2015 VoLTE State-of-The-Market Report

April 2015

Sponsored by: Sonus Networks, Inc.

Introduction and Key Findings

As mobile operators continue to build out their broadband data networks using 4G LTE (Long Term Evolution), Voice over LTE (VoLTE) is evolving as the platform of choice for delivering voice calls by mobile operators. Based on survey results from both mobile operators and enterprise IT professionals, this State-of-the-Market-Report demonstrates the progress operators have made in their VoLTE deployments and what their enterprise customers have come to expect from their VoLTE platforms.

The underlying foundation for VoLTE is 4G LTE, a wireless broadband technology that is 20 times faster than 3G broadband. In addition, 4G LTE networks offer more efficient broadband than 3G network technology supporting GSM and CDMA, providing improvements to radio spectrum utilization and a slower battery drain. LTE is already replacing 3G for broadband services, allowing some spectrum supporting these 3G technologies to be redeployed for 4G LTE broadband capacity.

However, although many service providers have deployed 4G LTE networks for data, they essentially all still use 3G GSM and CDMA platforms for voice calls. VoLTE provides a long term solution for voice so that the 3G networks can be retired, thus eventually salvaging all available spectrum for LTE. VoLTE is based on standards completed by the 3rd Generation Partnership Project (3GPP), providing Voice over IP (VoIP) that is supported by IP Multimedia Subsystem (IMS) architecture. While other VoIP applications such as Skype and Vonage Mobile can use any broadband data channel for mobile voice calls (including 3G), VoLTE is designed as a mobile carrier voice service designed to replace legacy mobile voice platforms. VoLTE offers other long term benefits such as the potential to more easily integrate Voice over IP services (including landline VoIP networks), unified communications (UC) services, and emerging IP technologies and services such as WebRTC and video collaboration.
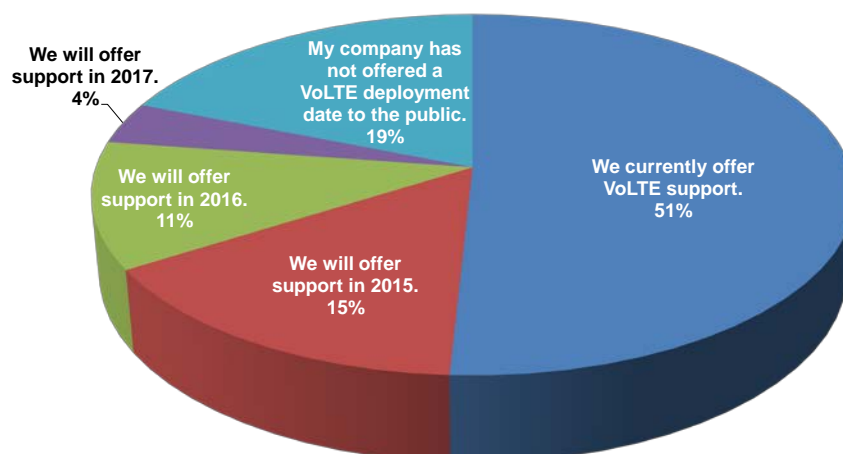
Both mobile operators and enterprise IT professionals are aware of VoLTE's benefits along with some of the possible concerns that must be addressed.

Among the key findings discovered in this survey[i]:

- Over half of mobile operators (67%) who responded to this survey said they already offer VoLTE or will offer it in 2015. (**Figure 1**)

- Among service provider respondents, 65% had already started to offer live network services to customers, including 26% who are in field trials.[ii] (**Figure 2**)
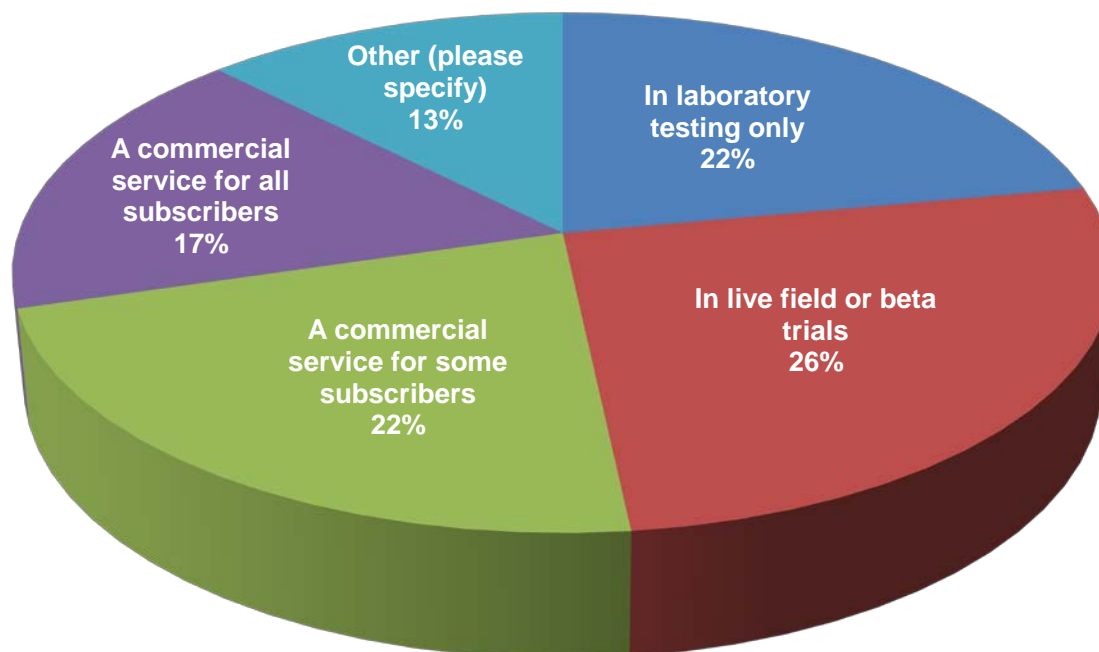
- Only 22% are still working in the lab or in field testing. The other 13% primarily remain in the decision or planning stage.

- Spectrum efficiency was the highest scoring reason to deploy VoLTE among operators.

- 75% of carrier respondents cite VoLTE as enabling roaming between WiFi and VoLTE networks.

- 79% of enterprise respondents see enterprise mobility as important to their business.

- 74% of enterprise IT professionals say it is important for carriers to deploy VoLTE.

- 43% of enterprise IT managers say that VoLTE integration with hosted UC services is important.

Figure 1: VoLTE Support Stage

- We will offer support in 2017. 4%
- My company has not offered a VoLTE deployment date to the public. 19%
- We will offer support in 2016. 11%
- We will offer support in 2015. 15%
- We currently offer VoLTE support. 51%

Which of the following best describes your company's support of VoLTE?

Figure 2: Status of VoLTE Support

Other (please specify) 13%

In laboratory testing only 22%

A commercial service for all subscribers 17%

In live field or beta trials 26%

A commercial service for some subscribers 22%

Please describe the status of your company's current VoLTE support.

| Reality Check | Among top tier US providers, only T-Mobile offers nation-wide VoLTE support, including support for Metro PCS subscribers who were acquired when T-Mobile bought Metro PCS in 2013. AT&T and Verizon are offering VoLTE in a select number of metro areas. Sprint has not disclosed when it will offer VoLTE, although it has deployed LTE and has selected infrastructure suppliers who can support VoLTE.

North American MVNOs (mobile virtual network operators) will need to wait until their wholesale provider has widely deployed VoLTE before proceeding, and smaller operators are largely in the "wait and follow" mode.

Deployment progress outside North America varies by region. For example, in India one mobile operator answered, *"Not many operators have deployed LTE in India. Out of that no one is offering VoLTE. In India, 2G and 3G rates are very [much lower] compared to other markets in the world and operators are hugely invested in 2G and 3G networks."*

Another operator added, *"in Australia only the carriers and three global mining companies . . . can afford to even consider deploying LTE. Perhaps the situation is different in North America? The average user or corporate [user] would not know they were even using LTE with their cellular service."* |
|---|---|

Why Mobile Operators are Deploying VoLTE

Mobile operators have many reasons to deploy VoLTE, and with the leading rationale that VoLTE offers improved use of spectrum resources when compared to 3G network infrastructure, 74% agree fully and 14% agree somewhat that this is a technology driver. (**Figure 3**)

Operator respondents also indicate that most other carriers seem likely to deploy VoLTE: 93% either fully agree or somewhat agree that this will happen.
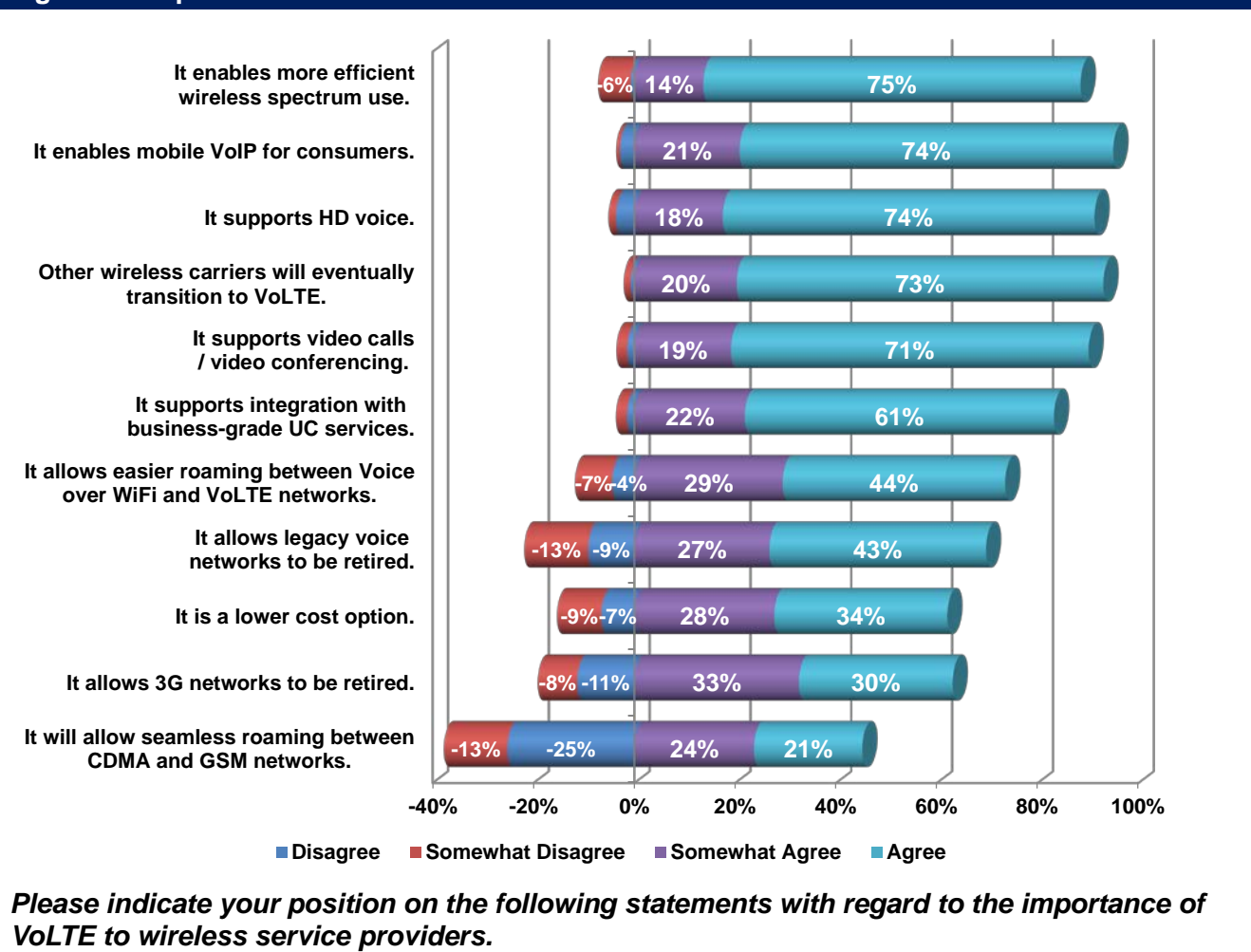
"VoLTE will enable carriers to retire older 3G technologies and move voice and data to one platform. The biggest cost savings is in the ability to retire the older platforms and not run multiple networks.

The spectrum efficiency gains that are the largest are freeing up channels that were previously for 3G voice only to be used for voice or data over VoLTE."

~ Mobile Operator Respondent

However, the research suggests that VoLTE isn't necessarily a lower cost option than existing platforms, with only 34% agreeing that lower platform costs are driving their decisions to deploy VoLTE. Operators are apparently slightly skeptical that deploying VoLTE will allow them to retire their existing 3G or voice networks, with about 37% saying that 3G might not go away, about 33% somewhat agreeing that it will, and 30% in full agreement that 3G retirement is likely.
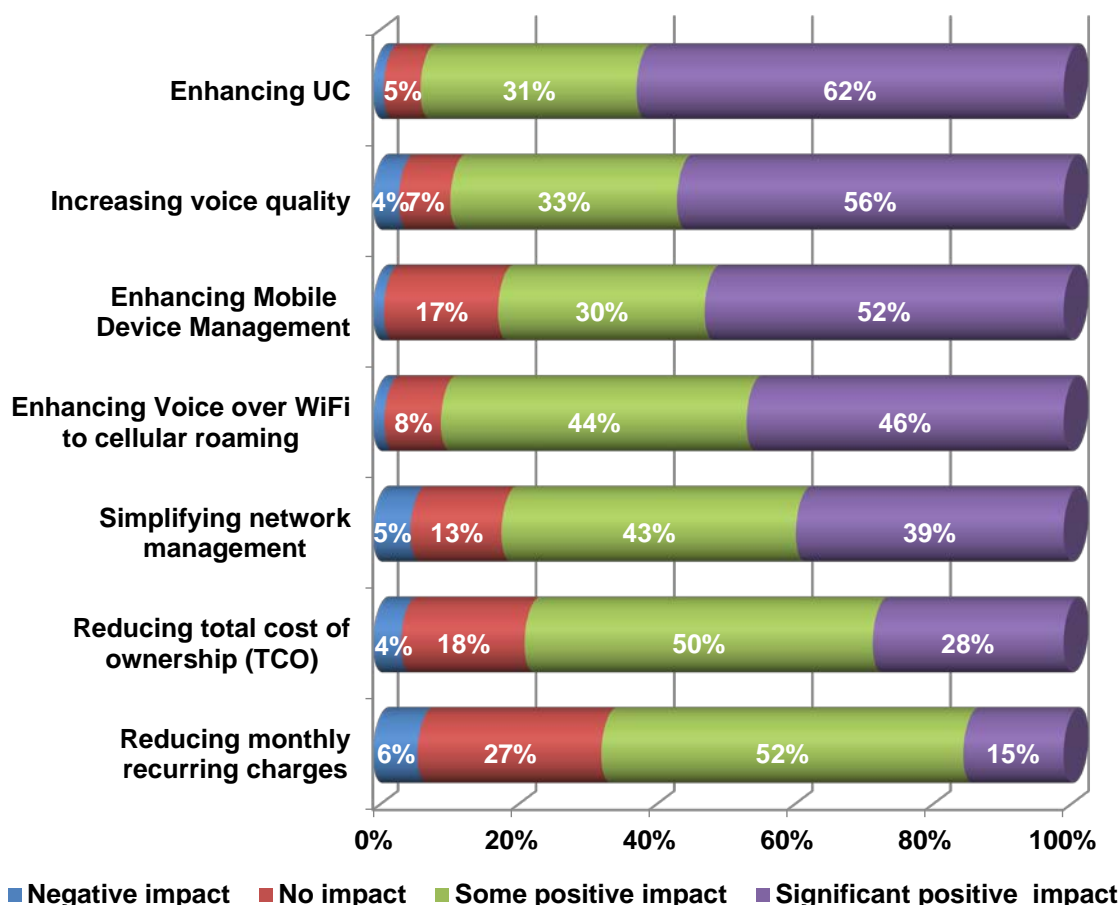
Figure 3: Importance of VoLTE to Wireless Service Providers

Statement	-6%	14%	75%
It enables more efficient wireless spectrum use.			
It enables mobile VoIP for consumers.		21%	74%
It supports HD voice.		18%	74%
Other wireless carriers will eventually transition to VoLTE.		20%	73%
It supports video calls / video conferencing.		19%	71%
It supports integration with business-grade UC services.		22%	61%
It allows easier roaming between Voice over WiFi and VoLTE networks.	-7% -4%	29%	44%
It allows legacy voice networks to be retired.	-13% -9%	27%	43%
It is a lower cost option.	-9% -7%	28%	34%
It allows 3G networks to be retired.	-8% -11%	33%	30%
It will allow seamless roaming between CDMA and GSM networks.	-13% -25%	24%	21%

-40% -20% 0% 20% 40% 60% 80% 100%

■ Disagree ■ Somewhat Disagree ■ Somewhat Agree ■ Agree

Please indicate your position on the following statements with regard to the importance of VoLTE to wireless service providers.

Mobile operators view VoLTE as a way to generate potential new revenue streams. VoLTE infrastructure is recognized for its ability to support HD voice (74% agree), video calls and conferencing (71% agree), and integration with business grade UC services (61% agree).

Operators also believe VoLTE will benefit corporate customers, with the majority of respondents agreeing that VoLTE will enhance the ability to enable voice roaming between cellular and Wi-Fi networks. This characteristic is important because mobile operators rely on Wi-Fi access points to offload mobile data networks, thus conserving radio spectrum. Wi-Fi to mobile network roaming is also important because more users have increasingly substituted their mobile device as a replacement for their desktop phone, and they use Wi-Fi to connect to VoIP networks while in the office.

Figure 4: Service Providers' Opinion of Impact of VoLTE on their customers

Category	Negative impact	No impact	Some positive impact	Significant positive impact
Enhancing UC		5%	31%	62%
Increasing voice quality	4%	7%	33%	56%
Enhancing Mobile Device Management		17%	30%	52%
Enhancing Voice over WiFi to cellular roaming		8%	44%	46%
Simplifying network management	5%	13%	43%	39%
Reducing total cost of ownership (TCO)	4%	18%	50%	28%
Reducing monthly recurring charges	6%	27%	52%	15%

■ Negative impact ■ No impact ■ Some positive impact ■ Significant positive impact

To what extent do you believe VoLTE will affect your corporate customers?

Mobile operators also expect that VoLTE will enhance UC services, an important consideration since, as shown by results later in this report, enterprise IT professionals expect this feature. Because VoLTE supports native wideband voice, service providers naturally expect voice call quality to improve. (**Figure 4**)

However, fewer service providers expect to see significant impact on the business customers' monthly bill or in their total cost of ownership. Operators are "somewhat" optimistic about VoLTE's positive impact on enterprise network management (38%) and device management (37%), although some respondents see the potential for significant positive impact for management elements.

As shown in **Figure 5**, most VoLTE-supported value-added services targeting the business customers will likely need to wait until operators have deployed their initial round of infrastructure and voice features. Only point-to-point video calls and audio bridge connectivity to video calls are more likely than not to be offered with initial VoLTE deployments or in the second wave of service features.

Integration with hosted UC services, interoperability with WebRTC platforms, and multipoint video conferencing are likely to be deployed eventually or not at all.

Figure 5: Expected Roll-out of VoLTE Offerings

■ At initial roll-out ■ As a secondary wave ■ Eventually ■ No plans
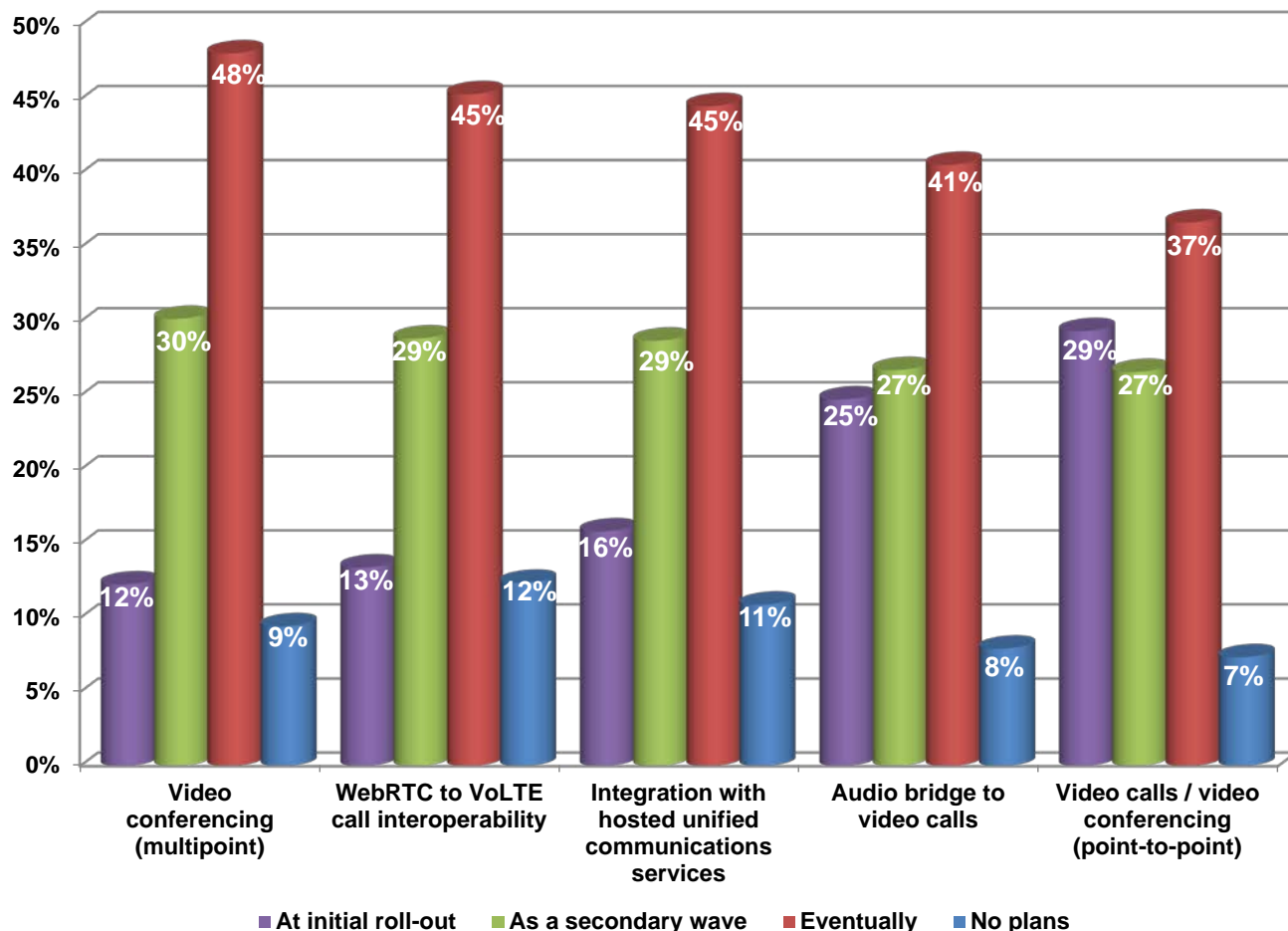
At what point does your company plan to include each of the following as a part of your VoLTE offerings?

Mobile Operators' VoLTE Roadblocks

Service providers are realistic about the roadblocks and potential roadblocks that remain ahead for VoLTE deployments. The top concerns about VoLTE services among operators today is the lack of VoLTE compliant handsets: 64% either agree or somewhat agree that VoLTE handset selection is too limited. However, handset manufacturers can hardly be blamed for this classic "chicken or egg" dilemma, as manufacturers need to have sufficient market opportunity before they invest in more VoLTE-compliant devices. Eventually, this issue will be resolved as more operators deploy VoLTE.

Another top concern is the potential for calls to drop as users move between 3G and VoLTE voice networks. Operators are concerned about calls dropped when roaming between VoLTE and 3G networks and calls dropped between two different VoLTE operators. The issue with dropped calls between one carrier's 3G and VoLTE issue will be alleviated once VoLTE is supported nationwide within that single carrier's network or once that carrier has appropriate gateways in place. Intercarrier VoLTE roaming, however, will most likely still continue to be in issue for the foreseeable future due to both business and technical issues.

Intercarrier roaming agreements for VoLTE may need to be adjusted from their current 2G/3G bias, plus gateways and intercarrier meet points between 2G/3G/VoLTE will need to be installed to enable smooth call transitions between networks.

Mobile operators will have many business process issues to address with VoLTE, including when (or if) to decrement mobile data buckets for voice calls, deciding if roaming calls from another carrier should be counted as voice or data for billing purposes, and how to manage and bill for calls that roam between voice over Wi-Fi and VoLTE.

The lack of business process resolution, along with concerns about the need for gateways and additional infrastructure is reflected.

Figure 6: Roadblocks to VoLTE deployment

Not enough handsets support VoLTE. -15% -6% 26% 38%

Calls can drop when roaming between my company's VoLTE and other 3G networks. 10% -10% 26% 36%

Calls can drop when roaming between other providers' VoLTE and my company's… -14% -7% 25% 35%

Business processes don't yet support VoLTE. 10% -6% 36% 30%

Network infrastructure isn't ready yet. -18% -14% 37% 20%

VoLTE standards are incomplete. -22% -17% 27% 19%

Voice call quality is not guaranteed / unstable. -27% -22% 27% 12%

The business case does not yet support VoLTE deployment. -26% -21% 26% 9%

The back office can't support VoLTE calls. -25% -27% 24% 7%

-60% -40% -20% 0% 20% 40% 60% 80%

■ Disagree   ■ Somewhat Disagree   ■ Somewhat Agree   ■ Agree

Please indicate your position on the following statements with regard to the roadblocks to VoLTE deployment:

On the positive side, operators indicated that their business case was not an impediment to deployment: only 9% agreed that their business case could not support VoLTE. Similarly, most (52%) agreed that their back office was more ready than not for VoLTE, with support in place for call authentication, billing, etc. Respondents were balanced in their assessment of sufficient VoLTE standards to proceed: 39% said this wasn't an issue, 46% said more work is needed, and 15% neither agreed nor disagreed that VoLTE standards were incomplete.

Enterprise Opinions on VoLTE

Enterprises confirmed, as expected, that they are heavily dependent on mobile devices to conduct their business: 79% agreed that enterprise mobility is important to their business. Counting those who agreed or agreed somewhat, 91% support mobile audio conferencing, 83% support employee collaboration using mobile devices, and 70% of organizations support BYOD (bring your own device.) Wideband (high definition) voice was also considered important by 70% of respondents. Mobile video conferencing support was considered only slightly less important than voice conferencing: 45% agreed and 29% somewhat agreed on the need for mobile video. (**Figure 7**)

Figure 7: Enterprise Opinions on VoLTE

Please evaluate the following statements.
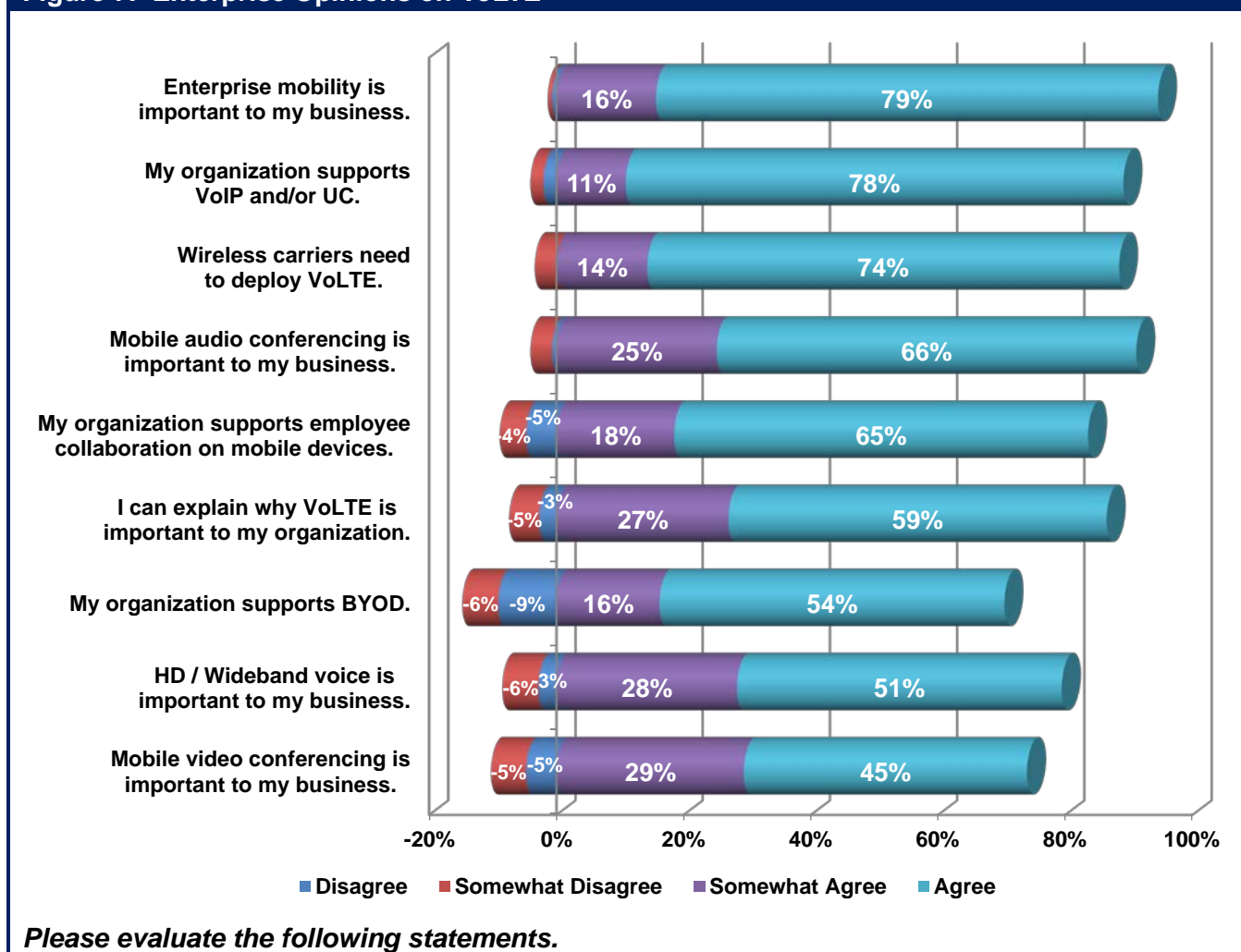
Most survey respondents (89%) also noted that their organization supports VoIP and/or UC[1]. Fortunately, mobile operators also see this as a VoLTE benefit; however, unfortunately most mobile operators don't plan to focus on UC integration with their initial deployments. (Please see these results in the section above on operator deployment plans.)

Enterprise IT professionals are well aware of VoLTE and its characteristics: 59% agreed and 27% somewhat agreed that they could explain why VoLTE is important to their organization. They also agree that wireless carriers should deploy VoLTE: 74% fully agreed and 14% agreed somewhat on the need for VoLTE.

These IT professionals also have expectations on what benefits VoLTE should bring to their organizations. Like operator respondents, the enterprise representatives expect that VoLTE should enhance UC and increase voice call quality, although enterprises expect slightly more of a positive impact than was indicated by service providers for UC and voice quality. The enterprise answers on what they expect for lower recurring charges and reduced TCO was also similar to what the service providers expected to offer.

Figure 8: IT Professionals' Opinion of impact of VoLTE on Their organizations
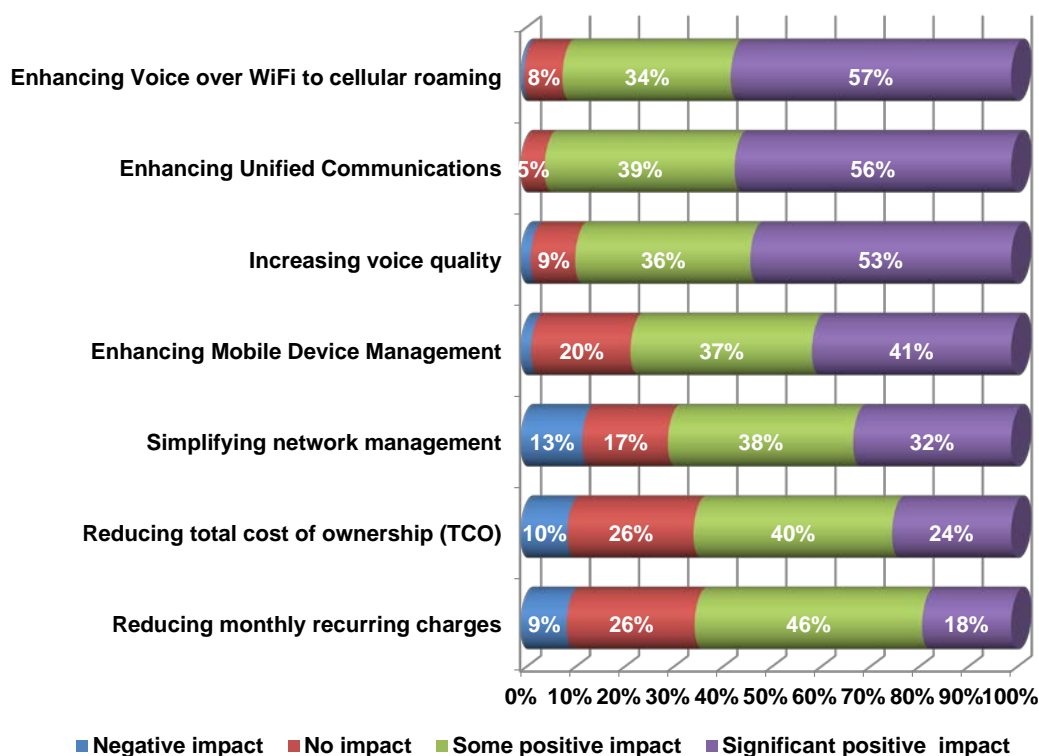

To what extent do you believe VoLTE will affect the above items?

[1] While this percentage is uncharacteristically high when compared to all businesses globally who support VoIP or UC, it is consistent with other Webtorials respondents' results as Webtorials respondents tend to be technology adoption innovators rather than technology laggards.

Enterprise and service provider responses also differed slightly in their expectations about Wi-Fi to cellular roaming and about mobile and network device management. Mobile operators listed roaming as a top benefit, with 56% counting it as likely to have significant positive impact; enterprise weighed in with a 46% significant positive rating. Enterprise managers also expect VoLTE to bring more enhancements to mobile device management, rating the opportunity for significant effect at 52% compared to 42% for the operator responses. Network management expectations were very similar between enterprise and carrier respondents.

Enterprise managers also offered some advice to service providers in this study on what features to offer with VoLTE. As shown in **Figure 9**, over half of these respondents (62%) said that VoLTE integration with UC was extremely important and 33% said it was somewhat important; this result is not surprising given that 78% of organizations who responded support VoIP or UC. A majority (59%) also found it extremely important for audio bridges to support VoLTE calls.

Figure 9: Importance of VoLTE features
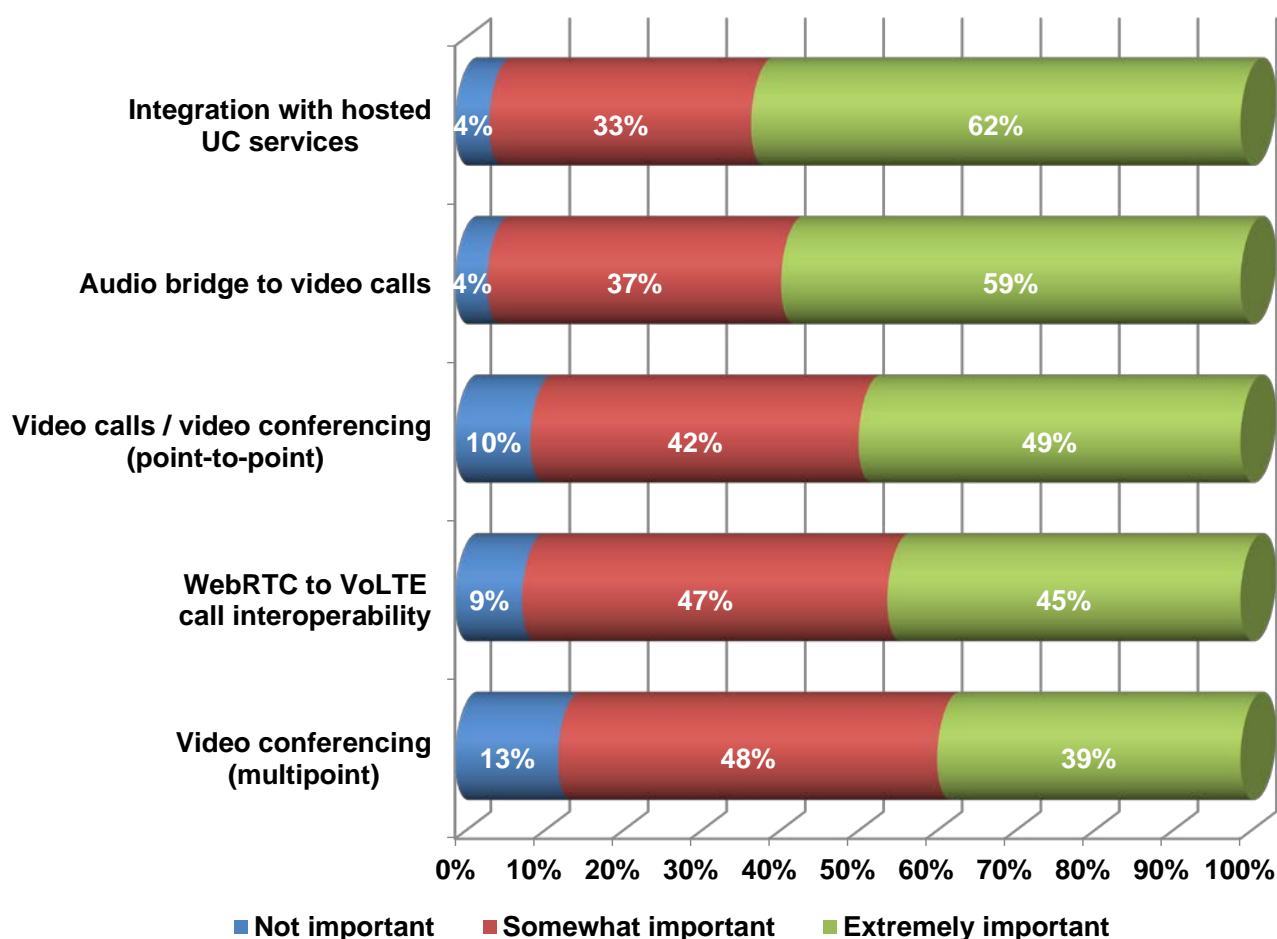
How important is it for your service provider to include each of the following as a part of their VoLTE offerings?

Enterprise customers also want VoLTE to support point-to-point video, with 49% rating this as extremely important and 32% rating it as somewhat important.

Enthusiasm for multipoint video conferences was slightly lower, with 39% citing it as extremely important and 48% citing it as somewhat important.

Finally, interoperability between VoLTE and WebRTC is also expected, with 91% of enterprises finding this feature as extremely or somewhat important.

Summary and Conclusions

VoLTE deployments are moving forward, although the pace differs by global region. Mobile operators are looking at VoLTE to create savings through better spectrum utilization, although few see 3G network retirement as imminent. Service providers see other benefits from VoLTE. However, most features that will benefit enterprise users are not planned in the first wave of feature deployment.

Aside from the survey's quantitative data, enterprise managers also had a few key points to make with their verbatim comments:

- *"The carriers have done a poor job of educating customers about what they planned and/deployed. VoLTE timelines affect service procurement. This is now."*

- *"We need more information about integration with the current environment."*

- *"Security and call quality management (and lack thereof) need to be addressed."*

"VoIP already made enough impact and VoLTE will go many steps further in making it even better."

Enterprise IT professionals are well aware of VoLTE progress and potential benefits. Their expectations of cost benefits, network and device management efficiencies, and features enabled by VoLTE are not far off the rankings of mobile operators. However, with the majority of enterprise users rating features like UC integration and video conferencing as extremely important, the enterprise customer may be disappointed at how long it might take mobile operators to offer these value-added services.

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The primary author of this study was Larry Hettick.

[i] The survey was fielded in December 2014 and January 2015, and included 567 total respondents. However, the final tabulations did not include responses from wireline service providers or from those unfamiliar with VoLTE (17% total), leaving answers counted from 46% of total respondents who were wireless service provider employees and 37% who were corporate networking professionals. Among enterprise responses, company size ranges from 1 to over 100,000, with 56% of enterprise responses coming from employees who worked in companies with 10,000 or more employees. About three-quarters of responses were from North America, with the reminder representing countries outside of North America.

[ii] There may be multiple respondents from the same mobile operator.

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