

## Business Value Analysis

### *The Viability of a Wireless WAN for Business*

Nemertes' Business Value Analysis independently evaluated wireless wide-area networking (WWAN) deployments to identify their business value to enterprise organizations. Through detailed interviews with technology professionals who use the products to power WANs across many geographies and industries, Nemertes has quantified the real-world benefits and improvements WWAN technology brought to these organizations.

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**TABLE OF CONTENTS**

**Executive Summary ..... 3**

**Wireless WAN Business Value Analysis..... 5**

*The Study ..... 5*

*Four Use Cases ..... 6*

*Key Findings ..... 6*

*WWAN Cost Management Strategies..... 7*

**Case Studies ..... 9**

*Summary..... 9*

*Retailer Bought Disaster Resilience but Found Path to Agility..... 11*

*Medical Services Chain Can't Afford Sites Going Offline—or Waiting Too Long to Come Online .. 12*

*Retailer Adopted WWAN Backup For Aging Copper, Then Ditched The Wires ..... 13*

*Retailer Got WWAN For Rock Solid Backup—Stores Always See Data Centers ..... 14*

*Professional Services Company Says Goodbye to Network Wiring ..... 15*

*Healthcare Company Went WWAN For Speed and Simplicity, Got Agility Into the Bargain ..... 16*

*Vets Went WWAN For Reliability..... 17*

*Government Agency Uses WWAN To Get Services Up Instantly and Keep Them Up..... 18*

*National Retailer Gets Better Everything on WWAN ..... 19*

*Distributor Embraces WWAN for Failover, So Users Won't Notice WAN Failures ..... 20*

*Restaurant Chain Orders Up Speed and Simplicity with WWAN..... 21*

*Professional Services Firm Can't Go Down, WWAN The Key..... 22*

**Conclusion..... 23**

**Methodology..... 24**



## Executive Summary

In September and October 2020, Nemertes Research conducted detailed interviews with technology leaders at 12 companies across a range of industries in the U.S. and Australia. Although all are customers of Cradlepoint, we focused on quantifying the business and operational impact of Wireless WAN (WWAN) technology within these organizations, not the impact of Cradlepoint's solution, in particular. All currently use only 4G services for their WWANs.

We found that WWAN technology has clear and dramatic benefits: it increases business agility, reduces downtime, and reduces network operating expenses, without sacrificing performance or reliability or driving up network costs. WWAN also works effectively across a range of use cases, with most study participants deploying multiple use cases.

### Key Findings on WWAN Benefits

- **Using WWAN significantly reduces WAN operating costs:** Participants reduced staff dedicated to WAN by an average of 19%, and WAN staff spent 54% less time troubleshooting WAN issues.
- **Using WWAN vastly improves reliability:** 75% of participants said availability was as good as or better than with wired links; participants with WWAN at more than 90% of sites reduced annual downtime per site by an average of 62% to 88% (depending on use case).
- **WWAN performs as well as legacy WANs:** 80% of participants found WWAN performance as good as or better than wired connectivity for loss, latency, and jitter. Two-thirds found throughput as good as, or better than, their wired WAN links, as well, with an average speed up of 5.5x.
- **Using WWAN is cost effective:** Overall, WWAN link costs ranged from roughly equal (on a per-Mbps basis) to the broadband links they replaced to costing as little as 10% as much as the MPLS T1s, DSL, and satellite links they replaced (per Mbps), allowing those companies to get much higher throughputs with average savings of 53%.
- **Using WWAN makes the business more agile:** Participants highlighted WWAN's strategic business benefits. Improved uptime means not only improved productivity but also increased confidence in the adoption of newer, more WAN-dependent technologies in stores and offices. The ability to "light up" a new location as soon as the wireless router is in place—with no weeks-to-months wait for wired network services—means the site drives revenue sooner. Reduced lead time and physical infrastructure needs enable a more agile branch strategy, supporting easy provisioning for pop-up, seasonal, and temporary branches.



## **WWAN Use Cases**

For most companies in the study, the entry point to wireless WAN has been as a backup link to provide failover services when primary (wired) links go down. They then found themselves leaning on WWAN in additional use cases: as long-term DR connectivity when wired services go down for months, e.g., after natural disasters; as startup connectivity for branches, so they can get online weeks earlier than when waiting for wired links; and ultimately as primary connectivity, permanently replacing wired links. Most study participants now use WWAN in at least two of these use cases: 75% of participants use WWAN for failover, 67% of participants use WWAN for primary connectivity; 45% use WWAN for startup connectivity.

## **About the Study**

For this research, Nemertes interviewed technology leaders at 12 companies in the U.S. and Australia during the period September-October 2020. Participants all use Cradlepoint's wireless WAN solution. They have used WWAN for an average of five years, and were selected for their insight into the business and operational impacts of wireless technology.

As noted, the research focused on WWAN overall, not on any specific type of WWAN, and not on the business or operational impacts of Cradlepoint technology.

Most companies are large: three-fourths have revenues of more than \$1B, two-thirds have more than 2,500 employees, and 58% have more than 500 network sites on the wide-area network.

About 40% of study participants are in retail, though of radically different types – one both makes and sells apparel, for example, while another is a “fast casual” restaurant chain, and another a home-improvement chain. A quarter are in healthcare, just under 20% are in professional services, and a government agency and a logistics company round out the dozen.

## Wireless WAN Business Value Analysis

Wireless WAN technology has clear and dramatic benefits: it increases business agility, reduces downtime, and reduces network operating expenses, without sacrificing performance or reliability, or driving up network costs.

### The Study

For this research, Nemertes interviewed technology leaders at 12 companies, mostly large: three-fourths have revenues of more than \$1B, two-thirds have more than 2,500 employees, and 58% have more than 500 network sites on their wide-area network. About 40% are in retail, though of radically different types – one both makes and sells apparel, for example, while another is a “fast casual” restaurant chain, and another a home-improvement chain. A quarter are in healthcare services or staffing, just under 20% are in professional services, and a government agency and a logistics company round out the dozen. (See figure 1).

Study Demographics and Key Findings	
Verticals	Retail, Healthcare, Professional Services, Logistics, State and Local Government
Average number of employees	43,118
Average number of locations	1903
Average annual revenue	\$ 11,186,190,500
Percentage using WWAN for failover links	75%
Percentage using WWAN for primary links	67%
Percentage using WWAN for day-1 links	45%
Average change in cost of bandwidth (per Mbps)	-90%
Average change in connection speed	5.5x
Avg. post-WWAN change in FTEs managing WAN	-19%
Avg. post-WWAN change in troubleshooting hrs.	-54%
Avg. post-WWAN change in annual site downtime	
when 90%+ sites have WWAN primary	-88%
when 90%+ sites have WWAN failover	-62%

Figure 1: Key findings and demographics data

We also asked participants about the overall corporate culture around information technology. We asked whether the company tends to look at IT as strategic or tactical, and if strategic, whether it was consistent or just now and then. If it was consistent, we asked whether the company partnered with technology companies in developing new solutions. We then classified folks as conservative, moderate, aggressive, or bleeding edge. Conservative companies always look at IT as tactical, and adopt new things only when



forced to, or to save money. Companies that invest in IT strategically from time to time are classed as moderate. Those that consistently treat IT as strategic, and try to be early adopters compared to peers, are aggressive. Those that get ahead of early adoption are bleeding edge. In most of our studies, conservative and bleeding edge usually add up to about 30% of the pool, with the rest evenly split between moderates and aggressives. In this study, there were only moderates (42%) and aggressives (58%).

No matter the size, vertical, or culture, these companies all see the WAN as crucial to delivery of services: “We are becoming a technology company, and realizing it at last. Service delivery is driven by technology,” says the telecommunications manager at a professional services firm.

## Four Use Cases

We explored WWAN adoption fitting into four different use cases:

- **WWAN for Failover Connectivity:** This is the most common scenario, with 75% of participants deploying WWAN to provide emergency backup for when wired networks fail.
- **WWAN for Primary Connectivity:** Second most common is the situation in which sites use wireless WAN not just in emergencies, but all the time, often with no wired link at all; 67% of participants do this at one or more sites.
- **WWAN for Startup/Day-1 Connectivity:** Next most common is using WWAN specifically to provide initial “day-1” network connectivity at a new location, while waiting for wired links to come on line (for which folks wait, on average, 35 days). Once wired links come up, WWAN is usually retained as failover capacity, although with the spread of SD-WAN some participants retained it as primary, with load balancing set up to prioritize the wired links unless they were under-performing.
- **WWAN for Bursting Capacity:** This involves using the WWAN to handle excess traffic, but no study participants use wireless this way.

## Key Findings

Across verticals and across company sizes, some remarkable findings emerged.

**Using WWAN significantly reduces WAN operating costs:** participants reduced staff dedicated to WAN by an average of 19%, and WAN staff spent 54% less time troubleshooting WAN issues. Moreover, several mentioned that less-skilled staff could resolve more issues in their WWAN, allowing more-skilled staff to focus on more important efforts.

**Using WWAN vastly improves reliability:** 75% of participants said WWAN availability was as good as or better than with wired links. Organizations with WWAN at more than 90% of sites reduced annual downtime at each site dramatically—by an average of 62% for those using failover WWAN, and by an average of 88% for those adopting primary WWAN. The greater reliability for primary WWAN is perhaps attributable to the fact that those





deploying it tended to have dual-carrier strategies at their sites, and/or service from multiple cell towers at each.

**WWAN performs as well as legacy WANs:** 80% found WWAN performance as good as or better than wired connectivity for loss, latency, and jitter. 67% found throughput as good as or better than their wired WAN links, as well. On average, participants realized a 5.5x increase in bandwidth on connections they switched to a wireless WAN.

**Using WWAN is cost effective:** WWAN saved study participants an average of 53.7%, in the following fashion: The per-Mbps price of WWAN ranged from roughly equal to that of wired circuits to costing as little as 10% as much (a 90% reduction in per-Mbps rates). This is largely due to the fact that the majority of the circuits WWAN replaced were older—and more expensive—technologies such as T1s, DSL, and satellite links. Companies typically replaced these low-bandwidth wired links with higher-bandwidth wireless; specifically, they moved from an average of 1.5 Mbps (T1) to an average of 5 Mbps. The average per-site wired cost was \$304, and the average per-site WWAN cost was \$141—a decrease of 53.7%. In other words, companies replaced lower-bandwidth, more expensive, wired circuits with higher-bandwidth, less expensive WWAN links, saving 53.7% on average.

**Using WWAN makes the business more agile.** Beyond the benefits of such savings and service improvements, participants highlighted other, more strategic business benefits:

- Improved uptime means not only improved productivity but increased confidence in WAN, making it easier to commit to deployment of newer, more WAN-dependent technologies in stores and offices
- Rapid “light up” of a new location as soon as the wireless router is in place—in 26 minutes, on average, rather than the typical 35-day wait for wired network services—means the ability to do business and drive revenue there sooner
- Instant-on branch connectivity also drastically reduces the overhead associated with agile branching approaches including pop-ups in places where wiring is difficult or impossible, such as the middle of a park; temporary locations, such as building sites; and seasonal locations, such as holiday-themed retail stores setting up in vacant storefronts in malls for a month or two. It also hugely simplifies the process of moving a branch from one location to another, especially if the WWAN router includes a WiFi controller, making it the only network infrastructure.

## WWAN Cost Structures

For the moment, site wireless data plans look very much like user data plans: they are subject to cumulative data throughput limits (usually measured in GBs/month), and passing those limits results in either an additional fee for each additional unit of consumption (again measured in GBs), or a throttling down of speeds, or both.



Many participants noted that such plan terms and cost structures were the only thing holding them back from much broader use of wireless options. They can afford to use it for start-up and failover connectivity, and maybe even save money with it in those roles. But because of consumption caps and “overage” costs and the potential for unpredictable monthly bills, plus the impact of throttling, they cannot use it widely for primary connectivity.

Others participants had more success in getting plans favorable to them (that is, sans usage caps and overages). They do this by negotiating intensively with their providers, and often by committing a significant quantity of business to their providers.

### **WWAN Cost Management Strategies**

The experiences of these companies suggest some strategies to pursue to get more WAN-friendly billing:

- Ask! All major LTE providers in the U.S. have implemented “wired-like” billing plans for select customers, on a one-off basis. If those have been successful, they may be willing to replicate the experiment with you. It never hurts to ask.
- Pool site connectivity and user data plans, so that sites can work against an overall combined cap
- Buy at a higher tier of data plan (a higher threshold level) than you think you need, if you are unable to get no-throttling service, in order to give your sites room to deal with sudden traffic surges without seeing performance decrease suddenly
- Negotiate with your account team for favorable terms (such as unthrottled services and/or truly unlimited data, or site/user data pooling) based on
  - Retaining your business, just shifting spending from a wired pot to an unwired pot, as compared to shifting it all to a different provider entirely
  - Lowering their overhead for providing your services; they will no longer have to manage last-mile connectivity for your branches since the last mile will be covered by their cell towers, and there will be little need for service visits specific to your WAN since connectivity will fail only when a tower fails and restoring service at cell towers is already a top priority for them.

Of course, all of these strategies are easier to execute successfully if the organization drives a pretty high level of spending on data services (wired and wireless) already.

Although everyone in the study is currently using only 4G LTE data services in their WWANs, Nemertes expects 5G services to spread rapidly over the next two years. As a part of that build out, carriers will deploy network slicing technology, making it easier for them to control per-user or per-site consumption of capacity across towers. To meet growing enterprise demand for comprehensive, high-speed 5G services, carriers will likely use slicing not just to make “wired-like” WWAN-friendly pricing plans available everywhere, but to open them to midsized and even small businesses.





## Case Studies

### Summary

#### **Retailer *Bought* Disaster Resilience, But *Achieved* Agility**

A retailer with thousands of U.S. locations began rolling out wireless WAN as a backup to wired connectivity in 2016. Experience in the aftermath of a hurricane convinced them that sites could come up on wireless WAN and not bother waiting for wires! Now all their locations are untethered, using only WWAN.

#### **Medical Services Chain Can't Afford Sites Going Offline—or Waiting Too Long to Come Online**

Providing outpatient care today involves lots of electronic medical records and imaging files; a clinic that is offline cannot serve patients. With thousands of clinics, this provider opted for wireless backup everywhere—and as day-1 connectivity for all new sites, to get them up and running fast.

#### **Retailer Adopted WWAN As Backup For Aging Copper, Then Ditched The Wires**

With more than a thousand stores needing reliable bandwidth and increasing speeds, back in 2015 this company saw the writing on the wall for DSL and T1s. WWAN came in first to backstop them and now is replacing them.

#### **Retailer Got WWAN For Rock Solid Backup—Stores Always See Data Centers**

With almost a thousand stores in malls and commercial districts across the U.S., this retailer saw as far back as 2011 that new applications and technology in stores absolutely require connectivity to data centers and the cloud. They deploy WWAN to meet that need.

#### **Employment Services Company Cut All The Cables**

Recognizing that work was getting done everywhere and that wireless services were coming to rival wired services on speeds and costs, this firm went all wireless at all offices to get resilient while shedding completely the burden of managing wired networks.

#### **Healthcare Company Went WWAN For Speed and Simplicity, Got Agility in the Bargain**

Negotiating DSL and cable connectivity to offices that often existed for only a year or two, this company spent far too much time waiting for installs, checking bills, and troubleshooting. WWAN brought ease and reliability—and made moving a branch to a new location a one-box operation.

#### **Vets Went WWAN For Reliability**

This fast-growing chain of veterinary clinics brought in WWAN to provide consistent and reliable backup connectivity to make up for the huge variety in service quality of the last-mile providers it uses for primary links.



### **Government Agency Uses WWAN To Get Services Up Instantly and Keep Them Up**

New locations come on line weeks faster with WWAN to start on, and stay on line continuously when as they use it for backup service for their wired primary links. State residents get more and better services, and locations generate more revenue for the state, as a result.

### **Home Improvement Chain Gets Better Everything with WWAN**

Replacing “antiquated, slow” backup services unable to meet the needs of modern applications, this national chain deployed WWAN across its entire network in five months, a “wildly and widely successful” solution delivering “better response times, better bandwidth, better reliability, better consistency.”

### **Distributor Embraces WWAN for Failover, So Users Won’t Notice WAN Failures**

This national chain of retail parts stores shifted to WWAN backup to make sure users in stores wouldn’t notice if their DSL or cable service went down, and access to services would not be interrupted: “They often don’t notice when the Cradlepoint has kicked in because the Internet is stable.”

### **Restaurant Chain Orders Up Speed and Simplicity with WWAN**

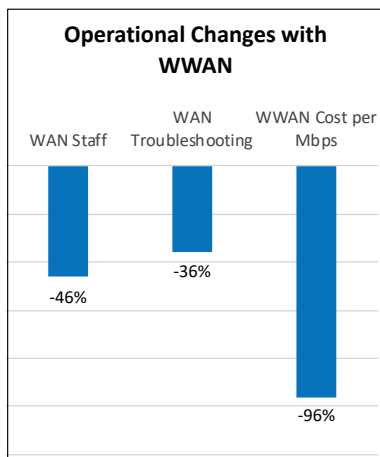
“Too important to have Internet all the time, we decided a few years ago, given the rise of gift cards and loyalty cards and such. Phone failover was OK when it was just credit cards transactions, before that.” A WWAN that makes management simple for all locations, seamlessly picks up when wired links go down, and supports VoIP phones too, was made to order!

### **Professional Services Firm Can’t Go Down, WWAN The Key**

A company providing vital tax preparation services needs rock-solid availability. They found it with WWAN for failover. “Service delivery, driven by technology.”

## Retailer Bought Disaster Resilience but Found Path to Agility

**R**etailer began rolling out wireless WAN across its thousands of U.S. locations as a backup to wired connectivity in 2016. Experience in the aftermath of a hurricane, when WWAN allowed them to restore services in heavily damaged areas weeks or months before wired services were restored, convinced them that sites could come up on wireless WAN and not bother waiting for wires! They rapidly transitioned from using WWAN for failover only to using WWAN as the primary WAN link—now, all their locations are untethered.



Replacing aging 1.5 Mbps T1 links at most stores with 8 Mbps LTE services reduced per-Mbps spend from over \$230 per site on average to \$9.38! “And, we can move a site with **no** downtime!” said the manager of network and data services.

Since making the shift to WWAN as primary connectivity—they power 94% of sites without legacy wired links—they have not only improved performance and uptime at sites, they have reduced their overall WAN spend.

DR to Agility Via WWAN	
Industry	Retail
Employees	14,500
Locations	3,002
Revenue	\$ 2,670,000,000
Culture on IT	Aggressive
Year started WWAN	2016
Percentage of sites with WWAN Primary:	94%
Percentage of sites with WWAN Day-1:	0%
Percentage of sites with WWAN Failover:	0%

And, business agility is hugely improved: sites can be brought on line in 15 minutes as opposed to 45 days, making store start-up much faster: “Site turn up is in hours as opposed to days or weeks, that’s a big plus we hear about all the time from the business.”

**“Everyone saw a lot of value in being able to turn stores up quicker, rather than waiting for carriers to supply service. Shifted to wireless first for new, and this year shifted to wireless only for vast majority of stores.”**

## Medical Services Chain Can't Afford Sites Going Offline—or Waiting Too Long to Come Online

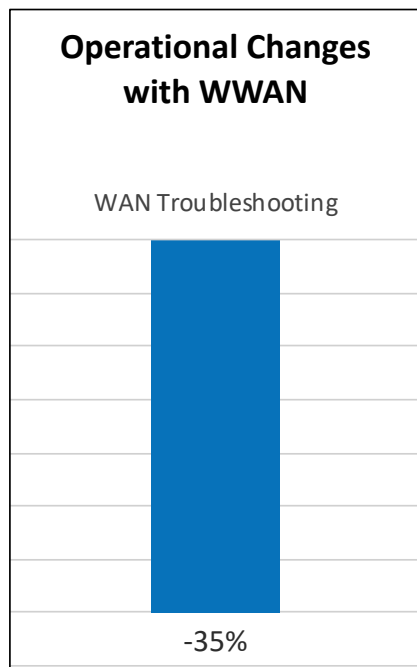
**H**ealthcare service provider began rolling out wireless WAN across its thousands of U.S. and overseas locations in 2014, to provide affordable, reliable failover connectivity for sites using commodity broadband in an SD-WAN. As the company has gained experience with the technology, it has also shifted to using WWAN as day-1 connectivity for new clinics.

With the wireless WAN, the firm is able to light up a new location in an hour or less, and begin serving patients out of that location an average of 20 days sooner than if it had waited for their cable or DSL connectivity

instead. However, due to the volume and nature of network traffic the locations generate, the company is not yet configuring permanently WWAN-only sites.

Fast light-up, always-on WAN	
Industry	Healthcare
Employees	65,000
Locations	3,512
Revenue	\$ 11,520,000,000
Culture on IT	Aggressive
Year started WWAN	2014
Percentage of sites with WWAN Primary:	0%
Percentage of sites with WWAN Day-1:	100%
Percentage of sites with WWAN Failover:	100%

The per-site cost for failover connectivity has declined, though the company has trouble quantifying how much: “We have a massive data plan, with minutes pooled across all locations,” and the same “big pool” covers mobile hotspots for their 65,000 staff. “Sites eat less than half, I suspect,” notes the Director of Networks and Telecommunications. Improvements in WAN reliability and availability have lifted customer satisfaction with the WAN, and allow uninterrupted services to patients even when primary links fail.

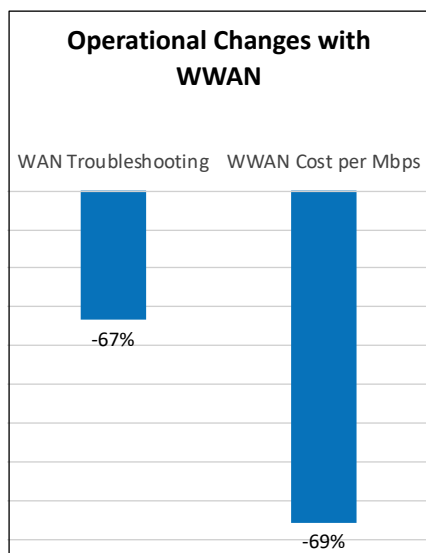


**“Our ‘clinic in a box’ is 100% wireless—we use it in disasters, and we use it at startup...there are 10 to 20 sites in these states at any given time. In time, we may expand to wireless-only sites with 5G.”**

## Retailer Adopted WWAN Backup For Aging Copper, Then Ditched The Wires

**R**etailer began rolling out wireless WAN across its more than 1,400 U.S. locations in 2015, to provide affordable, reliable failover connectivity for all of its locations, most of which use DSL. The company’s experience of improved speeds, performance, and costs led it to decide in 2020 to migrate to wireless as sole connectivity, everywhere possible. (About 50 stores—4%—cannot use cellular services at all, as yet.)

Cutting the cables everywhere	
Industry	Retail
Employees	34,000
Locations	1,415
Revenue	\$ 5,323,000,000
Culture on IT	Moderate
Year started WWAN	2015
Percentage of sites with WWAN Primary:	10%
Percentage of sites with WWAN Day-1:	0%
Percentage of sites with WWAN Failover:	100%



our connectivity,” said the Telecommunications Manager, adding “and that they should be reaping a bigger piece of the pie because now we are all on their network (the wireless) and not a patchwork of last-mile wired providers.”

The firm has made the shift to primary WWAN in 10% of locations already, and expects to bring that up to 50% by the end of 2021, and 100% the following year.

The per-site cost for cellular data services averages \$9.60 per Mbps, as compared to \$31.25 for DSL and cable broadband services. Network uptime has improved significantly: as measured, sites have gone from 99.8% uptime to 99.998% uptime—from 17.5 hours to about 12 minutes. Site bandwidth has on average increased 5.3x.

It took work to recruit carriers into the pricing plan they have. “To make it clear it was a win/win, we noted to them that there would be no truck rolls to fix or maintain

**“Used to be, all of us on the WAN staff were troubleshooting WAN issued, for five or six hours a day. [With WWAN] it’s just two people, an hour or so a day. Now we can focus on far more useful things.”**

## Retailer Got WWAN For Rock Solid Backup—Stores Always See Data Centers

**R**etailer began rolling out wireless WAN across its stores in 2011, to provide consistent, reliable failover connectivity independent of location. The firm has updated and shifted WAN technologies multiple times since, but maintained WWAN as a key component of the architecture. The company now plans to begin using WWAN for day-1 bandwidth at new stores, but no plans for WWAN-only sites beyond that.

**The option to use wireless provides a lot of flexibility, is generally reliable, and more often than not faster**

Because the firm pools data plans across all sites, the per-site cost for cellular data services is hard to nail down, though is certainly below \$12 per Mbps, compared to just over \$33 per Mbps for wired connectivity; moreover, they are realizing a speed-up of 4.2x.

The option to start new stores on wireless while waiting for wired connectivity is attractive because on average, the firm waits 75 days for wired links, but can turn up wireless connectivity in under an hour. “We waited eight months for a wired link in one city in California, and ran on WWAN until then,” says the Telecommunications Manager.

Business as usual demands access	
Industry	Retail
Employees	15,800
Locations	905
Revenue	\$ 5,800,000,000
Culture on IT	Aggressive
Year started WWAN	2011
Percentage of sites with WWAN Primary:	0%
Percentage of sites with WWAN Day-1:	0%
Percentage of sites with WWAN Failover:	100%

Although the firm has not tracked significant decreases in WAN troubleshooting in part due to the fact that it outsources support, internal staff (versus the outsourcer) is often handling what issues do arise with their WWAN. The Telecommunications Manager notes that the platform makes it easy to fix most infrequent problems by restarting the wireless router, so he spends little or no time troubleshooting: “I don't troubleshoot—I reboot.”

**“Network uptime has improved to the point where average site is down only 12 minutes per year—approximately 99.998% uptime.”**



## Professional Services Company Says Goodbye to Network Wiring

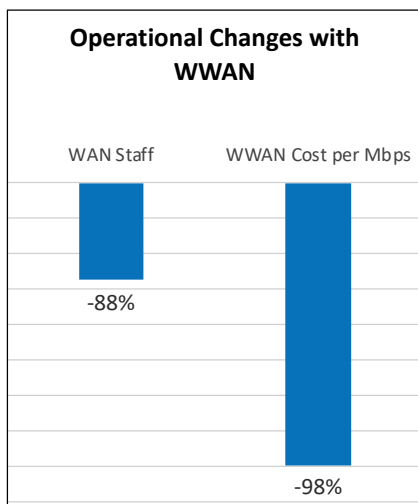
**P**rofessional services provider made a radical decision about networking in 2014: wired networks are more trouble than they are worth.

The firm was, at the time, paying more than \$1,000/month on average for about 1 Mbps on VDSL links of uneven quality. “It was clear then that copper was dying,” notes the CIO.

In looking at the future of data access, the firm saw LTE as the future for sites of the size it operates, and began migrating. It has since seen better uptime, a 50-fold increase in bandwidth, and is paying only about \$0.80 per Mbps of service.

Leave all network cabling forever	
Industry	Professional Services
Employees	1,000
Locations	160
Revenue	\$ 39,286,000
Culture on IT	Moderate
Year started WWAN	2014
Percentage of sites with WWAN Primary:	100%
Percentage of sites with WWAN Day-1:	0%
Percentage of sites with WWAN Failover:	0%

Critically, the company decided to shift to exclusively wireless networks in all their offices,



\* vs. average for participants

as well, and to have remote and mobile workers, including now all the pandemic-related work-from-home staff, working from cellular access routed on a private network segment to the company network, instead of traditional VPNs. Moving sites relatively frequently, the CIO notes, “now, wiring a site is no longer an issue, and there’s no cost to pulling out of a site either. With wireless we can be in and operational the day we sign the contract: instant connectivity, smaller footprint, easy to pull out when

**“We have maybe a tenth of a staff position dedicated to WAN management now, far less expensive than when we paid for managed services, and for 160 sites instead of 30, and current staff are far less experienced.”**

we move on. [We] can serve pop-up locations if we need one, or set up in an employer’s offices, but still be securely on our own network.”

## Healthcare Company Went WWAN For Speed and Simplicity, Got Agility Into the Bargain

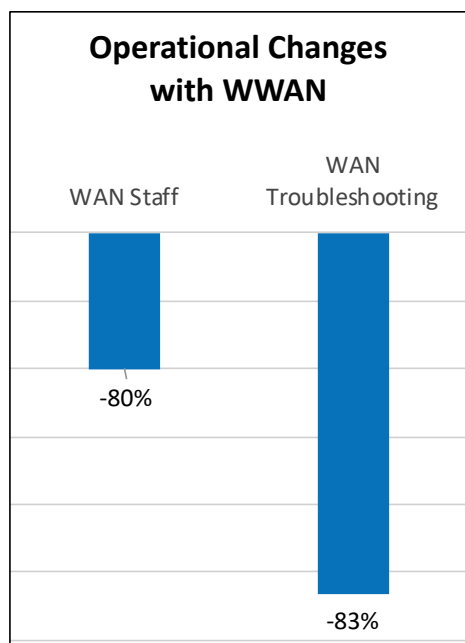
**H**healthcare company began rolling out wireless WAN across its changing array of offices in 2017.

Negotiating DSL and cable connectivity for its offices, which often existed for only a year before moving to different facilities was tedious and time consuming, and the company spent far too much time waiting for installs, checking bills, and troubleshooting connection issues.

“I was looking for a better solution than [our provider], especially one where tracking the financial info was going to be easier—it was just a nightmare tracking where we were still paying for what service,” said the Director of Telecommunications.

Speed and simplicity become agility	
Industry	Healthcare
Employees	200
Locations	18
Revenue	\$ 5,000,000
Culture on IT	Aggressive
Year started WWAN	2017
Percentage of sites with WWAN Primary:	94%
Percentage of sites with WWAN Day-1:	0%
Percentage of sites with WWAN Failover:	0%

Wireless WAN seemed like an intriguing solution, and so it turned out: Wireless WAN brought ease to installation and management of the WAN and reliability to the service—it went from 98% uptime to 99.9%.



And, crucially, going wireless made moving a branch to a new location a one-box, no-delay operation, with no long tail of administrative headaches around WAN bills.

**“Our users are much happier, especially due to the reduction in downtime. Plus, I can more easily resolve non-network issues, too, with a more reliable network in place.”**

## Vets Went WWAN For Reliability

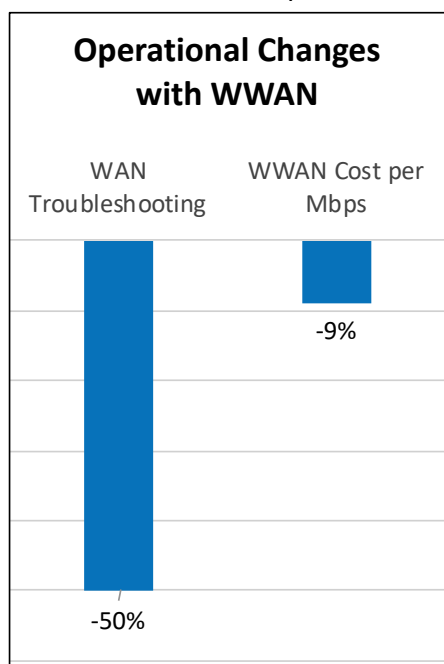
**H**ealthcare company began rolling out wireless WAN in 2016. This fast-growing chain of veterinary clinics brought in wireless WAN to provide consistent and reliable backup connectivity across its locations, in order to make up for the huge variety in service quality on the large number of last-mile providers it uses for primary links.

Because it grows largely through acquisition of existing clinics and care facilities, the portfolio of providers tends to grow over time.

Although it cannot yet strike a deal making wireless WAN acceptable primary connectivity, the firm is typically paying about 9% less on a per-Mbps basis for wireless data services.

The availability of reliable failover connectivity has eased many support issues, since even when there is a problem on the cable broadband, IT has access to the site, and guarantees at least the minimum capacity needed to keep operating a clinic.

As 5G continues to spread, the company is optimistic that it will in future be more consistently able to get the 20 Mbps throughput it needs for primary connectivity, and so will be able to embrace WWAN for that, as well.



Reliable access anywhere	
Industry	Healthcare
Employees	18,000
Locations	424
Revenue	\$ 5,500,000,000
Culture on IT	Moderate
Year started WWAN	2016
Percentage of sites with WWAN Primary:	0%
Percentage of sites with WWAN Day-1:	1%
Percentage of sites with WWAN Failover:	99%

**“Compared to pre-wireless, more issues are *not* coming to the WAN staff for resolution.”**

## Government Agency Uses WWAN To Get Services Up Instantly and Keep Them Up

**S**tate government agency operating across nearly 200 sites began deploying wireless WAN for backup in 2017.

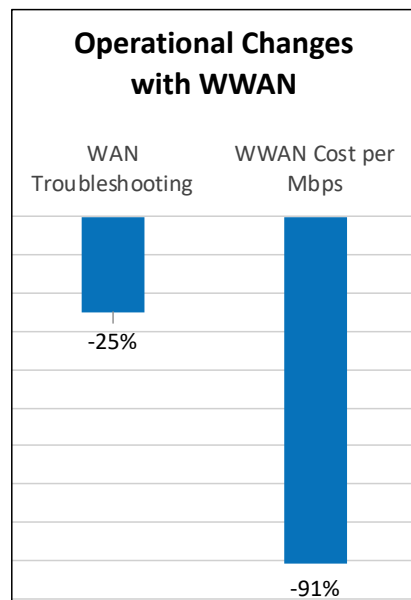
Since then, the company has slowly adopted a model of introducing WWAN in new sites while waiting for fiber connectivity to reach the site. New locations come on line weeks faster and stay on line thereafter as needed for backup.

Smaller sites never get the fiber, now. As a result of getting new locations in business faster, state residents get more and better services, and each location generates more revenue for the state.

Instant on, always on means more revenue	
Industry	State and Local Government
Employees	920
Locations	190
Revenue	\$ 97,000,000
Culture on IT	Moderate
Year started WWAN	2017
Percentage of sites with WWAN Primary:	26%
Percentage of sites with WWAN Day-1:	100%
Percentage of sites with WWAN Failover:	24%

The faster time to service is crucial in a state agency, since the wheels of state sometimes grind slowly: “It sometimes takes us 90 days to get an order for connectivity in,” notes the CISO, who is in charge of the WAN, “and 45 days more to get the connection in.” For about a quarter of locations, well outside urban areas, WWAN is primary connectivity

due to the greater expense of getting construction of new fiber runs. Those sites have significant downtime still, due to power and cell service issues, but are still in better shape now than before, and on average see a 4x increase in bandwidth.



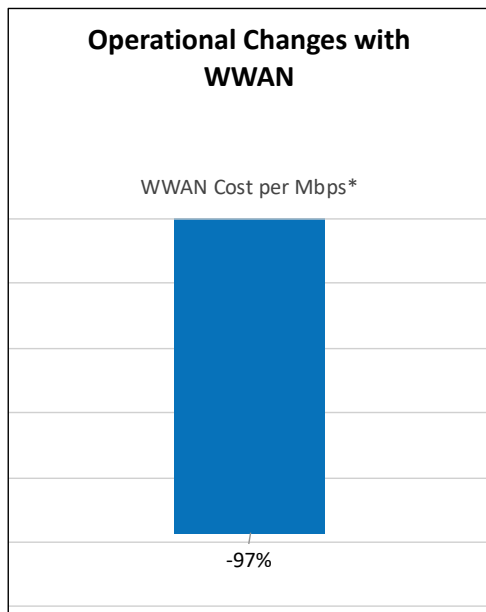
**“If a [cell] tower has a problem, the whole area does. We still open a ticket, but the carrier is rolling a tech anyway and sometimes *before* we notice the problem. We usually know the service is restored before the ticket is updated.”**



## National Retailer Gets Better Everything on WWAN

**R**etailer began rolling out wireless WAN in 2019, this national chain deployed wireless across its entire WAN in five months. Replacing “antiquated, slow” backup services unable to meet the needs of modern applications with wireless data services has been a “wildly and widely successful” solution delivering “better response times, better bandwidth, better reliability, better consistency” according to the Network Administrator. The company sees IT as the key to achieving its desired

Better everything with WWAN	
Industry	Retail
Employees	310,000
Locations	1,965
Revenue	\$ 71,300,000,000
Culture on IT	Aggressive
Year started WWAN	2019
Percentage of sites with WWAN Primary:	100%
Percentage of sites with WWAN Day-1:	20%
Percentage of sites with WWAN Failover:	100%



\* vs. average for participants

business outcomes; the lightning-fast deployment of WWAN in conjunction with an SD-WAN is an example of rapidly and thoroughly adopting new technology in order to radically improve service availability while reducing operating costs.

Under the SD-WAN, wireless links are part of an all-active architecture, meaning the wireless links are used all the time, even though use of the wired links is prioritized. This means failover to wireless, when it happens, is transparent—unnoticed by staff or customers.

Satisfaction with the network has increased in the wake of the rapid deployment of WWAN. “Business operations folks especially, because we keep the stores running. We *never* miss a store start date even though carriers are not getting any better at being on time.”

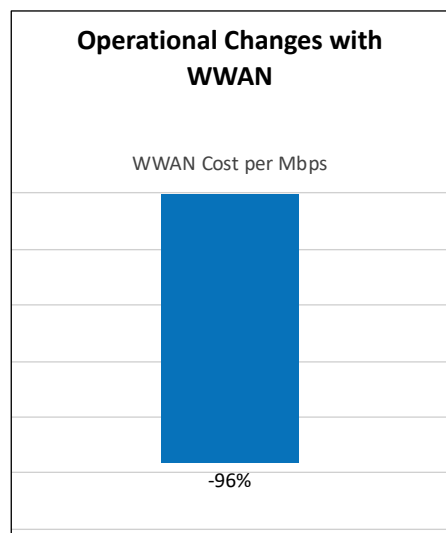
After testing the new architecture, the company’s only concern about the technology was “how to do the switchover faster,” the network administrator noted.

**“If I can get to 5G I may never go back to wired.”**

## Distributor Embraces WWAN for Failover, So Users Won't Notice WAN Failures

**L**ogistics company with a national chain of retail parts stores adopted wireless WAN services as failover links at 70% of its roughly 1,200 locations, to make sure both customers and staff in stores wouldn't notice if the primary DSL or cable service goes down, preventing access to company services would not be interrupted. Instead, the Manager of Telecommunications notes, "they often don't notice when the Cradlepoint has kicked in because the Internet is stable."

Smoothing over bad connections	
Industry	Logistics
Employees	48,000
Locations	1,200
Revenue	\$ 19,390,000,000
Culture on IT	Aggressive
Year started WWAN	2014
Percentage of sites with WWAN Primary:	7%
Percentage of sites with WWAN Day-1:	0%
Percentage of sites with WWAN Failover:	70%



\* vs. average for participants

Other than that, concerns run to the site-specific, such as whether the construction of the building they are moving into will require adding an external antenna for the router.

Wireless serves as the primary connectivity when there is no other option, usually in more rural locations, and also in the event of regional disasters. The company has begun to experiment with WWAN as start-up connectivity, too, because they can bring a site up on LTE in about 15 minutes, versus an average of 15 days for their typical DSL or cable-based wired primary links.

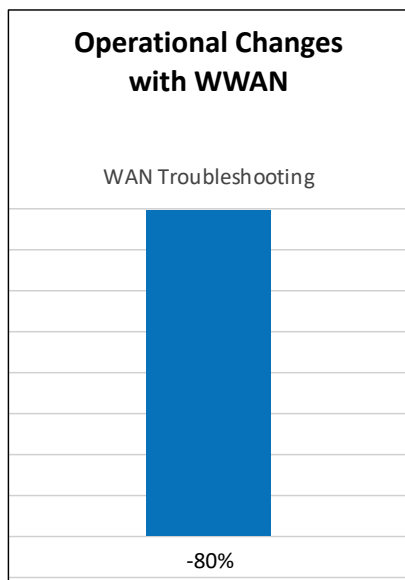
In embracing wireless for WAN, their only significant concern was that in some locations they did not have a lot of cell towers to rely on, but "there are more of those over time, so the worry decreases."

**"We're able to bring sites in hurricane zones back up very quickly with WWAN disaster recovery units."**



## Restaurant Chain Orders Up Speed and Simplicity with WWAN

**R**etailer decided it was “too important to not have Internet on all the time” back in 2015, “given the rise of gift cards and loyalty cards and such. Phone failover was OK when it was just credit cards transactions, before that.” So, the company began deploying LTE-based failover connectivity for restaurant WAN services. As a backup for the consumer broadband used for primary connectivity, the



minutes of downtime a year. “I can manage them from my cell phone while I’m out on the golf course, and diagnose and troubleshoot remotely,” notes the Telecommunications Manager.

Simple, reliable, easy, quick failover	
Industry	Retail
Employees	-
Locations	40
Revenue	\$ 9,500,000,000
Culture on IT	Moderate
Year started WWAN	2015
Percentage of sites with WWAN Primary:	0%
Percentage of sites with WWAN Day-1:	0%
Percentage of sites with WWAN Failover:	100%

WWAN seamlessly picks up when wired links go down, even supporting business-critical VoIP phone services. Moreover, because the router for the WWAN also manages the primary wired links, the solution has simplified management across all locations.

The company uses traffic shaping, segmentation, and whitelisting to protect traffic important to the business, especially VoIP.

The solution alerts network staff when any restaurant’s primary link goes down or becomes unreliable. The firm has had site downtime only on the rare occasions when the wireless router itself fails; sites average a mere 12

**“For a small business, it is an amazing technology! If the cell plans were more cost friendly, we would want to be wireless all the time. Reliability is better, especially when [there are] two providers.”**

## Professional Services Firm Can't Go Down, WWAN The Key

**P**rofessional services provider delivering vital tax preparation services needs rock-solid availability. The firm found it with WWAN for universal failover, back in 2010, and has been refining its approach to networking ever since. The firm is embracing wireless WAN for primary connectivity where sites are temporary (e.g. mall pop-up locations), and use it for day-1 when a new location comes on line. Currently, the firm is consolidating onto the wireless router as the sole network infrastructure in a location, reducing both capital investments and operational loads. The firm has even found enough SD-WAN functionality

WAN that doesn't go down...ever	
Industry	Professional Services
Employees	10,000
Locations	10,000
Revenue	\$ 3,090,000,000
Culture on IT	Aggressive
Year started WWAN	2010
Percentage of sites with WWAN Primary:	5%
Percentage of sites with WWAN Day-1:	3%
Percentage of sites with WWAN Failover:	100%

**“Internet down” used to be our number 2 help ticket type, now it is down to number 20. And the 4G de-escalates the calls, they are less of a fire drill.**

that for billing reasons,” says the Telecommunications Manager. “Where cell services is excellent, we worry about folks pulling the plug on the wired links.”

in its Cradlepoint solution to enable it to forgo investment in a separate one. And, the company is leaning on carriers for more favorable pricing, because cost is the only thing standing in the way of wider deployment of WWAN-primary sites. The firm has a minimum service level of 5 Mbps up and down at a site, and “LTE is almost always better, 8/8 or thereabouts. If folks notice that they have been on 4G and it was better, they'll want it full time, and we have to watch out for

**“Would lean to LTE first if pricing tips that way, because much easier to manage the use and operations. I’m hoping 5G pushes the pricing.”**



## Conclusion

Most organizations begin deploying Wireless WAN technologies to improve WAN failover behavior. With time and trust in its ability to deliver services with solid reliability and performance, they then employ it in other use cases, ranging from longer-term DR connectivity to day-1 connectivity to primary connectivity.

WWAN changes the landscape of enterprise networking by shifting WAN from being a long-lead-time drag on site turn-up to being instant-on, ready-to-run access available anytime, anywhere. Wireless can reduce the wait for WAN services by a factor of 1,000, delivering in less than an hour what normally takes more than a month.

As an engine of both IT and business agility, WWAN can decrease the cost of opening a new site, and of relocating or closing an old one, and speed the day when a location begins delivering services, and generating more revenues and profits.

At the same time, when architected in the mode of an SD-WAN to centralize management and engineer transparent failover among wired and wireless options, a wireless WAN can dramatically reduce the amount of work IT staff invest in delivering WAN services. It delivers those operating cost reductions with performance and reliability as good as or better than wired networks.

Through techniques such as pooling data costs across mobile users and sites, and by negotiating with their LTE service providers, larger IT organizations can often come to a very favorable cost structure for WWAN. Nemertes expects the rise of 5G over the next two years, coupled with enterprise expectations of comprehensive 5G services, to drive broad availability of WWAN-friendly pricing plans. When that happens, wireless will become central to many, if not most, WAN architectures.



## Methodology

**Business Value Analysis Interviews:** In August 2020, Nemertes developed a customized set of hypotheses and questions to determine the business value and operational impact of WWAN. We reviewed these hypotheses with Cradlepoint, which provided Nemertes with the names of current, experienced customers to interview. Nemertes scheduled calls with and interviewed participants in September and October. The same senior-level Nemertes analyst conducted all interviews, independently, gathering detailed data on each company's experience with its wireless WAN. Nemertes then analyzed the data for each company and collectively across organizations. We have kept the names of the companies confidential to protect their competitive information.

**About Nemertes:** Nemertes is a global research-based advisory and consulting firm that analyzes the business value of emerging technologies. Since 2002, we have provided strategic recommendations based on data-backed operational and business metrics to help enterprise organizations deliver successful technology transformation to employees and customers. Simply put: Nemertes' better data helps clients make better decisions.