Implementation of and deployment of a large scale programme – Magnetometers

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20th September 2013

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The Project

• Programme milestone of 1000 SCOOT commissionings by end of March 2013

• Ultimate target of benefits reported at 1000 sites by end of 2013

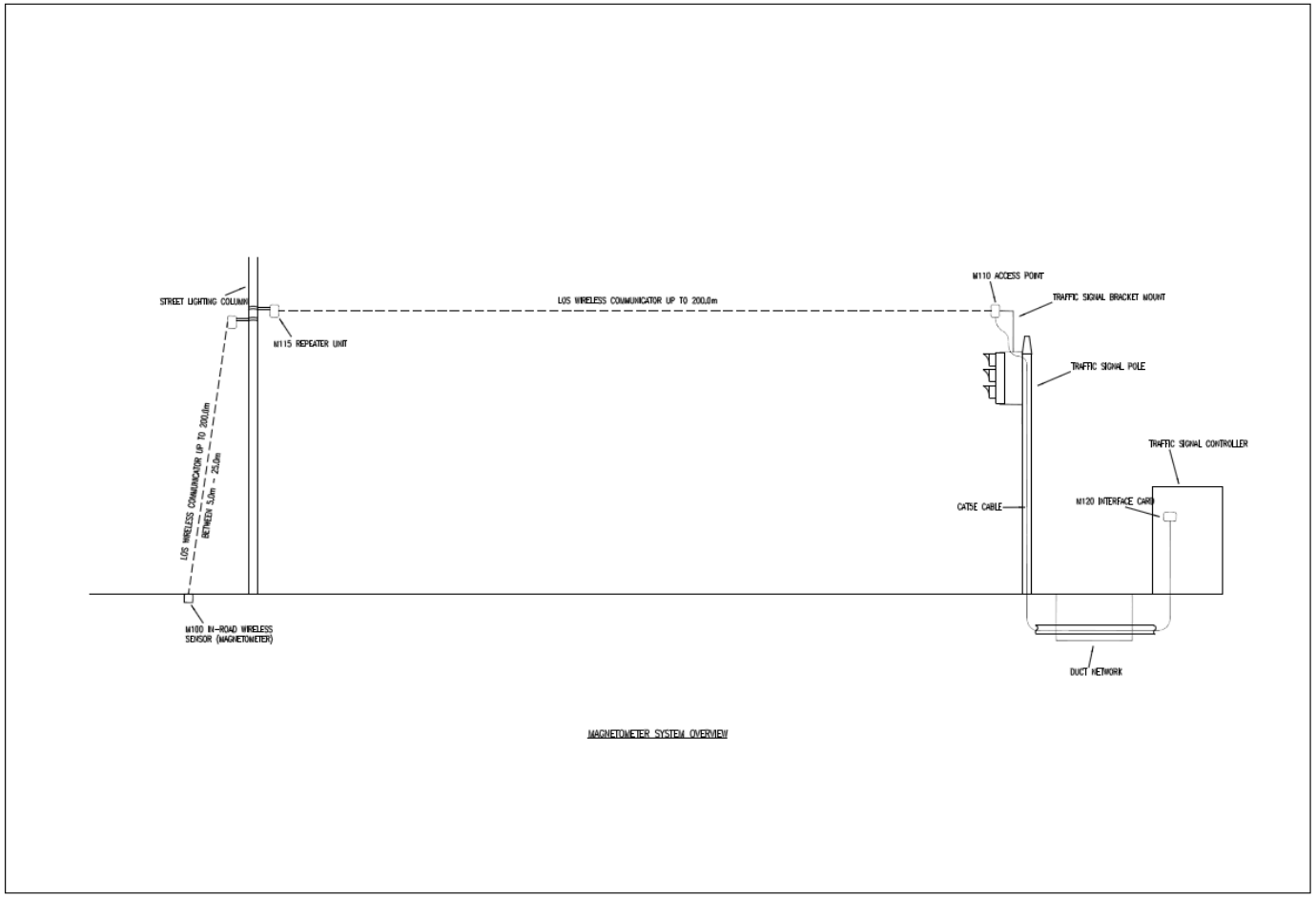
•Reportable to the DfT

•New SCOOT detection at 115 locations for final year of the New Investment SCOOT Programme

• Olympic delivery workload lead to compressed delivery period

Magnetometers – The Basics

A wireless system of vehicle detection



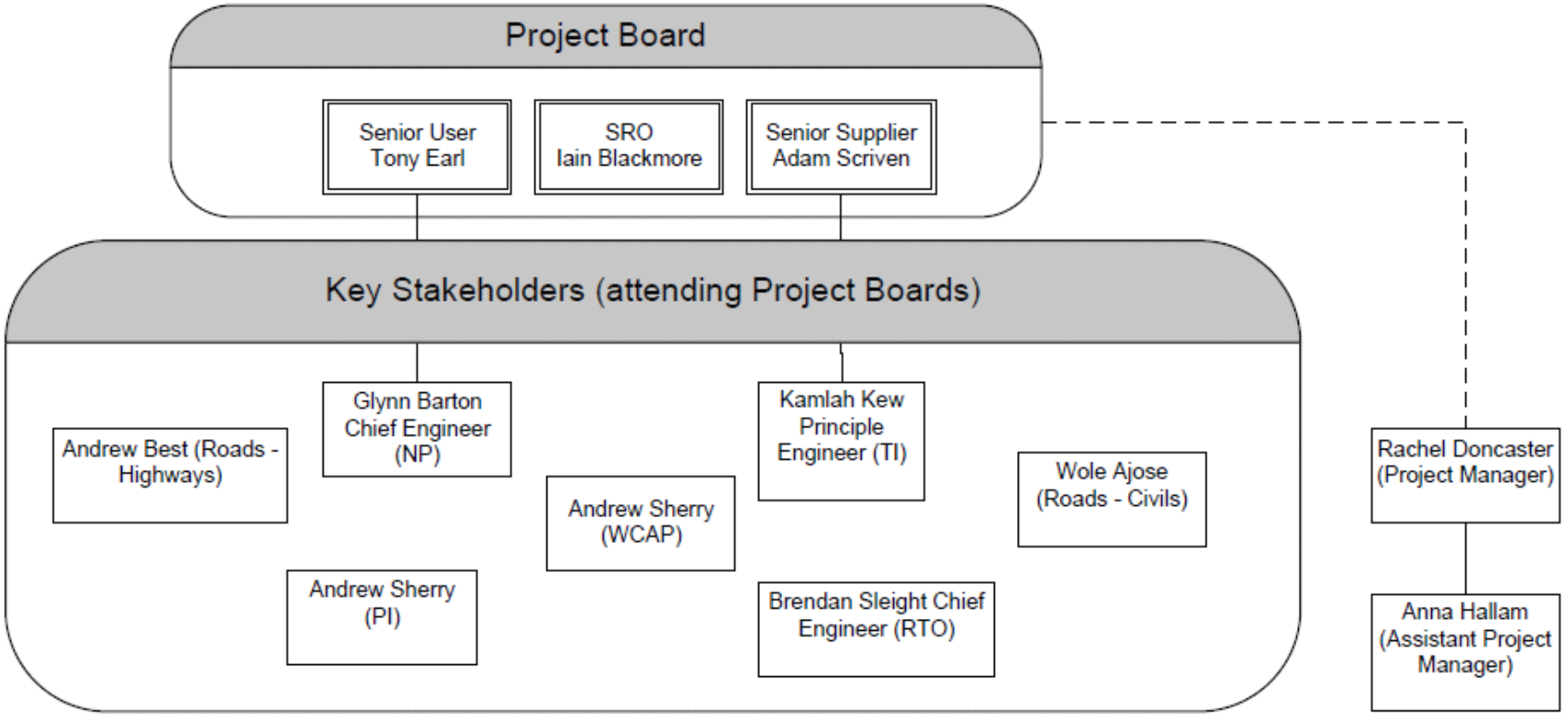
Magnetometers – Why Use Them?

Cost – whole life-cycle savings of 60% predicted vs inductive loops. Also, TfL's Lane Rental initiative added to the cost of major road works.

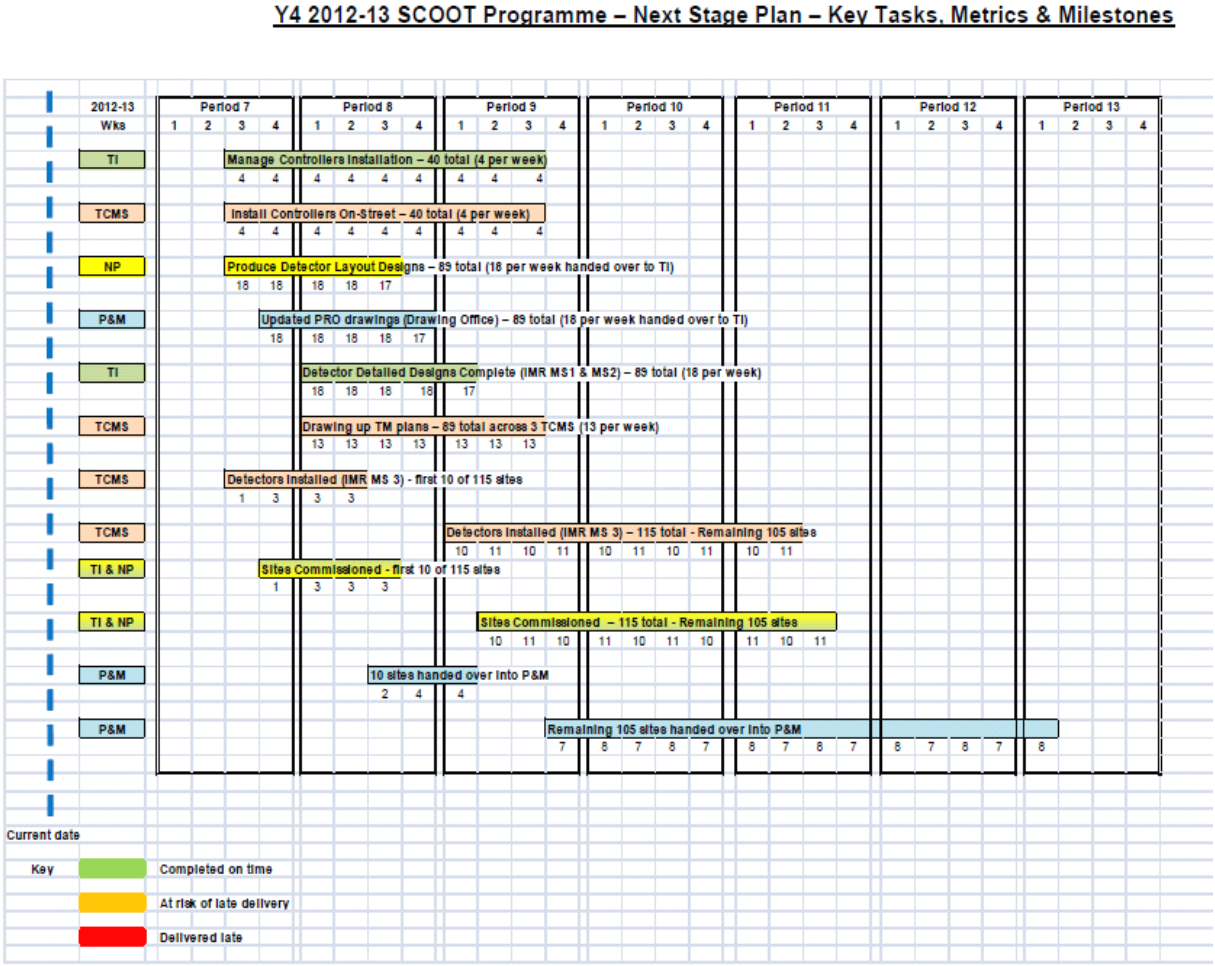
Time – minor works permits required as opposed to major permits for duct runs

Disruption – post-Olympics many projects were competing for road space, magnetometer installation is low impact.

Project Team Structure



Project Timeline



Supply Chain

- Supplier appointed in late July
- Periodic meetings held to:
  - » Forecast equipment levels – “just in time” delivery
  - » Agree processes for delivery and return of goods
  - » Forum for technical support / feedback

Training

- Basic training in design principles in May; follow up on installation given in October

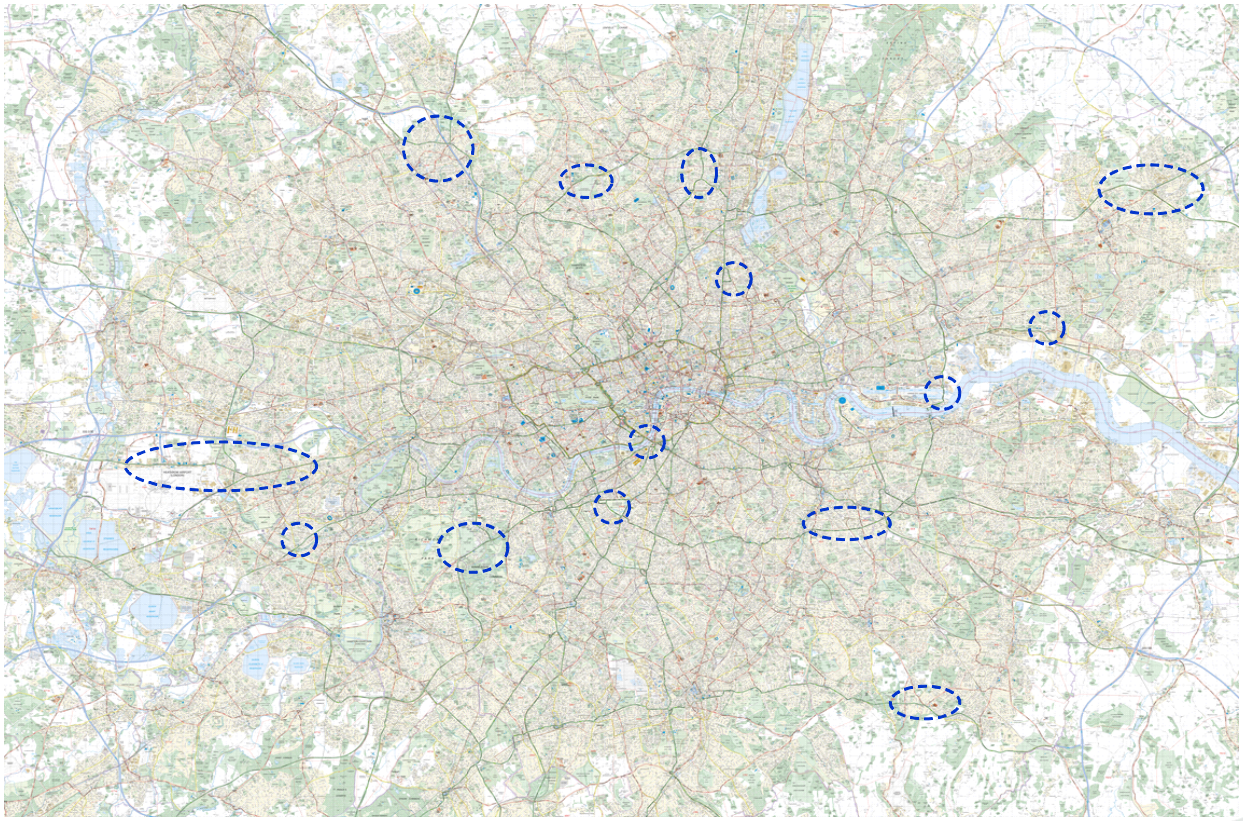
Design Engineers	Installation Engineers	Maintenance Engineers
• Traffic Infrastructure • Network Performance	• Traffic Infrastructure • Signals Contractors x3	• Maintenance Inspectorate • Signals Contractors x3

Preparing for installations

- Draft guidance note on installation prepared and circulated to contractors and internal staff
- Rates of installation agreed with contractors
- Procedure for handover into maintenance devised
- 33 London Boroughs and TfL Street Lighting departments contact and process for permission to mount repeaters agreed

Preparing for installations

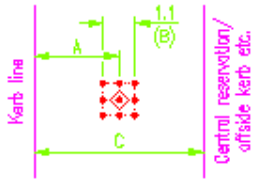
- Sites packaged geographically and programmed for installation in clusters

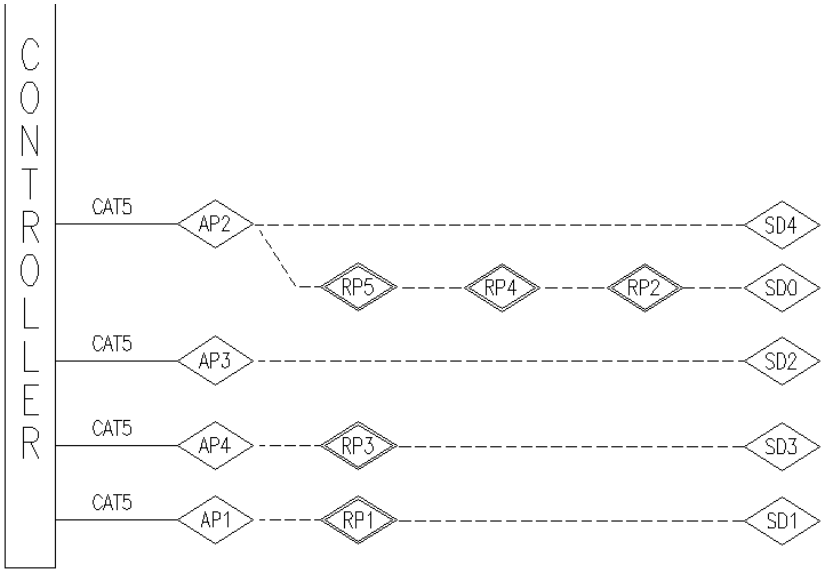


Installation

- First sites from programme installed and commissioned in November
- Supplier provided technical support during installation of each contractor's first two sites
- A typical installation took three days:
  - Day 1 & 2 – installation of equipment
  - Day 3 – configuration

Drawing Details





MAGNETOMETER'S FOR OTU: 07/001				
NUMBER	DISTANCE FROM N/S KERB	DISTANCE TO STOPLINE (METRES)	REFERENCE POINT	PROPOSED OR EXISTING
SD0	4.0	180.0	IN LINE WITH PARTY WALL #278/280	EXISTING
SD1	2.5	118.0	ADJACENT OF PARTY WALL 38-40	EXISTING
SD2	2.5	132.0	UPSTREAM OF PARTY WALL #297/299	EXISTING
SD3	2.5	156.0	IN LINE WITH PARTY WALL #87/89	EXISTING
SD4	3.0	180.0	IN LINE WITH PARTY WALL #306/308	EXISTING

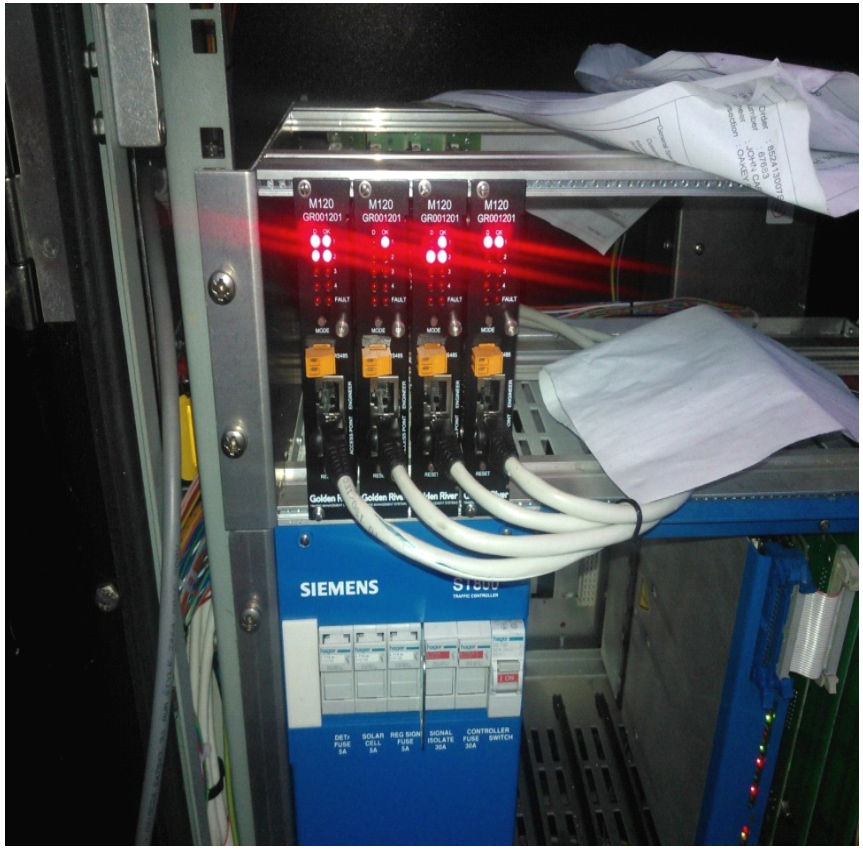
ACCESS POINT/ REPEATER	SIGNAL POLE/ LAMP COLUMN	LOCATION
AP1	P4	SIGNAL POLE 4
AP2	P1	SIGNAL POLE 1
AP3	P1	SIGNAL POLE 1
AP4	P2	SIGNAL POLE 2
RP1	LC	LC#17
RP2	LC	LC#26199
RP3	LC	LC#10
RP4	LC	LC#06202
RP5	LC	LC#06202

Equipment mounting height

- AP mounted on signal pole ~3.7m above ground
- Repeater mounted 3.5m-4.0m above ground
- 200m range found to be too long in some instances

Cable terminations

Cables direct to card



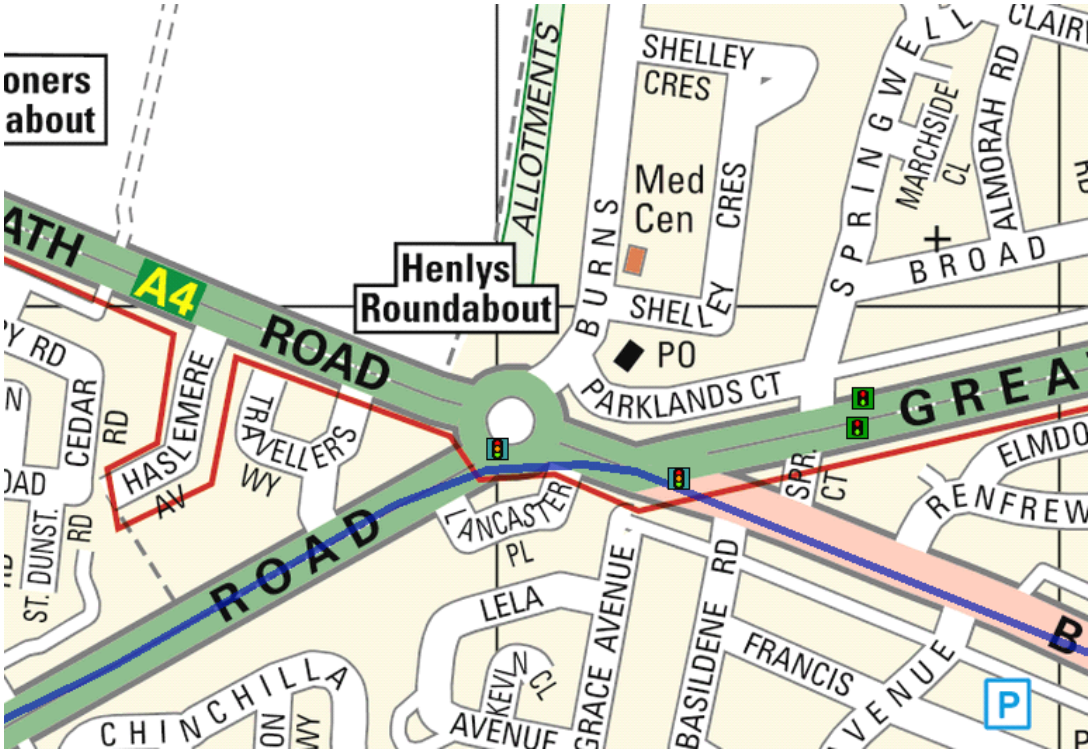
Cables terminated in sockets

Signal Strength

- Default sensitivity settings not always appropriate – resulted in a series of detectors with intermittent faults
- Currently carrying out analysis of performance of recommended sensitivity settings vs reduced sensitivity

Signal Strength

- High voltage of Piccadilly Line caused disruption to wireless signals at two junctions



Mobile Access Point

Used for:

- Monitoring of sensor activation
- Changing of remote units RF channels
- Taking signal strength measurements
- Scanning for an unknown sensor
- Proving Access Points and interface cards

Lessons Learnt

- Trial process needed to be better specified and with clear outcomes

- Training for maintenance engineers was too generic – it needed to cover the likely faults and difficulties that would arise

- Training given too early – too much of a time separation between design training and start of design

Output from the Project

- More accurate cost model for future business cases – RSM SCOOT
- Design and installation document
- Revised commissioning procedure to ensure robustness of wireless network
- Fault finding guide to assist maintenance engineers
  - Mobile access point

Questions