Controlguide Airo

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The system that dynamically adapts timetables and vehicle operation to predicted and current demand by using AI and real-time data collectors to reach higher resource efficiency levels.

Controlguide Airo (Artificial Intelligence Responsive Operation)

Product Description

The conventional internal data of mobility solutions limit the view of the mobility ecosystem and does not allow the immediate reaction in the operation. **Controlguide Airo** improves operational flexibility and optimizes operational KPIs by matching train availability with predicted and current demand and by optimizing the customer experience by reducing the average passenger waiting time.

Controlguide Airo solution

- AI for predictions
- Rolling forecasts based on external demand indicators for daily optimized timetables
- Proposals for operation improvements
- Real-time optimization for unpredicted events

Controlguide Airo is deployed through an on-premise timetabling system and it can combine an AI core in an edge system to collect and connect your systems safely to the cloud.

Mobility systems and external agents	• Collection of data from field signaling assets via KAFKA • Use of external demand indicators
CoreShield Connect	• Enabler for IoT connectivity • Data collector and standardized processor
CoreShield DCU	• Security of the rail data network • Secure cloud connectivity

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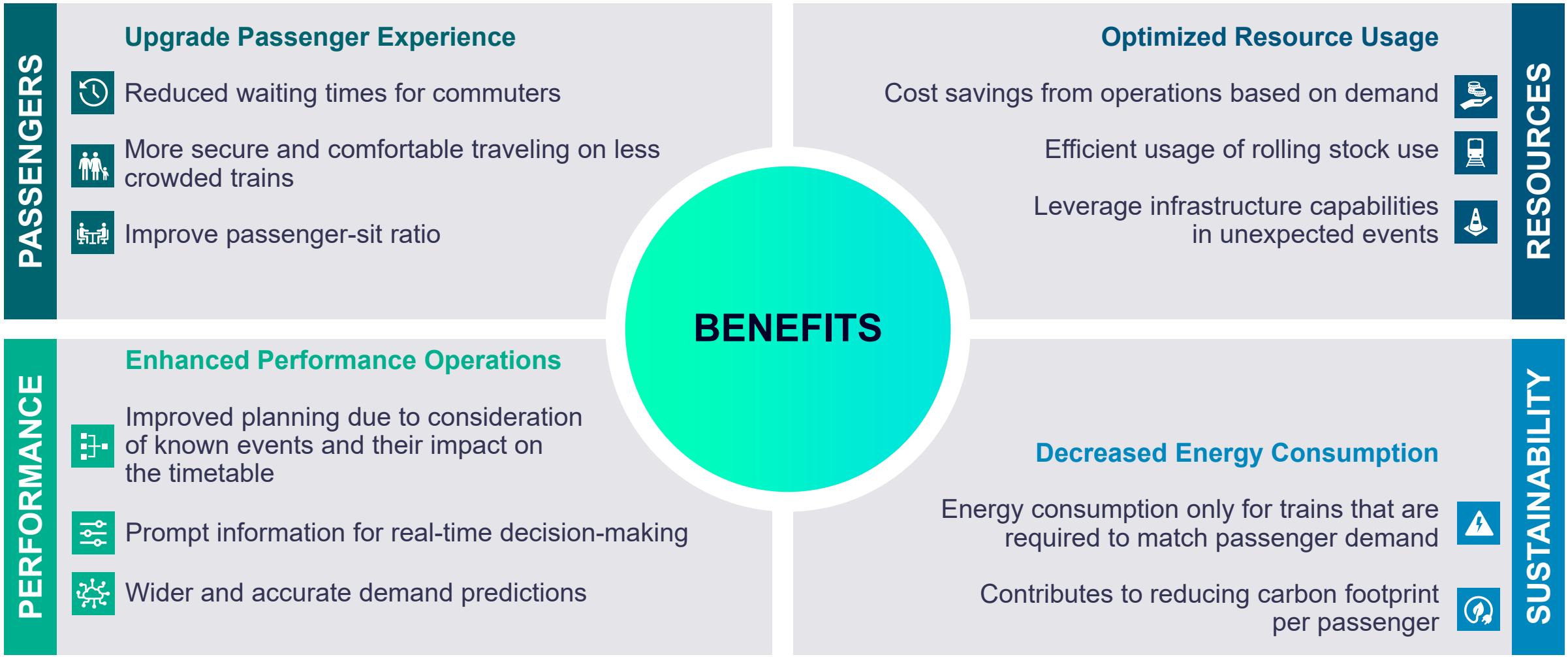
Benefits of Controlguide Airo



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Key Functionalities

Management of Resources

- Descriptive vs optimized view of graphs for operational enhancements
- Display of timetable generation, reduction of efforts regulating and maintenance to decrease inefficient operational costs
- Adjustment of the average number of trains
- Suggestions of on how to improve traffic regulation and fleet

Mapped-out for Enhancement Actions

- Real-time optimization of the fleet
- Enhanced management of real-time passenger demand
- Suggestions to foresee train capacity and backup transportation (e.g., buses)
- Suggestions based on demand and other factors (i.e., ticketing system, road traffic, weather conditions, bus status, emergency incidents, and social events)
- Suggestions for the whole line, focused on stations or critical sections

Tracking of KPIs

- Customizable setting of KPIs for specific areas of performance for each customer (i.e., vehicle occupancy, overcrowded vehicles, and the number of active vehicles…)
- Tracking of maintenance and energy costs savings

Key Functionalities

Vehicles Occupancy

- Optimization of waiting times through adjustment to passengers' affluence
- Prompt suggestions of alternative means of transport
- Anticipation of trains according to passenger demand at stations
- Increased passenger safety due to less crowded platforms
- Adaptation to passenger demand and network conditions in real-time

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System Architecture

Data sources

Internal sources:

- Trains
- Ticketing
- CTC

External sources:

- Weather
- Events and train timetables

System connectivity

CoreShield Connect

Data collector

CoreShield DCU

Secured connectivity

Data processing

Controlguide Airo analytics

Interfaces: MQTT, Kafka, HTTPS/REST, S3

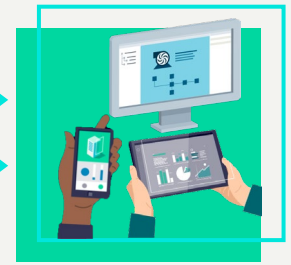
Development of optimized timetable based on demand

Edge application

Cloud-based application

Possible to offer digital services

Output front end



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References

Metro Line

Colombia

In 21 stations with a total of 26kms of the metro line covered, the deployment of **Controlguide Airo** helped to increase vehicle and platform occupation, as well as to enhance the average waiting time per passenger and decrease oversize time in vehicles and platforms. By increasing the average waiting time by 33sec, the kms done by the trains decrease by 17% (2000km) in a single day.

METRO DE MEDELLÍN
CALIDAD DE VIDA

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References

Metro Line

Singapur

Controlguide Airo was implemented to reduce occupancy peaks above 70%, without modifying the dwell times between the already scheduled vs the optimized one. Oversized situations were analyzed to increase vehicle occupancy.

Controlguide Airo evaluated a solution of the occupancy at every station to optimize the operation. By increasing the average waiting time by 17sec, the km done by the trains decrease by 15% (3800 km) in a day.

SBS Transit

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