

# Optimisation algorithms for routing & scheduling of fleets

# Benchmarking to identify pathways to fleet decarbonisation

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#### The Algorithm People

Formed in 2018 to provide optimisation algorithms and associated technology and services for fleets and organisations of all types.

The Algorithm People are specialists in optimisation, with experience and capabilities to use artificial intelligence and machine learning to solve the complex mobility challenges our clients face now and in the future.

Our optimisation algorithms deliver the breakthroughs necessary for our clients to decarbonise their businesses, reduce emissions, improve productivity and maximise the utilisation of their assets.



# How we help fleets today....

1. Make cost savings and operational improvements without compromising on service through optimisation for fleets.

#### Typical benefits include

- Savings of up to 30%
  - Reduction in fuel
  - Reduction in time
  - Reduction in CO2
- Increased vehicle utilisation
- Immediate return on investment
- Other operational improvements
  - Reduction in planning time
  - Digitise the process
  - Compliant and safe routes





My transport planner





2. Help to decarbonise fleets and help on the transition to net Zero through evidenced based analysis.

Typical questions customers are looking to solve;

- How can I start to reduce carbon emissions today?
- How many of my vehicles can I transition to alternative fuels?
- What vehicles should I choose?
- What infrastructure will I need?
- How will I manage my fleet:
  - during transition
  - post transition.



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# Benefits for customers..

# Optimisation

- Generate efficiencies on the existing operation of up to 30%.
  - ✓ Reduction of miles
  - ✓ Reduction of time
  - ✓ Reduction of fuel and CO2
  - ✓ Increased vehicle utilisation
- Immediate opportunity to start decarbonisation journey immediately before investing in new vehicles and infrastructure.
- Mitigate risk through efficient planning.
- Digitise the process
- Improve the customer experience:
  - ✓ Electronic POD
  - Customer communications for ETA's

# **Decarbonisation EV Analysis**

- **Simplify** the process on transitioning and considering alternative fuels.
- Generate efficiencies on the existing operation which can be typically 10-20% this in turn can:
  - Increase the opportunity to electrify
  - Deliver a "pot" of cash savings to invest in vehicles and infrastructure
- Validation on the business decisions:
  - Understand the starting position and emissions
  - Provides an evidenced based approach rather than perception or personal preference.

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# 1. Optimisation – My Transport Planner



#### My Transport Planner (MTP)

- MTP is a web-based application for all transport operators.
- Operators can sign up to the platform and start using it on the same day.
- No integration is required to use the platform with an import facility and mapping tool for existing data sets.
- MTP also has:
  - An associated mobile app for drivers including vehicle defect reporting and EPOD as standard
  - Customer communication module to send SMS and or emails to customers with configurable ETA's

### **Optimisation Case study – Fareshare**

#### **Headlines:**

- **20%** reduction in mileage
- **40%** reduction in planning time
- **20%** savings in fuel and CO2
- Increased vehicle utilisation

#### **Project Overview**

- Fareshare is a national charity who redistribute surplus food to charities that turn it into meals. Fareshare operate out of local depots nation wide.
- Fareshare are currently rolling out the technology to Fareshare sites across the UK.
- Currently using
  - My Transport Planner
  - Mobile application to digitise the process







# 2. Optimise first then electrify... the approach



Common approach is for fleets to look at individual vehicles on current mileage (telematics) to make decisions on the transition.

The Algorithm People approach is to go one step further using fleet data, rules and algorithms to see if there are efficiencies that can be made to the fleet before considering alternative fuels. This is using sophisticated algorithms to look holistically at the fleet to deliver a full fleet approach of evidence based methodology.





# What we offer today a clear and simple 5 step process to decarbonisation

1. UNDERSTAND OBJECTIVES

Through initial consultation understand key business objectives and support required on the decarbonisation journey.

#### 2. VALIDATE

Understand how the customer is operating today and baseline existing duty cycles using big data and optimisation algorithms.

#### 3. **OPTIMISE**

Using out award winning algorithms, **we** will re-sequence and optimise duty cycles to reduce mileage, increase productivity and cut emissions by up to 30%.

#### 4. DECARBONISE

Overlay electric vehicle ranges and/or alternative fuel options to understand suitability for transition and the optimum fleet mix for the customer. Whist the transition is in progress optimised duty cycles can start the decarbonisation today through reducing emission on existing ICE vehicles.

#### 5. TRANSITION

Consider infrastructure, home charging and continues BAU optimisation to generate continued savings and efficiencies.

### Decarbonisation Case study – Yorkshire Water

#### **Headlines:**

- **40%** of vehicles initially identified by Yorkshire Water suitable for electrification.
- **88%** of vehicles analysed suitable for electrification after optimisation, **an increase of 48%**.
- **95%** of duty cycles achievable without a top up charge after optimisation.

#### Outcomes

- Procurement of both Infrastructure and EV vehicle started 3 years in advance of previous plans.
- Influence on infrastructure decisions:
  - In depot charging will accommodate the large proportion of the fleet.
  - Less reliance on destination and public charging infrastructure which was perceived to be a barrier.



Decarbonise · Optimise · Innovate



# YorkshireWater



# **Collaborative R&D projects**

# The Algorithm People team have extensive prior experience of cR&D projects funded by:

- UKRI Innovate UK, KTP, Catapult network
- DfT
- EU Horizon 2020

# Subject expertise includes:

- Vehicle to grid, V2X, smart charging, second life battery storage, load balancing
- Range extended refrigerated BEVs for grocery deliveries
- Freight consolidation with static/dynamic hubs
- Quantum Computing, quantum machine learning
- MaaS





KNOWLEDGE TRANSFER

PARTNERSHIPS





Horizon 2020 European Union funding for Research & Innovation





Thank you for listening

Please contact Sarah Bee, Strategic Projects Director to discuss potential opportunities

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