



CASE STUDY

ESG & SUSTAINABILITY

TRANSPORT

Australian Transport Operator Reduces Carbon Emissions Without Reducing Ride Times

Overview

As governments, businesses, and individuals strive to reduce their carbon footprints, understanding the baseline through data is crucial for measuring progress. Public transportation is key to reducing road and air travel, thus lowering global emissions. Governments and transport providers are actively working to meet the growing demand for sustainable transit solutions. Data analytics and Decision Intelligence company Toustone | COSOL is helping Australian transport operators measure and interpret their complex energy and emissions data via predictive analytics and machine learning (ML) this greatly assists them in working to reduce their operating costs and environmental footprint.



Problem

One of Australia's largest rail operators approached Toustone | COSOL due to a lack of a unified and organised database, which was hindering their ability to accurately forecast energy consumption. The operator faced contractual mandates with private enterprises and government departments that included penalties for misforecasting energy usage. Recognising that incorporating more data sources improves prediction accuracy and extends forecasting capabilities, the operator enlisted Toustone | COSOL's expertise to establish a robust data foundation and implement an accurate energy consumption measurement and prediction system.



Approach

Toustone | COSOL collaborated with the transport operator to simplify data measurement and reporting; automating data collection from multiple, complex sources. Vast electrical consumption data from smart power metres across its network was broken into five second increments and surfaced in real time, for example. Through its Sustainability Suite, Toustone | COSOL developed a customised energy consumption prediction system, with above 90% accuracy. Beyond calculating the total energy consumption of trains, the Toustone | COSOL Sustainability Suite creates dynamic data scenarios based on variables such as schedules, trip numbers, electric train acceleration/deceleration, patronage, train weight, weather, and seasonality (including large events like the Melbourne Cup or the Sydney New Years) - these all impact energy consumption predictions. Applying ML empowered the train operator with the ability to analyse usage patterns such as energy volume and know where it's being used, when the peaks and the troughs occur, etcetera. Dashboards allow for easy visualisation of the transport operator's ESG metrics, drilling down to micro-detail (if needed) the usage from a single meter within a station. The client can pinpoint what is using the power from a specific meter in seconds - such as a faulty elevator causing a consumption spike.



Outcome

Toustone | COSOL's Sustainability Suite now gives the the transport operator the insights to strategise based on highly accurate energy forecasts to drive cost efficiencies and significantly boost and accurately track sustainability efforts. Once installed, the train operator ran an energy-saving experiment. They slightly slowed down a train, immediately seeing an energy reduction in the Toustone | COSOL dashboard, without negatively affecting customer experience. Management teams now accurately forecast 6-12 months into the future. It's opened opportunities for forward planning and purchasing energy, leading to huge cost and time savings. Knowing where the biggest consumers of electricity are and the ability to compare asset design for optimum electrical consumption is a game changer. The Sustainability Suite can cover all the transport operator's ESG bases including accurate forecasting of carbon emissions, without needing to deploy a task time. This frees them up for opportunities to grow its top and bottom lines like supplementing renewables. Best of all, Toustone | COSOL got the job done in just 6-8 weeks.

Advanced Data Analytics As A Catalyst For
Enhanced Rail Sustainability