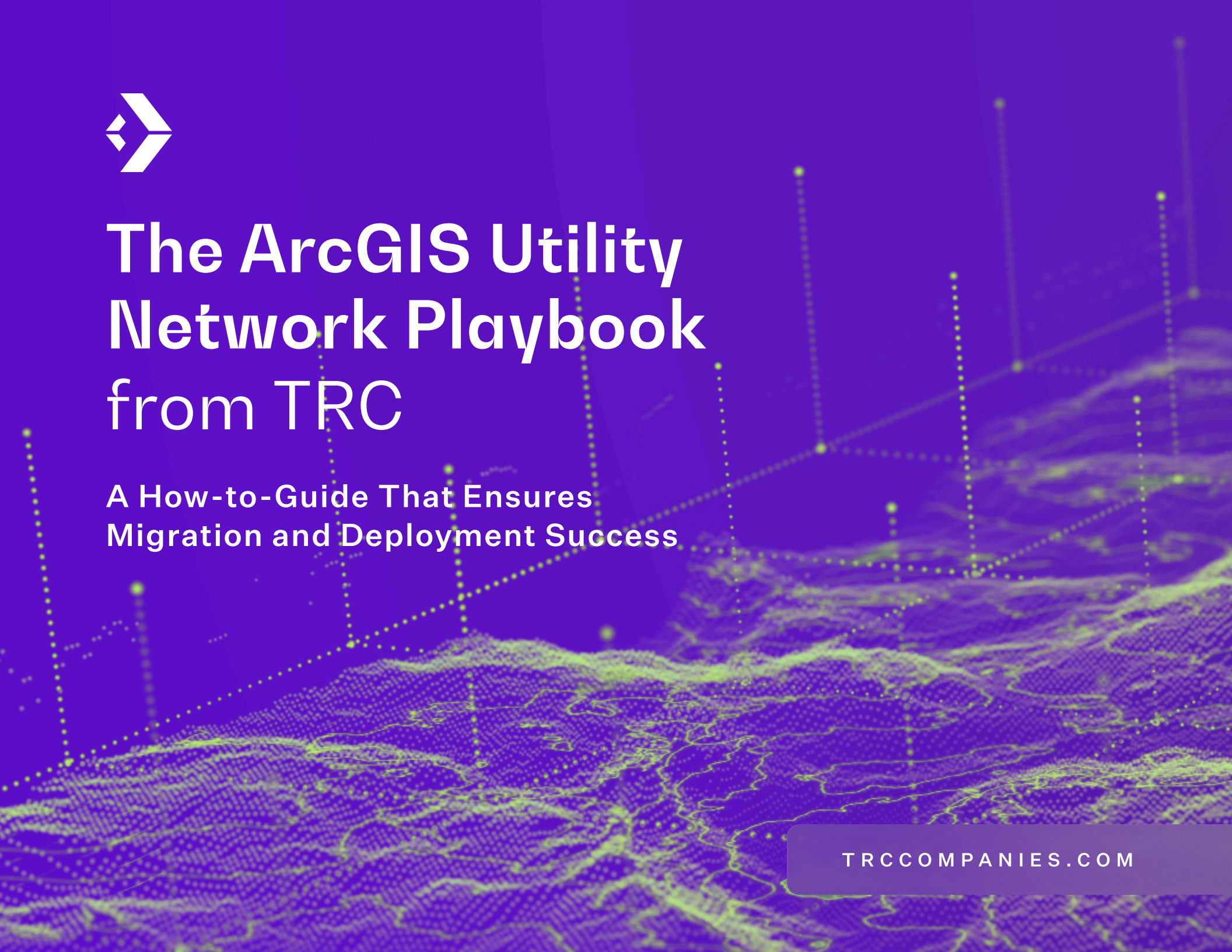

The ArcGIS Utility Network Playbook from TRC

A How-to-Guide That Ensures Migration and Deployment Success

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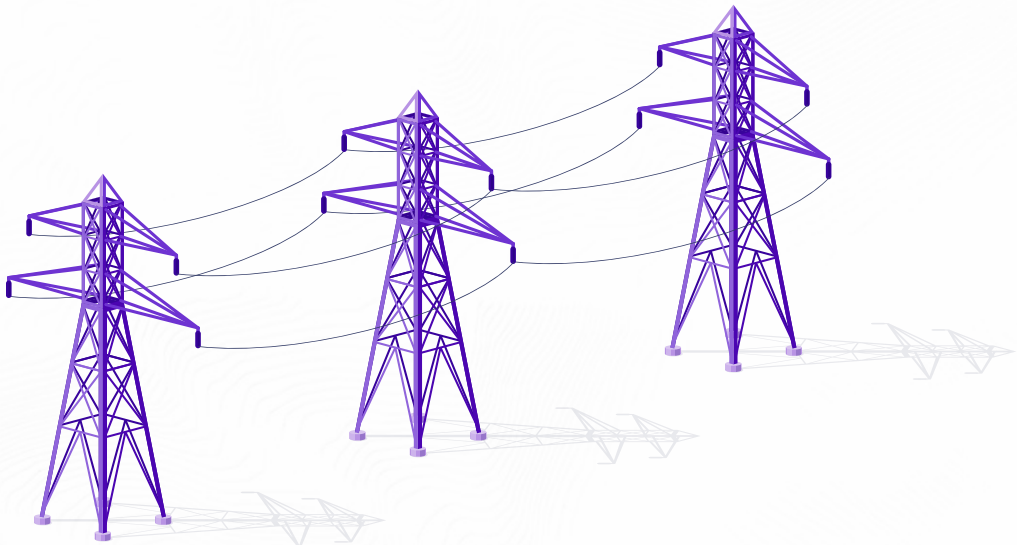
Introduction



Migrating to Esri's ArcGIS Utility Network (UN) is a quantum leap into digital transformation. Utilities harness the very latest modern mapping capabilities to modernize their asset management, streamline operations and fully leverage location analytics and data visualization.

This playbook synthesizes best practices from successful implementations across the utility sector, offering a structured and practical guide that ensures your migration is strategic, technically robust and organizationally aligned. Whether you are an IT leader or a line-of-business executive, this resource is designed to help you navigate the complexities of the migration process with confidence, maximizing return on investment while minimizing disruption to your operations.

Implementing the UN does more than modernize your geospatial capabilities. It transforms how your organization manages, analyzes and leverages geospatial and related tabular data. High-powered visualization and analysis become essential tools for daily decision making.

The UN model introduces advanced features, including true connectivity, integrated tracing and support for digital twins, all delivered through a modern, service-based architecture that enables real-time updates from both office and field environments. The benefits are clear: enhanced asset management, improved regulatory compliance, reduced operational downtime and the ability to make faster, data-driven decisions and communicate using maps as a common language.

This playbook will guide you through every phase of migration, from initial planning and stakeholder alignment to data readiness, model configuration, migration execution, change management and post-migration optimization. Each section provides actionable steps, expert insights and recommended tools to help you execute a successful migration and realize the full potential of your new system. By following this guide, you will be equipped to deliver a seamless transition and position your utility for future growth and innovation.

The time to migrate is now. The end of support for legacy systems, such as the Geometric Network, means that utilities must act to ensure continuity, security and compliance. Beyond these necessities, migrating now empowers your organization with the capabilities needed to meet evolving customer expectations, regulatory requirements and operational challenges. This playbook provides an essential roadmap to modernize and transform your utility operations.

1. Planning & Stakeholder Alignment

Why It Matters

Careful planning and stakeholder alignment are essential when implementing the UN. By addressing data quality, migration strategies, infrastructure planning and workflow documentation upfront, utilities can prevent project schedule delays, potential costly errors and rework down the line.

Engaging stakeholders early builds buy-in, enables project champions and clarifies requirements. Additionally, it helps tailor the deployment to the organization's specific operational and business needs, resulting in smoother adoption and improved long-term outcomes. A structured, collaborative approach also enables iterative testing and feedback, which reduces risk and ensures the solution delivers maximum value across the utility.

Planning &
Stakeholder Alignment

What to Do

Begin by assessing the infrastructure, reviewing the IT landscape and securing executive buy-in. Highlight the benefits of migration, including enhanced asset management and improved compliance. Develop a clear business case, a stakeholder communication plan and engage core teams early to secure buy-in and ensure smooth adoption.

Perform infrastructure/integration assessment

- Review IT landscape (security, hosting platform, etc.) and future roadmap
- Examine the current state of the GIS data, as well as understanding the enterprise architecture, is paramount to effective implementation.

Secure executive buy-in and alignment

- Articulate the UN benefits:
  - Enhanced asset management
  - Advanced network analytics
  - Futureproofing for digital twins
- Highlight ROI drivers:
  - Reduced operational downtime
  - Improved regulatory compliance
  - Better customer service.

Develop the business case for ArcGIS Utility Network

- Consolidation opportunities
- Better and more accurate representation of assets
- Real tracing supported by a true connectivity model
- Out of the box support for compliance-related inspections

Identify and develop a communication plan for key stakeholders

- Engage core team members throughout the project from the beginning
- Regular delivery updates
  - Ensure client buy-in of the result
  - Minimize the impact of change by involving users

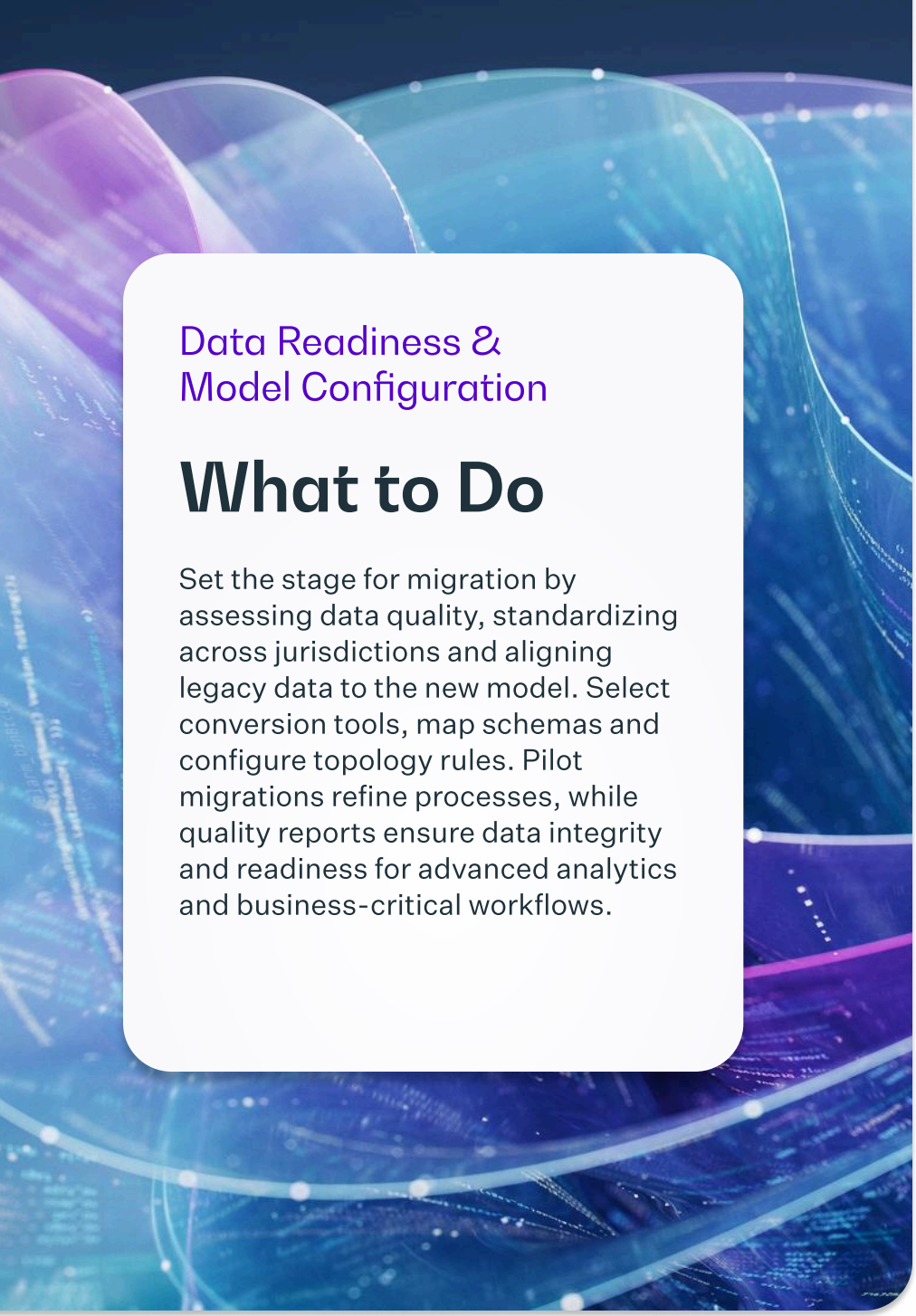
2. Data Readiness & Model Configuration

Why It Matters

Ensuring data readiness and carefully configuring the data model are paramount for a successful UN implementation. The UN uses an advanced data model that provides a bounty of benefits, and it enforces strict data quality and structure requirements that many legacy systems fail to meet.

However, it is crucial to understand early on how the source data will align with the new model, any potential data remediation needs, the impact on business workflows and the integration with other enterprise systems. Early data readiness and remediation help avoid migration delays and operational disruptions.

A tailored data model enables you to accurately represent your unique assets, workflows and regulatory requirements, thereby maximizing the value of the new system and supporting future scalability. Validation and configuration of the network topology and rules ensure data integrity and accuracy. It also enables advanced location-based analytics, providing confidence that the system will perform reliably from day one.



Data Readiness & Model Configuration

What to Do

Set the stage for migration by assessing data quality, standardizing across jurisdictions and aligning legacy data to the new model. Select conversion tools, map schemas and configure topology rules. Pilot migrations refine processes, while quality reports ensure data integrity and readiness for advanced analytics and business-critical workflows.

Data Quality Assessment

- Create alignment to the UN data model
- Standardize data across jurisdictions
- Identify remediation needs

Tool Selection

- Identify and implement conversion and reporting tools supporting automated migration and reporting
- Evaluate and select UN data maintenance tools (PRO, ArcFM, etc) that align with your organization's requirements

Schema Mapping

- Map legacy assets and attributes to landing spots in the UN data model.
- Focus on key attributes that impact business-critical operations (e.g., material, phase, lifecycle status, etc.).

Topology & Rule Configuration

- Configure connectivity and association rules that accomplish the level of data integrity needed at go-live and enhance from there
- Refine the rule base and add or adjust rules to improve data quality

Pilot Migrations (Iterative)

- Execute pilot data migrations on subsets early to identify key data remediation needs
- Adapt the model, conversion routines and mappings to refine the process and improve migration efficiency
- Evolve migration quality reports to document and assure asset counts equate between the legacy data and the target UN data instance

3. Migration Execution

Why It Matters

Effective migration execution transforms careful planning and data preparation into a fully functional enterprise UN deployment. It ensures that data integrity, network rules and integrations perform as intended in the new environment.

A structured and well-managed migration process minimizes operational disruptions, maximizes efficiencies in parallel efforts such as data remediation, reduces risk and enables utilities to deploy capabilities like advanced tracing and analytics. Proper execution also provides clear checkpoints for error detection and correction, laying a solid foundation for future enhancements and ongoing operational efficiency.

Migration Execution

What to Do

Execute your migration using a defined strategy, whether it's cutover, phased or parallel, to meet your exact needs. Employ automation for efficient iterative conversions and perform mock deployments to minimize downtime. Integrate and thoroughly test systems, prioritize error remediation and conduct data acceptance testing to ensure a seamless and reliable launch of the Utility Network.

Error Remediation

- Initiate data clean-up and fix activities during data assessment and pre-migration allowing additional time for automated and manual fixes
- Identify data clean-up conditions that can be automated to minimize manual efforts and improve data quality at release
- Focus remediation efforts on key aspects of your data needed to support UN functionality

Automated Fixes

- Apply automated fixes to reduce UN errors, improve data quality and improve analytical functionality.
- Select migration tools that have flexible data remediation capabilities to maximize the opportunity to fix any data issues pre-migration

Data Acceptance Testing

- Execute data acceptance independently of functional testing to ensure data quality and integrity
- Establish a data governance board for the UN data scheme, including attributes, domains and functional properties of the data model

Deployment Strategy

- Evaluate and define the best UN release strategy for your organization
- Tailor an appropriate pattern, whether cutover, phased release or parallel, to business needs
- Coordinate role-specific interfaces for analyzing, accessing and maintaining data

Iterative Conversions

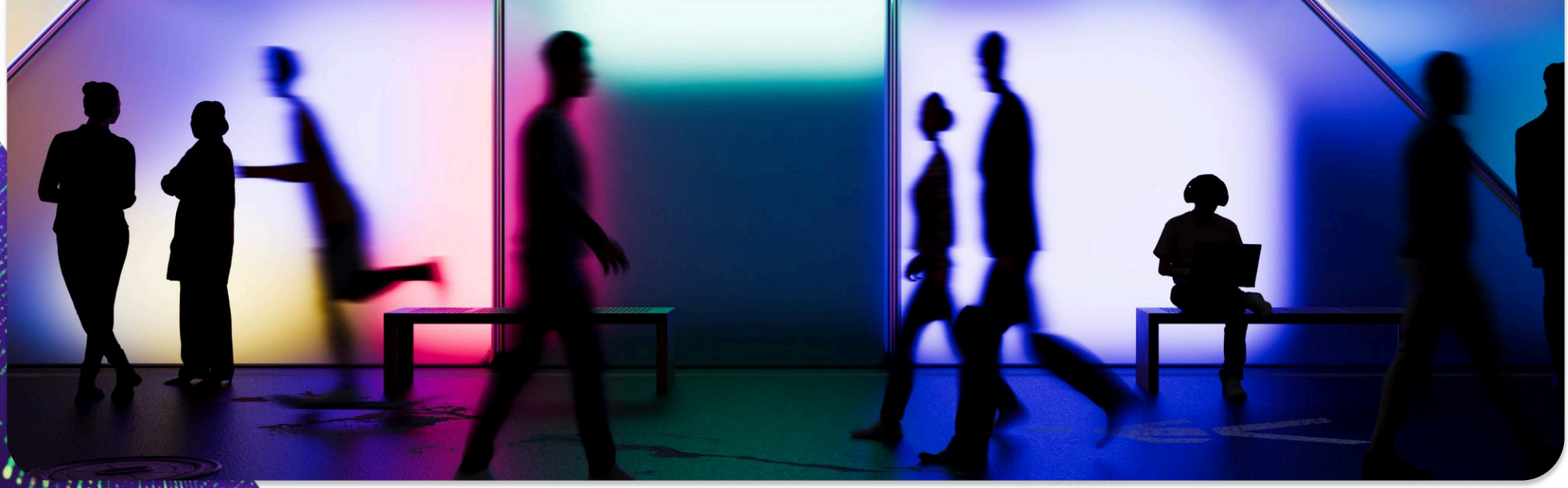
- Use proven automation to facilitate efficient and rapid iterative conversions, from pre-migration to release dress rehearsals
- Identify and resolve more data conditions and configuration settings with each iterative conversion

Mock Deployments/Dress Rehearsals

- Plan for several mock deployments to refine execution steps, minimize downtime and improve delivery reliability
- Implement and test DevOps tools during mock migrations to automate the deployment of data, services, web maps, applications and pro projects

System Integration Testing

- Incorporate integration testing as a key component of functional testing
- Prioritize active integrations during mock migration and functional testing cycles to ensure a seamless UN release



4. Change Management & Training

Why It Matters

Change management and training ensure that your workforce can quickly adapt to new workflows, technologies and business processes. It minimizes disruption and downtime while maximizing business benefits. By actively engaging stakeholders and providing targeted, role-specific training, you build confidence and competence across teams, which is crucial for maintaining data integrity and operational efficiency during the transition to the new system.

A structured approach includes continuous support and communication throughout the project. This open communication and collaboration approach supports adoption and ongoing innovation as the organization evolves with the UN.

Change Management & Training

What to Do

Educate and engage end users early with video demos and self-paced learning. Optimize workflows beyond parity and maintain clear stakeholder communication. Identify change champions, develop a tailored training approach and continuously support users to minimize disruption and maximize the value of your new Utility Network platform.

End-user engagement from the start of the project

- End users learn better through exposure over time
- Encourage the use of video demonstrations and self-paced learning for your end users

Workflow modernization and optimization

- Identify opportunities to improve or optimize business workflows as part of your UN migration

Stakeholder communication structure

- Establish a communication plan that extends to all key stakeholders from the outset of the project
- Identify and communicate key aspects of the migration to the UN that will change protocols, configurations or components for each related system or application

Identifying change champions

- Select participants inside the organization from various departments to help socialize learning, benefits, timelines, etc., as well as gather user input
- Developing a training approach
  - Customize instruction and exercise by department and user profile

5. Post-Migration & Data Integrity Optimization

Why It Matters

Post-migration and data integrity optimization ensure the UN delivers lasting value. It secures advanced network functionality, including intelligent snapping, network tracing and reliable topology validation, which are essential for operational efficiency and informed decision-making.

Defining governance and best practices for data stewardship, along with ongoing data quality control, ensures the accuracy and reliability of your network data moving forward. These best practices also support scalable performance and seamless integration with other enterprise systems.

Post-Migration & Data Integrity Optimization

What to Do

After the migration, ensure continued success by following some simple steps. Monitor system performance, capture baseline metrics and refine rules for ongoing improvement. Implement automated data integrity checks and QA/QC reporting. Continuously optimize associations, tracing and infrastructure settings. Doing so ensures accuracy, reliability and long-term operational efficiency.

Performance Monitoring and Improvement

- Capture baseline metrics and identify any bottlenecks in the system
- Adopt a pattern of continuous optimizations to realize incremental improvements
- Implement monitoring tools to capture consistent resource metrics and identify opportunities for performance optimizations

Continuous Improvement Activities

- Refine the rule base
- Enhance associations/tabular data
- Trace configurations
- Reporting
- Export settings
- Adjust underly infrastructure and associated settings as needed

Automated Data Integrity Attribute Rules

- QA/QC reports on the migration and measurable success

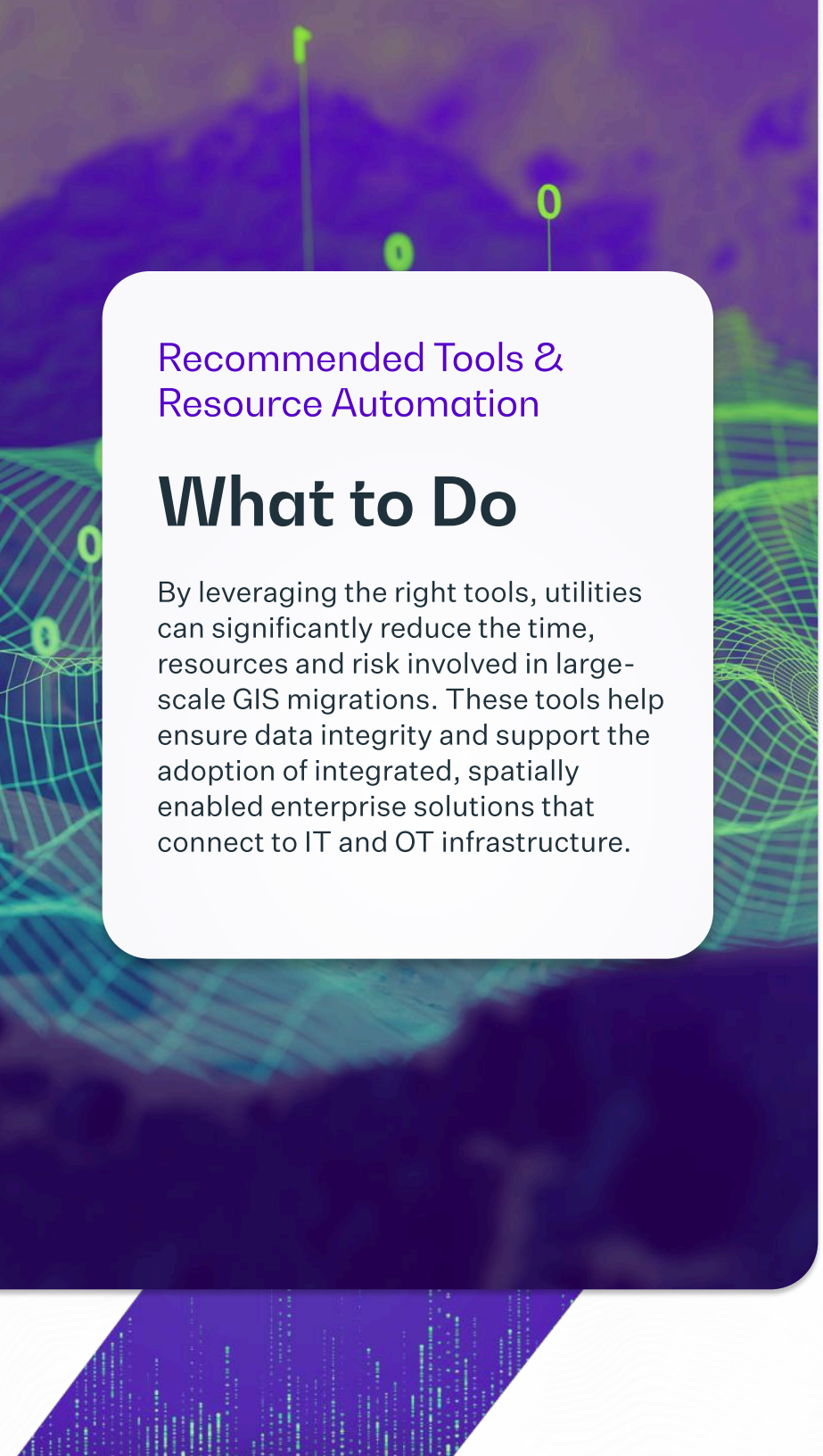
6. Recommended Tools & Resource Automation

Why It Matters

Having the right tools and resources automates and streamlines complex tasks such as data migration, model configuration and system integration. These tools reduce errors and accelerate deployment.

Purpose-built solutions like TRC's Carmen suite and Enterprise DevOps tools, as well as Utility Network Foundations, geoprocessing toolboxes and industry-specific templates, provide solutions to meet both technical and business requirements.

With robust tools and resources in place, your IT team can more effectively manage quality assurance, automate repetitive processes and adapt the system as your organization's needs evolve.



Recommended Tools & Resource Automation

What to Do

By leveraging the right tools, utilities can significantly reduce the time, resources and risk involved in large-scale GIS migrations. These tools help ensure data integrity and support the adoption of integrated, spatially enabled enterprise solutions that connect to IT and OT infrastructure.

Carmen:

The Carmen solution from TRC is an in-house, advanced suite of configurable tools designed to streamline and accelerate enterprise-scale GIS data migrations, particularly for organizations transitioning to Esri software. Carmen, which stands for Configurable Advanced Rapid Migration Engine, enables the efficient migration of complex utility data from legacy systems into modern Esri-based platforms, handling tasks such as data transformation, association and container implementation.

TRC Enterprise Esri DevOps:

TRC Enterprise Esri DevOps automates repetitive deployment and delivery tasks, which reduces manual efforts during project execution and long-term maintenance. Automating ArcGIS enterprise content and infrastructure deployment is a game-changer for organizations implementing CI/CD pipelines and rapid delivery strategies. Our framework features a modular design and is built to integrate with industry-standard tools, including Terraform, Ansible and Azure DevOps. The goal is to enhance the operational efficiency, scalability and reliability of enterprise GIS solutions.

Reporting tool for data errors (Power BI/Tableau/Esri Dashboards):

Reporting tools such as Power BI, Tableau and Esri Dashboards detect, visualize and communicate errors within complex datasets. These tools integrate with GIS and other data sources to create interactive dashboards and reports, enabling users to quickly identify anomalies and quality issues. They support real-time monitoring, custom analytics and automated alerts to facilitate proactive data management and decision making.

Why TRC

At TRC, collaboration is at the core of our approach. We strive to develop a solution that our clients can take pride in, recognizing that their active involvement is a key factor in the project's success. Our team stands out as a geospatial implementation service provider due to its Esri Network Management Specialty and status as an Esri Platinum partner.

We have implemented the utility network for over 20 different utilities, including electric, gas, water and wastewater commodities. As a result, our staff possesses extensive experience delivering successful, self-sustaining projects. We are committed to transparency, communication and collaboration throughout every phase of deployment.

Our tested practitioners bring technical expertise, robust change management strategies and strong relationships with Esri and other technology providers. Deep GIS, IT and project implementation experience ensure seamless integration, tailored solutions and effective knowledge transfer for your IT organization. By leveraging advanced technologies, including AI, cloud-native architectures and mobile platforms, TRC helps utilities implement the UN as part of a larger modernization initiative.

We offer services that span the full project lifecycle, from planning to data consolidation, migration, and change management, among others. Our services are tailored to meet the specific needs of each customer, ensuring the right fit for their organization. To learn more about how TRC can help you maximize your UN investment, contact us today.

About TRC

TRC stands for adaptability. With direction setting perspectives and partnerships, our 8,000+ tested practitioners in advisory, consulting, construction, engineering and management services deliver unique resolutions that answer any built or natural imperative. By creating new pathways for the world to thrive, we help our clients adapt to change and achieve long-lasting results while solving the challenges of making the Earth a better place to live — community by community and project by project. TRC is ranked #17 on ENR's list of the Top 500 Design Firms, #5 for Power and #3 for Transmission & Distribution. Learn more at TRCcompanies.com and follow us on LinkedIn.

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