**Problem Overview**

**Nightly Train Planning:**  
Every night, KMRL must decide which trains will operate, which remain on standby, and which go for cleaning or maintenance.

**Limited Time Window:**  
This planning happens between **9 PM – 11 PM**, leaving little room for detailed checks or error correction.

**Multiple Factors to Balance:**  
Supervisors must consider safety clearances, maintenance jobs, branding obligations, mileage distribution, cleaning slots, and depot positions.

**Fragmented Data Sources:**  
Information comes from spreadsheets, IBM Maximo, logbooks, IoT updates, and WhatsApp messages, with no single integrated view.

**Manual & Experience-Driven Process:**  
Supervisors rely heavily on personal judgment and ad-hoc methods, making the process inconsistent and hard to audit.

**Growing Complexity:**  
With the fleet expanding from 25 t**o 40 trains and 2 depots by 2027**, the current manual system will not scale and risks causing delays, higher costs, and contractual breaches.

**Need for Change**  
KMRL requires an AI-driven system to integrate data, enforce rules, optimize plans, and provide auditable, reliable daily schedules.

**No Real-Time Data Integration**

Current planning relies on static exports (like Excel/Maximo files or WhatsApp updates).There is no live feed of train fitness, sensor data, or bay status — making decisions outdated by the time they’re made.

**Pain points kochi metro**

**Manual Scheduling Delays**

Currently, scheduling for maintenance, cleaning, and branding is handled manually within a 2-hour window. This creates high pressure, increases the chance of human error, and often causes delays in preparing trains for service.

**Scattered Data Sources**

Key information comes from spreadsheets, logbooks, WhatsApp messages, and Maximo exports. With no single platform, supervisors spend valuable time reconciling data and can easily miss critical details.

**Risk of Last-Minute Withdrawals**

If a clearance from signalling, telecom, or maintenance is overlooked, a train may have to be pulled out suddenly. This disrupts service schedules and threatens the 99.5% punctuality KPI, Passengers may face inconvenience due to fewer trains running or delayed trips and increases stress on staff, who must quickly reshuffle trains and schedules.

**Uneven Mileage Usage**

Some trains are deployed more frequently than others, causing unbalanced kilometre accumulation. This leads to faster wear and tear on certain bogies, brakes, and HVAC systems, raising maintenance costs.

**Excessive Depot Shunting**

Without optimized stabling geometry, trains must be repeatedly moved at night to prepare for the morning.  
This wastes energy, increases staff workload, and introduces safety risks inside the depot.

**Pain Point 7: Lack of Transparency and Auditability**

Decisions are made based on individual judgment without a clear digital trail.  
This makes it hard to explain why a train was chosen, reducing accountability and limiting process improvements.

**Pain Point 8: Not Scalable for Future Growth**

The current manual system may work with 25 trains, but will not scale to 40 trains and two depots. The process will require more staff, add cognitive load, and become unsustainable.