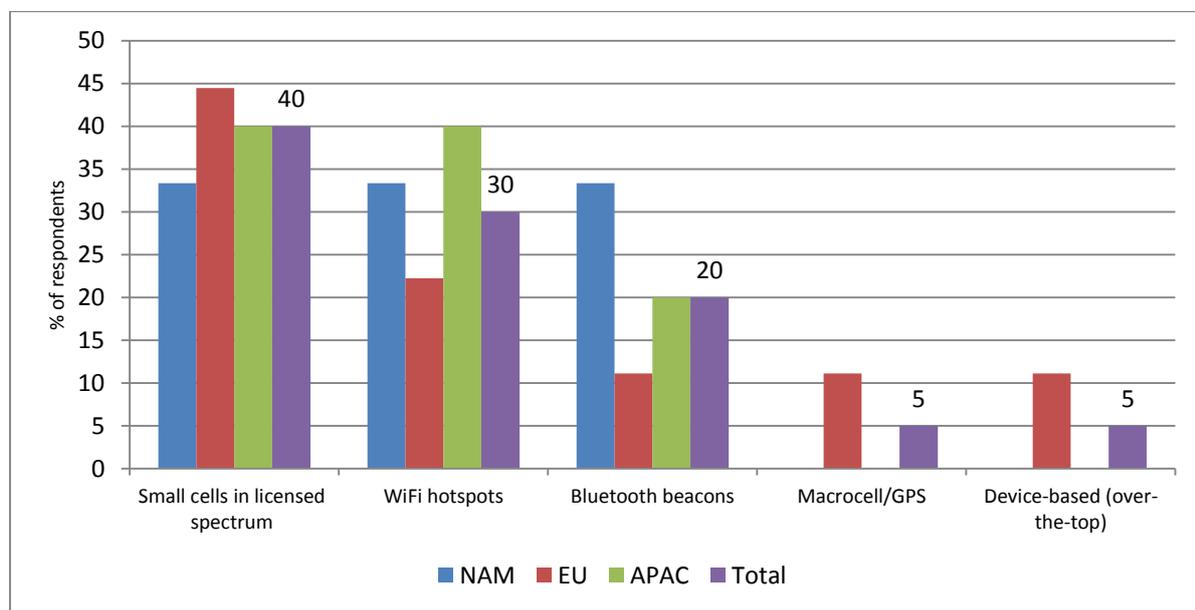


Figure 11. Favored approach for a wireless presence-based technology among vertical market players

Despite considerable publicity around Bluetooth beacons, and the low costs typically associated with over-the-top options, the technologies most favored by the sample were licensed small cells (named as the most attractive by 40%, though many will use a combination of approaches), and WiFi (30%).

The main factors behind these preferences, the respondents said, are that these technologies are well proven and the in-store infrastructure gives the enterprise a better level of control. The sample focused on respondents with an active interest in small cells, and in wireless presence in general, and it is certainly true that, in a less targeted sample, there would still be awareness work to be done. But the result indicates that, where companies have investigated small cells, they score highly.

According to input from the respondents, the main factors which put licensed spectrum small cells ahead of unlicensed options relate to security, authentication and accuracy, all of which, as seen in previous sections, are critical to the retail and banking business cases. All of these are seen as better supported in licensed spectrum because of the value of the SIM card as an entry point to the carrier's detailed information about a consumer.

In future, MNOs are aware that they will be harnessing both licensed and unlicensed spectrum, while retaining the key differentiator of the SIM card and the authentication structure built around that. That awareness of the blurring lines between cellular and WiFi is less apparent among the enterprises at this stage.

Of course, there are barriers to adoption too, and a successful presence cell will need to address these, both for MNOs and retailers.

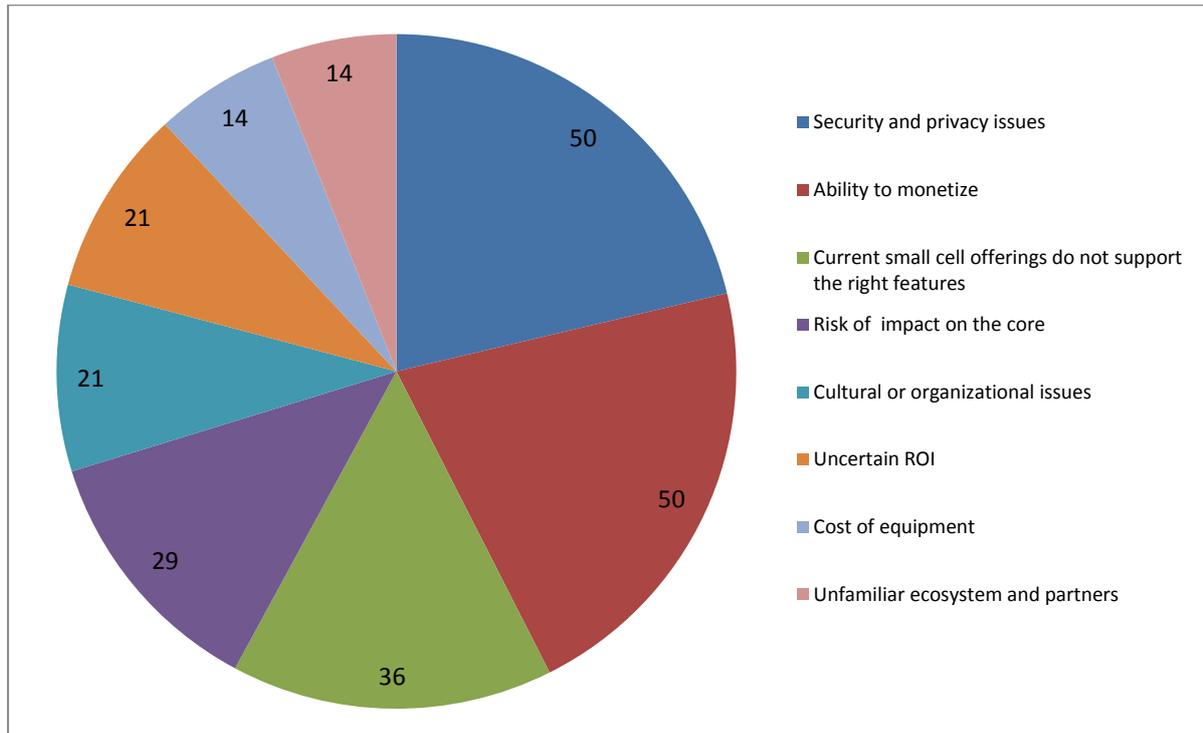


Figure 12. MNOs’ chief barriers to deploying vertical market small cell solutions (respondents could tick all that applied)

For MNOs, the main concerns again relate to security and privacy, and any offering would need to be very convincing that these issues would be fully addressed (Figure 12). Half the MNOs named this as a barrier, and the same percentage were concerned with how to monetize the deployments beyond basic airtime fees.

Over one-third felt that current small cells on the market were not optimized for the needs of these verticals and 29% were worried about the impact on the core network. While some issues are beyond the reach of a small cell vendor to address – cultural challenges with deploying vertical solutions, for example, or the need to deal with unfamiliar partners – others may be fixed by the right solution.

For vertical market respondents, security and privacy were even more overwhelmingly the biggest barrier. Asked for the single biggest hurdle to adoption, 30% cited lack of trust in security and authentication mechanisms, and another 30% put privacy concerns in top place. Other issues related to uncertainty about the business case, integration with existing systems, and willingness of consumers to use the services.

5. [The ip.access presenceCell](#)

The targeted survey reveals a significant market opportunity, from 2014 onwards, for small cell solutions which are specifically optimized for the needs of consumer facing verticals such as retailers and banks. In particular, such a solution would feature highly accurate presence and location capabilities, strong security and authentication credentials, and the ability to feed into big data analytics. It would also need to address key barriers to adoption, notably concerns about security and privacy, and ease of deployment and use by staff and customers.

This is the challenge to which ip.access is rising with its new presenceCell. ip.access is one of the most established suppliers of small cells, with major deployments in 2G, 3G and 4G technologies, and in many markets from residential to public access. It works with mobile operators and their partners and integrators, and the presenceCell was launched this year to offer a solution specifically tailored to key vertical segments, enabling MNOs to add value to their proposition and generate new revenues.

The presenceCell captures anonymous location and identity information from a user's smartphone, to accuracy of 5-10 meters or even better, and this data can then be fed into analytics, personalization and other engines. It is compatible with any handset and does not require any user action (there is no need for modifications or downloads, nor do Bluetooth and WiFi have to be turned on).

The platform targets the key business drivers outlined by the retail and banking segments – personalization, big data and secure transactions. For the first two, in the retail environment, the presenceCell captures data as soon as a customer enters the store, and can then enable delivery of targeted information and offers (to opted-in consumers handsets). In a large store or mall, the user's route and behavior around the facility can also be tracked or 'breadcrumbs' and all this information can be fed into big data systems inhouse or in the cloud.

Ip.access provides back end processing and management, to deliver the presence data anonymously and securely to vertical application providers and other ecosystem players, enhancing the MNO's big data capabilities. The company's Network Orchestration System provides infrastructure management and supports the GSMA's OneAPI standard, so that third parties can create their own services on top of the platform.

On the transactions side, the presenceCell can provide an additional layer of security on top of those which are standard in mobile commerce platforms, because it can authenticate a shopper's identity and presence at the till, in order to fight fraud.

In addition, presenceCells can be placed in specific areas to monitor who has viewed a promotion or advert and compare the response in that location to others.

Conclusion:

There is a significant opportunity for mobile operators and their specialist partners to deploy small cells in consumer facing enterprises such as retail stores, but to maximize this opportunity, the solutions will need to evolve from their current focus on coverage and capacity.

Solutions that make optimal use of small cells' presence and location awareness can help to address some of the critical business needs of these segments – in particular, the need to understand consumer behavior better in order to provide a well targeted experience; and to support mobile commerce without compromising security and privacy.

By offering such solutions, MNOs can greatly enhance their own business case for enterprise small cells, looking beyond capacity and coverage improvements to achieving a higher value, more strategic relationship with the enterprise.

There are various wireless solutions available, but small cells provide far more accurate and granular information than macro-based options, while their SIM-based platform offers high security and authentication, as well as compatibility with any handset without user action being required.

However, these segments have very specific business requirements and applications, and so small cells will need to evolve which are targeted at those. The presenceCell from ip.access is the first platform which has been designed with those specialized and challenging requirements in mind, from pinpoint accuracy to high security, as well as integration with big data systems.

About ip.access



Headquartered in the United Kingdom, ip.access has been deploying small cell solutions for more than ten years providing some 100+ customers around the world with the capability to accelerate the introduction of small cell solutions into their networks irrespective of use case, technology or deployment model.

The company's success is built upon its ability to provide its Service Provider customers with a range of small cell coverage, capacity and presence solutions across all technologies (2G, 3G, and 4G), with a focus on rapid return on investment and the ability to open up new markets and revenue streams.

The company has an end-to-end deployment philosophy that integrates the small cell access points with converged access gateways and comprehensive network management and performance tools; as well as a strong track record of working with trusted partners on integrated solutions.

www.ipaccess.com