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Niche for Now, Satellite Smartphones Could Answer the Call for Rural Connectivity



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Key Points

- Advancements in battery density, chipset processing power, and antenna technology have now made it possible for smartphones to connect with satellites for some basic services. This means the latest smartphones outfitted with this tech will soon work anywhere in the U.S., regardless of cellular coverage.
- In conjunction with Globalstar, Apple recently announced satellite service with its iPhone 14, giving them a two-year lead in the market.
- T-Mobile and SpaceX also announced plans to offer smartphone satellite connectivity, but will begin beta trials towards the end of 2023.
- Initially, Apple’s service will be limited to some basic text messaging and an SOS feature that sends a user’s latitude and longitude to first responders in emergency situations.
- However, voice calling and more advanced data services should be available as new satellites launch and the service evolves. This could have a profound impact on communication options for unserved rural Americans.

Introduction

Smartphones with satellite connectivity are generating quite the buzz in the wireless market thanks to recent announcements from industry heavyweights including Apple, T-Mobile, and Elon Musk’s SpaceX. And while the idea of being able to communicate anywhere on the planet is very compelling – especially for those living in rural America who lack any kind of connectivity – it’s important to understand the limitations of today’s technology, and when the industry can deliver higher speeds with greater bandwidth. Regulatory hurdles also need to be addressed before some of the companies can enter the market.

In this report we cover the current technology landscape and who the main players are, as well as what services they are able to offer. We also look at how we expect the technology to evolve over the next several years. Spoiler alert – those fed up with their national wireless carriers shouldn’t look to satellite smartphone connectivity service to replace them.



Technology

Until recently, sending a message or making a phone call from the middle of nowhere required a dedicated satellite phone or messaging device, which are very expensive to acquire and use. The reality is the market for this type of service is small, and reaching economies of scale to reduce equipment and service costs likely isn't viable. But, thanks to recent advancements in processing power, battery performance, and antenna technology, smartphones such as Apple's iPhone 14 are now able to communicate with satellites (beyond GPS) for some basic services.

Companies can provide satellite smartphone connectivity in one of two ways: 1) a partnership between a handset original equipment manufacturer (OEM) and a satellite operator who has satellite spectrum that's supported in smartphones, or 2) a partnership between a wireless operator and satellite company.

Apple pursued the first option with satellite operator Globalstar for its recently announced satellite service on iPhone 14. Globalstar has a unique asset: It owns a block of global satellite spectrum that has already been approved by the wireless standards body and has been incorporated into a Qualcomm chipset used in the iPhone 14. While these may seem like simple nuances, they are a

very big deal and a primary reason why Apple has such a lead over its competition. Its partnership with Globalstar enabled Apple to skip the regulatory and technical hoops as they have already been addressed. At launch, Apple's satellite service is limited to U.S. and Canada, but there are reports that it will be deployed in additional countries late this year and into 2023.

SpaceX and T-Mobile have taken a different approach and are partnering to offer satellite service on a wide range of T-Mobile phones. Unlike Apple and Globalstar, T-Mobile and SpaceX have a major spectrum hurdle to overcome that will impact their time to market in the U.S. and will create regulatory headaches in other countries. First off, T-Mobile and SpaceX do not have spectrum approved by the FCC for satellite use in any of their phones. This is likely why the two companies will only begin a beta trial in late 2023.

While T-Mobile owns a lot of spectrum – over 200MHz, to be exact – that has been approved for terrestrial use in its wireless network, none of it has been approved for satellite service. According to satellite industry expert Tim Farrar, the FCC has dithered for over two years about permitting terrestrial spectrum for satellite service. However, now that SpaceX is involved, we suspect the FCC will act sooner rather than later. But the two companies are probably two years behind Apple not only because of regulatory roadblocks, but also because SpaceX has yet to finalize the rocket needed to launch its next generation satellites into space.

Additionally, in order for SpaceX to make this service available outside of the U.S., it will need to find wireless operators willing to share/lease their spectrum to SpaceX. Also, they will need to secure the rights to use this spectrum in satellites from foreign regulators. And finally, SpaceX needs to ensure that the spectrum being used in other countries is supported in their satellites. All of this is technically feasible, but it is also littered with timing and execution risks.



Services

Initially Apple's satellite service on its iPhone 14 will be limited to some basic text messaging and an SOS service that alerts first responders to a user's latitude and longitude anywhere in the U.S. and Canada. And while this service may appear to be limited to a very small market, Globalstar has been offering an SOS service called Saved By SPOT since 2018, and has recorded 8,705 rescues so far. It requires a device that costs up to \$250 and service that costs \$11.95-\$39.95 per month. So with Apple making this service available for free on tens of millions of iPhone 14s, the number of people benefiting (i.e rescues) from the service is potentially 5-10x what Globalstar has been able to deliver.

As the technology evolves and next generation satellites are launched, the expectation is that Apple will roll out voice services and some more advanced data services. For those living in rural America, this could have a meaningful impact on their communications. Being able to make a call/send messages in remote parts of the country where no service exists today (at least half a million acres) would give some rural Americans options and flexibility, the likes of which they could only dream about a short while ago.

Of course, cost is an important component of adoption, and the finer details are still TBD. Apple is giving the service away for free for the first two years and it remains to be seen what they will charge after that. However, it's reasonable to assume that Apple will keep the price low

and use the service to increase iPhones sales, given its first mover advantage. After all, Apple's primary business is selling iPhones, so sacrificing some service revenue to increase iPhone sales might be the right strategy. T-Mobile has said its service would be free with the company's most popular plans. That sounds great, but what will the cost delta be between their most popular plans and other plans when they offer the service in the future?

Ditch your wireless operator?

On the surface, it might appear that when satellite service evolves to include more functionality, consumers will be able to use it exclusively and cancel their wireless carrier service. This is highly unlikely. First off, smartphones need a clear line of sight with the sky which would limit the service in urban and suburban areas. And secondly, the capital required to create network capacity in a satellite network comparable to what is currently available in terrestrial networks would be incredibly high – \$10 billion-\$20 billion. Quite frankly, the return on investment would never pencil out.

So how should wireless operators approach this?

Wireless operators could all take the T-Mobile approach and offer the service directly with SpaceX or a similar satellite operator. The downside is some terrestrial spectrum will need to be used for satellite use, but the upside is it could make wireless operators' service a little stickier – at least for non-iPhone users. The other option is to partner with Apple, and presumably Samsung as they are also expected to partner with a satellite operator directly. For example, wireless operators could bundle the service, just like they've done with some of the streaming services. If Samsung were to follow Apple's footsteps, the combination of the two would represent about 80% of the U.S. smartphone market. So, if a carrier were to simply bundle the two handset manufacturers' satellite service into their plans, they would address the lion's share of the market without having to deal with the operational and technical challenges associated with launching their own service.



Conclusion

The wireless industry has come a long way with the recently announced satellite service from Apple. And while these services will initially be limited to some basic options, there is reason to believe this will change. Voice calling and more advanced data services are very much in the cards, and should help those living in rural America who have no/poor cellular service or home broadband options. How should the wireless carriers approach this? Their core wireless business is not at risk of being cannibalized by satellite operators because the costs are enormous and unjustified. Instead, a better option for wireless operators would be to partner with Apple – and most likely Samsung – by bundling their satellite service with the carrier’s plans. They’ve done this with the streaming services, and doing so with satellite service seems like a natural extension – especially given the limited upside of going through the costs and operational headaches of offering your own service. ■

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