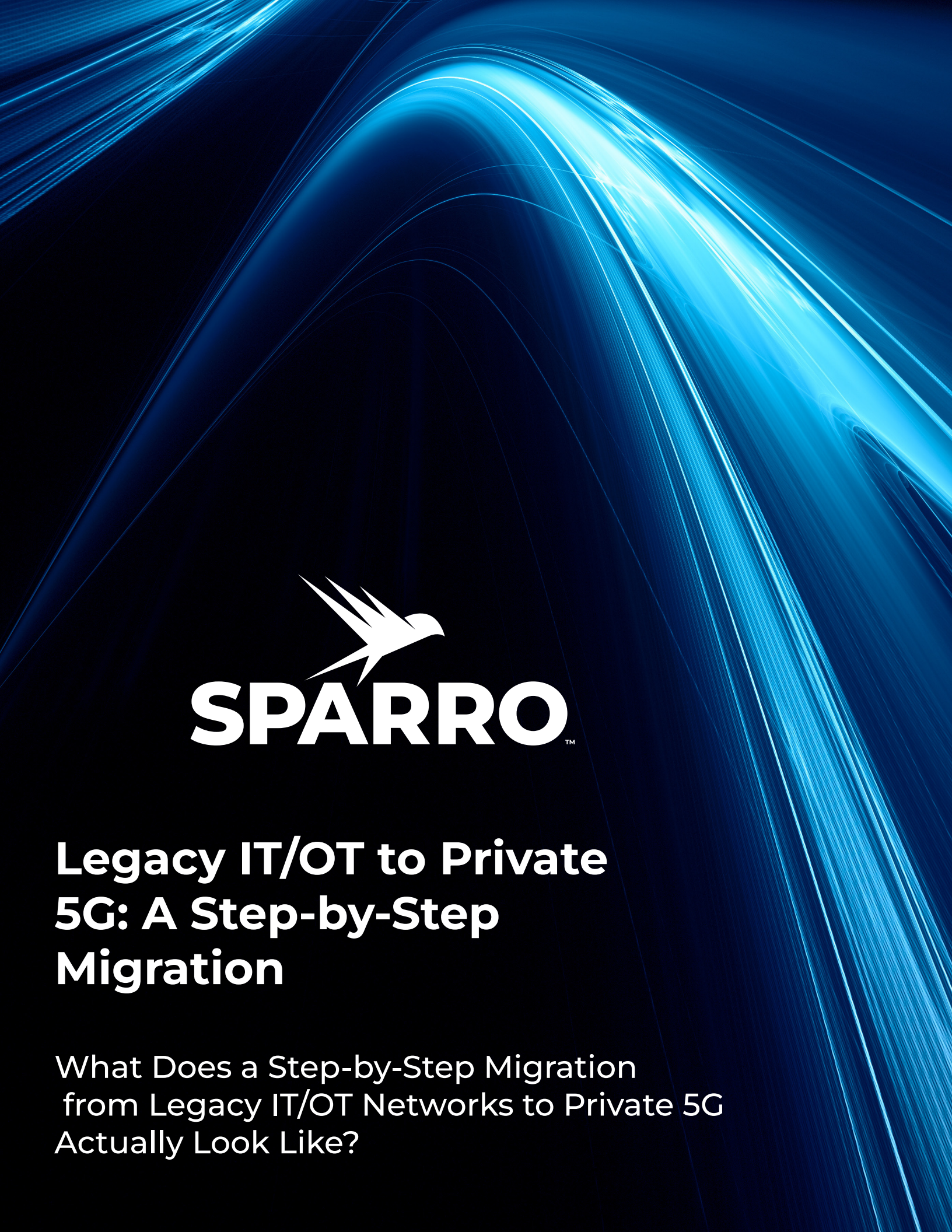


Legacy IT/OT to Private 5G: A Step-by-Step Migration

What Does a Step-by-Step Migration from Legacy IT/OT Networks to Private 5G Actually Look Like?

Enterprise leaders don't usually ask whether private 5G is valuable. They ask something much harder:

"How do we migrate without disrupting everything we've already built?"

That's a fair question. Most organizations have spent years, if not decades, building the infrastructure that supports their operations. They have invested in Ethernet networks, fiber backbones, Wi-Fi, industrial control systems, and thousands of connected devices.

According to the Capgemini Research Institute, legacy infrastructure remains a significant barrier to intelligent transformation. However, replacing all that infrastructure at once would be expensive, disruptive, and unnecessary.

Fortunately, in our experience, that's not how successful private 5G migrations typically happen. Private 5G doesn't replace your network; it overlays and complements it.

Industry leaders, including our strategic partner Ericsson, describe private 5G as part of a broader modernization strategy. Organizations often achieve the best results by introducing private 5G to address specific operational challenges while continuing to leverage technologies that already perform well.

The result is a phased migration that reduces risk, protects prior investments, and lays the foundation for future innovation.

This article outlines Sparro's practical seven-step modernization framework. Enterprise leaders can use this to evaluate, plan, and scale a migration where private cellular networks (PCNs) complement and bolster legacy IT/OT networks.

Why Many Private 5G Projects Stall Before They Begin

For many organizations, the biggest obstacle is not the technology itself; it's the assumptions surrounding it.

Some believe private 5G requires replacing the entire network infrastructure. Others assume it is only appropriate for manufacturers or organizations building entirely new facilities. Some worry that deployment will interrupt production or require years of planning before delivering measurable value.

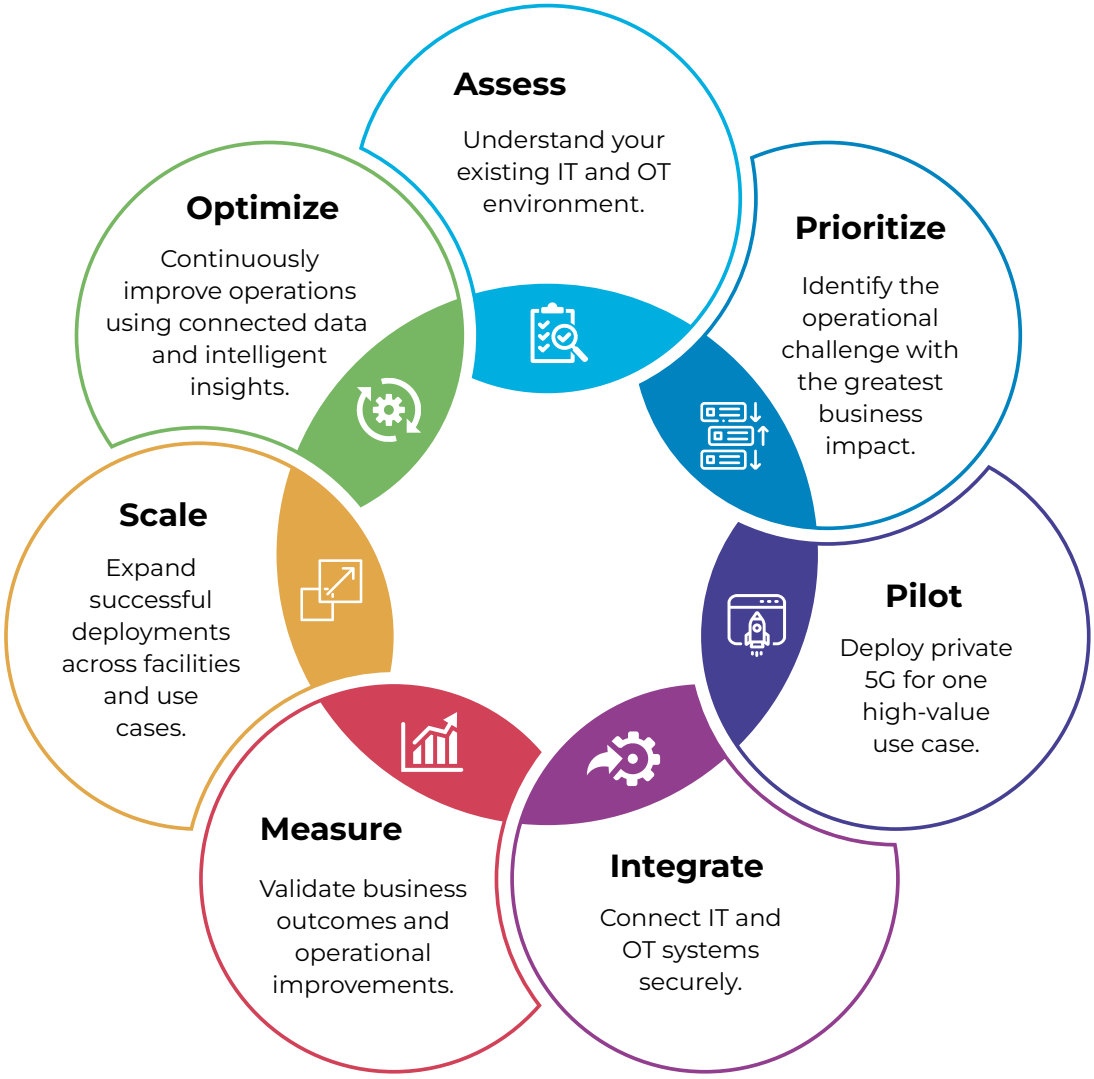
In our experience, most successful projects begin much smaller.

> "One of the biggest misconceptions is that private 5G requires a complete replacement of existing infrastructure. In reality, the goal is to design a network that overlays and complements what's already working, while delivering the performance today's applications demand."
>
> — **Jason Wickam**, *Vice President & General Manager, Sparro*

Rather than modernizing an entire enterprise at once, organizations identify one operational challenge, validate the results, and expand over time. That phased approach has become a common theme in enterprise private 5G deployments. It allows organizations to reduce risk while building confidence across both IT and operational teams.

Think of migration as a journey instead of a destination. Each step builds on the last, creating measurable business value before moving to the next phase.

The Sparro Seven-Step Modernization Framework



Step 1: Assess Your Current Environment

Every successful migration begins with understanding the environment you already have.

That sounds obvious, yet many organizations start by evaluating new technology before fully understanding the infrastructure supporting today's operations.

Begin with a comprehensive inventory of your existing environment, including:

- Wired Ethernet infrastructure
- Fiber backbone
- Existing Wi-Fi deployments
- Industrial control systems
- PLCs and SCADA platforms
- Cameras and IoT devices
- Mobile equipment
- Critical business applications
- Operational workflows

The goal isn't to identify everything that should be replaced. It's to understand how each technology supports the business today.

That perspective often reveals opportunities to modernize selectively rather than broadly. Ethernet may continue serving fixed industrial equipment. Fiber may remain the ideal backbone for high-capacity transport. Wi-Fi may still provide excellent connectivity for office users and guest access.

Enterprises can then introduce private 5G where its unique strengths provide the greatest operational value.

Legacy Doesn’t Mean Obsolete

Legacy infrastructure often represents years of successful investment.

The question is not, “What should we replace?” Instead, the better question is “Which connectivity technology is best suited for each workload?”

A modern enterprise network frequently combines Ethernet, fiber, Wi-Fi, and private 5G into a unified connectivity strategy rather than relying on a single technology.

Step 2: Prioritize the Right Business Challenge

Once you understand the current environment, resist the temptation to begin designing a network.

Instead, define the business problem you want to solve.

> "Private 5G can be a cost-effective solution when it's designed for the right use case. Success starts with right-sizing the network to solve a specific operational challenge, not overengineering the deployment."
>
> — **Jason Wickam**, *Sparro*

Organizations that lead with operational outcomes often realize greater business results than those that begin with technology specifications alone. Rather than asking where you should install private 5G, ask where better connectivity could improve business performance.

For example:

- Where does unreliable connectivity interrupt operations?
- Which mobile assets lose connectivity as they move throughout the facility?
- Where are workers forced to rely on manual processes because data isn't available in real time?
- Which environments demand greater mobility, reliability, or coverage than current networks can consistently provide?
- Which operational insights could unlock new opportunities if they were more accessible?

These conversations naturally bring IT and OT stakeholders together. They also help establish measurable objectives before the first piece of equipment is deployed.

Enterprises that align technology investments with clearly defined business outcomes are better positioned to demonstrate value and secure support for future phases of modernization.

Step 3: Pilot a High-Value Use Case

With business priorities established, the next step is to validate the technology in a controlled environment.

One of the most common mistakes organizations make is trying to modernize an entire campus or production environment at once. Large-scale projects introduce unnecessary complexity and make it difficult to isolate the value of new technology.

Instead, identify a single use case where improved connectivity can deliver measurable operational benefits.

Organizations often begin with applications such as:

- Autonomous mobile robots (AMRs)
- Automated guided vehicles (AGVs)
- Connected maintenance teams
- Machine vision systems
- Predictive maintenance
- Outdoor yard operations
- Large warehouses with highly mobile workers
- High-value assets that move throughout a facility

These deployments create an opportunity to validate network performance while building confidence among both technical and business stakeholders.

Ericsson notes that many organizations begin with targeted operational use cases. They expand only after proving value. This phased approach helps reduce risk while demonstrating measurable business value.

Common First Private 5G Deployments

In our experience, organizations frequently begin with use cases that demand reliable mobility, consistent coverage, or predictable performance. Examples include:

- Warehouse automation
- Manufacturing robotics
- Connected field workers
- Industrial IoT sensors
- Video analytics and machine vision
- Outdoor logistics operations
- Fleet and asset tracking

These targeted deployments often become the foundation for broader digital transformation initiatives.

Private 5G as Part of a Unified Connectivity Strategy

Business Applications: Transform operational data into actionable insights.

ERP	MES	WMS	AI and Machine Learning
Analytics Dashboards	Digital Twins	Asset Management Systems	

Intelligent Connectivity: Each technology supports different workloads. Together, they create a resilient connectivity strategy.

Private 5G	Ethernet	Wi-Fi	Fiber	Edge Computing

Operational Technology:

PLCs	SCADA Systems	Cameras	IoT Sensors
AGVs	AMRs	Industrial Robots	Handheld Devices
	Mobile Workers	Environmental Sensors	

Step 4: Integrate IT and OT

Once a pilot proves successful, organizations are ready to think beyond connectivity and begin integrating information across the enterprise.

Private 5G delivers its greatest operational impact when it helps organizations connect operational technology with enterprise IT systems. That integration helps eliminate isolated data, giving operations teams and business leaders access to a more complete picture of what's happening across the enterprise.

Historically, many organizations have managed IT and OT independently. That separation often made sense because the two environments served different purposes. Today, many organizations combine operational insights with enterprise data. Doing so improves visibility, supports automation, and enables better decision-making.

This does not mean removing the security boundaries between IT and OT. Instead, it requires thoughtful integration supported by appropriate governance and security controls.

Throughout this phase, organizations should consider:

- Network segmentation
- Identity and access management
- Zero Trust principles
- Secure remote access
- Edge computing requirements
- Data governance
- Regulatory or industry-specific compliance

As operational technology becomes more connected, maintaining security becomes even more important. Modernization should strengthen resilience, not introduce unnecessary risk.

Why Operational Data Is the Real Goal

Private 5G is not the destination. Operational intelligence is.

Many organizations already generate enormous amounts of operational data. The challenge is making that data available when and where it can improve business decisions.

Ericsson describes this evolution as a shift toward data-driven operations. Secure connectivity enables technologies such as AI, predictive maintenance, digital twins, and advanced analytics.

When viewed through that lens, private 5G becomes an enabler of business transformation rather than simply another networking technology.

Step 5: Measure Business Outcomes

Technology deployments should never end with a successful installation.

Before expanding to additional facilities or use cases, organizations should confirm that the initial deployment delivers measurable performance improvements.

Enterprises should measure both technical performance and operational outcomes.

Technical measurements may include:

- Network availability
- Coverage consistency
- Latency
- Roaming performance
- Device connectivity

Business measurements may include:

- Reduced downtime
- Faster maintenance response
- Increased productivity
- Improved worker safety
- Better asset utilization
- Faster access to enterprise data
- Reduced operational interruptions

Measuring these outcomes gives executive leaders the confidence to expand investments based on evidence instead of assumptions.

> "When a private 5G network is designed correctly, the impact is often immediate. Better coverage, more stable connectivity, and stronger application performance quickly translate into improved operational efficiency."
>
> — **Jason Wickam**, *Sparro*

Step 6: Scale What Works

Once the initial deployment has demonstrated measurable value, organizations can begin expanding private 5G to additional locations and use cases. The key is to build on proven success.

As deployments scale, consistency becomes increasingly important. Standardized architectures, governance models, and deployment processes make future expansion faster and less disruptive.

Many enterprises scale by extending private 5G to additional production lines, warehouses, distribution centers, outdoor operations, or remote facilities. Others introduce new use cases, such as connected vehicles, expanded IoT deployments, or additional automation initiatives.

Each phase should build on the lessons learned during the previous one. That includes technical performance, operational processes, security practices, and stakeholder collaboration.

A phased approach also helps organizations manage investment more effectively. Instead of committing significant resources to a large-scale deployment upfront, leaders can make informed decisions based on demonstrated results and evolving business priorities.

Step 7: Optimize for Continuous Improvement

A successful migration does not end when the network goes live.

PCNs create new opportunities to improve operations long after the initial deployment is complete.

As more assets, workers, and systems become connected, organizations gain access to richer operational data. That data can support predictive maintenance, AI initiatives, digital twins, workflow automation, and more informed business decisions.

> "Application requirements aren't standing still. Every year they demand more from the network. Building resilient connectivity today gives organizations the foundation they need to support tomorrow's applications."
>
> — **Jason Wickam**, *Sparro*

The network itself also becomes part of a continuous improvement process. Organizations should regularly evaluate performance, identify new operational challenges, and determine where additional connectivity can create value.

This mindset helps ensure that technology investments continue supporting business objectives as operational needs evolve.

Rather than viewing private 5G as a finished project, leading organizations treat it as an evolving platform for innovation.

Common Migration Mistakes to Avoid

Even well-planned modernization efforts can lose momentum when organizations focus on technology before strategy.

Watch for these common pitfalls:

Trying to replace everything at once

The best migrations aren't measured by deployment speed. They're measured by how effectively organizations improve operations, unlock data, and prepare for future innovation.

In that context, private 5G typically works best as part of a broader connectivity strategy. Ethernet, fiber, and Wi-Fi often continue serving important roles within the enterprise.

Choosing technology before defining the business problem

Connectivity should support measurable operational outcomes. A clearly defined use case creates a stronger foundation than a broad technology initiative.

Treating IT and OT as separate conversations

Successful modernization requires collaboration between operational leaders, IT teams, security stakeholders, and executive leadership.

Skipping baseline measurements

Without clear performance benchmarks, it becomes difficult to demonstrate progress or calculate return on investment.

Assuming the journey ends after deployment

Private 5G is not a finish line. It creates opportunities for ongoing optimization as organizations introduce new applications, connect additional assets, and gain deeper operational insight.

Bringing It All Together

Every organization's modernization journey will look different, but the most successful migrations tend to follow the same progression. Rather than attempting a large-scale transformation all at once, they:

1. **Assess** the current environment.
2. **Prioritize** the highest-value business challenge.
3. **Pilot** a focused deployment.
4. **Integrate** IT and OT.
5. **Measure** operational impact.
6. **Scale** proven successes.
7. **Optimize** continuously as business needs evolve.

This framework helps organizations reduce risk while building a stronger foundation for future innovation. It also demonstrates that successful private 5G migrations are less about replacing technology and more about modernizing connectivity with purpose.

> "Resilient connectivity is no longer a nice-to-have. Organizations that want to improve customer experiences, empower employees, and increase operational efficiency will need an infrastructure that can support the next generation of applications."
>
> — **Jason Wickam**, *Sparro*

Ready to Plan Your Next Step?

Whether you're evaluating your first pilot or planning a multi-site modernization strategy, the right roadmap can help you move forward with confidence.

At Sparro, we help organizations assess their existing environments and identify strategic objectives and opportunities. We then develop connectivity strategies that align technology investments with measurable impacts.

Our approach recognizes that every modernization journey is different. PCNs should overlay and complement your existing infrastructure to support your business needs today and in the future. Successful migrations build on existing strengths while preparing for what's next.

If you're ready to explore what a phased migration to private 5G could look like for your organization, let's start the conversation.