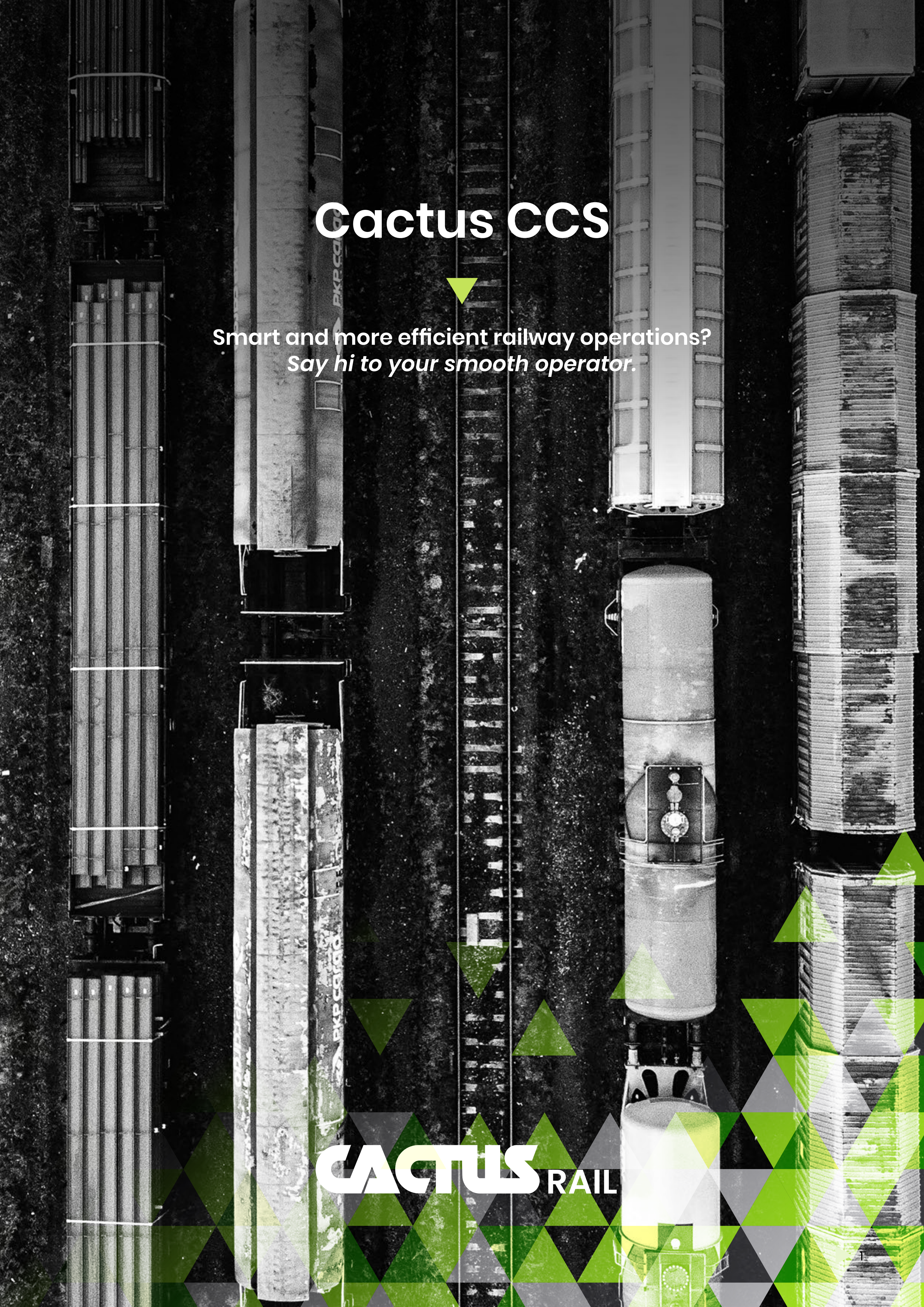
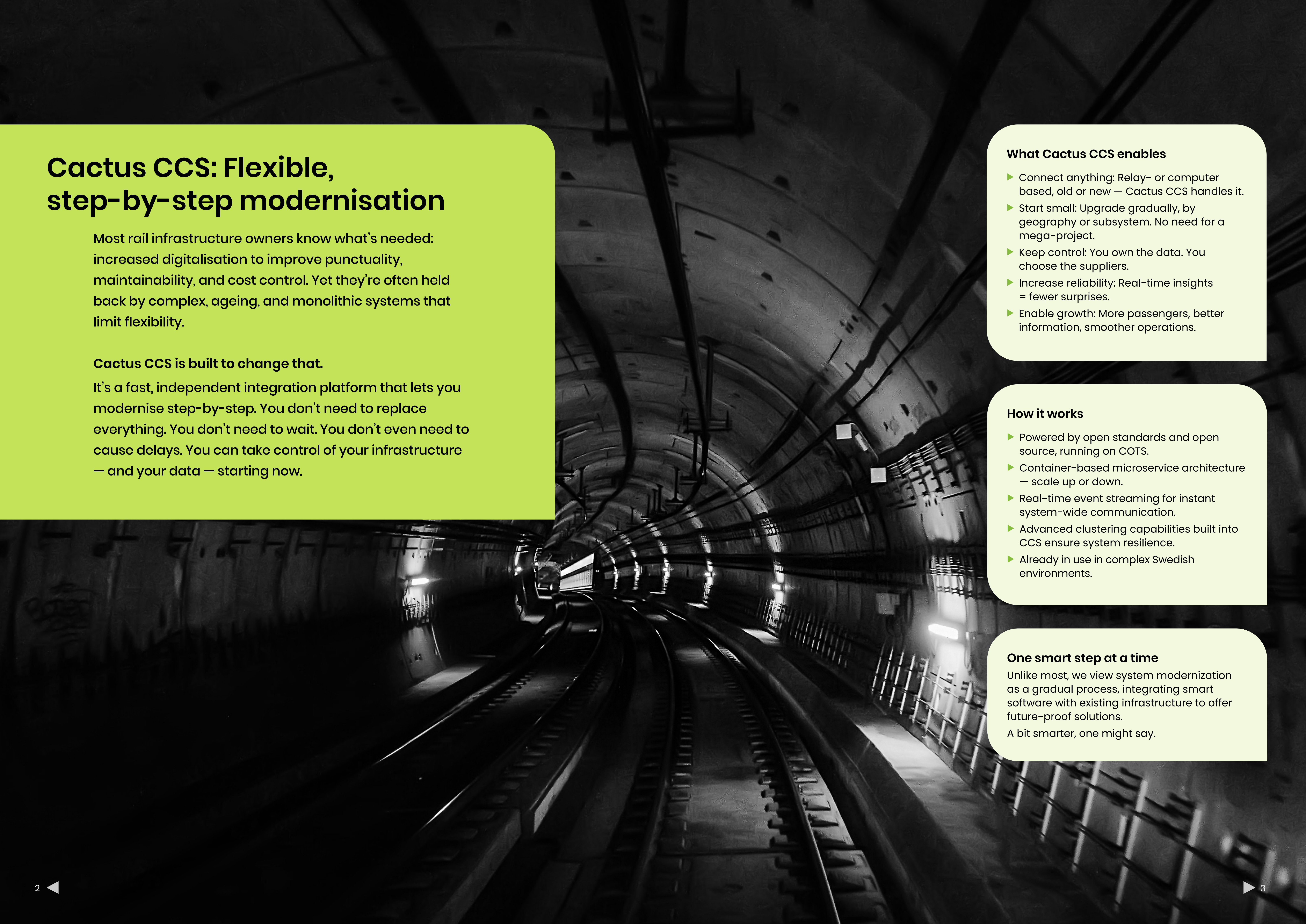


Cactus CCS

Smart and more efficient railway operations?
Say hi to your smooth operator.

CACTUS RAIL



Cactus CCS: Flexible, step-by-step modernisation

Most rail infrastructure owners know what's needed: increased digitalisation to improve punctuality, maintainability, and cost control. Yet they're often held back by complex, ageing, and monolithic systems that limit flexibility.

Cactus CCS is built to change that.

It's a fast, independent integration platform that lets you modernise step-by-step. You don't need to replace everything. You don't need to wait. You don't even need to cause delays. You can take control of your infrastructure — and your data — starting now.

What Cactus CCS enables

- Connect anything: Relay- or computer based, old or new — Cactus CCS handles it.
- Start small: Upgrade gradually, by geography or subsystem. No need for a mega-project.
- Keep control: You own the data. You choose the suppliers.
- Increase reliability: Real-time insights = fewer surprises.
- Enable growth: More passengers, better information, smoother operations.

How it works

- Powered by open standards and open source, running on COTS.
- Container-based microservice architecture — scale up or down.
- Real-time event streaming for instant system-wide communication.
- Advanced clustering capabilities built into CCS ensure system resilience.
- Already in use in complex Swedish environments.

One smart step at a time

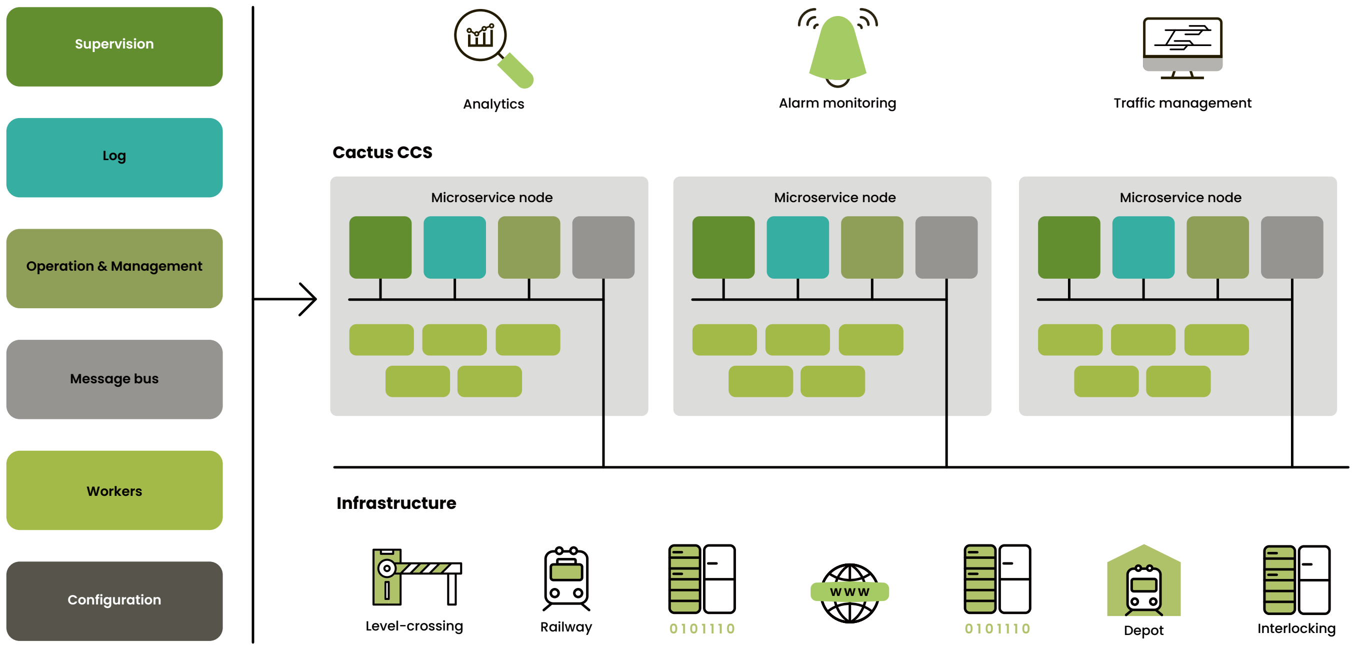
Unlike most, we view system modernization as a gradual process, integrating smart software with existing infrastructure to offer future-proof solutions.

A bit smarter, one might say.

Technical excellence

Cactus CCS is defined by its flexible architecture, real-time data integration, and strong cybersecurity. It supports seamless system interoperability, avoids vendor lock-in, and ensures data ownership and operational agility.

EN 50 128 compliant platform



Cactus CCS is built for high availability and resilience, with a modular microservice architecture that supports distributed deployment across physical servers and geographically separated data centres. It integrates seamlessly with legacy rail systems, IoT devices, and modern services — ensuring continuous operation in complex, mission-critical environments.

Unify, reuse, and modernise

Cactus CCS enables seamless integration across rail systems of any brand, age, or protocol — all through a unified communication layer. At the core is a global object model that provides a consistent, system-wide naming convention, independent of the equipment's type or manufacturer.

This abstraction not only simplifies operations today, but also ensures a smooth transition to future upgrades. As infrastructure is modernised, the object model is already prepared to accommodate new capabilities — without the need for reengineering.

Flexible architecture

Cactus CCS employs a robust microservices architecture, utilizing container technology and a high-performance event streaming platform to ensure highly reliable, real-time communication. This modularity supports scalability and allows independent updates, adapting smoothly to operational needs.

The platform can interface effectively with all types of signaling equipment and interlockings, irrespective of their brand, technology, or age — ranging from relay-based to modern computer-based systems.

Data ownership

Infrastructure owners maintain ownership and access to their operational data through Cactus CCS's unified data model. Cactus CCS also supports standardised descriptive models for railway data exchange, while remaining adaptable to alternative frameworks and standards.

Real-time data integration

Through dynamic middleware integration, CCS enables real-time, low-latency, and efficient data exchange across functions within the rail domain, including traffic management, maintenance, energy management, passenger information, and signalling. This integration improves responsiveness and supports faster decisions.

Cost and flexibility

Cactus CCS addresses vendor lock-in by enabling infrastructure owners to select the most suitable products for each functional area, such as TMS, maintenance solutions, and interlocking systems. The platform's open integration layer permits efficient product addition or substitution without extensive system reconfiguration.

Advanced cybersecurity

Cactus CCS prioritizes cybersecurity, ensuring protection and compliance with industry standards and best practices. The cybersecurity framework within Cactus CCS is professionally managed, providing infrastructure owners confidence in data integrity, availability, and confidentiality.

Compliance with rail standards

Cactus CCS meets key rail standards, ensuring safe, reliable integration with critical systems. Its proven performance and support for phased upgrades make it a future-ready, standards-aligned solution.

Proven deployments

The effectiveness of Cactus CCS has been demonstrated managing numerous interlocking systems and supporting multiple communication protocols. Advanced clustering capabilities built into Cactus CCS ensure system resilience, automatic failover, and continuous high availability across multiple data centres, even in demanding operational environments.

Strategic benefits

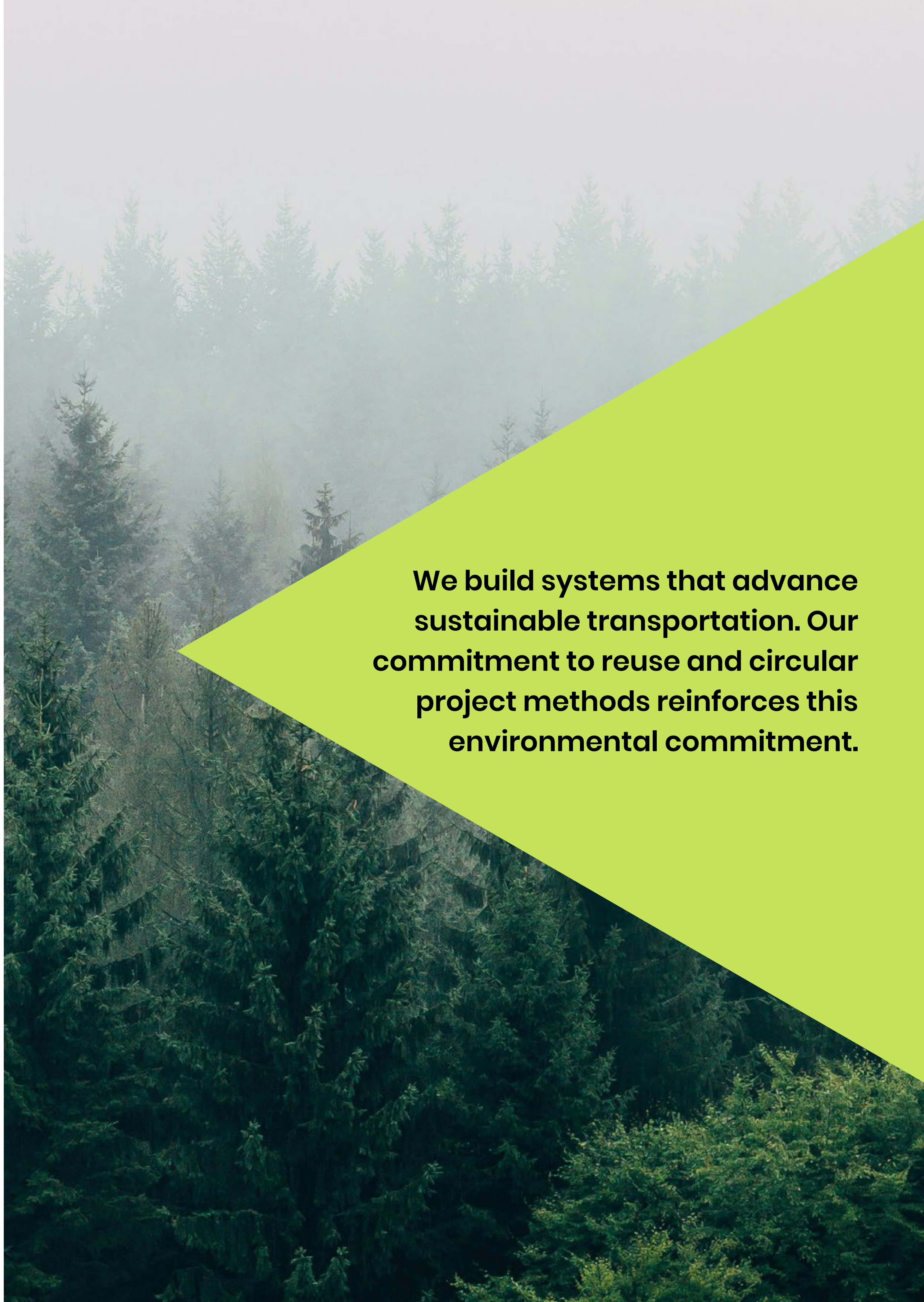
Cactus CCS supports a gradual approach to modernisation, allowing infrastructure owners to upgrade systems step by step — minimising disruptions and adapting to real-world constraints. Unlike monolithic solutions, Cactus CCS enables flexible, incremental improvements aligned with operational needs.

By implementing Cactus CCS, infrastructure owners regain strategic control, with the freedom to choose the best solutions for each function. The platform ensures future-ready operations through seamless integration of new technologies, direct data access, and advanced analytics — improving decision-making and asset management.

Cactus CCS ensures strategic control, robust compliance, and resilient operations.

Compliance and reliability by design

Cactus CCS is compliant with vital rail industry standards, including EN 50716:2023 (formerly EN 50128, SIL2), EN 50126 (RAMS), and aligns with the interface and integration principles of EN 50129. This ensures robust operational safety, availability, and maintainability when operating alongside safety-critical systems.



We build systems that advance sustainable transportation. Our commitment to reuse and circular project methods reinforces this environmental commitment.

Smartening up our railways

Are you an infrastructure owner? Is punctuality, comfort, cost-efficiency and sustainability important to you? Welcome aboard. Unlike most, we view system modernization as a gradual process, integrating smart software with existing infrastructure to offer future-proof solutions at a fraction of the cost.

A bit smarter, one might say.

cactusrail.se

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