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The future of geospatial capability in the UK water sector

FROM MAPS TO REAL-TIME DECISION ENGINES

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Executive summary

Geospatial capability is moving from a specialist toolset to a strategic operating system for the UK water sector. As water and sewerage companies face intensifying regulatory pressure, climate volatility, asset fragility, and growing public scrutiny, leaders need an enterprise approach that enables faster, more confident, and more transparent decisions. That approach is geospatial: not merely "where assets are," but **what is happening, why it matters, and what to do next** in real time, across the whole network and catchment.

The next phase for the sector is not defined by better maps; it's defined by better decisions at network speed. Geospatial platforms, when treated as mission-critical, connect operational data, regulatory obligations, environmental conditions, and customer experience into a single, living picture of the system. In doing so, they turn insight into coordinated action, shorten incident response, improve resilience, reduce cost to serve, and lift trust with regulators and the public.

UK-specific momentum makes this an urgent leadership priority. The PR24 final determinations usher in a generational step up in investment with sharper expectations for measurable outcomes; storm overflow data is now near-real time and public; and NUAR and statutory DWMPs raise the bar on transparency and safe-dig performance. In combination, these forces are shifting geospatial from a helpful system to the backbone of how the sector plans, operates, proves, and improves.

This paper sets out a leadership blueprint: why geospatial matters now, what "good" looks like, a pragmatic maturity journey (expressed in business language), two viable modernisation pathways, the value unlocked along the way, and the guardrails that keep transformation safe and focused on outcomes. The call to leaders is simple: **appoint a senior sponsor, set the mandate, connect geospatial metrics to PR24 outcomes, and start building the operating rhythm that turns maps into decisions.**

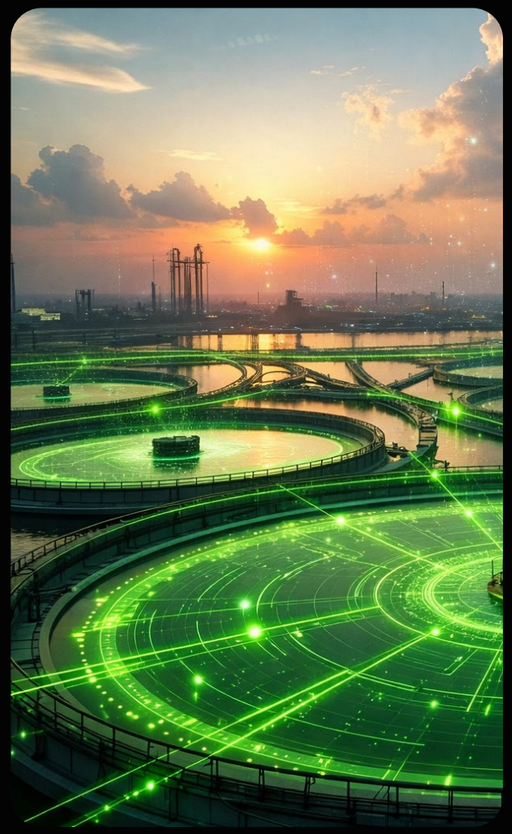
Why geospatial now: *the strategic moment for UK water*

A convergence of forces is redefining the sector's operating model. Customers and communities want fewer interruptions and less pollution; regulators want evidence-based accountability; boards want resilient and efficient operations; the climate demands adaptation, not aspiration.

At the same time, the **capability itself has evolved.** The modern GIS platform is no longer a back office tool for cartography. It is a cloud-enabled, integrated decision environment that draws from live sensors, field mobility, hydraulic models, satellite layers, and enterprise systems, and elevating that data into a shared operational reality. In practical terms, that means a single picture of the network that everyone trusts, from the control room and customer call centre to field teams to the board, so actions align and value compounds.

> *These demands are place-based, time-bound, and system-interdependent, which are exactly the questions geospatial is built to answer.*

And there is **national momentum**. PR24's investment programme and outcome-focused scrutiny, near real-time storm overflow requirements, NUAR's single view of underground assets, and statutory DWMP guidance all point in one direction: greater openness, stronger evidence chains, and faster, measurable improvement underpinned by authoritative location data.



The implication is clear. Geospatial capability has moved from "nice to have" to non negotiable

for leadership teams who intend to outperform through AMP8 and into AMP9.

The sector today: *progress made, value still to unlock*

Across the UK, water and sewerage companies have consolidated fragmented mapping into enterprise platforms, extended access to field teams, and integrated geospatial data with core systems. This base, where it's in place, has improved day-to-day incident management, asset planning, customer communications, and regulatory reporting.

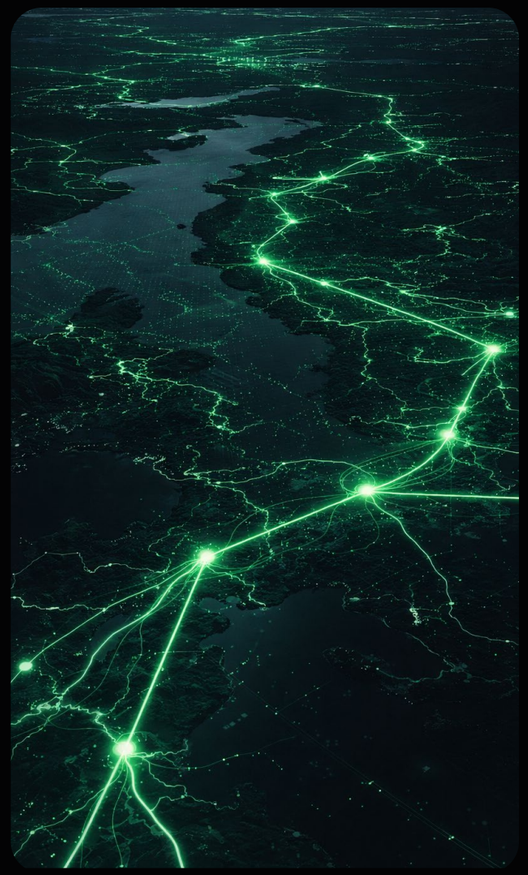
Yet **maturity varies.** Some organisations are still wrestling with inconsistent datasets and siloed workflows, limiting confidence in analysis and hampering adoption. Others have modern platforms but haven't embedded new behaviours or operating rhythms, leaving value on the table.

> *The gap will widen as Digital Twins and AI-assisted operations move from pilots to business-as-usual; those with strong geospatial foundations will layer intelligence quickly, those without will struggle to participate.*

The opportunity is to turn today's advances into an e**nterprise decision capability** that threads together operational telemetry, environmental context, customer impacts, and investment choices into faster, more confident decisions.

From transparency to orchestration: where the sector is heading

If AMP8 is about investment, transparency, and operational discipline, AMP9 will be about geospatial orchestration where decisions are made faster, simulated first, and communicated openly.



> *AMP9 is where geospatial becomes the engine of faster, simulation-led decision making.*

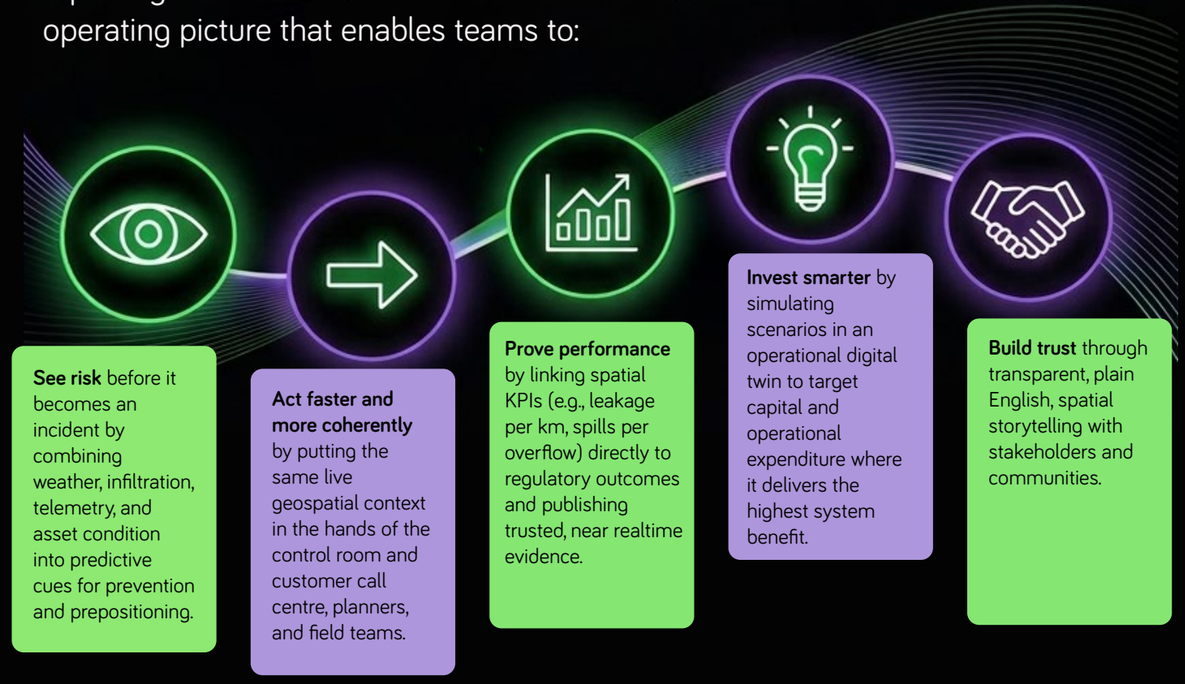
The building blocks already exist: NUAR, Utility Network models, DWMP guidance, open interfaces, and an ever-maturing Digital Twin practice. The challenge is aligning governance, procurement, and skills so the sector can reap the benefits.

Expect Digital Twins to become business-as-usual in operations; storm overflow monitoring and publication to remain near real-time; cross-sector data exchange to increase; and spatial KPIs to feature more prominently in both internal performance management and public reporting. As the climate continues to test networks, resilience will hinge on how well leaders can combine **systemic insight** (catchment, social, environmental, and infrastructure interdependencies) with **local execution**. Geospatial is the coordination language for that complexity.

Geospatial is the coordination language for the increasing operational complexity faced by WASCs in AMP8-9.

What "great" looks like: the geospatial operating picture

In a leading water utility, geospatial capability functions as a **nervous system:** sensing, understanding, and orchestrating in space and time. It connects SCADA, work management, incident response, environmental monitoring, and regulatory reporting into a live model of the network and catchment. The result is a shared operating picture that enables teams to:



See risk before it becomes an incident by combining weather, infiltration, telemetry, and asset condition into predictive cues for prevention and prepositioning.

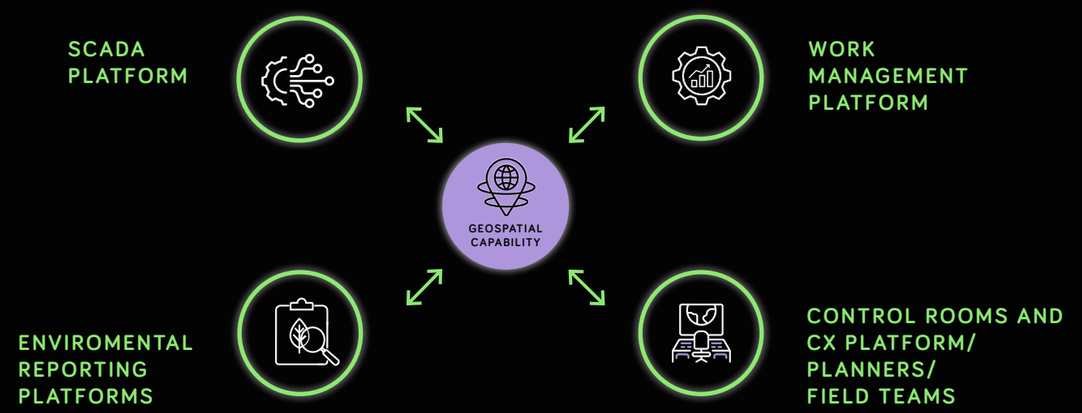
Act faster and more coherently by putting the same live geospatial context in the hands of the control room and customer call centre, planners, and field teams.

Prove performance by linking spatial KPIs (e.g., leakage per km, spills per overflow) directly to regulatory outcomes and publishing trusted, near realtime evidence.

Invest smarter by simulating scenarios in an operational digital twin to target capital and operational expenditure where it delivers the highest system benefit.

Build trust through transparent, plain English, spatial storytelling with stakeholders and communities.

This is not about one vendor or one tool. It's about establishing Geospatial as the common, authoritative frame within a system-of-systems, so information flows, decisions compound, and accountability improves across the enterprise and extended ecosystem.



A maturity journey expressed in leadership terms

Technical roadmaps often obscure the leadership choices that accelerate value. Below is a simplified maturity lens that re-frames the journey in terms of business outcomes and operating rhythms rather than protocols and data models. It aligns with the industry direction of travel, regardless of platform choice.

FOUNDATION: ONE SOURCE OF SPATIAL TRUTH

Enterprise geospatial integrated with core systems; field access and updates in place; data governance established; cyber posture aligned with other mission-critical platforms.
Outcome: A reliable, joined-up picture that underpins decisions everywhere.

INTEGRATION: FROM DATA TO DECISIONS

Seamless data flows between geospatial, OT/IT, and analytics; clearer ownership of standards; spatial KPIs linked to regulatory outcomes.
Outcome: Faster decisions, fewer reworks, stronger evidence chains.

SCENARIO PLANNING: MODELLING

Twins move from pilots to platforms to support "what if?" and "what next?" in daily planning and incident play-books.
Outcome: Capital and operational choices are stress-tested before they are executed.

LIVE OPERATIONS: REAL-TIME ORCHESTRATION

Near real-time telemetry and events visible on shared maps; alerting aligned to thresholds; response is coordinated and evidence-rich.
Outcome: Shorter incident duration, higher first-time-fix, better customer outcomes.

AUTONOMOUS ASSISTANCE: SAFE, EXPLAINABLE AUTOMATION

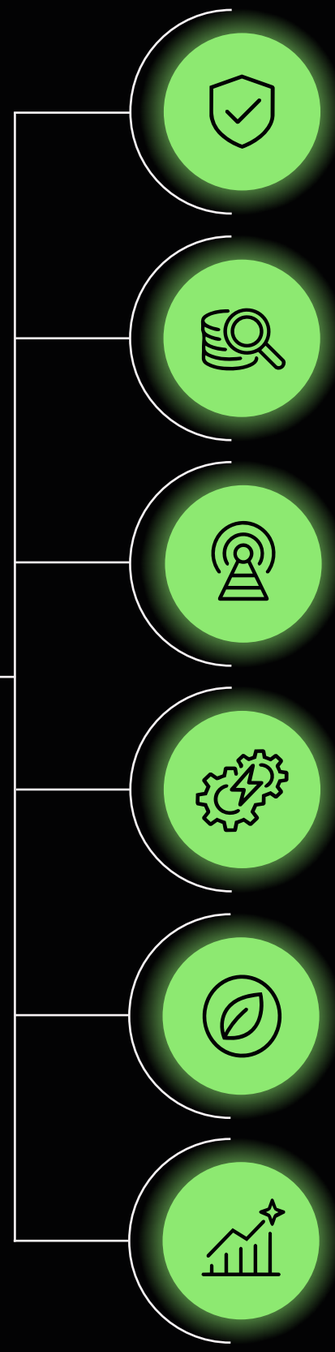
AI-assisted recommendations are simulated in the Twin, approved by humans, and then executed with full traceability.
Outcome: Decision cycles compress from days to minutes; human oversight remains central.

PREDICTIVE OPERATIONS: STAYING AHEAD OF RISK

Predictive cues (from weather, vegetation, pressure/flow, condition) inform proactive work; field teams focus where it matters most.
Outcome: Reduced bursts, spills, and service interruptions; improved ODI position.

This journey applies across legacy GIS platforms, open-source, or hybrid stacks, the point is the operating model you enable, not only the technology you install. **Strategic value is unlocked on the journey**; moving up the maturity curve isn't a tech upgrade; it's a business model shift that creates value across customers, operations, finance, and reputation.

Strategic value outcomes



REGULATORY CONFIDENCE & ODI PERFORMANCE:

Faster, more accurate evidence; fewer and shorter interruptions; more credible investment cases grounded in a shared spatial reality.

CAPITAL DISCIPLINE:

System-level scenario testing that defers or avoids unnecessary build, focusing spend where it shifts outcomes most.

INCIDENT EXCELLENCE:

Better detection, isolation, and restoration; coordinated response across control rooms and field; public reporting that builds trust.

DEVELOPER SERVICES EFFICIENCY:

Real-time capacity insight, faster feasibility, and clearer customer communication.

NET ZERO DELIVERY:

Spatial optimisation of renewables siting and nature-based solutions at catchment scale.

OPTIONAL UNREGULATED REVENUE:

For companies that reach higher maturity, there is potential to monetise expertise through advisory services, digital platform services, and data-enabled offerings.

The benefits case

Geospatial capability is not simply a better way to see the network; it is a better way to run it. When treated as a mission-critical operating system, geospatial turns disparate data into coordinated action by compressing decision cycles, improving regulatory outcomes, and reducing total cost to serve.

The prize is practical and near-term: fewer incidents, faster restoration, stronger evidence, and more disciplined investment, all of which compound into ODI out-performance and greater public trust. The benefits case is an operating case: **see sooner, act earlier, and prove better.** Geospatial delivers this by putting the same, authoritative spatial context in the hands of the board, the control room and field teams, so decisions connect, outcomes improve, and value compounds across AMP8 and into AMP9. The high-level benefits case can be set out thus:

SELECT CHALLENGES - AMP8	POTENTIAL OPPORTUNITIES WITH GIS	POTENTIAL BENEFITS
Leakage performance - PR24 targets up to 15% reduction	Satellite-GIS integration enables active leak detections at DMA level before surface evidence appears. Further, with Smart meter event data included this can be more impactful.	• ODI - Over performance and associated rewards • Reduced cost to serve • OpEx reduction - Reduced leak detection efforts, reduced unnecessary excavations, and faster repair scheduling. • Informed asset investment decisions • Enhanced reputation
Storm overflow spill counts at unacceptably high levels per EA	EDM signals overlaid on network topology, rainfall radar, and catchment sensitivity data will enable proactive spill monitoring and control.	
Sewer flooding - property-level ODI exposure	Real-time sewer level telemetry mapped against properties, flood modelling, weather data enables predictive monitoring and interventions.	
Burst mains - supply interruption ODI penalties	Predictive burst risk models combining pipe age, material, soil type, frost depth, and maintenance history identify the highest-risk sections for proactive interventions.	• ODI - Over performance and associated rewards • Accurate regulatory reporting • Achieve financial spend commitments • CapEx reduction • Informed asset investment decisions • Enhanced reputation
Capital programme delivery - PR24 spatial commitments	GIS-integrated programme management of large capital programmes with location, cost, and time for real-time tracking and prioritisation.	

Two viable paths through AMP8/9

Every water company starts from a different place. In practice, leaders converge on one of two strategies, on the way to the same destination:
a scalable, interoperable geospatial backbone that supports real-time, AI-assisted decision-making.

Path A: Legacy transformation

EVOLUTION WITHOUT DISRUPTION

This approach modernises from today's estate, nursing critical operations while tackling the underlying issues that erode trust such as data quality, schema inconsistencies, and brittle integrations. The emphasis is on **phased migration** (by asset class or geography), stabilising the platform, and building adoption across teams. Value appears early and compounds as behaviours settle and integration matures.

WHEN TO CHOOSE IT:

Business continuity risk is high; domain complexity is deeply encoded in current systems; and you need fast time-to-value via incremental wins.

Path B: Future-facing acceleration

DESIGN FOR THE ORGANISATION YOU'LL WANT AT THE END OF AMP 9

This approach works from a cleaner slate, designing new geospatial architecture, governance, and operating rhythms with AMP time-scales in mind. Interoperability, security, and flexibility are designed upfront, guided by the future operating model rather than the past. It requires rigorous planning and a clear change narrative but can leapfrog constraints and align to a five-year strategic horizon.

WHEN TO CHOOSE IT:

Technical debt and licensing constraints dominate; or you want to align a TOM redesign to AMP boundaries and exploit modern capabilities (cloud-native, event-driven, zero-trust) from day one.

Whichever path you take, the key is sequencing: anchor to outcomes, build learning loops, and pace delivery to sustain adoption and value.

Building blocks that enable scale (without the jargon)

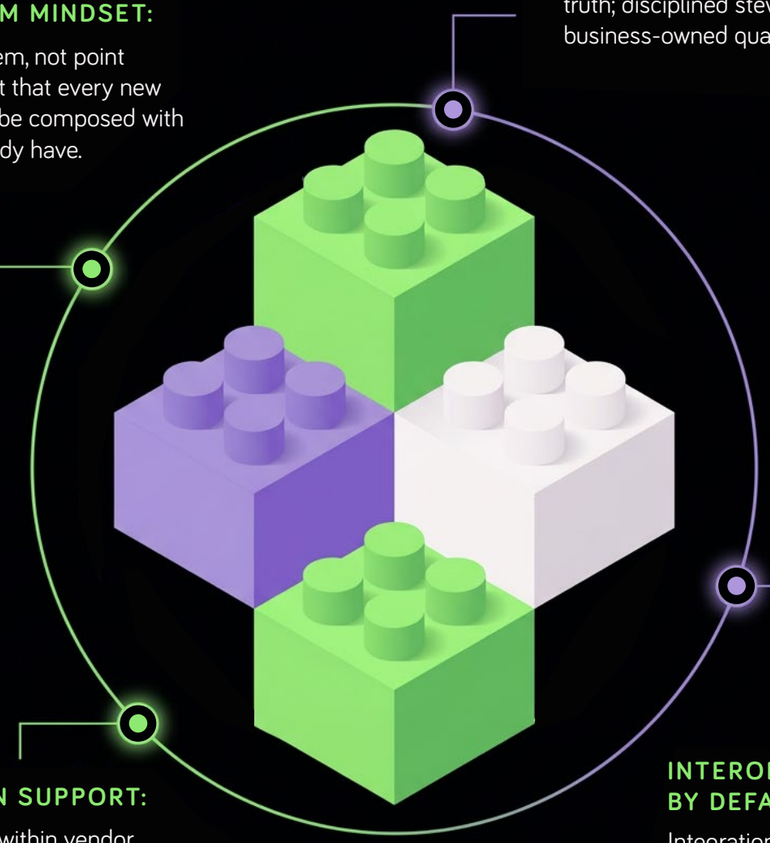
Leaders don't need to wade into protocol debates to set direction; they **do** need to insist on a few enabling characteristics that future-proof investment and invite innovation:

A PLATFORM MINDSET:

Think ecosystem, not point solutions; insist that every new capability can be composed with what you already have.

AUTHORITATIVE DATA:

One mastered, governed spatial truth; disciplined stewardship; and business-owned quality metrics.



SECURITY IN SUPPORT:

Platforms kept within vendor support windows, with cyber controls aligned to their growing role in operations.

INTEROPERABILITY BY DEFAULT:

Integrations that are robust and reusable; clear standards and patterns so data and decisions flow between geospatial, OT/IT, analytics, and reporting.

Keep the technical vocabulary in service of these strategic tests. If a technology choice doesn't improve data authority, interoperability, security, or platform leverage, it likely won't move your outcomes.

Leading through change: the people side

Transformation success will be determined by **adoption, ownership, and culture,** not just by code. The sector faces a skills challenge: the future requires hybrid talent that blends geospatial literacy, data/AI awareness, domain expertise, and strategic thinking. The remedy is cross-functional teams, targeted up-skilling, and a clear change narrative tied to customer and regulatory outcomes.

> *Transformation succeeds through people, not platforms. Adoption, ownership, and executive sponsorship are what turn ambition into outcomes.*

Above all, **sponsorship matters.** Executive sponsorship is the single biggest predictor of success because it confers decision rights, protects scope, and keeps the mission focused on business outcomes. Sponsors role-model the behaviours, align incentives, and help teams move from pilot-itis to production value.

A practical blueprint for AMP8–AMP9

By 2030, leading water only companies/water and sewerage companies will run a geospatially-enabled operating model: near real-time sensing and events; simulation before action; clear line of sight from board-level KPIs to field activity; transparent reporting that builds trust. The winners will be the organisations that make standards non-negotiable, treat GIS as an enterprise platform, and bring AI to the edge responsibly - with human oversight and explainability.

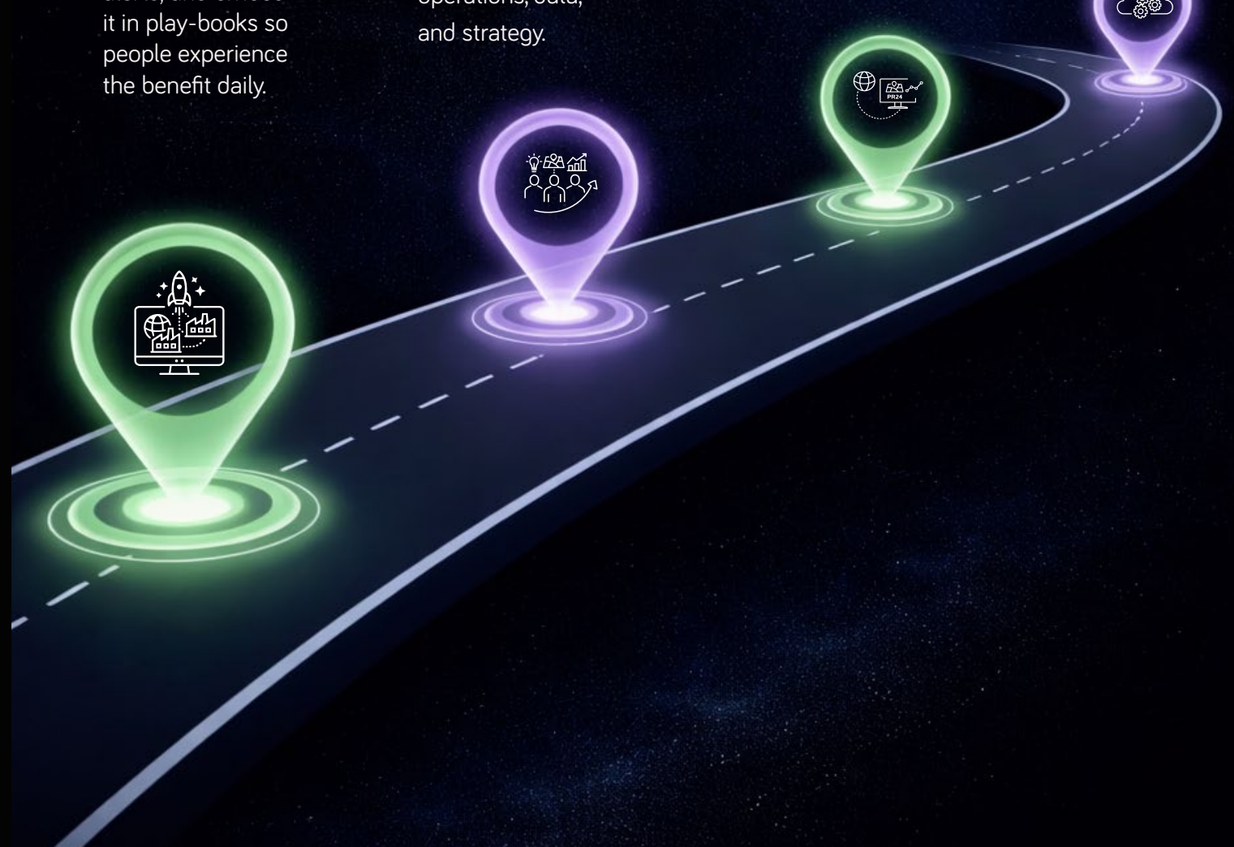
To get there:

LAUNCH THE FIRST OPERATIONAL DIGITAL TWIN:
focused on incident-prone hot spots (e.g., spills and bursts). Connect it to the control room; automate threshold alerts; and embed it in play-books so people experience the benefit daily.

INVEST IN WORKFORCE CAPABILITY:
targeted upskilling and recruitment for hybrid roles; partnerships with sector forums to spread good practice; and a clear career path for geospatial leaders who can bridge operations, data, and strategy.

EMBED GEOSPATIAL METRICS IN EXECUTIVE PERFORMANCE:
so PR24 outcomes are visible, spatial, and actionable.

ADOPT A PLATFORM MINDSET:
build reusable integrations; avoid one-off fixes; prioritise the patterns that scale.



Risk management and guardrails

Like any mission-critical change, geospatial modernisation demands clear guardrails.

DATA TRUST:
Inconsistent schemas, topology errors, and missing associations create operational uncertainty. Leaders must make data integrity non-negotiable, measured, owned, and continually improved.

INTEGRATION FOCUS:
Your network doesn't live in one system; neither can your analytics. Build for resilient integrations with SAP, SCADA, and analytics platforms so geospatial does not become a new silo.

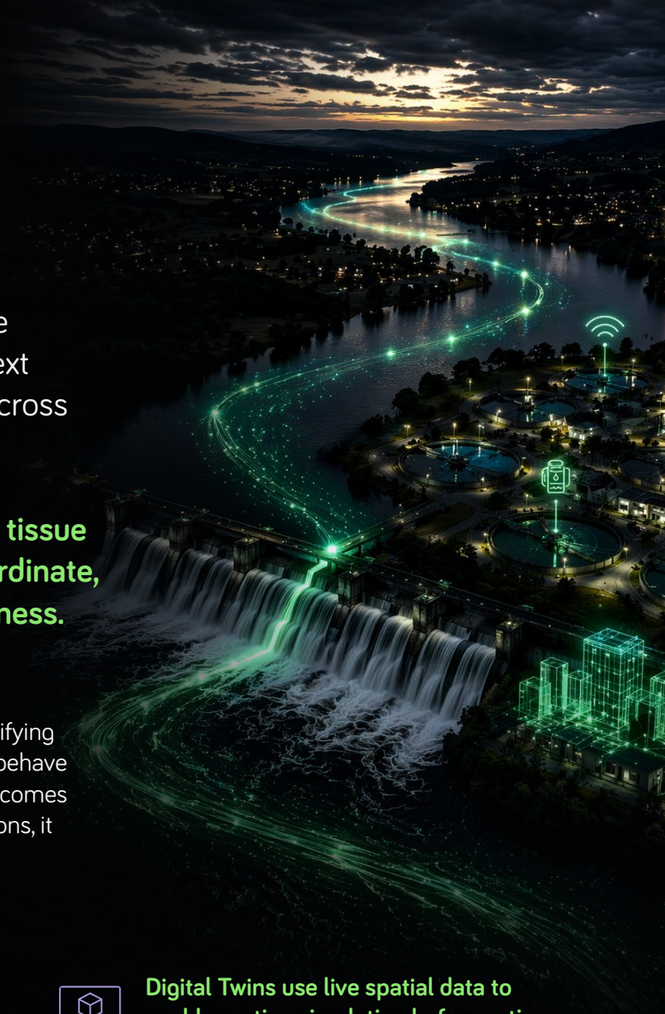
TOTAL COST CLARITY:
Budget not just for licenses but for migration, change, skills, and operating rhythms. Measure returns in operational outcomes, not only project milestones.

CYBER & DIGITAL RISK:
As geospatial joins the operational control loop, uplift your cyber posture, keep platforms in support, and ensure explainability for any AI-assisted decision paths.

ENTERPRISE ARCHITECTURE DISCIPLINE:
Anchor the roadmap in business outcomes and the future operating model. Ask, "How does this help us operate the network we want to run in three to five years?"

AI WITH INTENT:
Make AI an embedded accelerant inside processes rather than a parade of pilots. Tie use cases to measurable outcomes and retain human oversight, especially as recommendations get closer to the control loop.

What comes next: unlocking interoperability



Once organisations have aligned their geospatial capability and embedded the operating rhythms set out earlier, the next horizon emerges: true interoperability across **geospatial, IoT, OT, and Digital Twins.**

Geospatial evolves into the connective tissue through which data flows, systems coordinate, and decisions compound across a business.

Water companies possess strong sensing, telemetry, models, and operational systems, but often lack a unifying spatial framework that allows these components to behave as a coherent system. When geospatial capability becomes authoritative, integrated, and trusted across all functions, it forms the environment through which:

IoT data is interpreted in context, converting raw sensor output into operational foresight.

OT systems operate with greater intelligence, informed by spatial risk, consequence, and sensitivity.

Digital Twins use live spatial data to enable routine simulation before action.

Analytics and AI rely on consistent spatial foundations, improving explainability, governance, and organisational trust.

This is not simply an evolution of technology; it represents a shift in how water companies operate their networks in real time. Interoperability becomes an operating principle rather than a technical aspiration, increasing value with every integration, improvement in data authority, and new event stream connected to the spatial core.

In practice, geospatial increasingly serves as a dynamic layer, supporting incident response, capital allocation, environmental performance, asset intelligence, and customer outcomes. Leaders must focus on roles, governance, and design patterns that keep systems open, adaptable, and future-proof.

This whitepaper establishes the foundation. Future papers will explore enterprise-scale architectures, integration patterns, and operating models that connect GIS, IoT, OT, and Digital Twins while remaining resilient, explainable, and ready for the AI-enabled future.

The opportunity ahead is significant. With a mature geospatial foundation in place, the next leap is a more intelligent, interoperable, and adaptive utility, capable of making faster and more confident decisions every day.

Closing thoughts

This is a leadership moment. The sector already has many of the building blocks, what's needed now is the decision to elevate geospatial from a capable tool to the enterprise decision engine. Appoint the senior sponsor, stand up the cross-functional council, set the KPIs that link directly to PR24 outcomes, and publish the roadmap this quarter. Then move deliberately, transparently, and with the confidence that comes from a single, shared operating picture.

The prize is significant: fewer incidents, faster restoration, stronger regulatory confidence, lower cost to serve, and a resilient, trusted service for customers and communities. The real risk is not overreaching, it is inaction while the operating context moves on. The future will not be decided by who has the most data; it will be decided by who can make their network think, and who can turn that intelligence into action, day after day. What changes in how leaders lead? If you take away four thoughts about how leadership should move thinking in the next twelve months, it is the following four points:

FROM PROJECTS TO PRODUCTS:

Treat geospatial capabilities as enduring products with roadmaps, owners, and customers (operators, field teams, analysts) not as one-off projects.

FROM MAPS TO MISSIONS:

Start every investment with the outcome (e.g., reduce spill duration) and work back to the minimum viable data, integration, and operating changes required.

FROM PILOTS TO PLAYBOOKS:

Codify proven patterns such as incident playbooks, standard integrations, data quality routines and scale them.

FROM REPORTING TO OPERATING:

Make near realtime spatial data part of the daily rhythm as part of operational teams' morning reviews, incident stand-ups, and weekly performance huddles.

Lee Powell

GIS LEAD

A senior geospatial leader with nearly 20 years' experience delivering enterprise GIS and large-scale digital transformation across defence, government, and critical infrastructure.

lee.powell@nxzen.com

David Butcher

CLIENT PARTNER

A strategic advisor with 25+ years' experience in the UK energy and water sectors, leading major transformation programmes and shaping industry direction in partnership with a range of utility networks organisations..

david.butcher@nxzen.com

Easwar Parameswaran

BUSINESS SOLUTION LEAD

A programme and transformation leader with over 38 years' experience in the water and wastewater sector, delivering complex capital programmes, digital strategies, business transformation, and operational efficiencies for regulated utilities.

easwar.p@nxzen.com

nxzen

www.nxzen.com