

An Intro to Route Optimisation

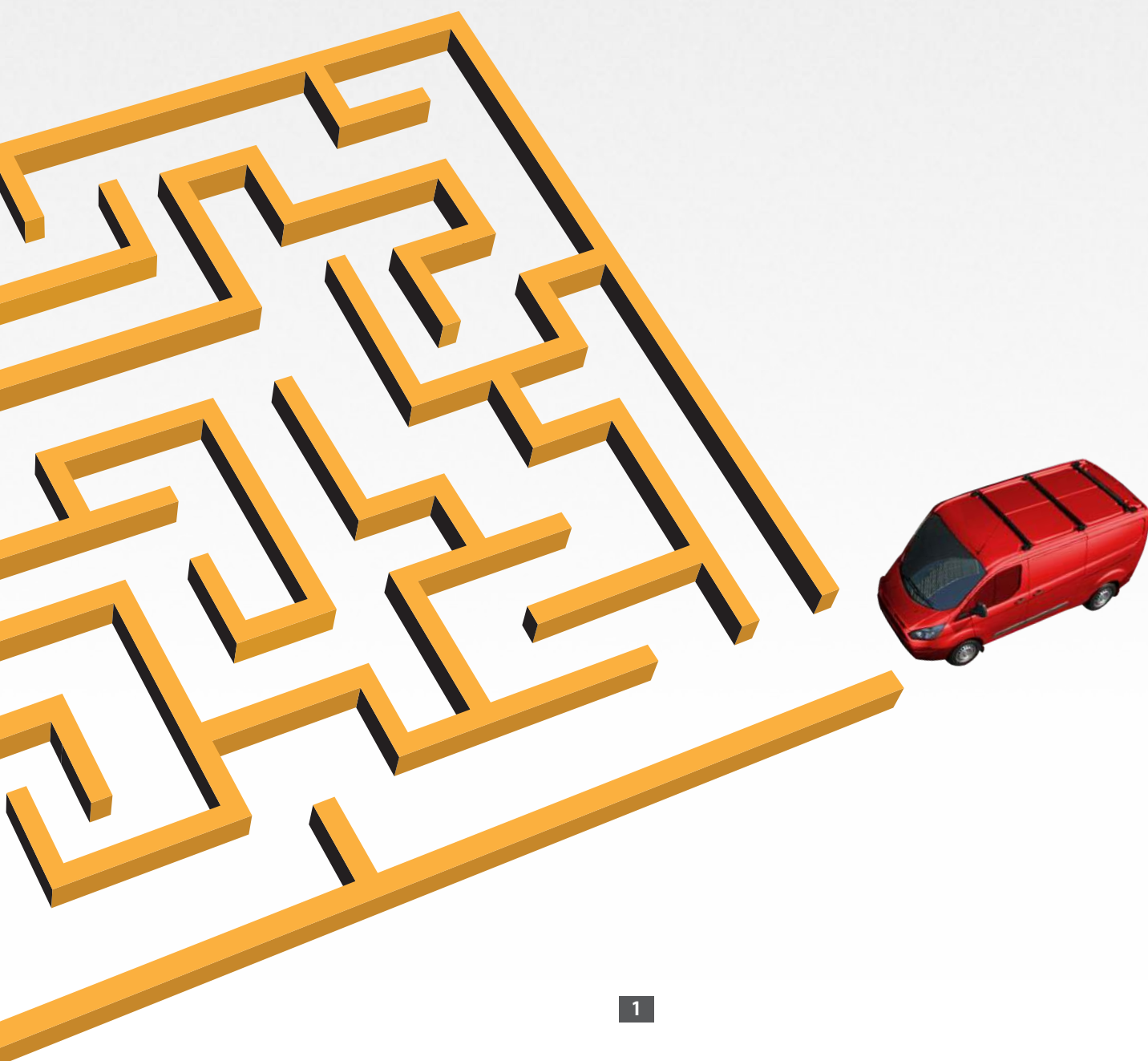
Building your business
through territory planning
and optimising routes

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Introduction

Putting a commercial vehicle and driver on the road is expensive. Smart fleet owners and operations leads know that it is important to run them as efficiently as possible by maximising utilisation.

One of the most effective tools you can have in your fleet management arsenal to achieve this is **Route Optimisation**. This eBook will introduce you to the concept and theory of Route Optimisation, as well as the benefits you may expect to see by deploying it within your fleet.



What is Route Optimisation?

In commercial applications, distribution companies with large and small fleets may incorporate route planning software into their fleet management systems to optimise route efficiency and boost profits.

The goal is to do more work with fewer resources and in fewer miles.

An ideal route planning solution for companies that move or deliver goods and services will often **include GPS tracking capability and advanced reporting features which enable dispatchers to prevent unplanned stops, reduce mileage and plan more fuel-efficient routes.** Such software solutions are offered as a SaaS model, allowing them to be hosted offsite, and updated on the fly without client-side downloads or undue burdens on your business to stay up to date.



Things to Think About

Some facts to keep in mind when thinking about route optimisation:

- **Route planning is tough:** As the number of stops increases, the number of possible routes goes up exponentially. For example, 4 stops has 24 possible routes, while 5 stops has 120 possible routes, and so on
- **Software programs are better at route optimisation:** As you can see, manually routing your fleet even on a small scale is out of the realm of human capacity and is best left to technologically advanced algorithms in routing software
- **Eliminating unnecessary miles has HUGE payback:** The fewer miles your fleet drives to complete the jobs, the more money you keep in your pocket – it's that simple

Number of vehicles	Number of stops per vehicle	Number of Route Possibilities
1	1	1
1	5	120
1	10	3,628,800
5	10	37,267,043,023,296,000

Why is Route Optimisation Important?

A route optimisation solution incorporates the tools companies require to **plan, analyse, create and deliver the most profitable route strategy for today's mobile workforces**. Optimisation technologies allow companies with fleets of all sizes to effectively address a variety of issues they would otherwise face when trying to develop routing and distribution plans.

- Create optimised customer 'territories' based on predefined criteria
- Create routes based on driver and vehicle availability and calendar constraints – weeks or even months in advance
- Easily incorporate delivery frequency and time windows into your plans

- Test “what-if” scenarios to see different route and resource options before you commit resources
- Comply with customer requests and SLAs

Three Key Steps of Optimisation

Step 1. Define Territories: Where the Strategic Planning Begins

Route optimisation solutions offer the tools to divide data in a way that makes sense so it's easier to analyse jobs and relevant details and define optimal territories. Apply criteria and specific filters and business rules to test-drive scenarios and ultimately form your territories.

Examples of criteria:

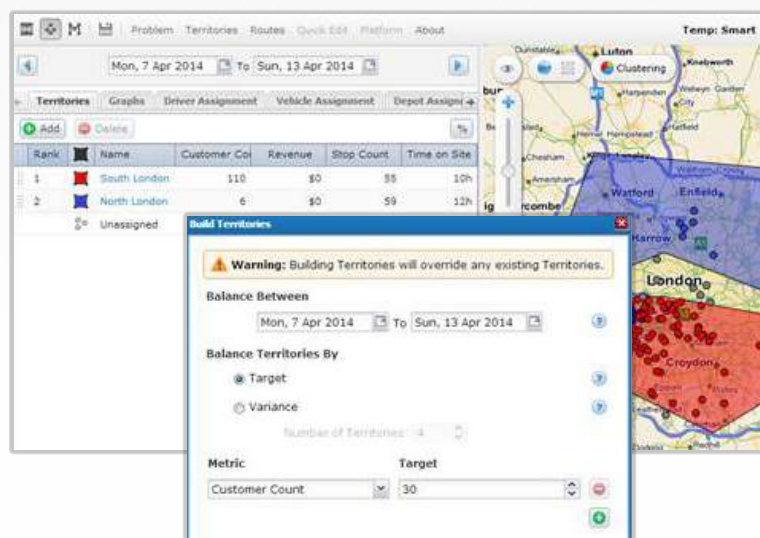
- Number of customers (ex. 2000 jobs)
- Number of scheduled stops (ex. 50 stops per week)
- Total time spent at each customer site (ex. 140 minutes per location)
- Revenue generated by each customer

Use criteria to build territories based on:

- Geographic
- Non-geographic (using filters)
 - - Revenue, services, vehicles, driver attributes and more
- Hybrid

TIP: Look for a solution that allows you to consider “what-if” scenarios before committing resources and view the expected cost of making changes.

Model your scenarios by location and/or customer needs, load type and size, driver attributes, or predefined criteria to create strategic territories and determine depot locations. This strategy helps to maximise revenue and positioning yourself to plan future resource needs.



Step 2. Build schedules: Long-term tactical scheduling

Schedules are meant to improve productivity and keep you on track, but what happens if you have challenging SLAs, a new job is added or time windows are changed? The use of route optimisation solutions allows productivity to meet flexibility.

- Build long-range job schedules and **fine tune them as you go**
- **Easily make changes** once you've built routes and schedules to incorporate new customers and jobs, modifications, or changing time windows
- Determine if **multi-day routes** are required for your fleet

The screenshot displays a software interface for route optimization. The top menu includes 'Problem', 'Territories', 'Routes', 'Quick Edit', 'Platform', and 'About'. The main window is titled 'Temp: Smart' and shows a weekly schedule starting on 07 April 2014. The interface includes tabs for 'Customers', 'Drivers', 'Vehicles', 'Depots', 'Routes', and 'Notes'. A toolbar contains 'Undo', 'Redo', 'Add', 'Import', and 'Hide All Routes'. A table lists the schedule for 'John S' on 08 April 2014, showing a total distance of 64.9 miles and a time of 4h 52m. The schedule includes a depot stop at 08:00 and four customer stops: *329 UPPER R (09:00), 116 Colehill Lz (09:14), 116 Colehill Lz (09:24), and Emirates Arse (09:54), ending with a *HOME collection at 10:20. A second route for 'Smart I' is also shown for 08 April 2014, with a distance of 94.7 miles and a time of 4h 51m. On the right, a map of London shows a blue route with numbered stops (1-8) corresponding to the schedule. The map includes various landmarks and road networks.

Drive	V	Date	Stops	Distance	Time	Initial Lo.	Sh
+ 07 April 2014							
- 08 April 2014							
John S	Sr	08 April 201	11	64.9	4h 52m	1.0 Unit	
No.	Order	Location	Schedule	Arrive	Load/Unk	Time O	
		London Depot		08:00	1.0 Unit	0s	
...	1	*329 UPPER R	Schedule 1	09:00	0.0 Unit	10m	
...	2	116 Colehill Lz	Schedule 1	09:14	0.0 Unit	10m	
...	2	116 Colehill Lz	Schedule 2	09:24	0.0 Unit	10m	
...	3	Emirates Arse	Schedule 1	09:54	0.0 Unit	15m	
...	4	*HOME	Collection	10:20	0.0 Unit	10m	
Smart I	Sr	08 April 201	9	94.7	4h 51m	1.0 Unit	
+ 09 April 2014							
+ 10 April 2014							
+ 11 April 2014							
+ 12 April 2014							
+ 13 April 2014							

Step 3. Publish routes: Dynamic routing at work

Last-minute changes are inevitable – traffic, customer and vehicle conditions are all in flux – so a routing solution that allows you to dynamically change routes the day-of or the day before is key.

- **Publish the day's routes** for the drivers and dispatch teams
- **Allow for last minute tweaking** by your teams in the field to ensure practicality of the day's events based on these constraints
- **Re-optimize** a single route (sequence) or selected set of routes



The screenshot displays a dynamic routing software interface. On the left is a map of London with several red circular markers containing the number '1' and yellow rectangular markers with numbers (8, 11, 4, 1). Major roads like A10, A21, and M25 are visible. On the right is a table with columns for Name, Site, and Type. The table is sorted by 'Time To Expiration'. The 'Type' column includes entries like 'Stop', 'Depot', and 'Depot Pick up'.

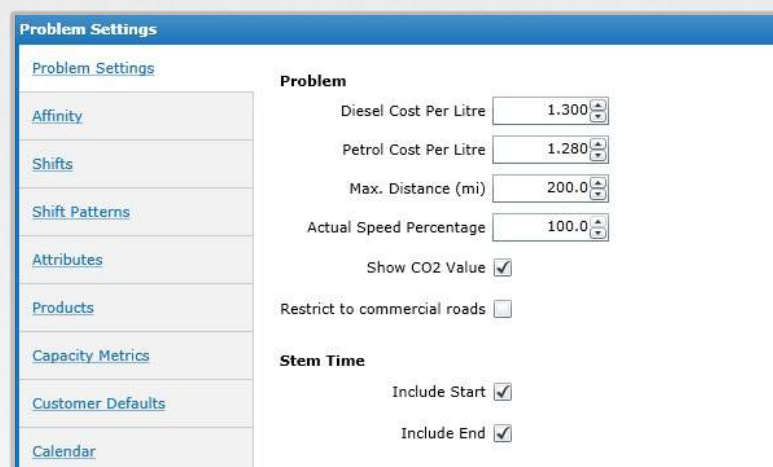
Name	Site	Type
*NOT PAID! 21	*NOT PAID! 21	Stop
131 Jersey Road	131 Jersey Road	Stop
131 Jersey Road	131 Jersey Road	Stop
London Depot	London Depot	Depot
12 Staines Road [A315]	12 Staines Road [A315]	Stop
*HOME	*HOME	Stop
*HOME	*HOME	Depot Pick up
London Depot	London Depot	Depot
12 Southcote Avenue	12 Southcote Avenue	Stop
Emirates Arsenal Stadium	Emirates Arsenal Stadium	Stop

Choosing the Right Route Optimisation Solution

When researching a route optimisation solution for your company, it's important to keep in mind that a continuous and consistent optimisation engine will deliver the most profitable route strategy.

The **FIVE MUST DOs** of a strategic route optimisation system*:

- 1. The system must support “what if” modelling** using production data without altering current plans or operations.
- 2. The system must be flexible.** Changing variables should be easy and the system should allow for multiple scenarios.
- 3. The system must allow rapid update and change.** Customer data should be simple to enter.
- 4. The system must integrate with all other company systems** including order management systems, the warehouse management systems,



The screenshot shows a 'Problem Settings' window with a sidebar on the left containing menu items: Affinity, Shifts, Shift Patterns, Attributes, Products, Capacity Metrics, Customer Defaults, and Calendar. The main area is divided into two sections: 'Problem' and 'Stem Time'. The 'Problem' section includes: Diesel Cost Per Litre (1.300), Petrol Cost Per Litre (1.280), Max. Distance (mi) (200.0), Actual Speed Percentage (100.0), Show CO2 Value (checked), and Restrict to commercial roads (unchecked). The 'Stem Time' section includes: Include Start (checked) and Include End (checked).

with GPS systems, purchase order systems, and federally mandated electronic on board recorders systems.

5. The system must be FAST!

Complex modelling solutions should take no more than a few minutes to solve. Imports and report generation should be instantaneous. The entire process of importing late orders for assignment to existing routes must take only a few minutes.

* David K Schneider & Company, LLC, Innovative and Practical Supply Chain Solutions
Link to Whitepaper: 'The Strategy of Route Optimization' (<http://bit.ly/1ggUQEm>)

Continuous Improvement



Excellent firms don't believe in excellence – only in constant improvement and constant change”

Tom Peters

Strategic route planning requires continuous optimisation for maximum results. Solutions with **plan vs. actual reports** will highlight variations to the plan, **such as route deviation**. This allows fleet managers to fine-tune their planning over time.

Real-time alerts can also notify of immediate problems with a plan, allowing any disruptions to be handled proactively. Consider the value of being able to send customers service messages when you know a time window may be missed.

The screenshot shows a software interface with a sidebar on the left containing menu items: FAVORITES, MAIN, DASHBOARDS, REPORTS, TASKS, Job Types, Driver Forms, and Form Templates. The main area is divided into several sections. At the top, there are tabs for Drivers, Install Types, Map, Scorecard Dashboard, and Operational Efficiency. Below these is a table with columns 'Type' and 'Name'. The table contains the following rows:

Type	Name
Ignition	Start Route - London
Idle	Idle Time >15
Switch Diagnostic	MIL Lamp
Maintenance	Oil Change
Marker	Marker at ESPO
Speeding Against Speed Limit	Posted Speed Limit
In Marker Category	Customer Stop >15 Min
Gauge Diagnostic	Harsh Acceleration
Maintenance	Six Week Check

To the right of the table is a configuration panel with tabs for Parameters, Email Options, Popup Options, and Roles. The Parameters tab is active, showing settings for an alert:

- Type: Running Late (Latest Arrival)
- Name: [text input]
- Item Type: Fleet (dropdown)
- Fleet: [dropdown]
- Threshold (mins): 0 (spinner)
- Aggressive
- Time to trigger: 5 (spinner) minutes
- Severity: Normal (dropdown)

Conclusion: Advantages of Route Optimisation

The benefits of a route optimisation solution to a company are wide spread and include:

- Lower transportation costs
- Fewer vehicles to do same amount of work
- Reduced working capital invested in inventory
- More responsive customer service and better “on-time” percentages
- Better utilisation of drivers and crews
- More flexibility to accommodate drivers and crew preferences for shifts and routes
- Better compliance with HOS driver logs, regulations, and work rules
- Higher utilisation of facilities and vehicles



Resources

ROI Calculation

The business case and return on investment (ROI) for route optimisation is usually based upon doing more work with less resources and/or reducing the number of miles driven.

Use this simple ROI calculator to plug in your numbers and see first-hand the benefit of fleet management and route optimisation would have for your fleet

[ROI Calculator](#)

“The Telogis platform has allowed us to add thousands of new customers without adding that many more routes.”

Peter Tighe, Director of Operations,
Door-to-Door Organics

Videos



[Customer Case Study:
Door-to-Door Organics](#)

See how Door-to-Door Organics, a web-based retailer that delivers natural foods to nine states, is using Telogis Route to do more and improve ROI.



[Telogis Route](#)

What Route Optimisation looks like in the Real World: ‘A Day in the Life of a Route Planner’

About Telogis

Telogis provides a cloud-based location intelligence software platform for companies that require route optimisation, real-time work order management, commercial navigation, telematics and mobile integration services for their mobile workforces.

Telogis is dedicated to enhancing the value of its customers' businesses through intelligent integration of location technology, information and services. Telogis was established in 2001 and is headquartered in Aliso Viejo, California, with offices in Europe and Latin America as well as development centers in Austin, Texas; Toronto; and Christchurch, New Zealand. Telogis' products and services are used and distributed in more than 100 countries worldwide. To learn more about Telogis, visit www.telogis.co.uk or call: +44 (0) 203 005 8805.