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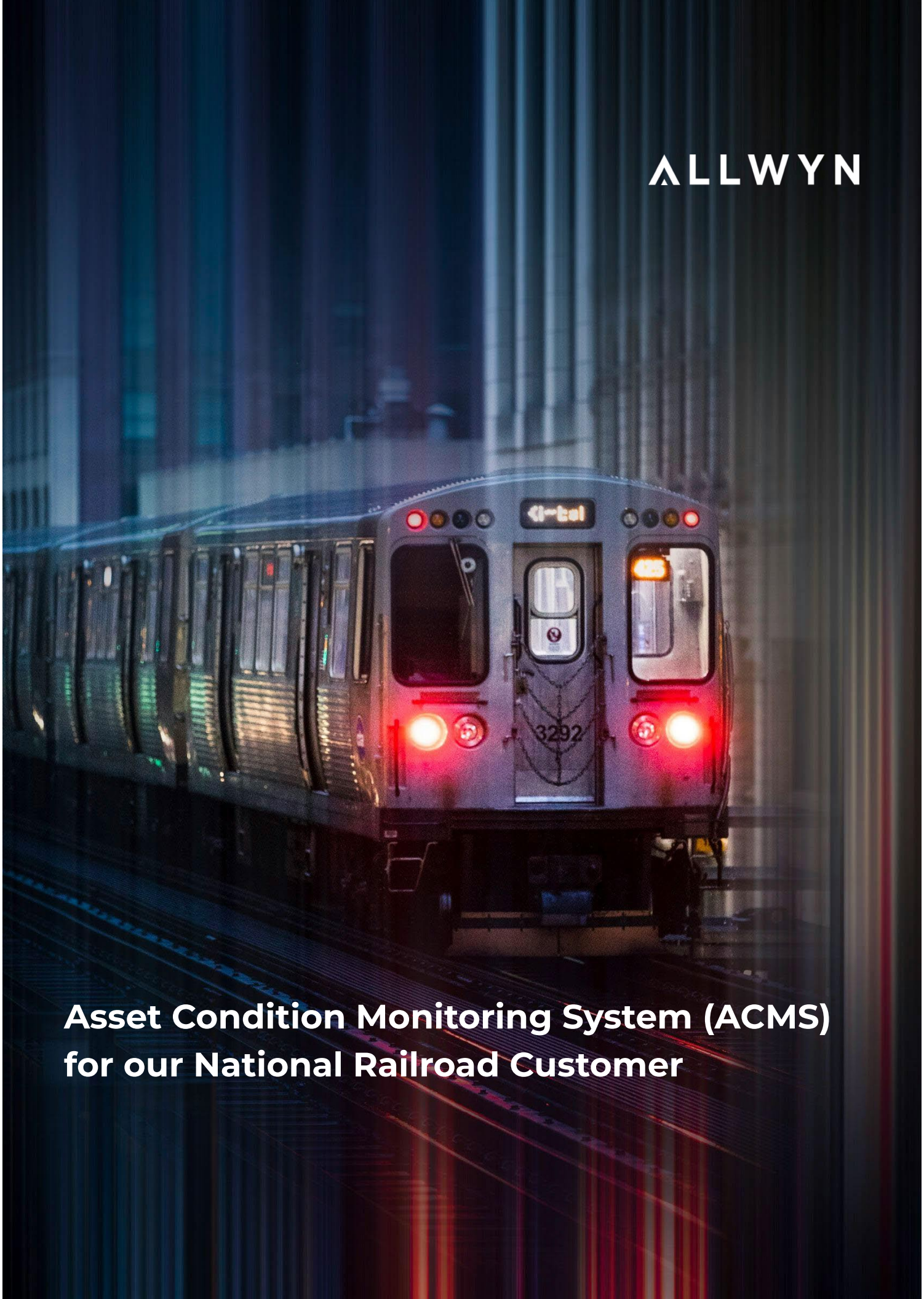


Asset Condition Monitoring System (ACMS) for our National Railroad Customer

Executive Summary

National Railroad Customer's Asset Condition Monitoring System (ACMS) is a transformative initiative that Team Allwyn designed and delivered to unify and automate the monitoring of rail asset health across its national network. The project integrates disparate wayside sensor data into a centralized, actionable unified data platform. Our solution enhances operational reliability, improves safety, and boosts efficiency. It facilitates timely decision-making and predictive maintenance, supporting national railroad customer's long-term vision of delivering high-quality, safe, and on-time passenger services.

Introduction:

Our National Railroad Customer operates a vast rail network supported by a diverse array of fixed and mobile assets. Historically, monitoring these assets have been fragmented across multiple systems, often requiring manual data collation and analysis. The ACMS project addresses these limitations by implementing a scalable, unified data management and analytics platform. Leveraging AWS for data storage and advanced analytics, ACMS brings transparency and automation to asset health monitoring.

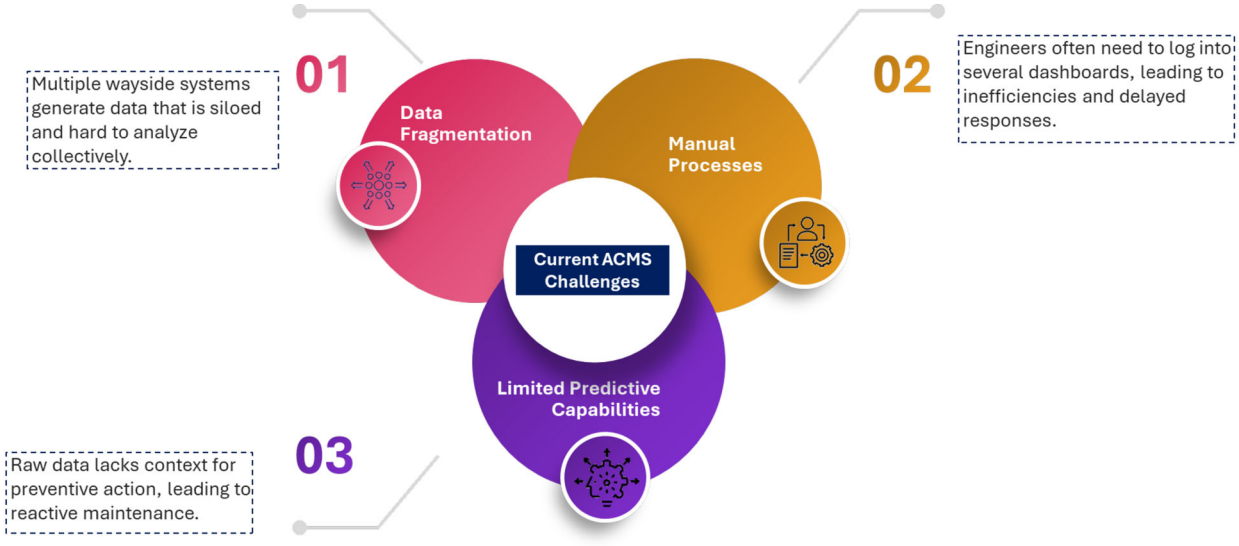
1. Current Challenges:

The National Railroad Customer faces several challenges in asset condition monitoring:

a) **Data Fragmentation**: Multiple wayside systems generate data that is siloed and hard to analyze collectively.

b) **Manual Processes:** Engineers often need to log into several dashboards, leading to inefficiencies and delayed responses.

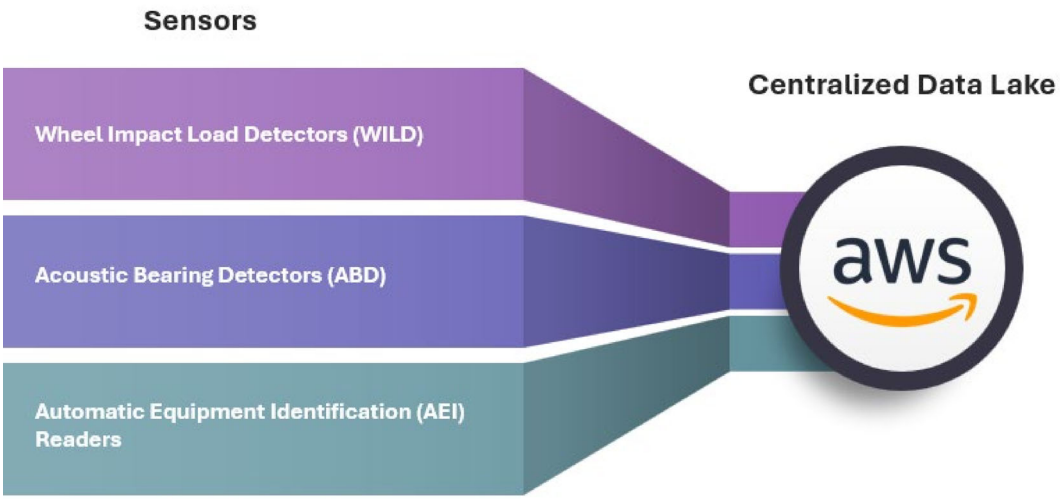
c) **Limited Predictive Capabilities:** Raw data lacks context for preventive action, leading to reactive maintenance.



2. Key Delivered Solutions:

Team Allwyn worked on the ACMS initiative and has achieved several critical milestones that lay the groundwork for a robust, scalable asset monitoring system.

One of the most significant accomplishments is the integration of data from various sensors—such as Wheel Impact Load Detectors (WILD), Acoustic Bearing Detectors (ABD), and Automatic Equipment Identification (AEI) readers—into a centralized AWS-based data lake. This unification streamlines access to real-time and historical data, eliminating the data fragmentation.



The data lake serves as the foundational layer for analytical applications, enabling consistent data processing, trend analysis, and advanced diagnostics. For instance, AEI detectors now provide real-time train consist data, while WILD data from both Salient and Railinc sources has been harmonized to offer a comprehensive view of wheel impact metrics. ABD data adds another dimension by capturing anomalies in bearing acoustics, allowing earlier detection of potential failures. This unified dataset supports a range of use cases, from operational dashboards to predictive maintenance models, and forms the basis for automation features like the generation of work orders and real-time alerting.

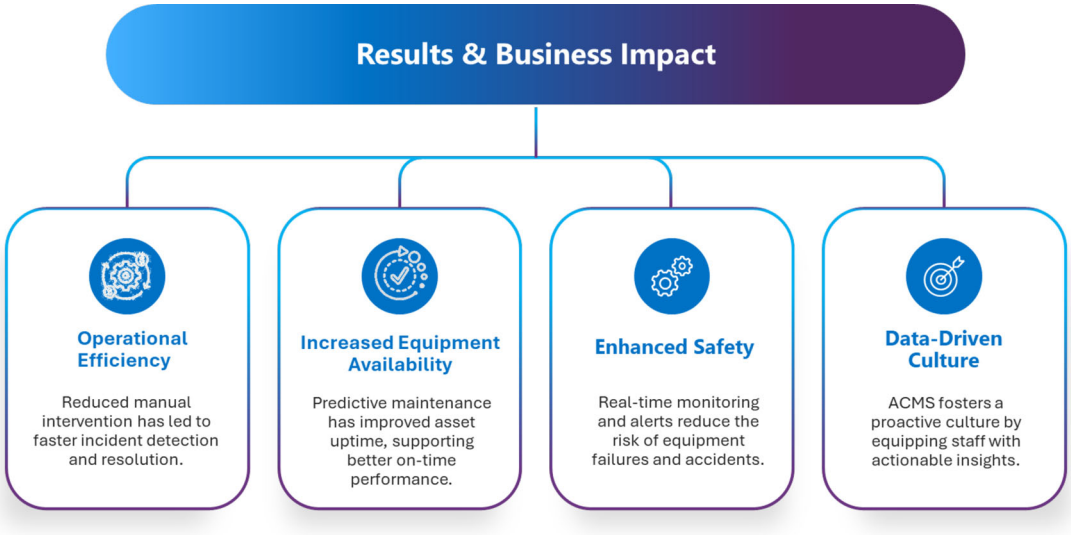
Other foundational solutions that mark substantial progress toward the strategic objectives. are as follows:

These implementations not only improve situational awareness for the mechanical and engineering teams but also enhance the national railroad customer's ability to coordinate with host railroads and ensure timely asset interventions.

Team Allwyn's implementation of tools offers a consolidated view of condition monitoring across the railroad customer and its host railroads. The system also initiated the automation of work order generation based on analytics from WILD and ABD sensors. Furthermore, prototypes for image and video data ingestion from Secaucus detectors have been completed, and repair data is being published through APIs to support the Maintenance Feedback Loop with host railroads. These achievements underscore Allwyn's capability to integrate complex systems and provide scalable, actionable insights.

3. Results and Business Impact:

The visual below illustrates how Allwyn has created results and impacted the national railroad customer's overall operations by enhancing the operational efficiency, better equipment availability, enhanced safety and a data driven culture.



Conclusion

The ACMS initiative signifies a major leap in the national railroad's digital transformation journey. By integrating modern data infrastructure with domain-specific analytics and machine learning, the national railroad customer is not only improving asset reliability but also setting new standards for railway safety and service excellence.

For more information on how Allwyn can support your organization's digital transformation efforts, please contact us at info@allwyncorp.com.

Contact Information

Sid K. Hasan

Chief Growth Officer (CGO),

Allwyn Corporation

+1 (415) 377-0693

Swathi Young

Chief Technology Officer (CTO),

Allwyn Corporation

+1 (703) 638-2538

About Allwyn Corporation

Allwyn Corporation (www.allwyncorp.com) is a forward thinking, innovative software solutions company, headquartered in the Metropolitan Washington DC area. Allwyn was founded in 2003 with a mission to help organizations address complex technology challenges by providing industry-leading tools, technologies, seasoned professionals, and proven methodologies. We are proud to be certified for ISO 9001 (Quality), ISO 27001 (Security), and ISO 20000 (Service Delivery).
With a team of ~200 professionals, Allwyn delivers high-quality services to a wide range of clients in the public and private sector.

Allwyn has been providing leading-edge IT professional services to various government agencies through the GSA MAS Schedule. We are also on the FAA eFAST, GSA OASIS+, and GSA STARS III contract vehicles.

Allwyn has experience with implementing Artificial Intelligence and Machine Learning solutions and Modernizing Applications using Low Code Technologies. Our relationships with AWS, Appian, ServiceNow, Microsoft, Databricks, Informatica, Salesforce, etc. strengthen our ability to support our customers in their Digital Transformation journey. We are already supporting several of our customers in the public as well as commercial sector with their cloud adoption strategies and Artificial Intelligence and Machine Learning implementations. For additional information on Allwyn's full range of services, please visit our website at www.allwyncorp.com.