

# Revolutionizing Wireless Site Infrastructure Analysis and Management Through Technology Advancements

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## Network Construction & Maintenance



- Site analysis & design
- Construction
- Upgrades & modifications
- Maintenance

## Balancing Expenses vs Revenue



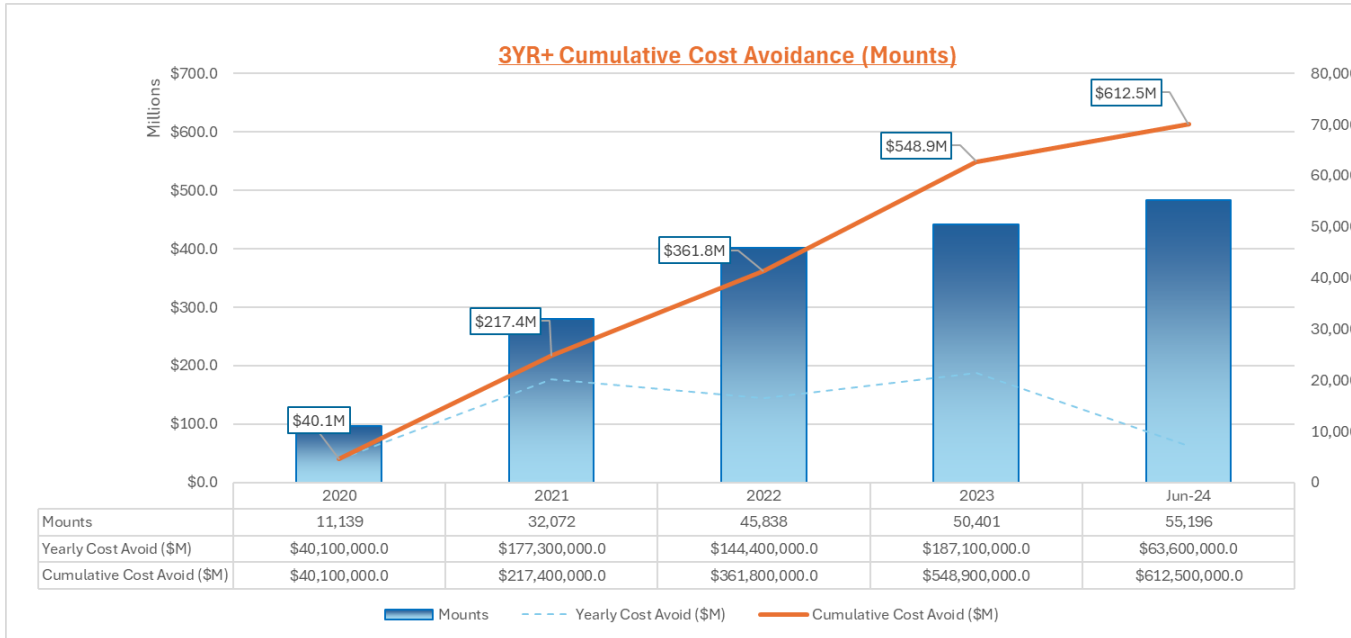
## Network Services & Capabilities



- Wireless connectivity
- Private networks
- 5G-Advanced technologies
- RAN & Core

# Pioneering Work with Tier 1 MNO Achieves \$612M in Savings

\$11K per site average cost savings - reuse of existing mount steel & reduced re-analysis fees



## Key Program Elements:

- Tier 1 MNO running national program on a single Congruex platform
- Standard process across 5 A&E firms reduced cycle-times and streamlined data capture and reporting
- Adoption of TIA-222-I industry standards, supported by best-in-industry subject matter experts at Congruex
- Use of Congruex data Lakehouse (>70,000 sites) to forecast failure rates

## Additional Savings Not Accounted For Include:

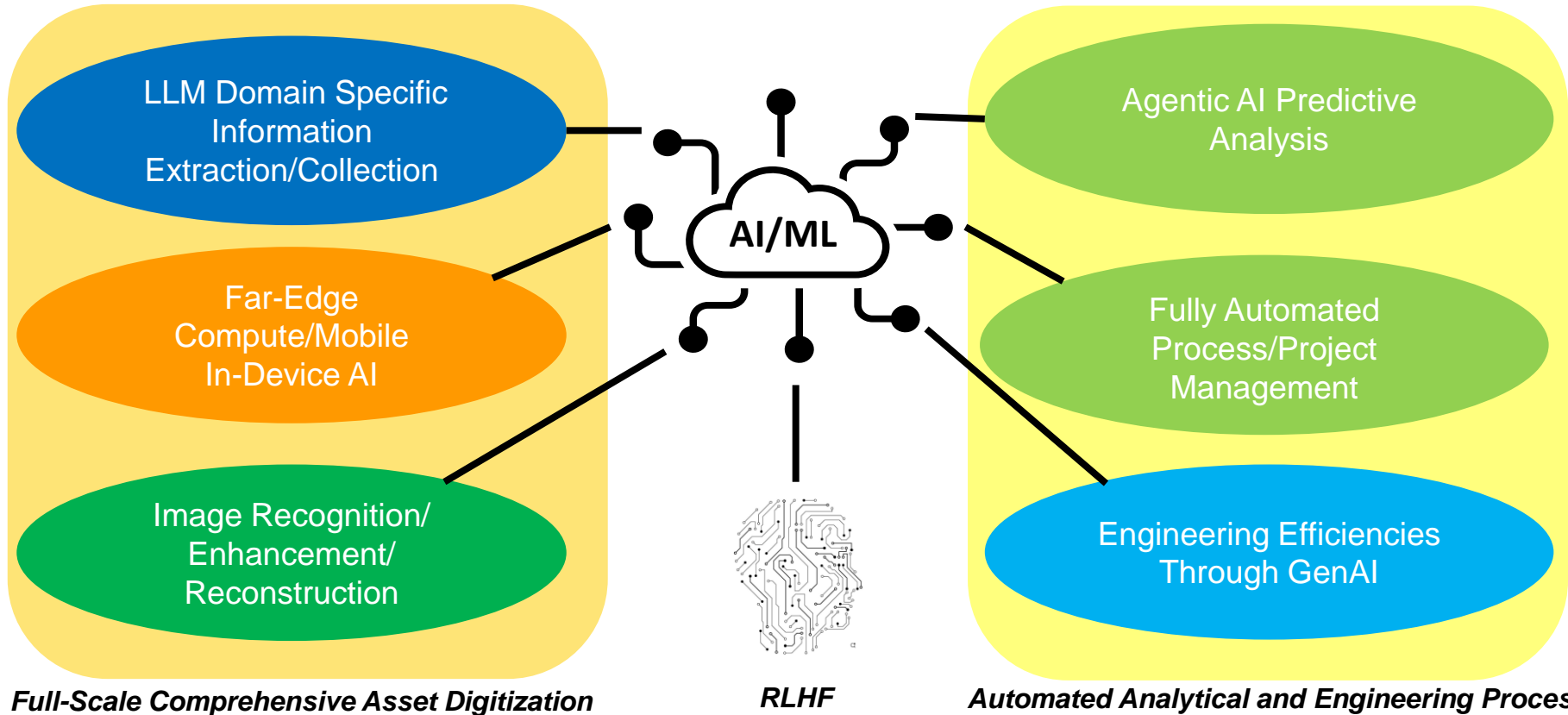
- ~71% reduced downtime by avoiding mount replacements
- ~66% fewer touchpoints required for each mount analysis due to reduction in re-mapping

- ✓ Fragmented industry
- ✓ Variety of business models
- ✓ Multitude of data collection systems, tools and methodologies
- ✓ Lack of adherence to consistent and proven standards
- ✓ Ripe for disruption and meaningful innovation



# AI Centric Approach to Wireless Infrastructure Analysis and Maintenance

The **42<sup>nd</sup>** GTI WORKSHOP



*Full-Scale Comprehensive Asset Digitization*

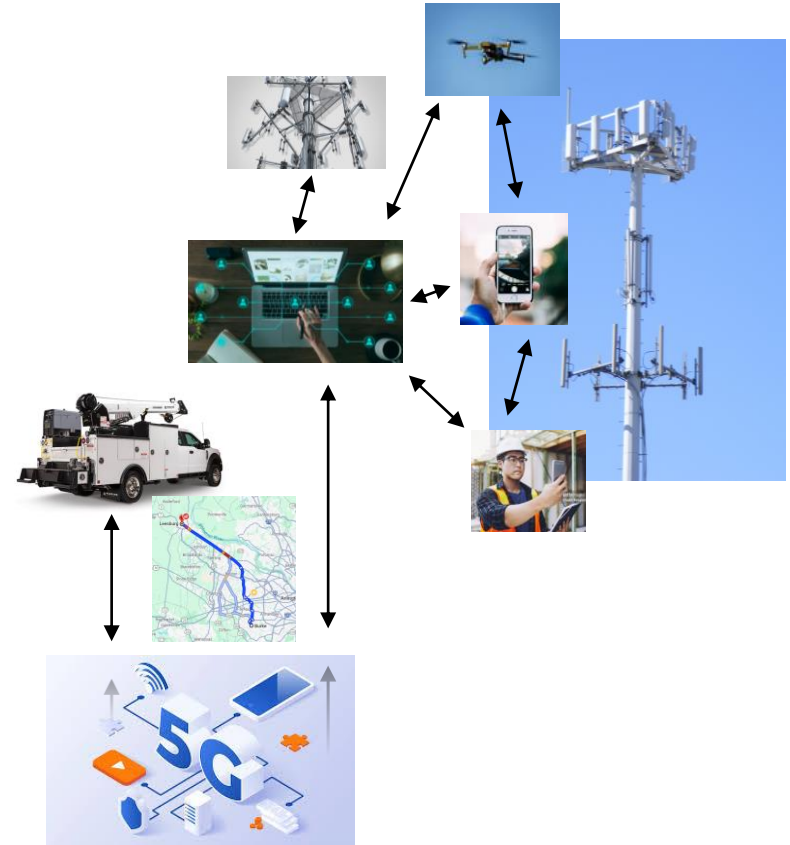
*RLHF*

*Automated Analytical and Engineering Process*

# Onsite Engineering Workforce Enhancement Through Hybrid Cloud/Edge Processing & On-Device AI/ML

The **42<sup>nd</sup>** GTI WORKSHOP

- Create reliable site IoT data collection and processing using an ad-hoc device mesh network
- Enable real-time automated decisions with intelligent on-site inspections, using multi-device data analysis without human input or cloud connectivity
- Enhance workforce safety and efficiency with on-device AI guidance
- Use AR for step-by-step on-site repair instructions
- Use of tonnage, time, and location defined 5G-Advanced network slicing feature to ensure minimal capacity impact on 5G network while ensuring timely and secure data transfer

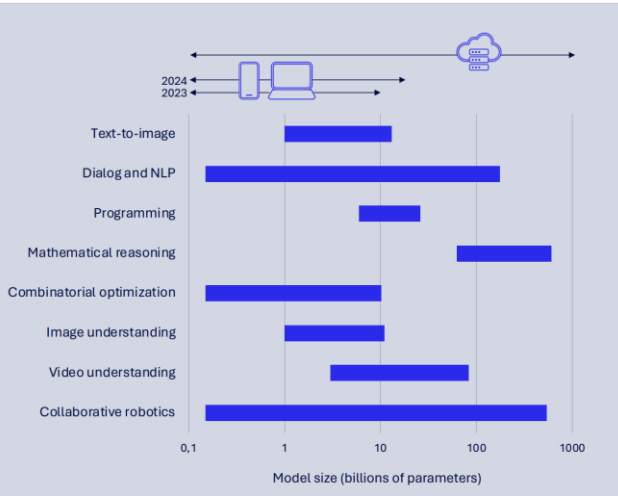


# The Power of On-Device AI: Low-Cost Cloud Free Remote Wireless Site Automation

## On-device AI can support a variety of Gen AI models

A broad number of Gen AI capabilities can run on device using models that range from **1 to 10 billion parameters**

We can run models with over **10 billion parameters on device today** and anticipate this growing substantially in the coming years



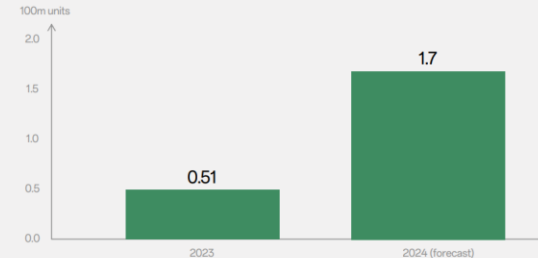
- Shipment of AI enabled smartphones is gaining significant market traction
- LLM AI inference execution on smartphones and other mobile devices is more than a reality

- Advancements in smartphone/laptop chipset processing are allowing AI models with more than 10-15B parameters to be trained on devices
- A powerful ecosystem (i.e. MSFT, QCOM, MKT, Apple, Samsung, etc.) is enabling a low-cost widespread on-device AI industry

## Shipments of next-gen AI smartphones forecasted by IDC (global market)

IDC forecasts 170 million next-gen AI smartphones to be shipped in 2024, representing almost 15% of the total smartphone market.

### IDC forecast of the next-gen AI smartphone market worldwide



Next-gen AI smartphones to be shipped worldwide in 2024

**170** million units

**15%**

of total smartphone market worldwide

\*Next-gen AI smartphones use SoCs capable of running on-device GenAI models more quickly and efficiently and have an NPU with at least 50 TOPS performance. Examples of on-device GenAI include Stable Diffusion and various large language models (LLMs). Read more on [DC AI Smartphones Definition](#)

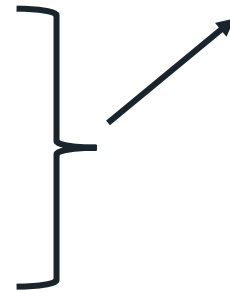
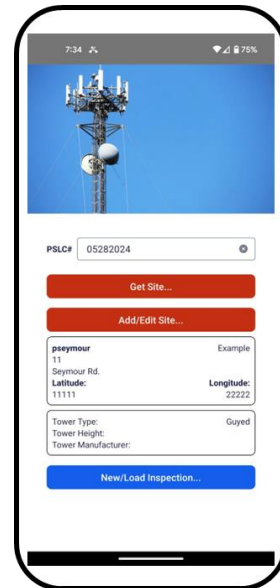
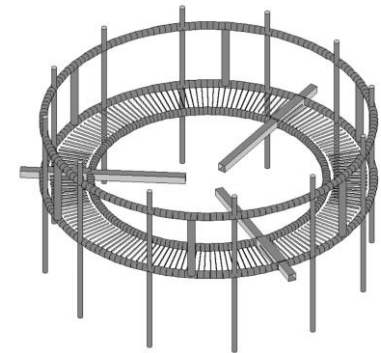
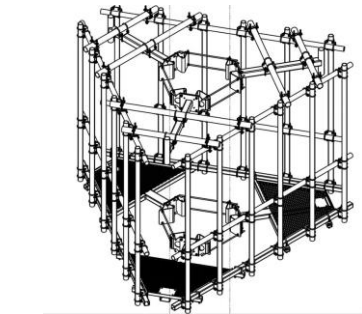
# Expanding Drone Functionality Through Supervised AI/ML Training

- Congruex's national engineering data set includes **16.7M images (10.4TB of data)**
- Data can be used to extend drone video functionality beyond basic site inspection (i.e. structural failure detection)

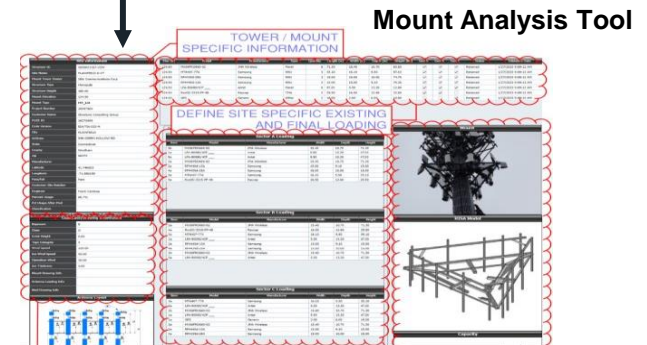


# Real-Time Automatic Mount Type Detection

- Congruex's national engineering data set includes **7M Mount Images**
- Real-time mount type detection based on supervised image recognition learning can shorten and improve accuracy of Mount Mapping process while enhancing/automating Mount Analysis efficiency

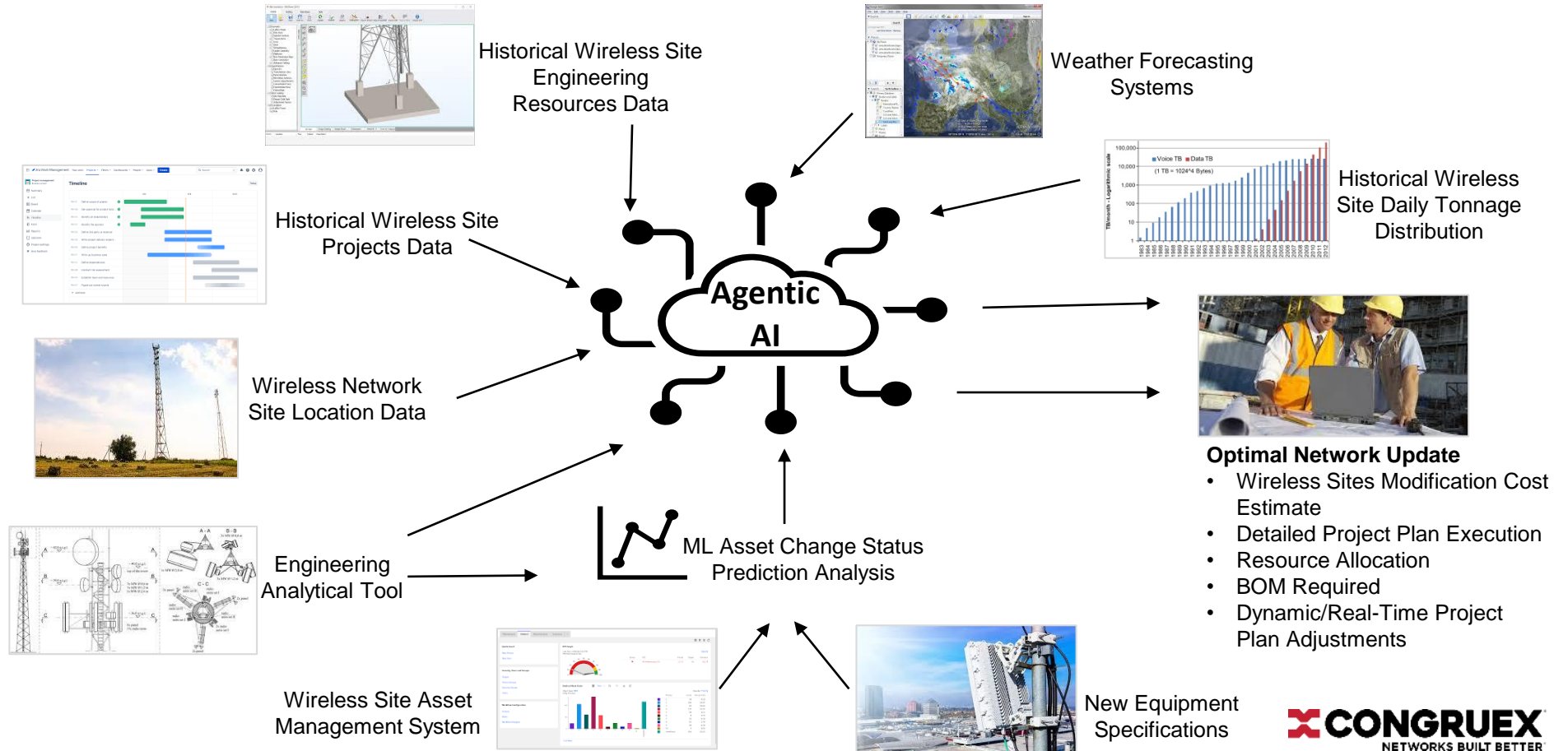


Matching Mount Data Template



Mount Analysis Tool

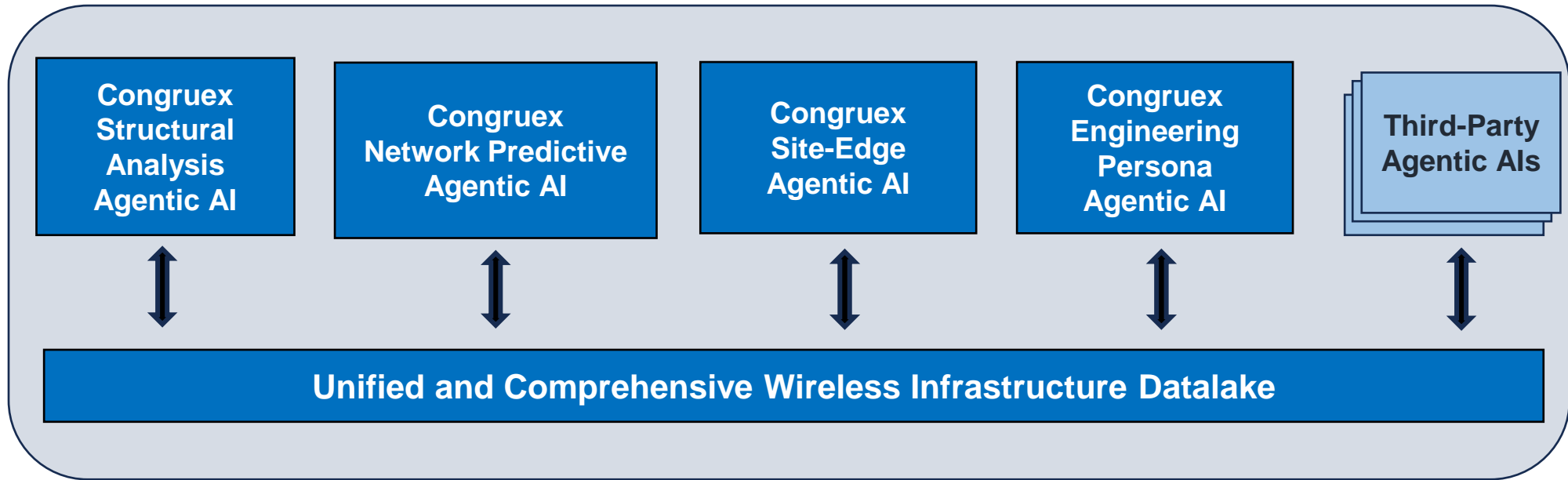
# Automated Large Scale Multi-Modal Network Predictive Analysis



# Fully Automated Wireless Infrastructure Agentic AI Platform

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Migrating to a fully automated Agentic AI-based solution enhanced  
through human reinforcement learning



# Conclusions

- Wireless site infrastructure is ripe for a major transformation based on recent AI/ML technological advancements in combination with 5G Advanced features
- Full and comprehensive wireless site asset digitization is foundational to any modernization effort
- Congruex is transforming the wireless infrastructure industry by leveraging advanced digitization, AI/ML-powered predictive analytics, and cloud-native technologies to achieve unmatched efficiency, innovation, and sustainable growth
- Come visit us at Hall 3, Meeting Room #3K1MR

*Thank you*