ROUTEMONKEY

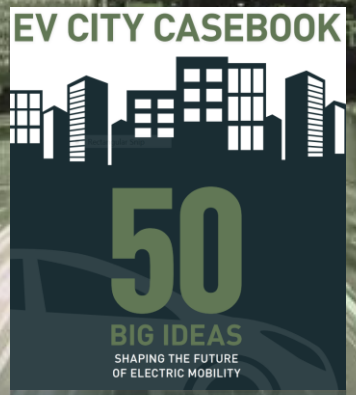
Optimising Vehicles, People and Energy

Infrastructure Planning

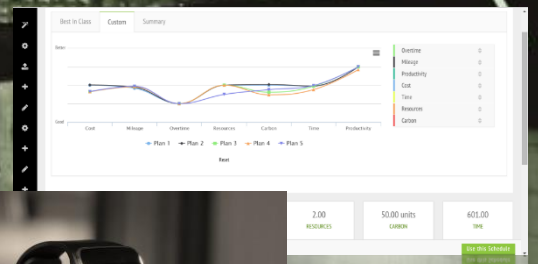
Low Carbon Communities

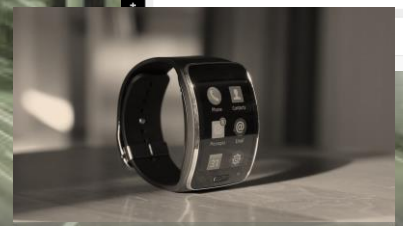
Modelling Future Fleets

Thought Leadership



Smarter Mobility





About Route Monkey…

- Member of Trakm8 telematics solutions group
- 30 employees in the UK with new offices in Hong Kong and Amsterdam.
- Route Monkey algorithms are used at over 1000 sites worldwide.
- Proven savings of up to 20% by implementing Route Monkey technology.

Some numbers on potential mileage and CO2 reduction potential in freight

12.5% CO2 reduction by use of top-tier asset optimization tools and are still to be taken up by approx. 85% of fleet operators;

promotion of relaxed delivery windows would lead to savings of 25% if relaxing from 1hr to 5hrs,
6% per hour relaxed on average, this applies to currently 20% and rising to 30% by 2020;

7% to 70% asset sharing driven mileage reduction

modest sharing models that can save 15% are in place, yet still to be taken up by at least 80% of operators
horizontal joint sharing of vehicle assets and depots is a particular approach that can lead to savings of at least 20% on average, and is yet to be taken up in the case of at least 85%

eco-driver training can save on average 7% in emissions by better fuel efficiency, however take-up is already high in developed countries, 80% in the UK.

Step to real collaborative logistics

Single fleet optimisation case studies have proven to provide 5-20% of savings through optimisation, but there is no collaboration involved.

2 types of collaboration in logistics are studied that are believed to have largest impact on efficiency:

- Sharing of information among logistics providers
- Sharing of assets to improve utilisation
- Sharing allows better consolidation and smarter use of EVs

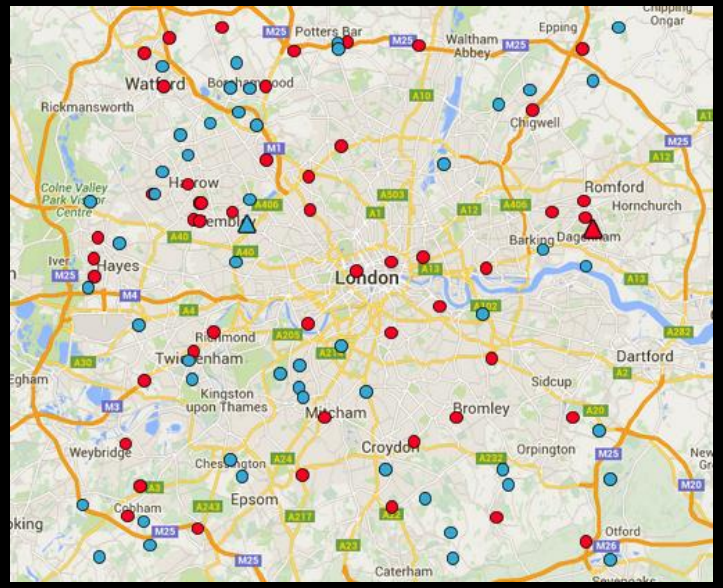
In addition to single fleet optimisation, the logistics providers would further benefit from being able to predict their operations based on shared information and improve their operation by sharing their assets. Large Shippers can influence their 3rd party logistics providers to use technology to improve their utilisation, CO2 or other KPI. Large multinationals have gathered at the blue chip CEO club World Business Council for Sustainable Development to demonstrate how these two drivers of efficiency increases could add value on top of fleet optimisation. Route Monkey announced this partnership at COP21 in December 2015.

http://www.transportengineer.org.uk/transport-engineer-news/wbcsd-low-carbon-transport-partnership-at-cop21/111003

Low Carbon Freight Partnership

wbcsd ROUTEMONKEY®

@wbcsd #LCTPi @routemonkeyltd

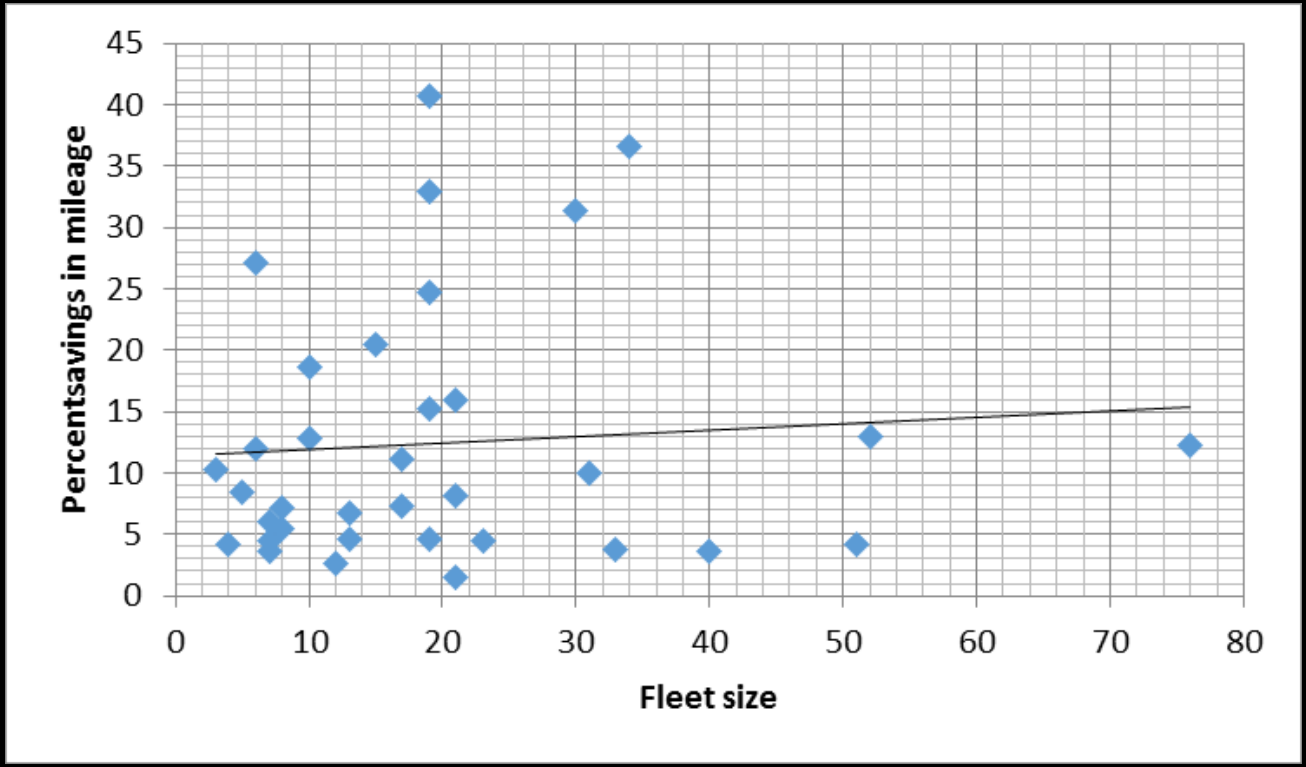


- Global collaboration in decarbonising freight
- Demonstration sites in up to 10 cities in 2016
- Optimisation to save 15%-60% CO2

"Even a highly fuel efficient truck completing an empty run generates unnecessary emissions, and its presence on the road contributes to the current chaos of traffic flow in many places."

MICHELIN ups® SCANIA Nestlé at&t TOTAL Brisa Internacional

Fleet optimisation



Range of improvement among the 35 fleets	**1.5% to 40.8%**
Mean improvement	12.5%
95% confidence range around the mean	9.0% -- 16%

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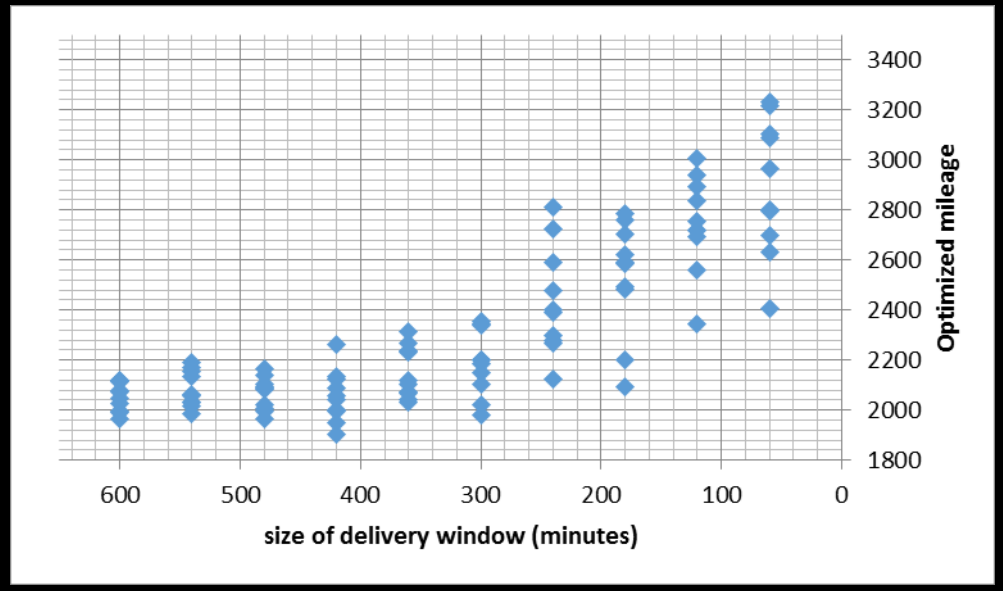
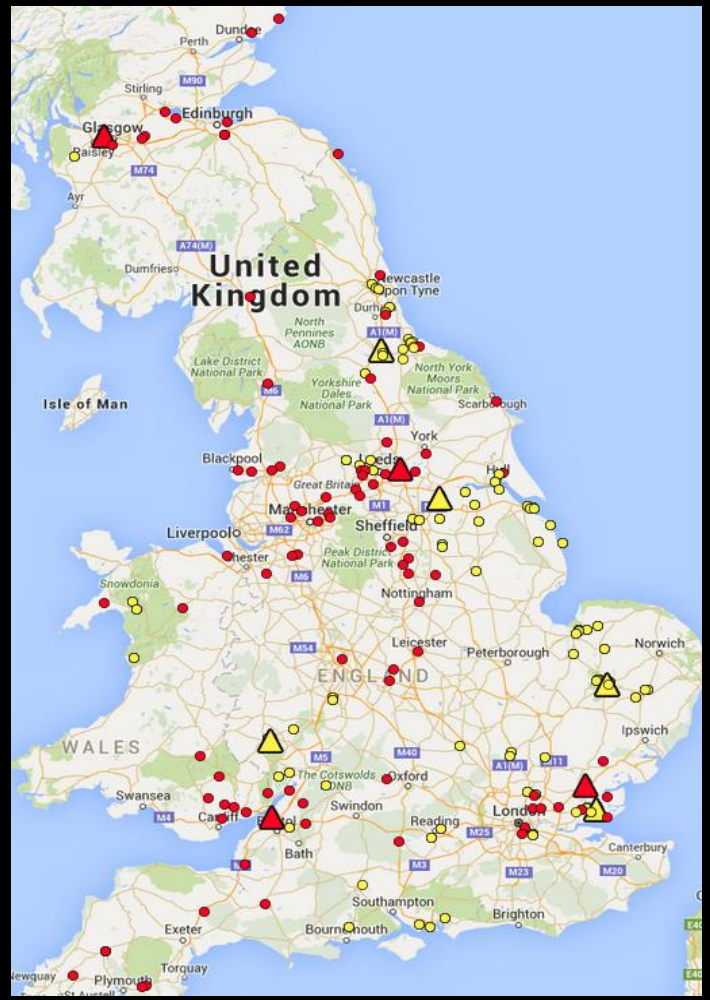
Relaxing time windows



Asset sharing

- matching ‘bakchaul’ with coincident loaded trips;
- joint consolidation centres (essentially, strategically situated shared depots)
- joint optimization of vehicles and depots

Scenario 1: UK-wide fleets, all diesel	
Cost savings from collaboration of fleets A and B	20%
CO2/mileage savings from collaboration of A and B	19%
Scenario 2: UK-wide fleets, half diesel half EV	
Cost savings from collaboration of fleets A and B	22%
mileage savings from collaboration of A and B	25%
CO2 savings from collaboration of A and B	64%
Scenario 3: London fleets, all diesel	
Cost savings from collaboration of fleets A and B	22%
CO2/mileage savings from collaboration of A and B	36%
Scenario 4: London fleets, half diesel half EV	
Cost savings from collaboration of fleets A and B	14%
mileage savings from collaboration of A and B	21%
CO2 savings from collaboration of A and B	63%



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Conclusion

It is possible!

Our small contribution to make this happen are these 3 types of Route Monkey algorithms:

- Fleet modelling (marriage algorithm)
- Pre-jobs allocation algorithm
- Delivery scheduling and end location

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Experience in Logistics Optimisation: Case Study XDP

Route Monkey provided its algorithm engine in 2013 to XDP Express, which was fully integrated into their own web based dashboard and deployed to 60 sites across the UK. Each site has multiple vehicle types and handles odd sized and shaped freight, optimised by cubic capacity and weight. This customer demonstrates scale and flexibility of our planning tool to deal with non-standard freight, deliveries and collections with different vehicle types.

Experience in Logistics Optimisation: Case Study Yodel

Route Monkey first provided a web based solution in 2013 to Yodel to optimise its lifestyle courier business. Our technology generated savings of 19% in fuel use and a reduction 6% in time. This is a good example of branch and clustered regional planning and the holistic benefits, savings and efficiencies that this solution brings.

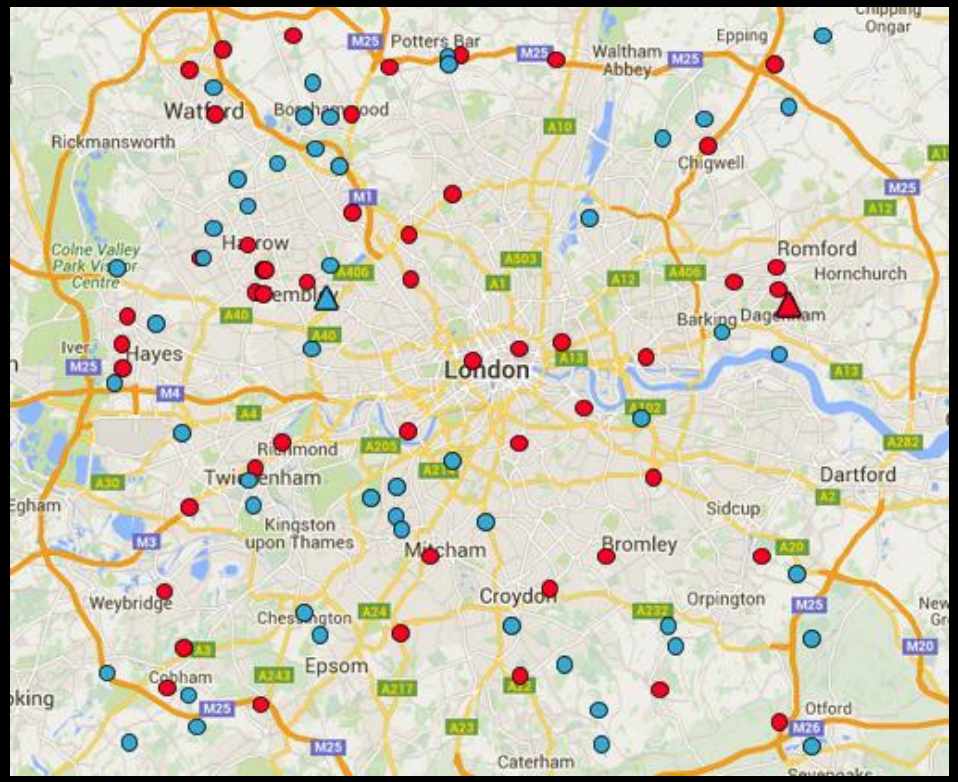
Experience in Logistics Optimisation: Case Study Metsa Wood

Route Monkey delivers our server and branch based scheduling and route optimisation tool to multiple locations across the UK to optimise Metsa's subcontractor fleet and reduce costs. In addition to automating the planning process; our technology generated savings of 21% in terms of reduced subcontractor costs and increased vehicle utilisation by 11%. This is a good example of a standard planning tool.

Experience in Logistics Optimisation: Case Study Iceland

Iceland: Route Monkey have implemented a fully dynamic, web based scheduling solution for Iceland, the frozen food retailer, across its 800 stores in the UK. Our algorithm optimises their 1500 vehicles in real-time for its online and home delivery operation and links into their back office and telematics solution. This is the biggest deployment of scheduling technology in the UK and demonstrates scale.

Two fleets in London: all-diesel details of best-cost schedules



Fleet A:

5 vehicles / 314 miles / 157 kg CO2

£642

Fleet B:

6 vehicles / 320 miles / 160 kg CO2

£650

Not working together:

30 vehicles / 634 miles / 317 kg CO2

£1,292

Fleets A and B working together

10 vehicles used (**9%** saving)

404 miles 202 kg CO2

(**36%** improvement mileage/CO2)

£1,008 (22% cost-saving for both fleets)

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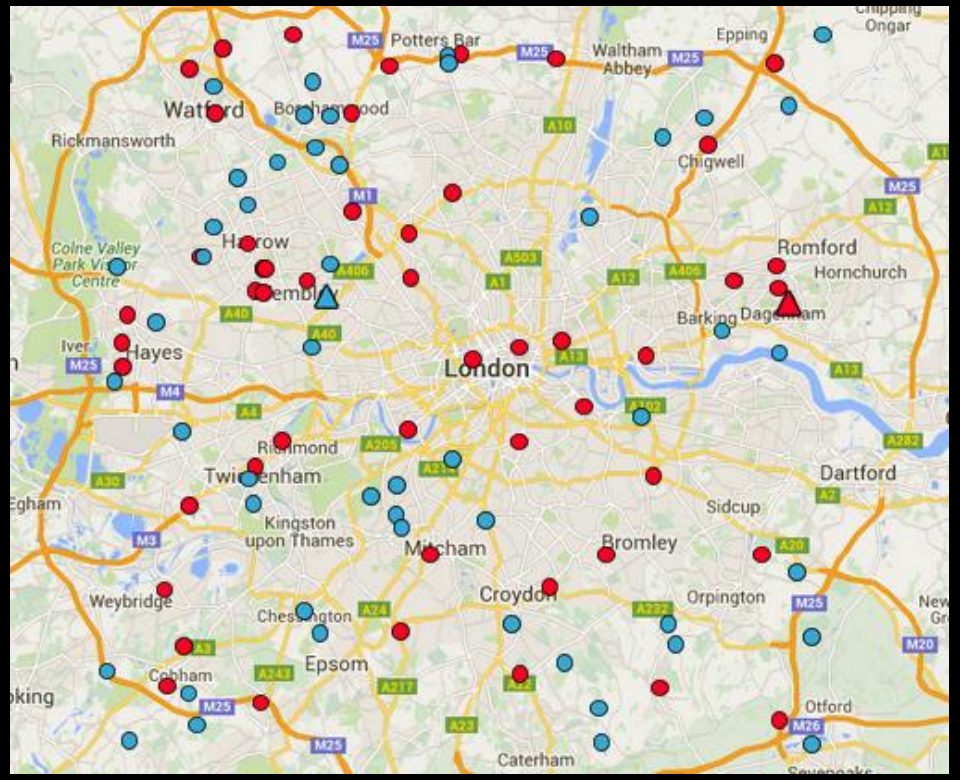
2 Fleets in London, both half-EV (EV range 50 miles) details of best-cost schedules



Fleet A:

5 vehicles (2 EV)/ 303miles / 107 kg CO2

£618

Fleet B:

5 vehicles (3 EV) / 276 miles / 86 kg CO2

£595

Not working together:

10 vehicles (5 EV) / 579 miles / 193 kg CO2

£1,213

Fleets A and B working together

12 vehicles (**8 EV**) (**20%** more vehicles)

(**60% better EV util**)

457 miles 71 kg CO2

(**21%** improvement mileage)

(63% improvement CO2)

£1,041 (14% cost-saving for both fleets)

Sharing company information and assets

Description Due to the nature of market competition, there is little precedence of sharing on truck operations for dedicated business use. The mismatch between supply of trucks and demand for goods results in (partially) empty trucks taking up road time-space and generating unproductive emissions. This also translated to higher costs for final consumers. The key barrier is one of business attitudes and perception. The protection of trade and company confidential information has been shown possible and can be expanded.

Main Objectives

1. Identify root causes of empty miles
2. Define conditions under which freight transport can and should be shared
3. Identify barriers and solutions to sharing freight transportation assets
4. Identify synergies between high empty miles routes/operators and transport demand
5. Evaluate potential for mandated sharing

Minimum Design Elements

Assets
- Vehicles
- Distribution centres/Warehousing
- Custom trailers and or parcel trackers

Data
- Historical utlisation rates load factors in space and time
- Vehicle fleet capacities and capabilities
- Delivery schedules

ICT infrastructure
- None necessary unless testing solutions
- Truck sharing module for scenario 2

Actors

Required
- Fleet owners
- Connected vehicles/drivers suppliers
- Fleet optimisation suppliers

Potential
- Local traffic management operators
- Local administration