INTELLIGENT RAIL PLANNING

FOR CLEANER, SAFER, SMARTER TRAVEL

Rail operations have never been more challenging than today. Train operators move vast numbers of people through complex, densely populated regions – and all while navigating a near continual state of disruption.

Our customers depend upon Trapeze's planning software to address these challenges and keep their trains running. We equip rail operators with intelligent, easy-to-use tools that provide all the information required to make informed decisions.

Together we are rising above present challenges, delivering cleaner, safer, smarter train schedules and train services on the day of operation.

Trapeze™
Here for the journey

INTELLIGENT RAIL PLANNING FOR CLEANER, SAFER, SMARTER TRAVEL

Trapeze's solutions empower train operators to make informed decisions through the entire rail planning process: from evaluating complex scenarios years ahead, through to planning options weeks before train services operate – and eventually real time 'on-the-day' decisions in response to actual events as they happen.

Supported by our range of modular, Cloud enabled and fully integrated solutions, our customers are able to make informed decisions across the rail time cycle to suit their priorities and objectives. Here are some examples:

Combine Accurate Data with Extensive Functionality

- Our Planning solutions enable train planners to assign the optimal combination of trains and crew required to run a working, conflict-free timetable. Our tools are highly visual and calendarized, which helps train planners to respond quickly, producing multiple working timetables that can be saved as scenarios ready for deployment if required.

Take Advantage of Decision Science-Based Technology

- Customers use our Optimiser tools to model or 'stress-test' the impact of infrastructure investment on rolling stock and crew scheduling needs against scenario timetables. An example scenario might be: What would be the impact and solution to maintaining train schedules if a new fleet of electric trains were delayed by 12 months?

- Our Optimiser products are decision-science tools that identify optimal outcomes each time a variable is changed. This enables customers to visualise and understand the impact of changes to fleet and crew strategy as well as infrastructure projects upon train services. This is paramount for decision-makers striving for the cleanest, safest, smart railway.

Use Real Time Information to Keep the Trains Running

- Our operational 'on-the-day' products form a single-source of truth for controllers, enabling them to make smarter decisions. We remove the need to move between systems or documents and use the advanced user interfaces to make the train plans a reality. Re-assign trains, find and deploy spare trains and keep track of resource usage. Anticipate and resolve conflicts as they arise using live data imports – see exactly what is going on and be able to share your understanding in real time with maintenance teams, train and station crew.

- These products enable controllers to see and respond to deviations to a plan, as well as to rapidly deploy contingency plans previously stored in readiness for circumstances already anticipated by controllers. All this vital operations data can be shared across other systems and stakeholders who need to know the state of the operation and service in real-time.

PRODUCT MAP v1.1

	STRATEGIC — Years and Months Ahead	TACTICAL — Months and Weeks Away	OPERATIONAL — On-the-day and Real Time
NEED	SIMULATE	PLAN	RESPOND
PRODUCT	OPTIMISER	TRAIN PLAN / RESOURCE PLAN — OPTIMISER	FLEET MANAGER / ADR — ENERGYMISER®
PURPOSE	Model, 'stress-test' and evaluate train fleet & crew schedules against scenario timetables	Assign optimum trains and crews required to run timetables / Detect and resolve conflicts or inefficiencies	Manage disruption by knowing where all trains are in real-time / Optimise energy consumption using Driver Advisory Systems in every train cabin
OUTPUT	A credible, risk-assessed and optimised fleet size and crewing capacity aligned with anticipated train services	Robust, dependable and optimised working timetables with ready-to-implement scenarios	Make the plan a reality and keep the trains running in the most efficient way
WHO	Train, Vehicle and Crew Planners working within a Finance function remit	Train, Vehicle and Crew Planners within an Operations function	Train Controllers, Operations Team and Train Drivers
VALUE	Directly addresses the strategic cost of operations over the long term i.e. challenges true rolling stock volume and overall crew needed.	Reduces the cost of operations and carbon consumption. / Enables a rail operator to meet its own key performance indicators e.g. revenue, customer experience	Minimise the impact and consequences of disruption to on-the-day train services / Know and manage the full extent of energy consumption across the fleet

TRAIN OPERATOR BENEFITS

All of our products are designed to be modular and fully integrated. Each system therefore communicates with one another, and we also offer the ability to import and export data to/ from other systems used by rail operators.

RAIL PLANNERS BENEFITS:

1 Everything you need to develop robust, conflict free-train timetables in one system

2 Simple, fast import of train and geography information, all of which is then easily editable

3 Manage and overcome short term disruption by developing and saving multiple, detailed train schedules in 'layers' in readiness for deployment

4 Flexibility to address and resolve conflicts and re-save calendarized train schedules in minutes

5 Plan vehicle and crew assignments while supporting union and organisation rules

6 Strong visuals and graphics to support pre-emptive decision-making by clearly identifying the impact and consequences of disruption or special event planning

RAIL CONTROLLER BENEFITS:

1 All the information required to see and respond to disruption 'on-the-day' of operations in real time

2 Know exactly where each train is in real time as well as its detailed status and maintenance condition

3 Single-source-of-truth, trusted by multiple stakeholders across the rail operation.

4 Powerful situational planning tool tracks resource usage

TRAIN DRIVER BENEFITS:

1 In cabin driver advisory system promotes 'right-time running' and compliance with energy consumption targets
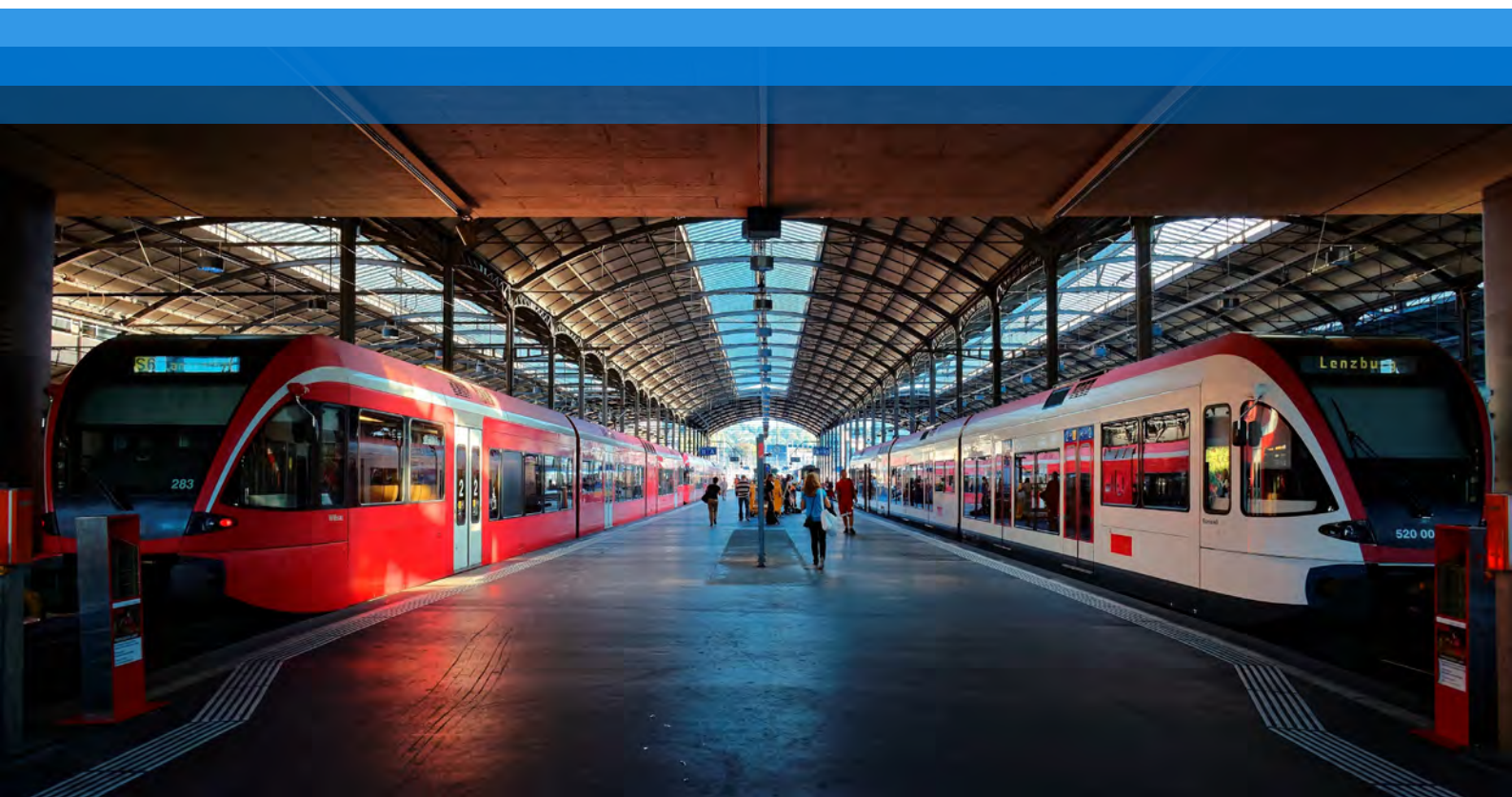
PUBLIC BENEFITS

ENVIRONMENT

Decision science ensures that we can find the most effective solutions when creating timetables and responding to 'on-the-day' disruption to services:

- Minimise vehicle miles to deliver required train services

- Optimise use of trains within maintenance regimes to maximise asset lifetime

- Integrate train service data with Driver Advisory Systems to minimise energy consumption

- Provide rich analytics to determine energy savings through infrastructure upgrades and power changes (e.g., to electric)

PASSENGERS

Efficient, achievable train timetables developed from a single trusted source.

Assurance of reliable, dependable train timetables through planned and unplanned disruption, e.g.:

- Introduction of new trains
- Line upgrades and capital investment
- Special events
- Major weather events
- Regional restrictions during pandemics

Safe and dependable alternatives to train services when unforeseen disruption occurs on the **day:**

- Replacement bus services
- Replacement trains (of correct type and condition)
- Clear, trusted communications on what is happening and options available

Awareness that rail operators have invested in tools and are equipped to manage circumstances in passengers' best interests.

TRAIN PLAN AND RESOURCE PLAN

High performing train timetables

- Easy to import and edit train and geography data as a basis for creating train timetables.

- Fully integrated train service, vehicle and crew planning solution removes requirements for planners to re-key data or transfer files between systems.

- Use a range of highly visual graphic and tabular displays showing complete service schedule information to modify or add additional services easily and visibly.

- Detect and resolve all conflicts arising from Train Planning Rules and validate against all infrastructure changes such as temporary speed restrictions.

- Create and save "what if" scenario plans and hold in readiness as part of a more disrupted short-term planning environment.

- Talk directly to 'on-the-day' solutions providing accurate short-term timetables.

- Link with Driver Advisory Systems in train cabins to ensure on-time running and optimise energy consumption.

A 'single source of truth' solution providing complete confidence in timetable creation.

Planners are able to pre-empt shorter term situations by running and saving 'what if' scenarios that could impact on cost, revenue, passenger satisfaction and energy consumption.

OPTIMISER

Algorithm engines that challenge and drive insight

- Use the Optimiser algorithms to increase the speed of informed decision making within the planning environment.

- Take planning data and planning rules for both vehicles and crew and drive the Optimiser to create:
  + The number of diagrams required to execute a train service based on the minimum number of vehicle miles utilised.
  + A crew schedule capable of delivering those diagrams at minimal cost
  + Configure the Optimiser with rules and conditions that apply to your operation; set priorities and conditions based on your overall business objectives.

- As a business evaluation tool for both strategic and operational use, the Optimiser can execute decisions in a fraction of the time taken in environments where systems are fragmented, and algorithm engines are not deployed.

- Use the Optimiser to gain insight around key business decisions and build up a traceable business case to answer fundamental questions:

- Could train services be maintained at current level whilst reducing the total fleet by retiring older rolling stock much earlier than planned?

- What would be the impact on rail operation's total energy consumption if the fleet mix were altered, train services modified – or both?

Use the Optimiser algorithm engine to interrogate the performance of your rail operation.

Understand the commercial, operational and environmental impact of changing the fleet mix or the framework of crew schedules.

OUR SOLUTIONS

FLEET MANAGER

The 'mission control' for 'on-the-day' rail controllers

- Access to all the real-time fleet status and accurate timetables enables rail controllers to quickly respond to disruption 'on-the-day' of operations.

- Identify replacement trains based on an understanding of exactly where they are, and their maintenance status and condition.

- A range of highly visual graphics enable users to see and anticipate potential disruption to plans and evaluate options as part of fast, informed decision-making.

- Keep trains running by executing decisions and rapidly updating alterations before communicating to staff and passenger information systems.

- Save decision-making data as part of machine learning to anticipate future disruption.

- Assess, create, and hold contingency plans in readiness for major forms of disruption.

Managing disruption on the day of operations requires safe, smart and trusted decision making.

Keeping trains running and protecting customer experience come from informed and well communicated decisions.

ENERGYMISER

Energymiser is a Driver Advisory System (DAS) that enables two-way communication from driver cabins to shore-based systems.

This system delivers energy savings by providing drivers with specific behavioural instructions on speed, acceleration, braking and coasting for specific routes and train schedules.

Energymiser:

- Informs drivers of detailed running information to keep themselves and the train safe.

- Reinforces efficient driving by advising the precise sequence of driving modes and switching points, ensuring that the pace of the journey is as uniform as possible.

- Uses GPS and GSM data to monitor the train against the timetable, send and receive data via GSM and can provide updates to the driver on any schedule changes when connected to our planning products.

- Gathers actual performance data throughout the journey and sends this to the Shore Base System which can be exported to other systems including our planning products.

- Improves performance by ensuring right time running, and alignment with the train schedule.

Energymiser is in service with 20 rail operators in Europe all of whom are achieving energy savings of between 7-10% through this tool.

Aside from the financial savings, this directly helps operators to meet carbon reduction targets set by the UK and EU.

Trapeze™
Here for the journey

Trapeze Group works with public transport agencies and their communities to develop and deliver smarter, more effective public transport solutions. For more than 25 years we have been *Here for the Journey*, evolving with our customers around the world to help them move people from point A to Z and everywhere in between.

Australia +617 3129 2092
United Arab Emirates +971 42526640
Saudi Arabia +971 42526640
India +9198 1040 7444
South Africa +27 11 025 9970

Canada +01 905 629 8727
Malaysia +60 327 708 750
Singapore +65 6202 0269
United Kingdom +44 0 8445 616 771
United States +01 319 743 1000

TRAPEZE GROUP ASIA PACIFIC HEAD OFFICE
Level 25, 288 Edward Street, Brisbane, QLD 4000 Australia
info@trapezegroup.com.au | 1300 663 662
trapezegroup.com.au