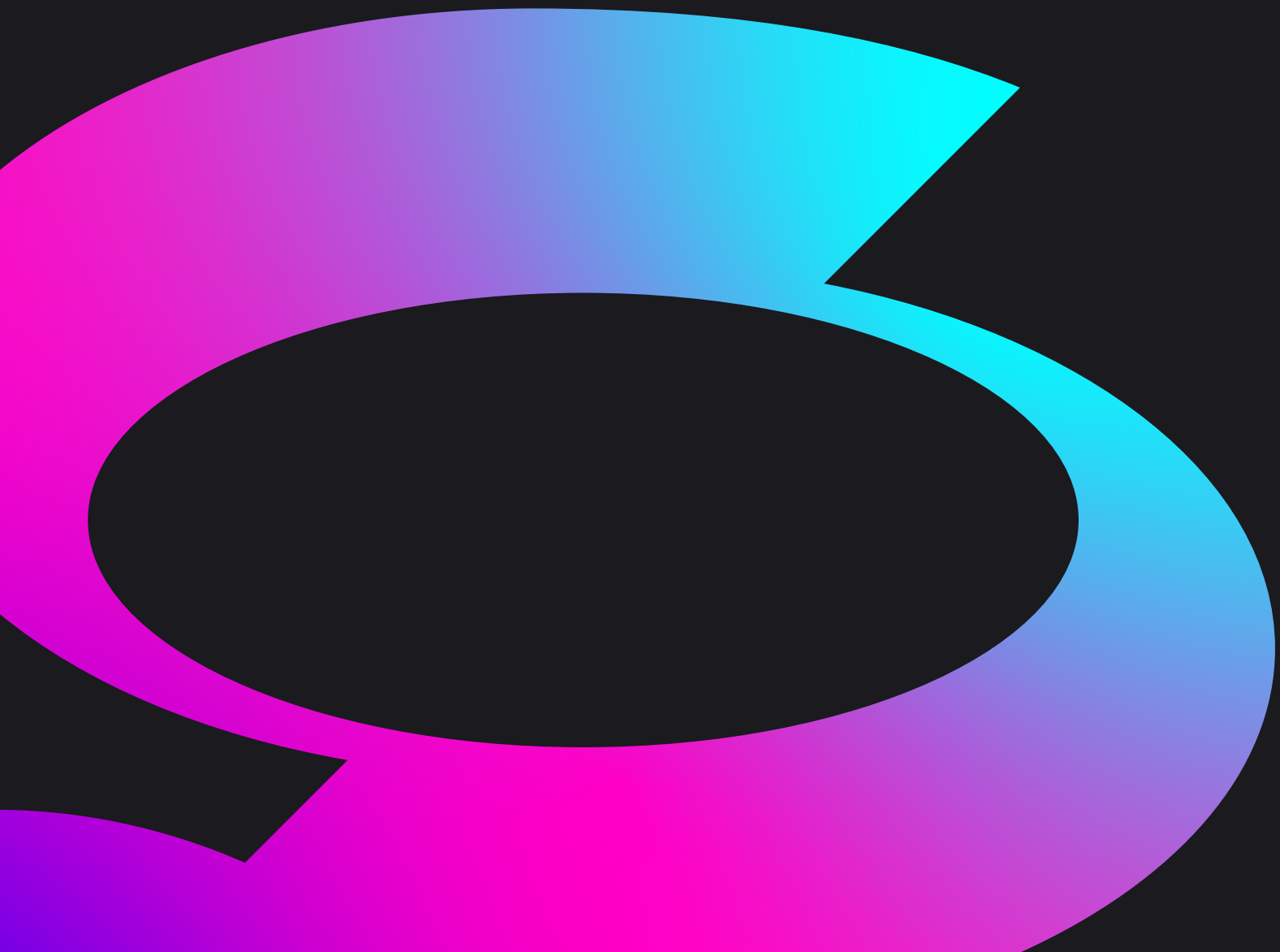
OCTAVE

WHITE PAPER

Enterprise asset management for transit operators

Better asset data. Safer, more reliable transit.



Transit agencies face pressure from every direction: ageing infrastructure, growing ridership demands, sustainability mandates and staffing gaps. Asset management is no longer a back-office concern. It's central to whether operators can meet their obligations.







The current state of the transport industry

The transport industry is often considered in terms of passengers and vehicles. However, this ignores the wider ecosystem that includes terminals, ports, stations and the supporting infrastructure within these facilities, including track, signals, switches, catenary and other assets essential to delivering a transport service. This principle applies to all transport providers, whether passenger or freight, rail or otherwise. All types of vehicles and infrastructure need to be considered in depth:

- Light rail, heavy rail and the track infrastructure
- Buses and roads across inner city, long distance, domestic and international routes
- Ferries and their docks, terminals and other related infrastructure

To deliver the improvements demanded by stakeholders, shareholders and passengers, the transport industry will need to take a holistic view of their operations and interactions. Many have realized that more can be achieved, leading to increased interest in digitalization.

Advances in technology, such as high-speed 5G cellular network deployments and smarter IoT sensors are also creating new opportunities to better understand operations at a more granular level. For many, the next challenge will be how they collect, collate, analyze and action the data they collect for maximum effect.

The challenge of complexity

Sluggish economic growth and net zero obligations were already creating significant challenges for the transport industry. For some rail operators, the task is even harder as they attempt to run 21st century services on infrastructure that has been in place since the 19th century.

Now, the post-pandemic recovery, surge in demand for services, supply chain challenges and increasing costs of doing business have added several more layers of complexity that need to be addressed. Take the rail industry, for example – demand for services is expected to double by 2050.

Governments and urban planners across markets are calling for significant expansion of public transport capacity through 2030 and beyond — not as a post-pandemic rebound, but as a long-term strategic priority. For operators already running near capacity, that pressure has nowhere to go except into smarter operations. Rail companies must innovate across multiple areas to meet this growth, including:

- Modernizing their assets (infrastructure and rolling stock)
- Eliminate human errors by using newer IT and technology (driver errors, inspection, safety hazards, etc.)
- Autonomous rolling stock using smart sensors to self-drive

They will also need the correct IT infrastructure to support and communicate with these innovations. For example, implementing an enterprise asset management (EAM) system provides a platform to collect and interpret data from sensors, and to automate key actions using those insights.

If any transport operator is unable to deliver on all these demands, they are likely to suffer ongoing damage to their reputation in addition to financial loss and/or regulator action.

Here are some of the major industry trends you need to be aware of.

Sustainability and energy transformation

Sustainability is rapidly rising up the corporate agenda in line with tougher government targets and customer demands. The industry is under sustained pressure to decarbonize – not just rolling stock and vehicle assets, but their entire supply chain too. Bus companies will feel the squeeze hardest and soonest as governments push to end sales of new vehicles with internal combustion engines. The EU plans to implement a ban of fossil-fuel powered car sales by 2035. Buses will follow, with a similar ban coming into force no later 2050. Any operators running a fleet (road, rail, sea) powered by fossil fuels will inevitably face similar constraints soon – so they must plan how best to replace or renew their vehicles before then.

Safety, reliability and regulations

Safety and reliability are both processes of continuous improvement that encompass all processes within the transport sector. As well as internal efforts, governments and trade bodies are constantly adding and strengthening frameworks to better protect workers and service users. Although the outcomes are better for everybody, each change adds to compliance complexity.

ISO 55000, AWM, APM and AIP

ISO 55000

Best practice asset management has been codified under the international standard ISO 55000. ISO 55000 provides a baseline on which any organization can establish their asset management practices. To ensure comprehensive control, the standard is divided into three main sections (with several accompanying technical specifications):

- ISO 5500:2014 Asset management – overview, principles and terminology
- ISO 55001:2014 Asset management – management systems – requirements
- ISO 55002:2018 Guidelines for the application of ISO 55001

Once ISO 55000 implementation is underway, transport operators can then begin measuring and improving their asset management performance with three new metrics:

Optimization of the asset lifecycle

Inter-related disciplines of asset management



Asset investment planning (AIP)

Optimizing the potential long-term future deployment of limited financial resources to best manage the asset base and meet service level objectives. Effective AIP should include long-term capital planning, asset lifecycle monitoring and levels of service provided.

Asset performance management (APM)

Asset performance management is an approach to managing assets that prioritizes business objectives alongside traditional asset reliability and availability goals. Modern APM combines established asset management practices with new digital technologies for measurable improvements in reliability, centered maintenance execution, asset health and asset condition.

This involves tasks like statistical analysis, risk criticality (failure mode, effects and criticality analysis – FMECA) and condition (State of Good Repair – SGR).

Asset work management (AWM)

Asset Work Management (AWM) is concerned with how each transport/infrastructure asset is actually used and maintained, including planning workloads and execution. AWM includes health and safety monitoring and compliance, parts inventory management, nonconformity tracking, inspection management and effective prioritization.



From data to decisions

The shift toward digitalization is changing the way every business unit operates.
All are expected to capture, analyze and act on information captured from their processes. They are also expected to share that data with other business units to ensure wider trends can be identified and capitalized on. This data needs to be extremely granular, going far beyond traditional measures like passenger count or rolling stock movements. It will also need to be collected and actioned in real time, demanding a whole new level approach to technology. Ultimately there is an expectation that transport businesses will be able to see operations in real time and be able to accurately forecast any metric into the future. Access to more accurate, real-time data enables smarter decision-making to avoid safety hazards and run operations more efficiently.

The role of enterprise asset management (EAM)

What is EAM and why does it matter?

EAM describes the tools and processes used to manage the maintenance of your physical assets – including secondary concerns like linear track and facilities. More than a generic asset database, EAM reduces unplanned downtime and extends asset longevity by giving operators the tools they need to plan, optimize, execute and track the needed maintenance activities with the associated priorities, skills, materials, tools and information.

EAM also extends into the wider digital programs of transport providers. Functionality should also assist with scheduling, supply chain management and environmental, health and safety (EHS) initiatives.

Working with EAM, operators have tools they need to see all their assets and their condition. Factor in IoT technology and real-time visibility becomes a reality, allowing for granular analysis and planning.

Already under pressure to fill roles in the pandemic recovery, operators are facing another challenge — an ageing workforce. Across the U.S., Australia and Germany, a significant share of transport industry employees are approaching retirement age. This is not a local problem. It is a structural shift playing out across every major market.

This means that operators are facing a massive potential brain drain as retiring workers take undocumented, valuable knowledge and experience with them. Ensuring this knowledge is captured and retained will be essential to maintaining efficient operations and providing a platform for future development.

How can EAM help the industry?

EAM addresses all these issues and more to help businesses in the transportation sector sharpen operations, strengthen safety and improve efficiency and profitability.

Enforce compliance with confidence

At the top of the EAM agenda is compliance enforcement, helping operators to ensure rider and employee safety through better data collection and analysis so they can make smarter strategic decisions sooner – or even automate common activities to reduce the risk of human error. Adopting ISO 55000 will go some way towards ensuring improved compliance.

Cut costs with better data

Initial investments in sustainable operations – such as rolling out an electric fleet – can often be extremely expensive. Realizing a return on investment as quickly as possible is therefore a priority. With EAM you can better understand your current vehicle assets and make smarter decisions about when to replace, upgrade or repair them. Similarly, you can understand current fuel and energy consumption trends and identify potential savings – both financial and ecological.

Build a defensible evidence base

When applying for grants, operators are expected to provide a clear picture of conditions, future capital requirements and how their strategic management plan aligns with funding guidelines. EAM provides a place to collect and collate that data, becoming a real-time repository of proof that allows operators to prove that their funding obligations are being met.

Go real-time with mobile

Whatever your assets are – rolling stock, buses, ferries, etc. – mobile-enablement and digitalization allows you to collect important data in real time, wherever the unit may be. Similarly, mobile-enablement places that information in the hands of your employees, allowing them to take effective action more quickly, further improving efficiency and quality of service for your customers.

Prioritize capital budgets

Without a holistic asset management system that provides complete end-to-end visibility, it is hard to be sure investments are being made effectively. By improving transparency, EAM allows for data-driven choices, ensuring that budgets are invested where they will have the greatest effect – or where they are needed the most. With better planning and directed investment, it is easier to avoid emergency budget overspend too.

Improve insights, context, reporting and sharing

EAM solutions provide a 360° view of your assets – their condition, their maintenance history, their ongoing costs, etc. Every asset can be viewed in context to better understand its overall value and impact. These insights, coupled with improved reporting, give transport operators the information they need to better plan future services. EAM can also be integrated with other business information management systems, enabling sharing across the rest of the organization.



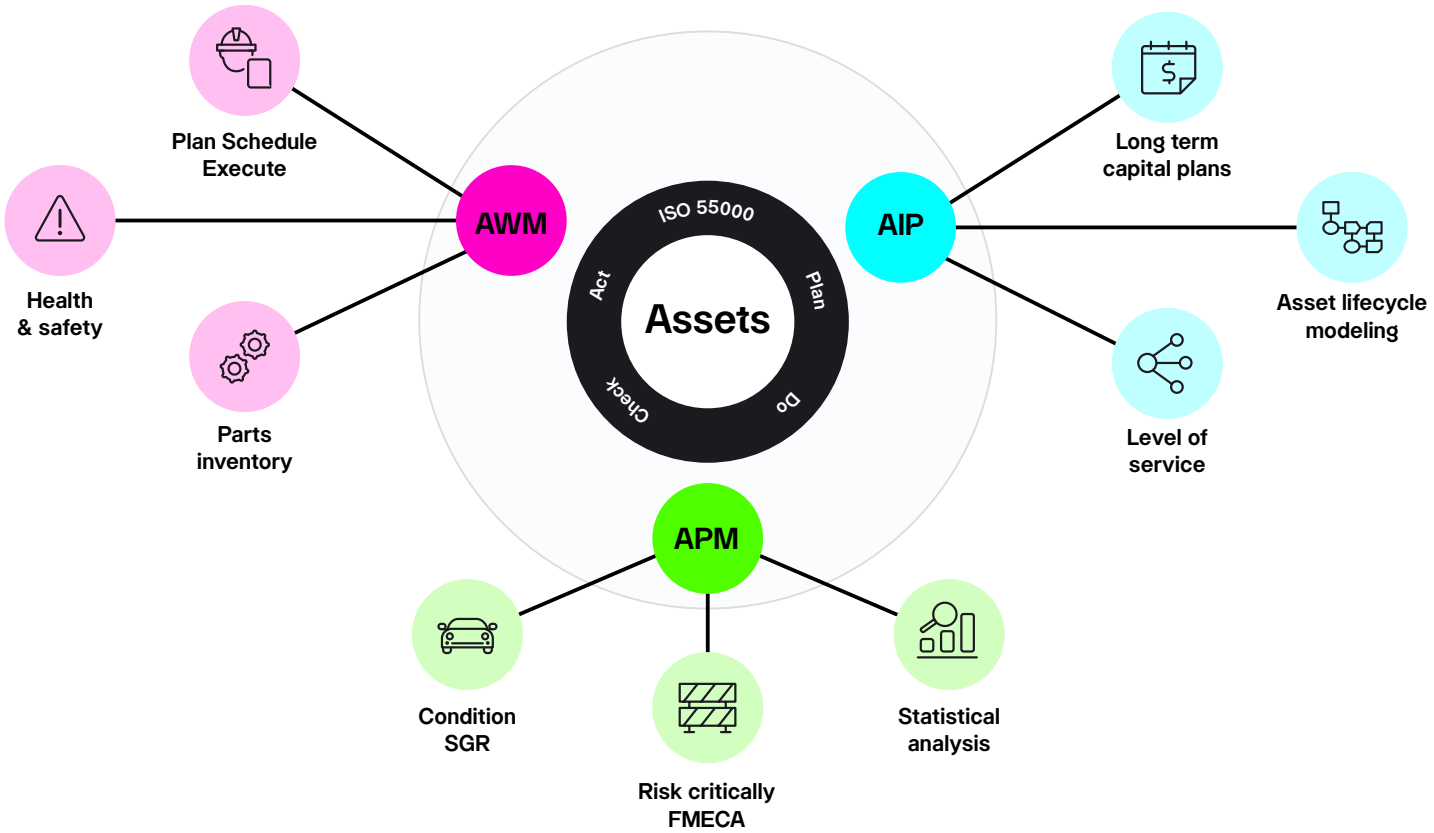
How to get started with EAM

Answering these questions will ensure the best possible start to your EAM project:

- Where does enterprise asset management fit into our wider corporate strategy? Until you understand how asset management can feed into business goals, you will never realize its full potential.
- How are current tools failing us? What data and metrics are not available to you? What information do you need to improve operations?
- Are we thinking in terms of ISO 55000? Applying an internationally recognized standard will help ensure your deployment is compatible and optimized – and that your business is ready for asset management. This will mean combining AWM, APM and AIP to provide a complete overview of enterprise assets, how they are being used and what the future holds for each.

Development vision

Enterprise asset management



Conclusion

Without comprehensive insights into vehicles, track, and facilities, operators cannot make confident investment decisions. ISO 55000 has elevated EAM from optional to operationally essential.

Enterprise asset management is an integral part of any broader digital program – and a direct path for transport operators to better understand and get more from their investments.

EAM helps operators:

- Create defendable, long-term asset investment plans
- Forecast financing needs to sustain required service levels
- Measure investment trade-offs against risk tolerance
- Align asset investments with strategic objectives, including ESG goals
- Evaluate extending asset life versus replacement with clarity

The agencies that will meet tomorrow's demand are already making smarter decisions today. That starts with knowing your assets.



From insight to impact: learn how Octave Attune EAM (formerly HxGN EAM) maps to transport-specific needs and why a generic platform falls short. Contact us to discuss your requirements.

About Octave

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property, and assets– for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency, and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.

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