Reducing Costs and Improving Efficiency Using Route Based Forecasting

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0. CONTENTS

1. INTRODUCTION

The Met Office works closely with our customers to continually improve our services to the transport sector.

This talk outlines two innovative services which reduce costs to our customers without compromising safety.

- Route Based Forecasting (RBF)

- Route Optimisation.

2. What is Route Based Forecasting (RBF)?

Domains

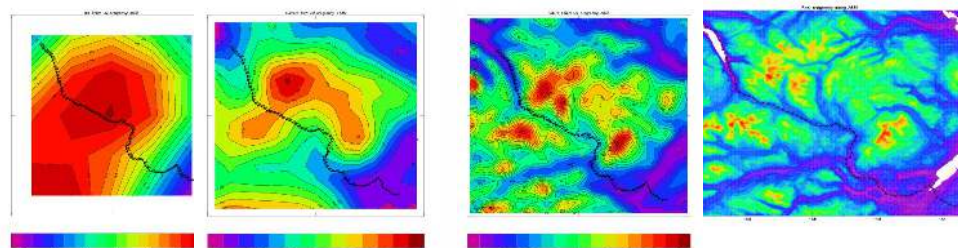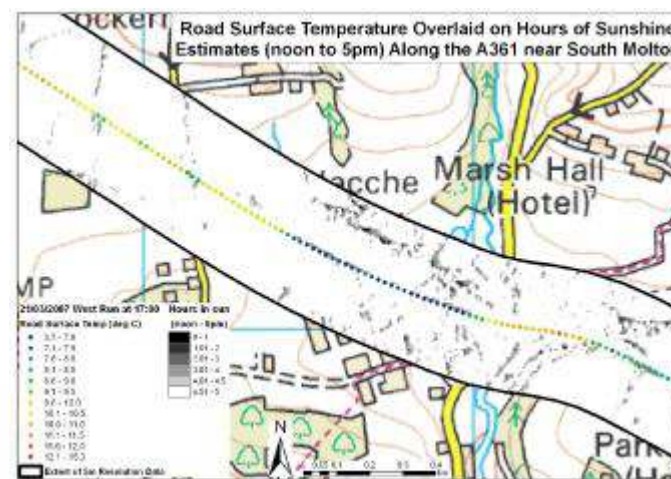
Representative for the domain.

Routes

Representative forecast for the route.

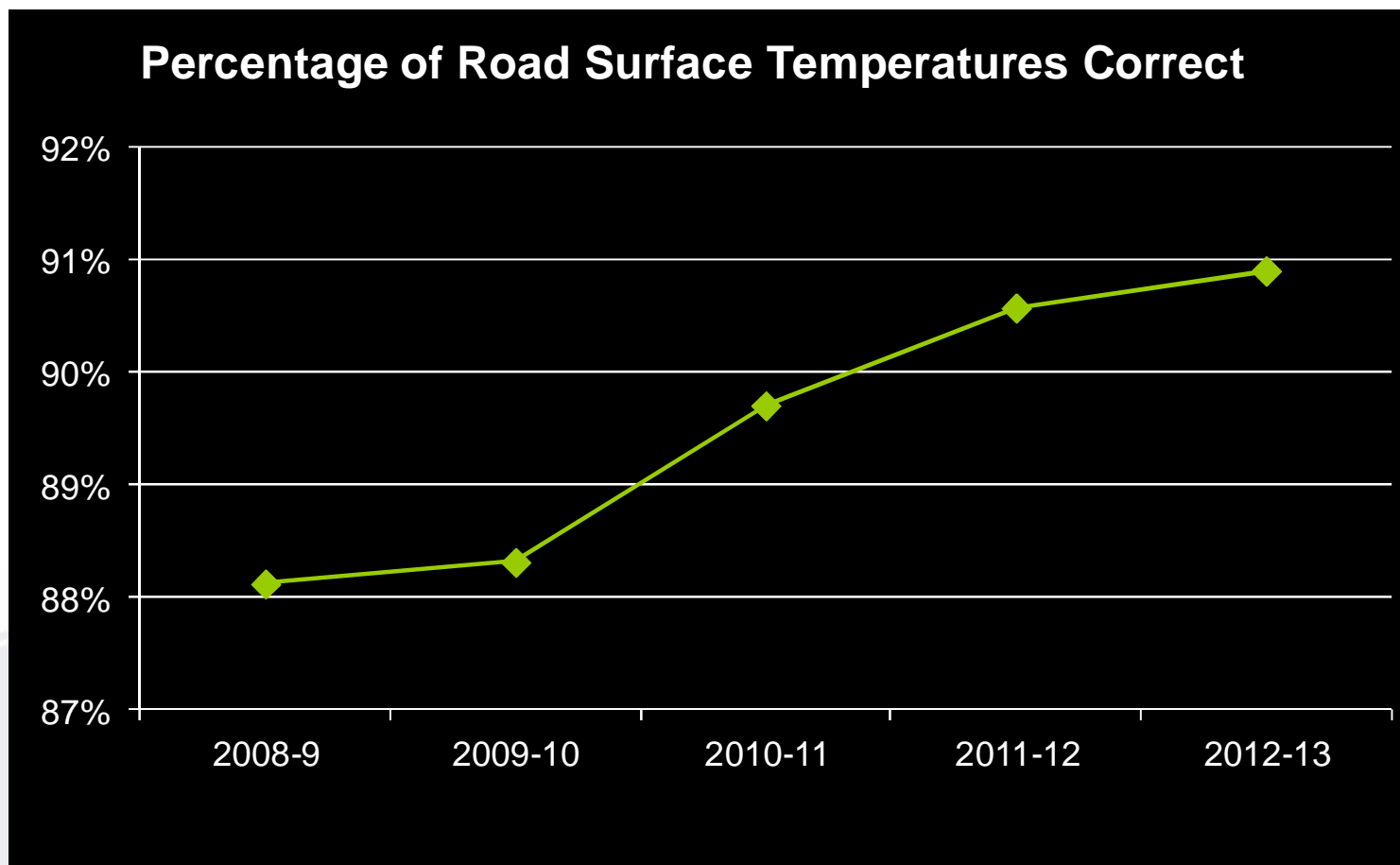Andorra
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3. What does RBF add over Domain Forecasting?

As RBF is representative of the route localised features can be taken into consideration such as:

- Shading

- Skyview

- Traffic speed

- Traffic volume

- Orography

Road Surface Temperature Overlaid on Hours of Sunshine Estimates (noon to 5pm) Along the A361 near South Molton

4. How accurate is RBF?

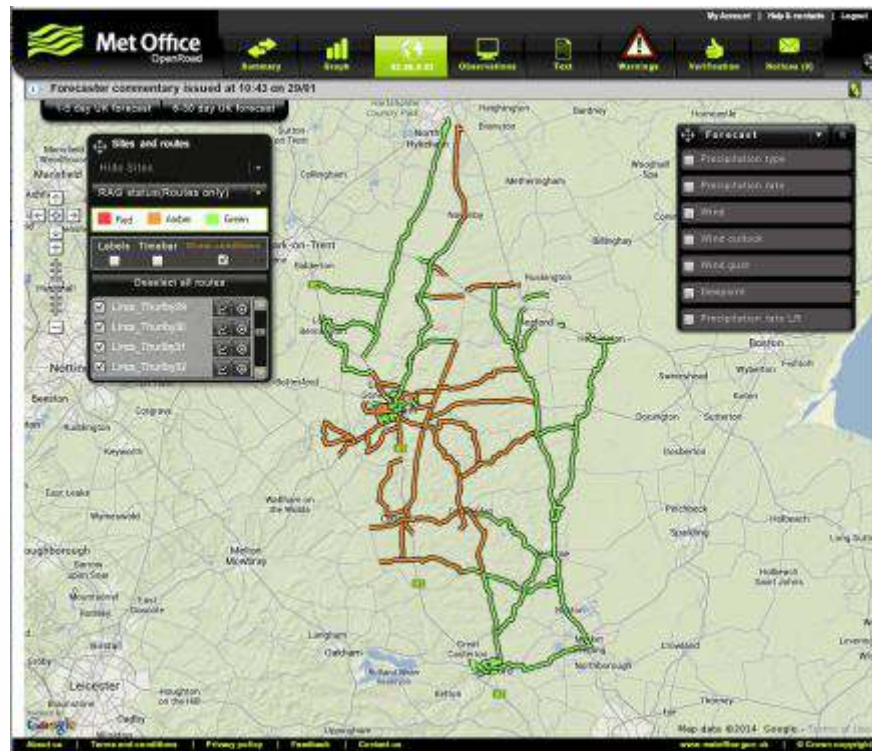**Percentage of Road Surface Temperatures Correct**

5. Benefits of RBF for the decision maker (part 1)

Colour state for the domain

Colour state for each route

Not all routes in the domain need treating

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6. Benefits of RBF for the decision maker (part 2)

Colour state for the domain

Colour state for each route

Not all routes in the domain need treating

7. Savings of RBF over a domain decision process on Marginal Nights*

Results from a pilot study – 50 nights from Feb to Mar 2013

Customer	Km saving from using RBF	Average saving from using RBF on marginal nights	Average % of Network
Lancashire County Council	5 222 (8 marginal nights)	652	26.4%
Balfour Beatty Area 10	1 913 (7 marginal nights)	273	22.7%
Lincolnshire County Council	2 057 (5 marginal nights)	411	13.9%
Wiltshire County Council	124 (2 marginal nights)	62	27.0%
Enterprise Mouchel Ltd Area 1	54 (1 marginal night)	54	8.9%
		Overall average % of Network	19.7%

Approximately half of de-icing nights are marginal therefore 9.9% can be saved on de-icing actions

* - Marginal nights are defined as forecasted road surface temperatures between -2C and 2C.

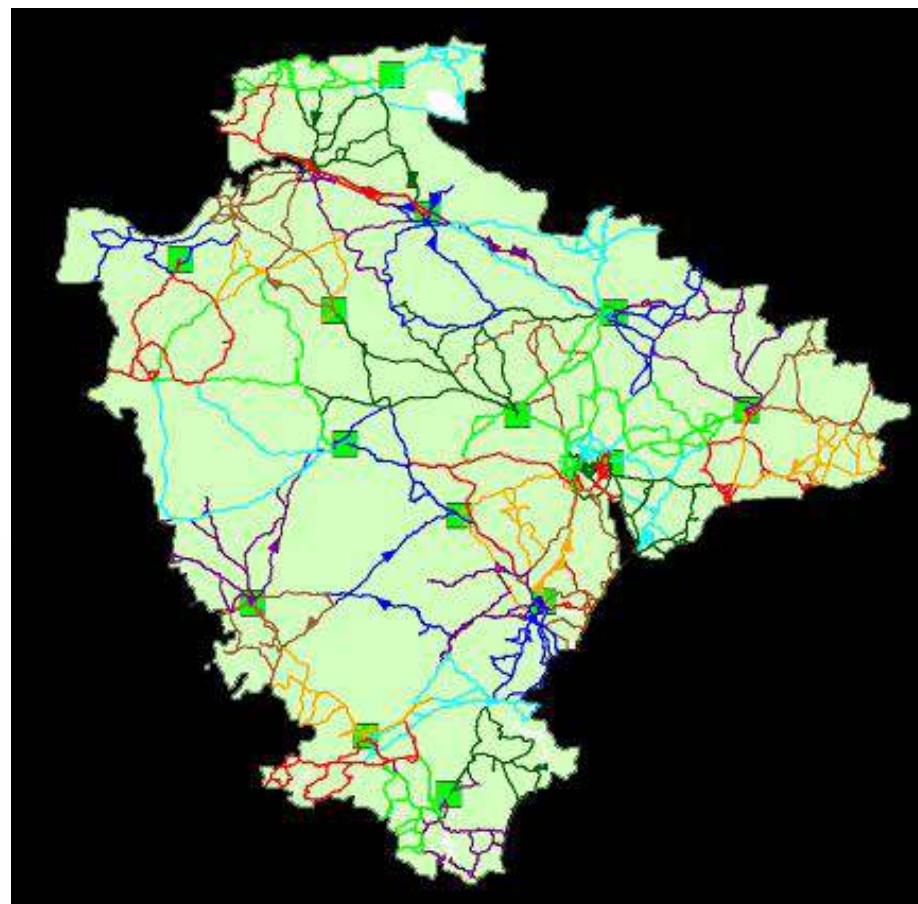# 8. Reducing costs through Route Optimisation

Factors affecting optimisation

•Logistical

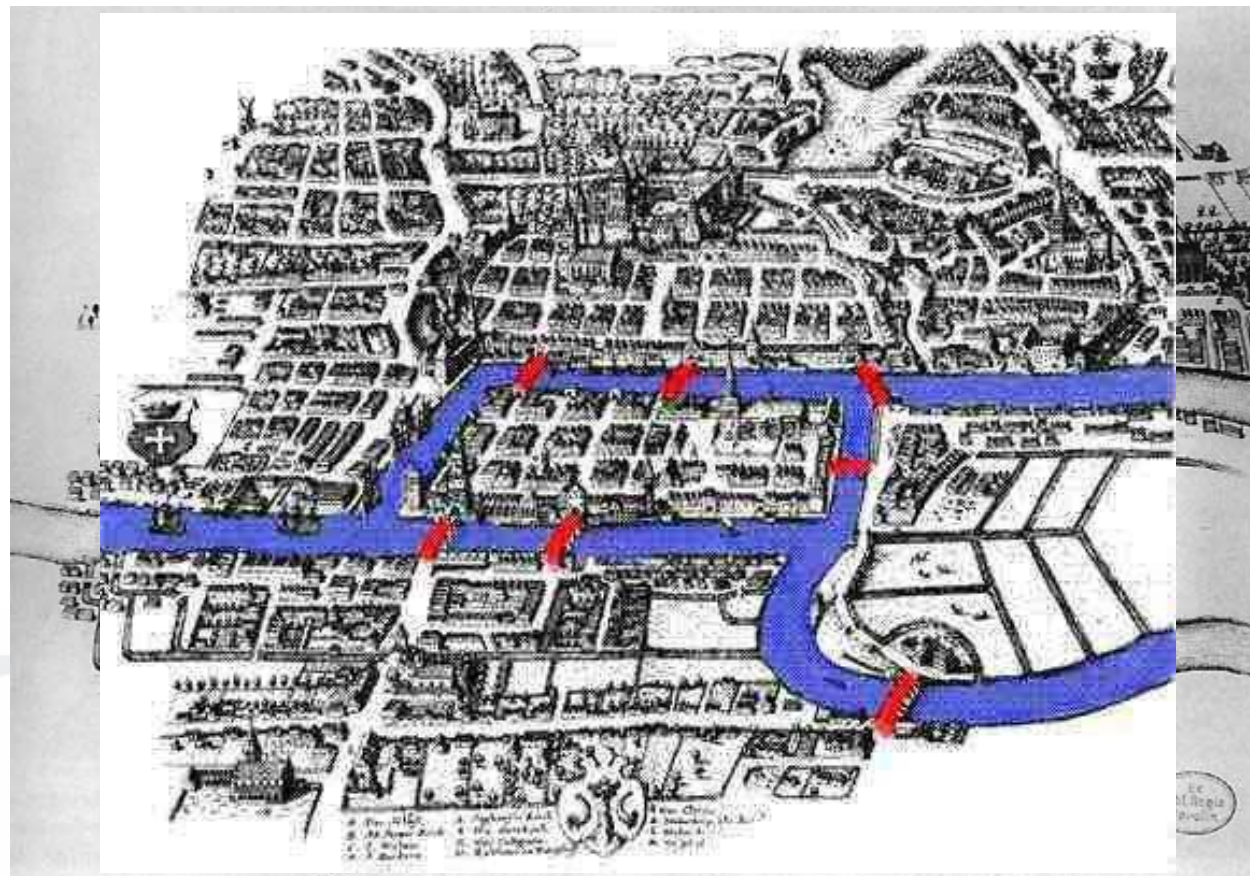How to deliver the same service for less >>> mileage, fuel, fleet, labour

While keeping driving times below 3 hours.

•Climatological

How to deliver the same for less than above
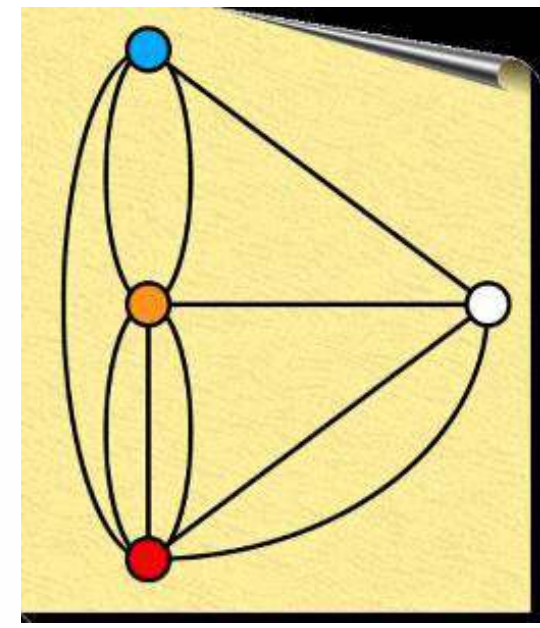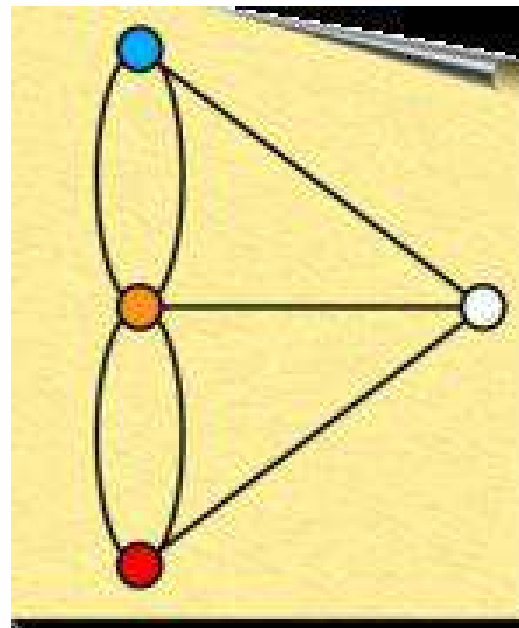>>> Selective domain / route treatment.

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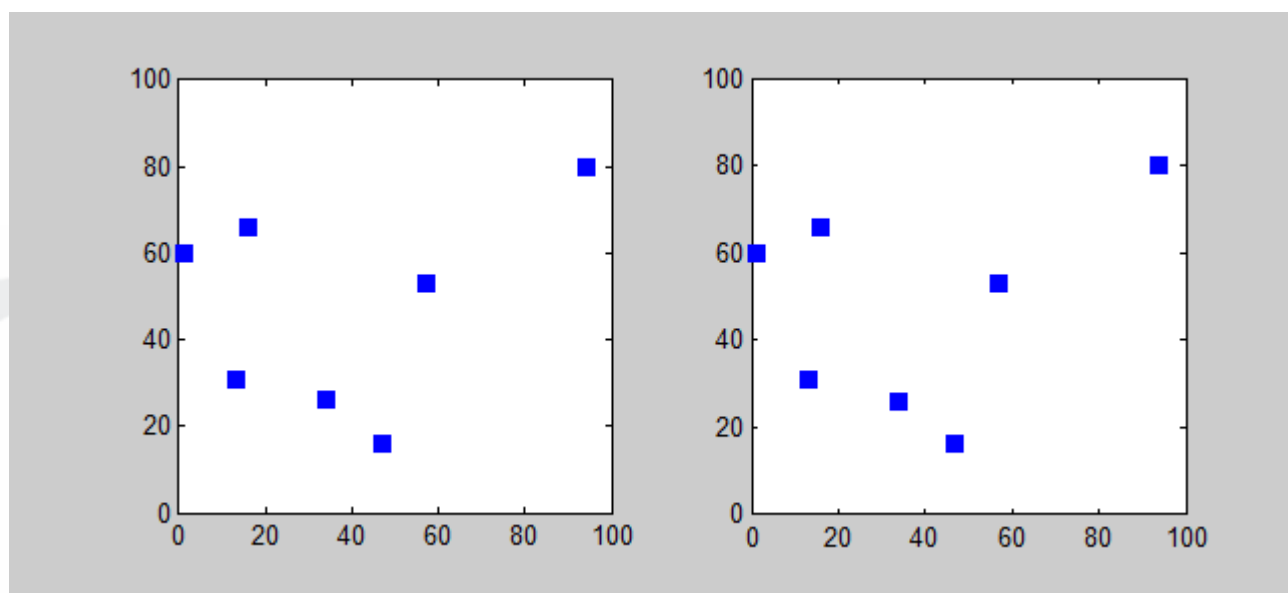# 9. Route Optimisation - Königsberger Brücken problem

10. Reducing costs through Route Optimisation

- Far more complex road network

- Many routes and several depots

- Multiple passes along specific stretches

- Different speeds for different roads

- Time limit / salt capacity for each run

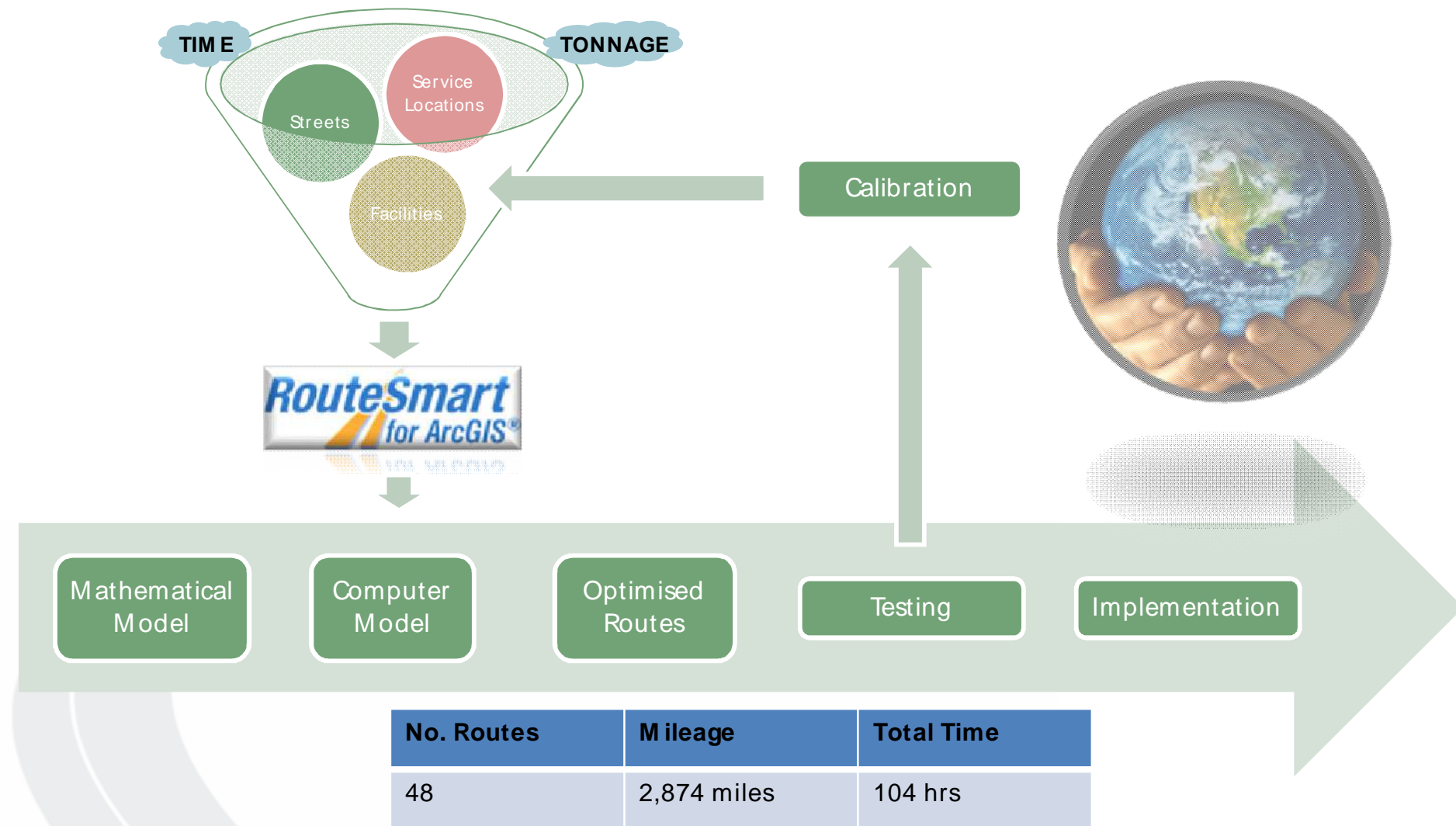- One way streets / turn restrictions
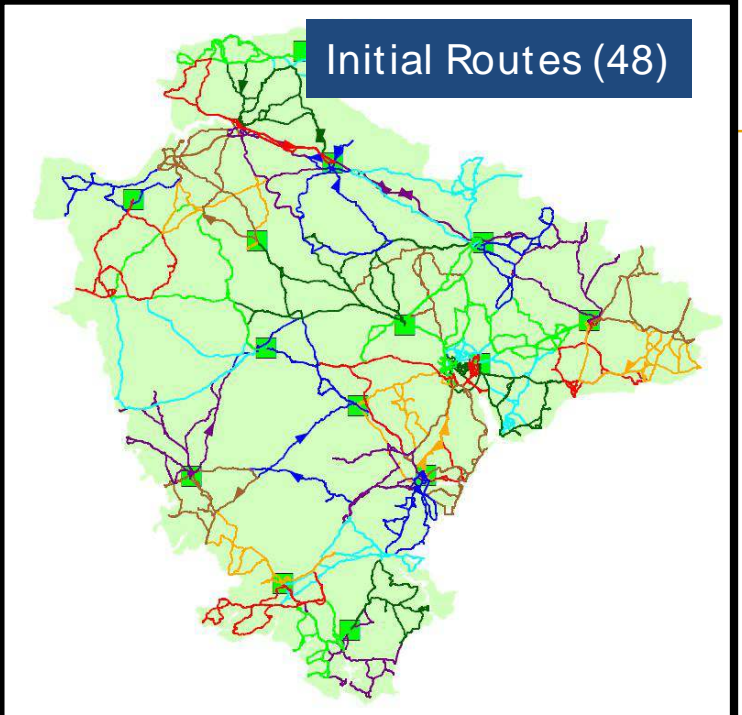
11. Aiming to find the optimal solution?

- 7 route sections = (7-1)!/2 = 360 combinations

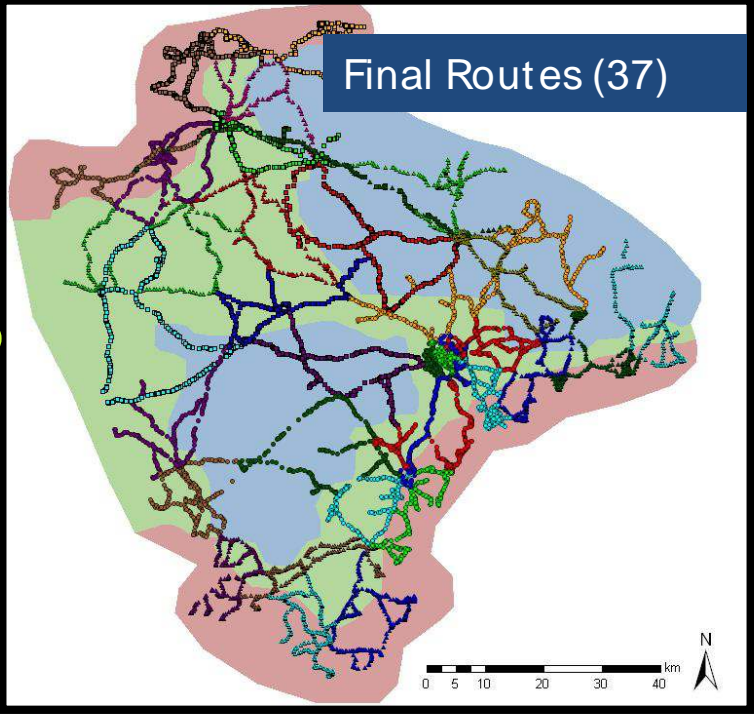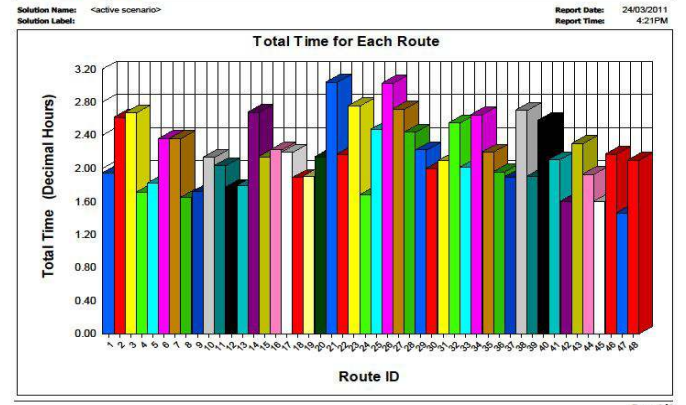- 14 route sections = (14-1)!/2 = 3,113,510,400 combinations

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12. The process
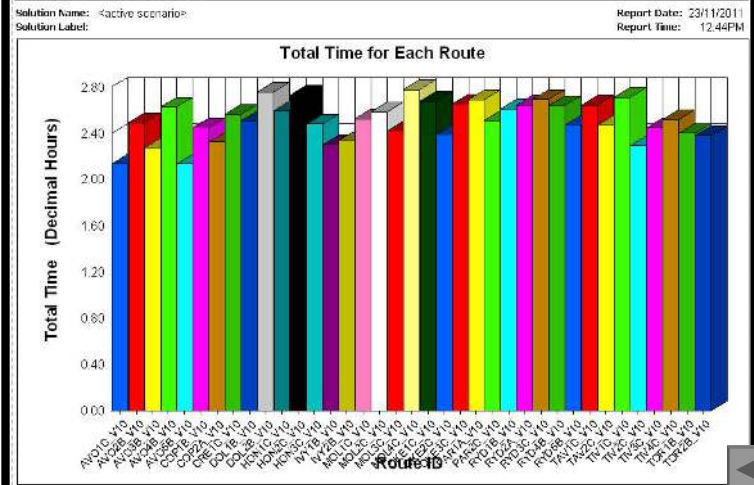

No. Routes	Mileage	Total Time
48	2,874 miles	104 hrs

Initial Routes (48)

Final Routes (37)

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14. Summary

- **Route Based Forecasting** - 10% saving on expendables i.e Fuel, Labour, Deicing chemical.

- **Route Optimisation** - 8% saving on expendables i.e Fuel, Labour, Deicing chemicals. Plus reduced assets i.e Lorry Fleet.

15. Questions

Questions?