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MILANO 2024

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SALFO

ENGINEERING & MANAGEMENT

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Utilizing Connected Vehicle Data for Enhanced Decision Making

Compass Road Intelligence Platform

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 - Path Analysis & Intersection Analysis
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COMPASS



About Compass IoT

Compass IoT provides Connected Vehicle Data across the UK, Europe, Asia, and Australia. It provides billions of granular data points and analytical insights to over 80 customers across:

- State Government Transport Authorities
- Local Governments
- Highway Operators

Our software platform leverages both anonymised and identified data formats, depending on permissions and use cases (within the GDPR framework).

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Compass IoT

Traffic Management and Road Safety is **shifting**
from a Detect & Repair to a Predict & Prevent approach

Better, Safer Roads with Connected Vehicle Data

- No hardware
- Proactive
- Real-time Connected Car Data
- Unique Datasets
- No traffic counts



Compass IoT

Road insights at your fingertips.

An Artificial Intelligence Web Platform

Uses “Natively Connected Vehicle” data to provide Country-wide Road Network Insights to Traffic Engineers, Road Safety Professionals and Road Operators.

1. The Data from the Vehicles are (“natively”) transmitted **every 2 seconds** from the Car’s Head Unit.
2. Vehicle manufacturer connected vehicles are available with (but not limited to) **64 brands**, makes and models including:



1. Compass IoT Applications; Near Misses, Path Analysis, Origin Destination, Intersection Analysis

Identify high risk locations **before** accidents happen

Road Safety - Near Misses

The Application identifies “**Near-Misses**”
 (a situation in which an accident/crash almost happened).



Instantaneous



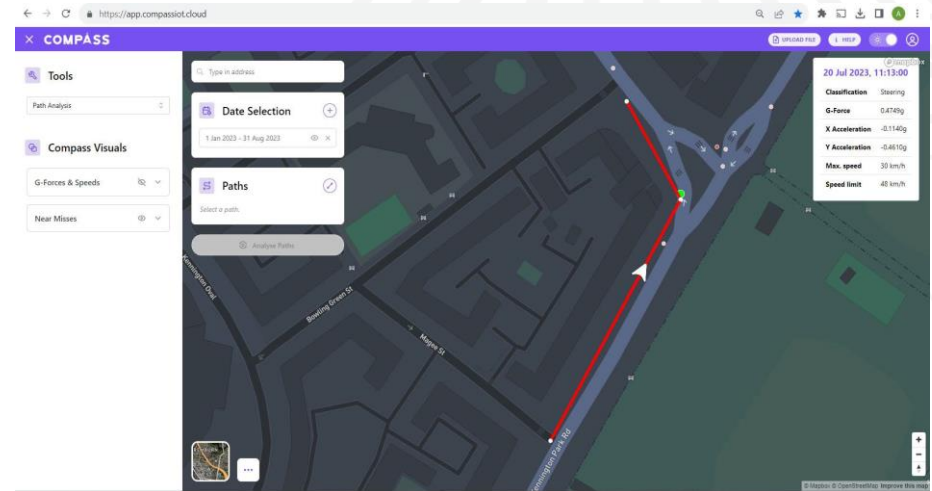
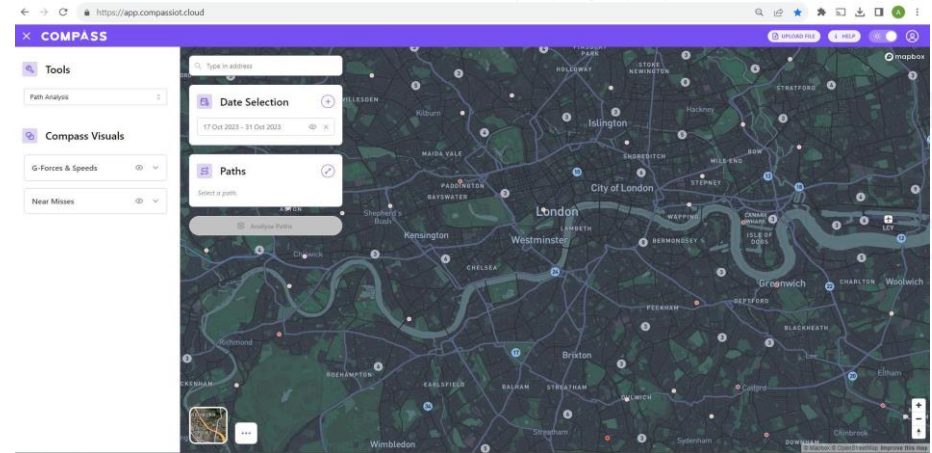
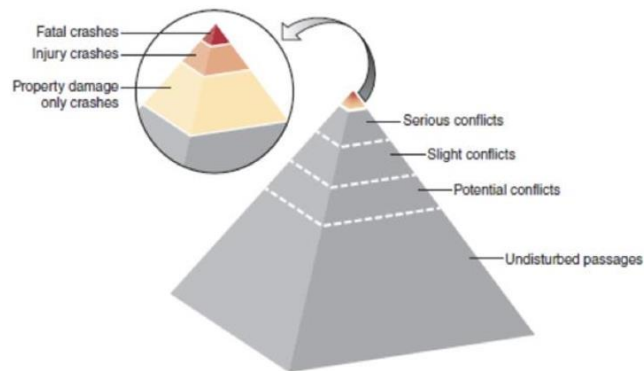
Proactive



Prioritize Road Safety Infrastructure

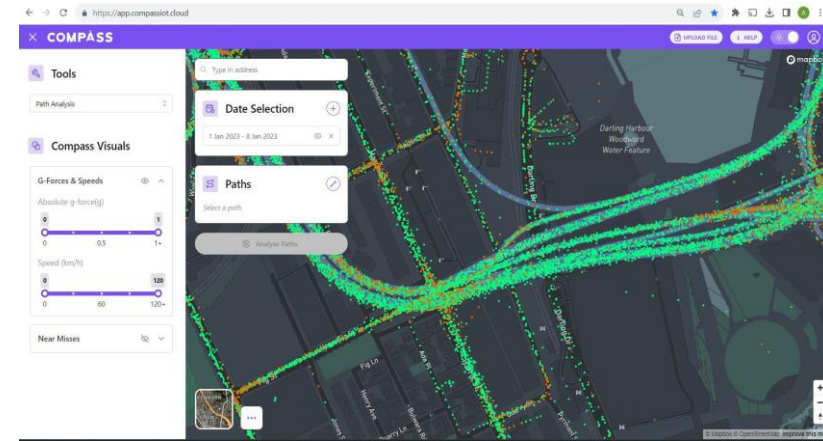


Historical insights



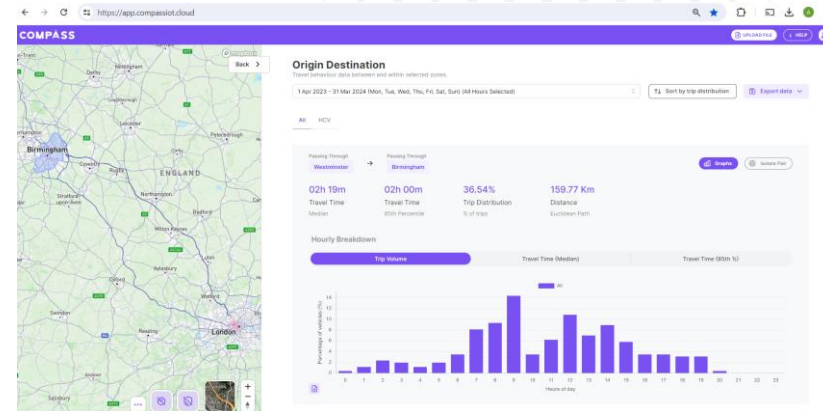
Path Analysis

Network-wide speed, predictive volume, travel times, pavement ride quality, and g-forces



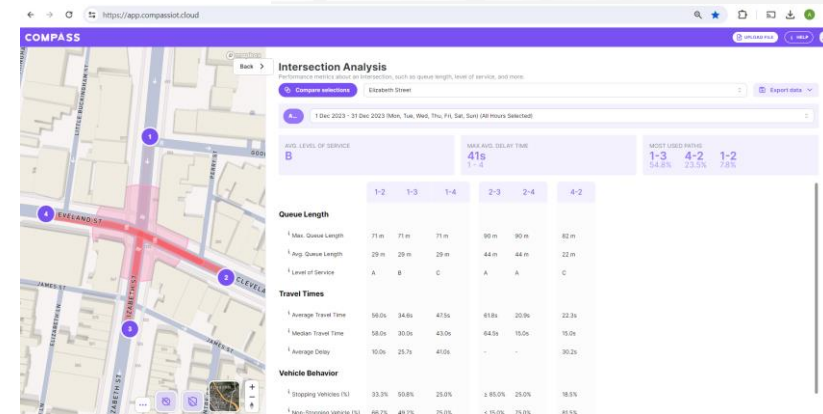
Origin Destination

Understand travel times, trip distribution, travel routes, speed, and hourly volumes



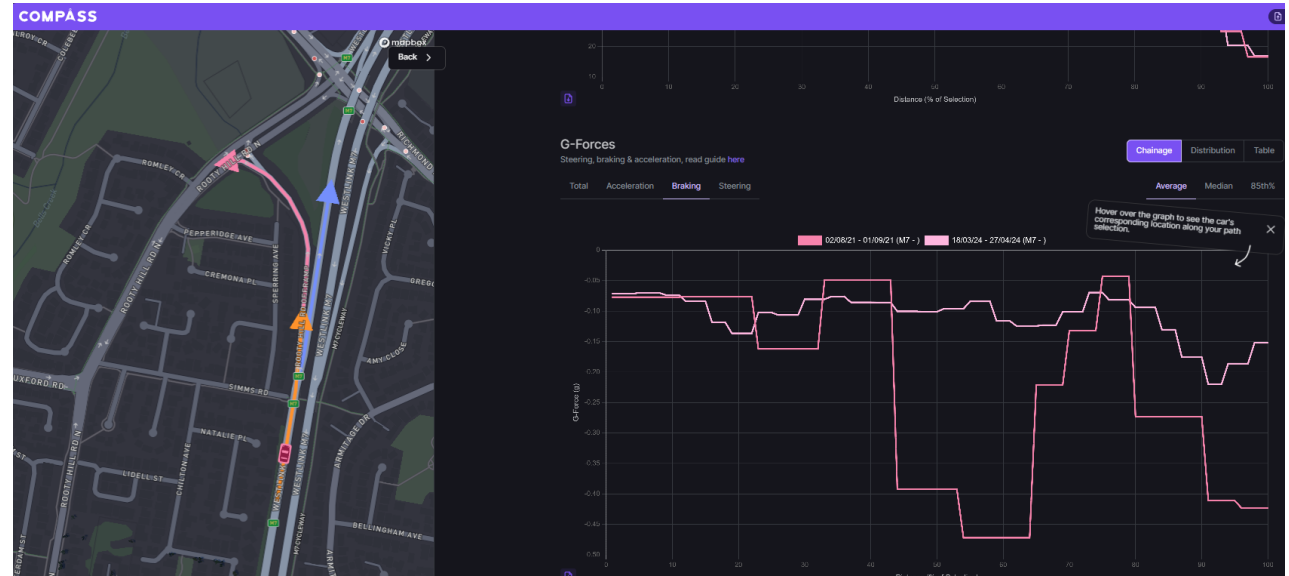
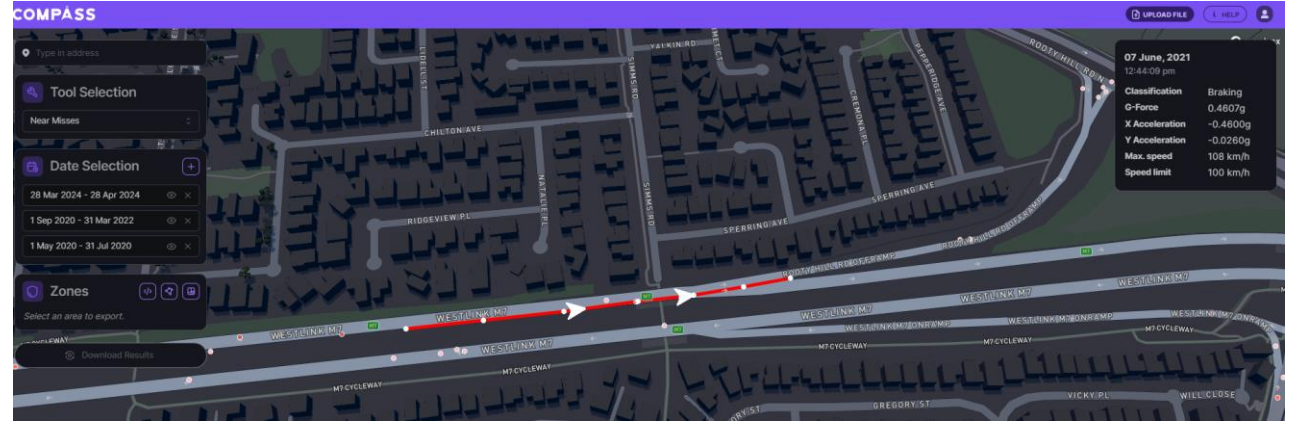
Intersection Analysis

View the level of service and queue lengths



Transurban - Sydney M7 Motorway

- The road operator identified crashes at the approach of an exit ramp along the M7 motorway in western Sydney NSW
- There was evidence of spillback causing drivers to swerve or brake violently
- Through the platform high braking, swerving g-forces and near misses were identified along and on the M7 before the ramp
- The solution that was identified was signal phasing changing at the western end of the ramp
- Connected vehicle data showed the immediate impact of the improvements
- Speed and g-force metrics appeared within the acceptable limits



Sydney M1 - Congestion vs Rear End Near Misses

- Connected vehicle data provided to identify rear end crashes along congested sections of the road
- Near Miss Compass indicators was used to predict 'Rear End' Crashes along high volume congested roads
- 5-year Rear End Crash data along high volume motorways matched 'near miss' data
- High braking and some swerving g-force data combined with low speeds indicate congestion combined with potential rear end crashes
- The evidence based analysis, using connected vehicle data provides a strong prediction indicator of future rear end crashes on specific section of the road network



Compass IoT - Use Cases

1. Before and After Surveys (“Plan” vs “Actual”) in real time

- Highway/Road Projects
- Performance Evaluation
- Traffic Impact Assessment Evaluation (Design vs Actual)
- Mega Projects Operations Commencement
- Real Time Traffic Engineering data for Decision making

2. Origin-Destination surveys

- Exact Routes
- Travel times
- Timing of trips
- Percentage of vehicle trips for each route

3. Input for Incident Management

- Accidents
- Unexpected Lane Closure
- Triggering of Emergency Services Action

4. Freight Management

- Traffic Volume
- Travel Time
- Input for Route Selection/Guidance between any two points

5. Savings in

- Maintenance Costs
- Network Management

6. Road Operations

- Planning input
- Toll charging
- Traffic monitoring during construction and maintenance

7. VMS + Push Info

- Travel times
- Incidents
- Impact on network

8. PPP Projects

- Input to the Economic Appraisal

9. Prioritization of Investments and Interventions on Network Infrastructure

10. Evaluation of Roads and Highways for Autonomous Vehicles Readiness

11. EVs Infrastructure Planning

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THANK YOU

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