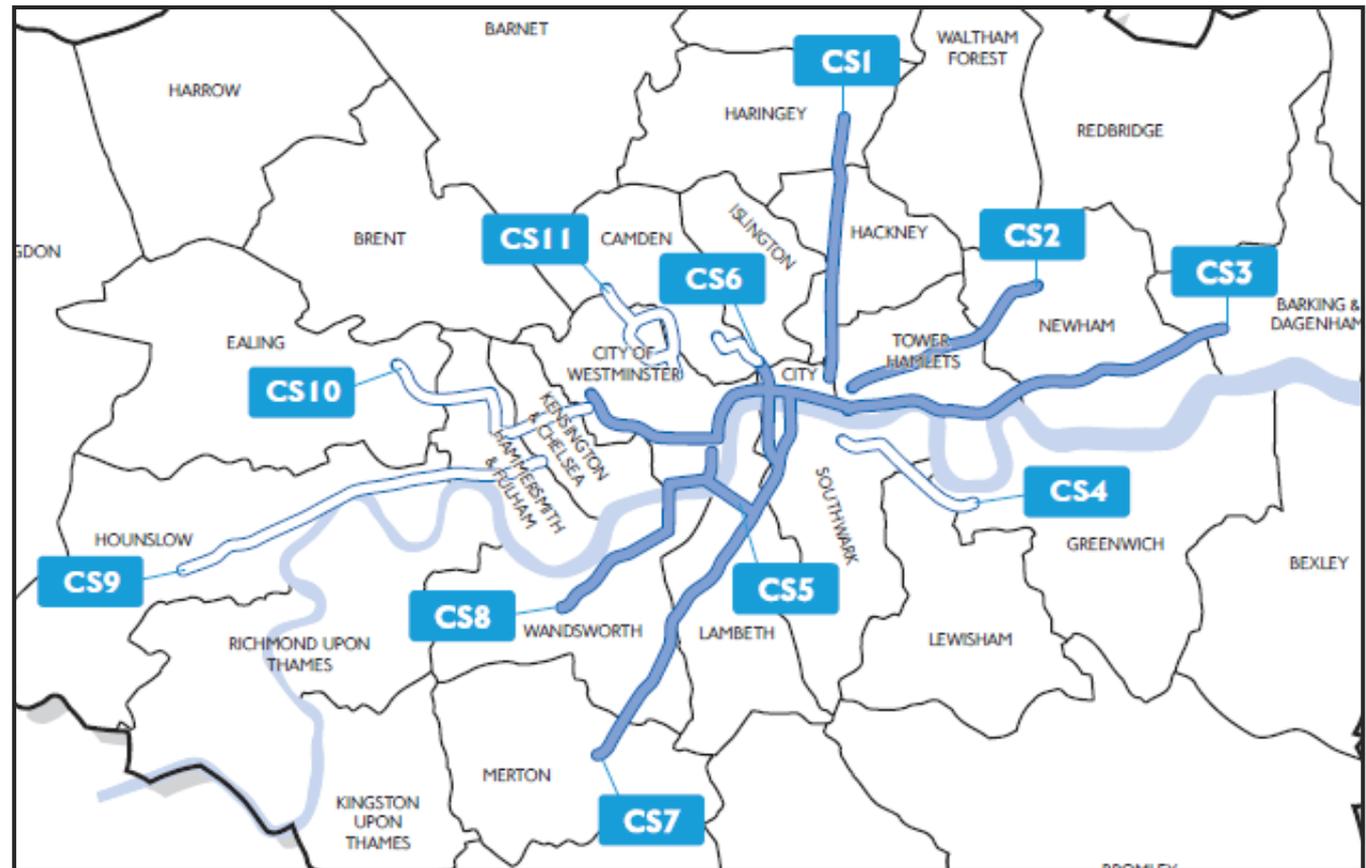


# Network Operation: Construction and Optimisation



# Overview

- Managing the network during Cycle Superhighway construction
- Optimising the network for cyclists including Cycle SCOOT



# Construction: Challenges



- Challenging traffic management
  - Loss of lanes
  - Additional stages
- Temporary signals



- Protect bus network
- Maintain a high standard of safety at junctions for all road users



# Construction: Review Traffic Management

- Scheduling of works (conflicting works/events e.g. Marathon)
- Review traffic management / diversions
- Review need for temporary traffic signals



# Construction: UTC Temps

## Tool:

- Offers flexible signal head location but maintains UTC control



## Benefits:

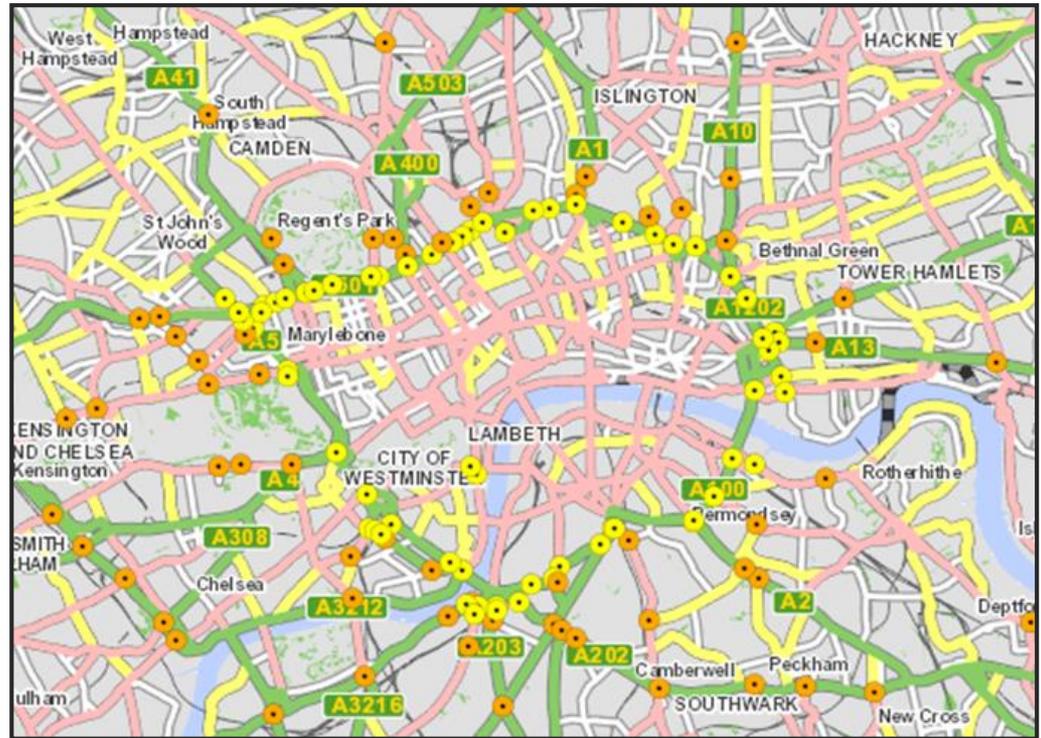
- Change signal timings by time of day
- React to contingency situations
- Maintain offsets between junctions



# Construction: ATM

## Tool:

- Control flow of traffic approaching major works



## Benefits:

- Use appropriate level of ATM to manage flow of traffic for specific TM phase
- Prevent exit blocking and protect major gyratories
- Protects bus network



# Active Traffic Management (ATM) Video



# Construction: London's Street Traffic Control Centre (LSTCC)

## Tool:

- 24/7 monitoring and managing of the network
- Engineer present from 7am-7pm and additional stand up for major works



## Benefits:

- Monitor network and bus delays in real time
- Select appropriate signal strategies
- Review level of ATM required





# Construction: LSTCC Tools

## Bus Network Disruption Monitor

MENU

Disruptions  
History  
User Guide  
Settings  
About

### Disruption List - Above 15 (mins)

#### DELAYS COLOUR LEGEND

**Yellow** (Moderate = less than 20 mins)

**Orange** (Serious = 21 - 40 mins)

**Red** (Severe = 41+ mins)

Refreshed at: 10:37:55 AM 6/1/2017

Latest feeds from: 7:27:35 AM 5/1/2017

Route	Towards	From Stop Point Name	To Stop Point Name	P2P Delay (mins)	Total Directional Delay (mins)	Trend (mins)	Time First Reported	Last Data Updated	More
65 [RATP]	CHESSINGTON WORLD OF ADVENTURES	GILDERS ROAD	CHESSINGTON WORLD OF ADVENTURES	46	53	No change [0]	05:48:05	07:23:27	
362 [GOAHD]	KING GEORGE HOSPITAL	MANOR ROAD	THE LOWE	25	29	No change [0]	07:03:22	07:18:14	
12 [GOAHD]	DULWICH LIBRARY	CONDUIT STREET / HAMLEYS TOY STORE	HAYMARKET / CHARLES II STREET	15	19	Worsening [4]	07:18:28	07:18:19	
173 [ARRIVA]	BECKTON BUS STATION	RENWICK ROAD	RIPPLE ROAD	15	16	No change [0]	07:03:22	07:23:29	

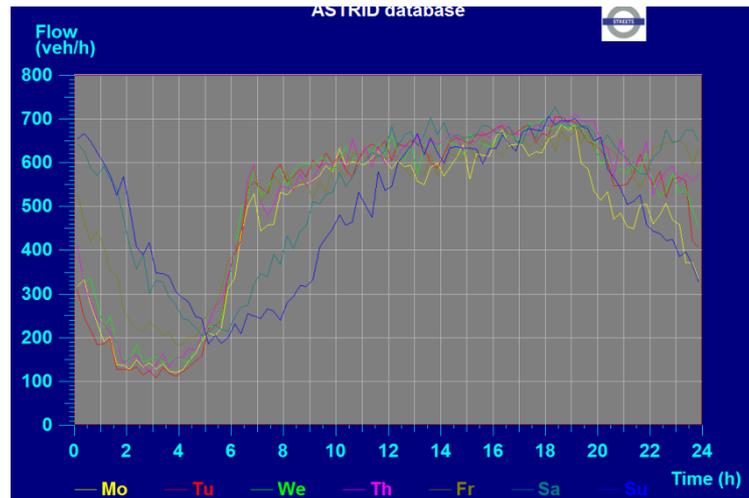
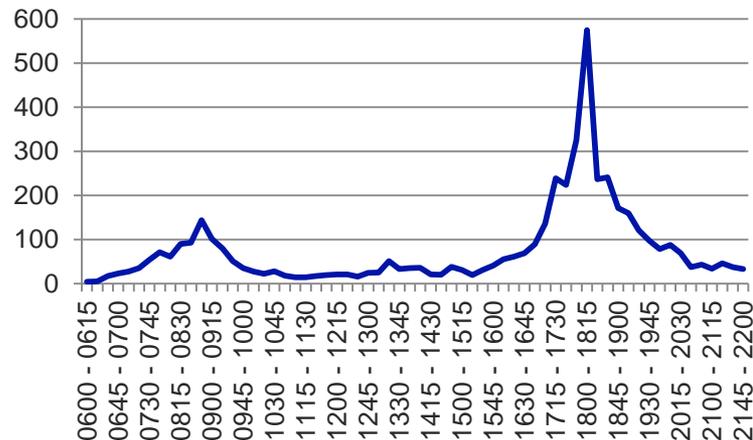
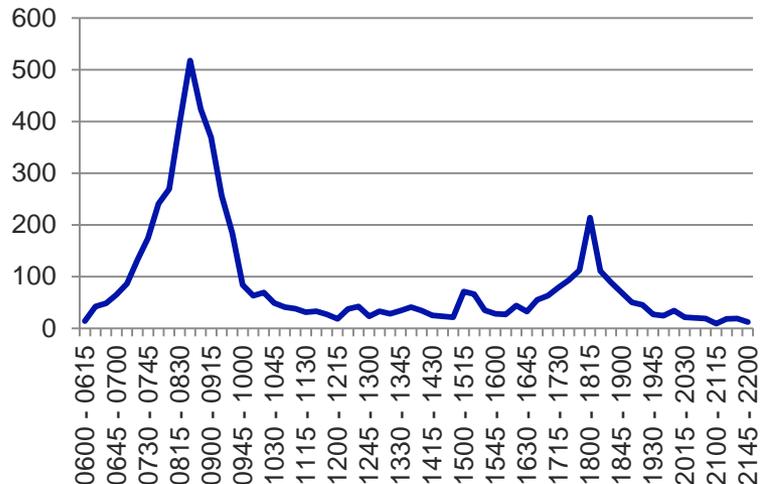


# Network Optimisation



# Optimisation: Challenges

## Blackfriars Junction: Cycle and Traffic Peaks

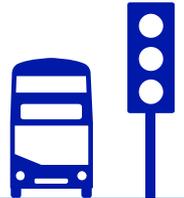


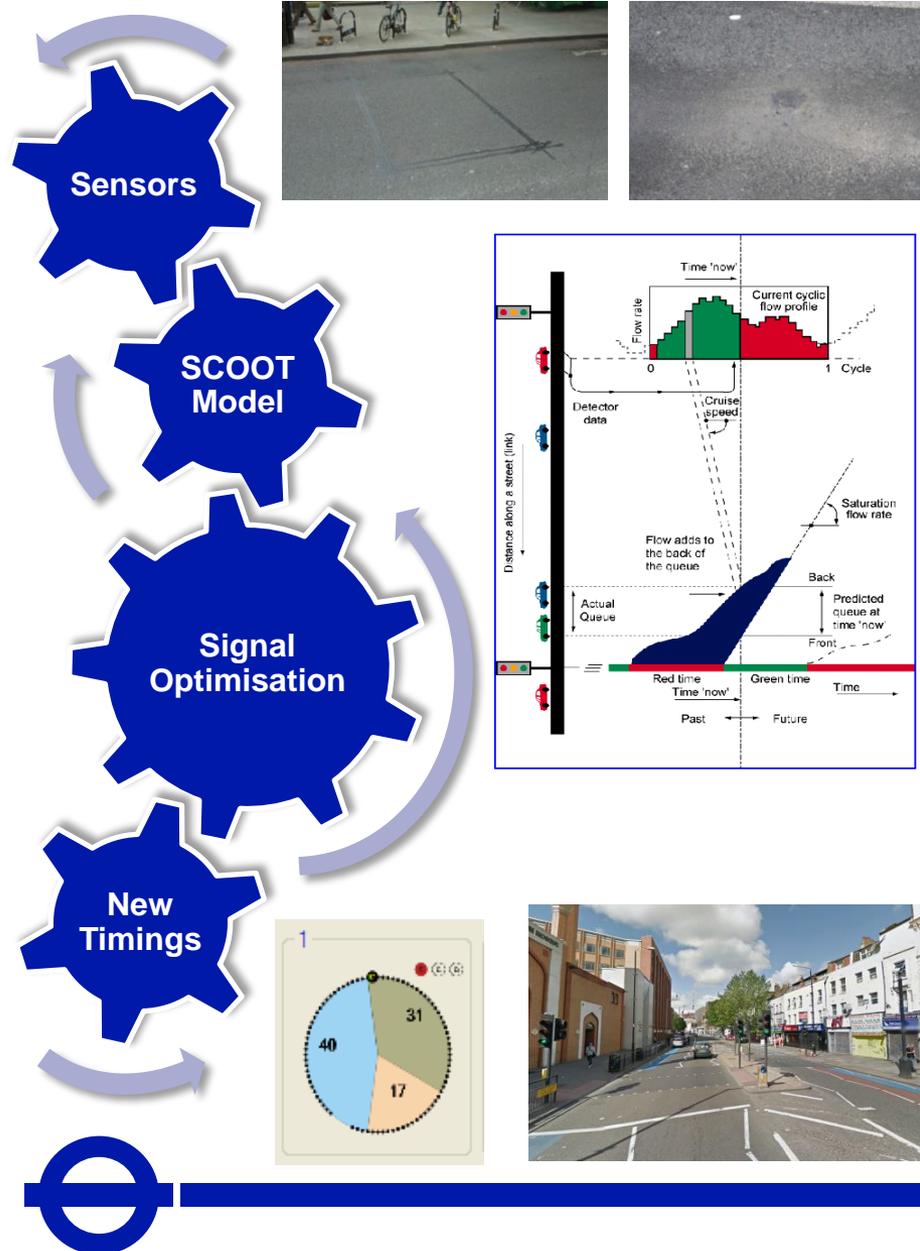
## SCOOT: What is it?

TfL uses a bespoke Urban Traffic Control (UTC) system to optimise throughput and combat congestion on London's road network

SCOOT is the software used to optimise signal timings second by second using real time data collected by sensors located on London's road network

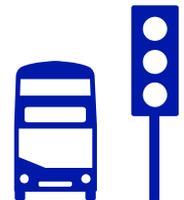
SCOOT can now be used to optimise for general traffic, buses, cyclists and pedestrians.





## SCOOT: How does it work?

- Data gathered from sensors in the road network
- Junction modelled second by second within SCOOT
- Buses and their location in the queue are also modelled
- Signal timings optimised to make best use of available capacity
- New timings sent to junction controller



# Cycle SCOOT

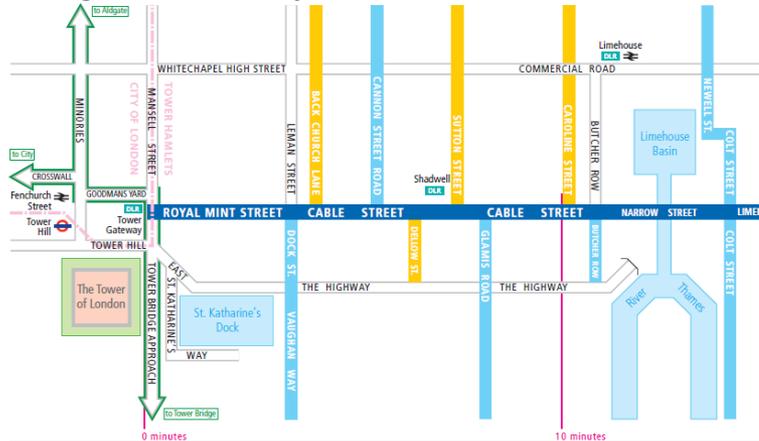
Two directional detectors for cyclist with their own track

Incorporating the demand of cyclist in the normal optimisation of the junction through SCOOT.



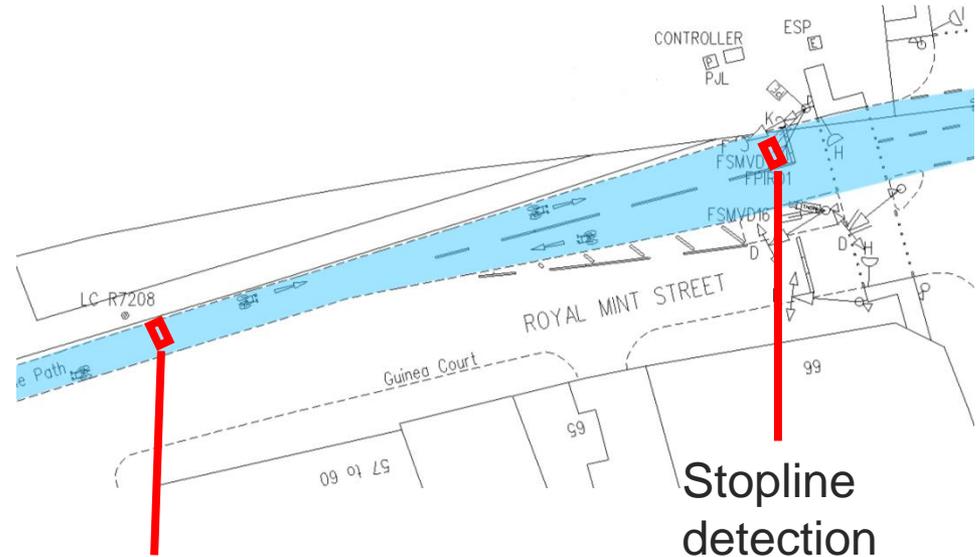
Using SCOOT “normal” and “stopline” traffic links

Barking to Tower Gateway: CS3



This cycle route is about 7.6 miles, or 12.3 kilometres, from end to end.

**CABLE STREET** Barclays Cycle Superhighway.



Upstream detection

Stopline detection

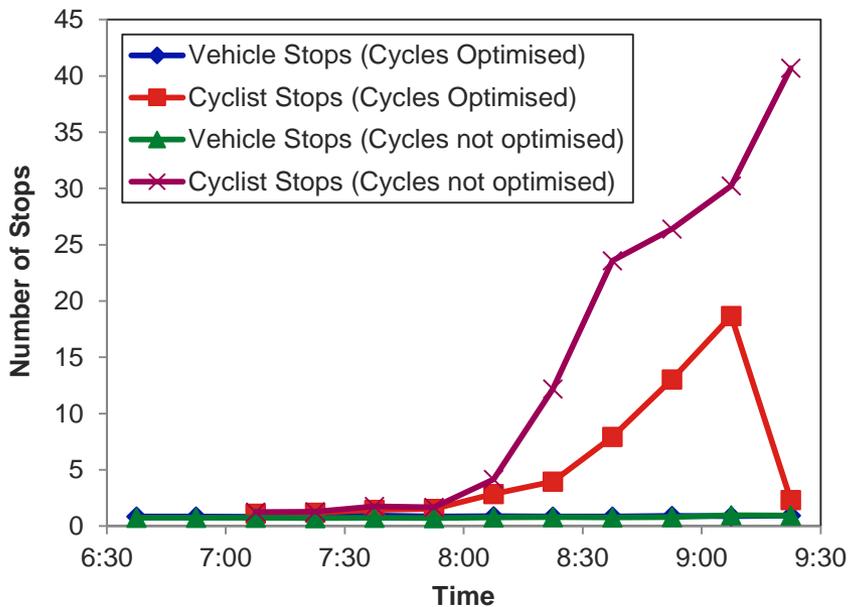


# Cycle SCOOT

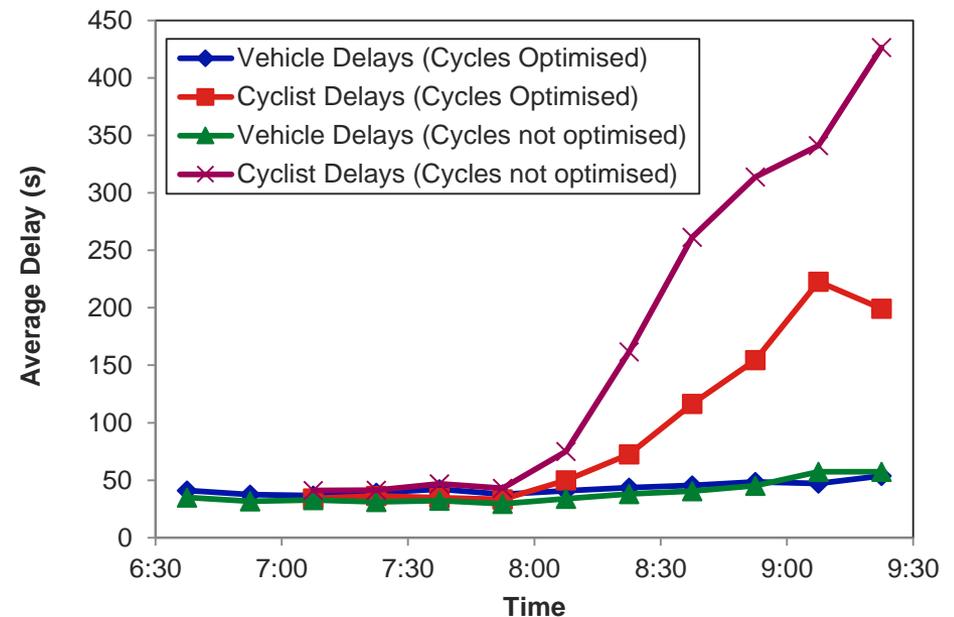
Split Cycle Offset Optimisation Technique

A UTC-VISSIM Study showed that SCOOT optimisation for cyclists can result in significant reductions for cyclists in terms of delays and stops, with no significant adverse impact seen for vehicles. This is now being observed on street.

**Average Stops per Vehicle/Cyclist (10 Seeds)**



**Average Delay per Vehicle/Cyclist (10 Seeds)**



# Cycle SCOOT Benefits

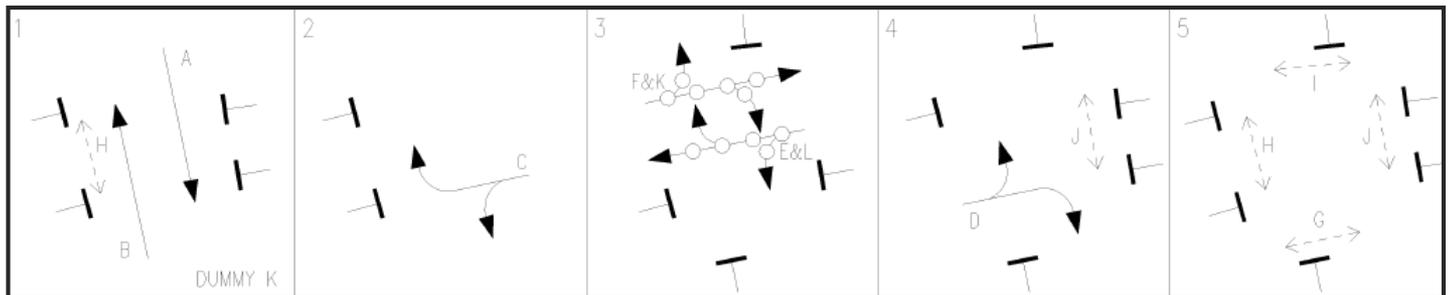
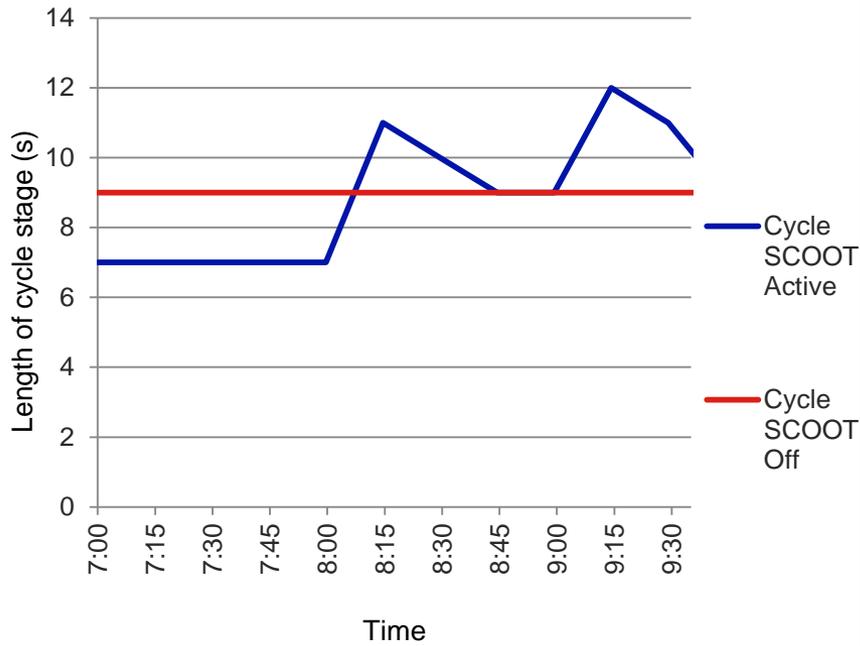
- On average we saw a 6% reduction in cyclist delay and 1% reduction in cyclist stopped at Cycle SCOOT trial sites

Peak	Cycle Time	Delay per Vehicle	% of Vehicles Stopped	Junction Average DoS	Flow	Peak	DoS	Flow	Delay per Cyclist	% of Cyclist Stopped
AM	0.46%	-0.86%	-1.02%	-6.62%	-5.81%	AM	-25.36%	-2.77%	-46.22%	-2.76%
OP	0.67%	3.84%	-0.17%	-3.66%	-7.22%	OP	-4.86%	0.19%	-2.83%	-1.43%
PM	0.34%	5.14%	0.09%	-4.09%	-8.78%	PM	-10.97%	7.25%	-36.32%	-3.16%
LE	0.35%	-1.57%	-1.36%	-3.12%	-1.58%	LE	-1.73%	6.52%	-8.58%	-5.05%
ON	0.37%	0.77%	-3.24%	-3.48%	-4.22%	ON	15.88%	-7.20%	17.95%	0.88%
Average	0.44%	1.47%	-1.14%	-4.19%	-5.52%	Average	-5.41%	0.80%	-15.20%	-2.30%
						40% of benefit measured			-6.08%	-0.92%



# Cycle SCOOT

Split Cycle Offset Optimisation Technique



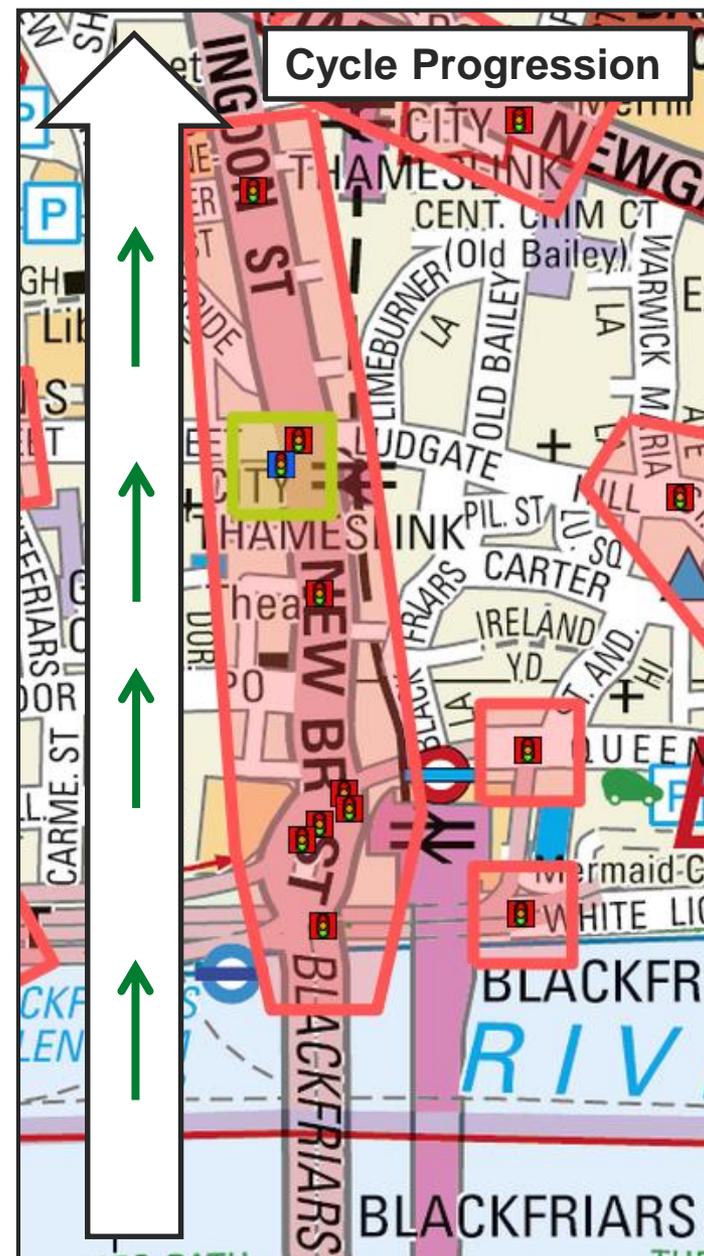
# Optimisation: Offsets Blackfriars to Ludgate Circus

## Tool:

- Cycle SCOOT
- Manual setup of SCOOT parameters

## Benefits:

- Reduce cyclists wait time
- Improved compliance with signals



# Optimisation: Blackfriars to Ludgate Circus Video



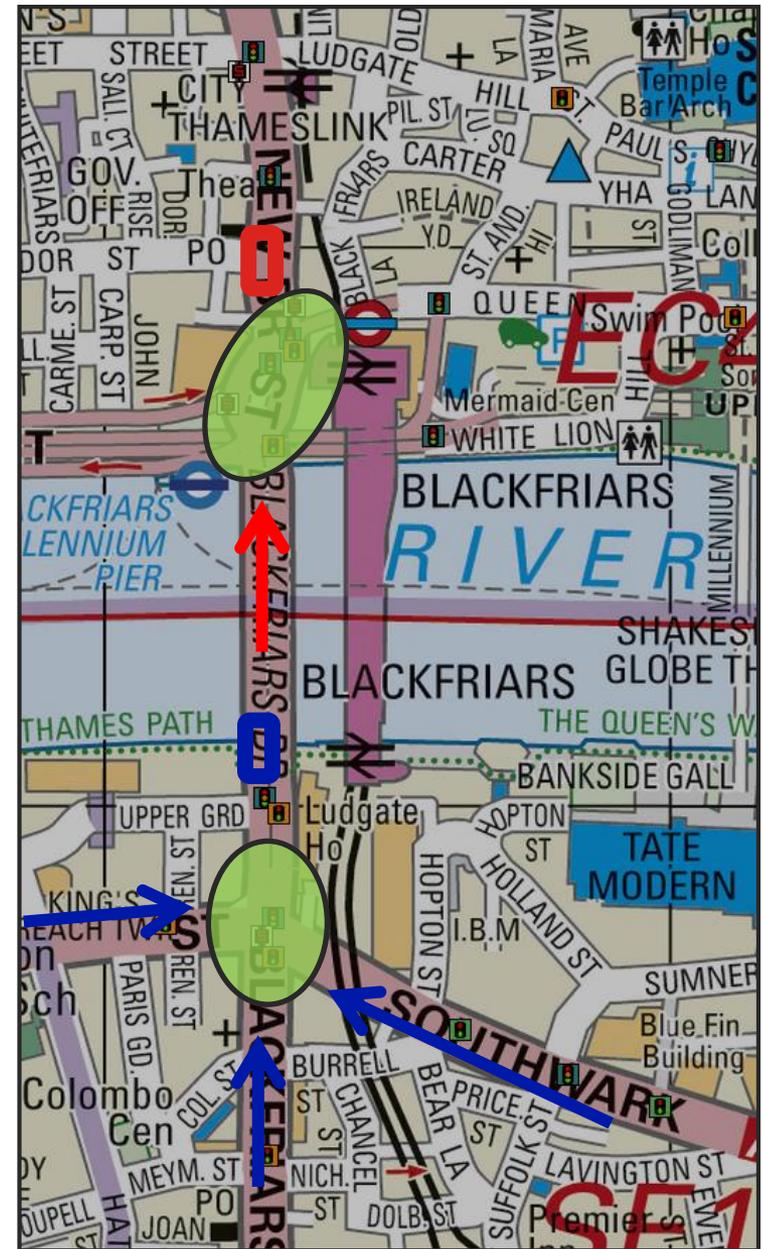
# Optimisation: SASS - System Activated Signal Strategy

## Tool:

- Logic dependent signal timings

## Benefits:

- Dynamically change signal timings to manage congestion and exit blocking
- Useful in oversaturated networks



# Summary

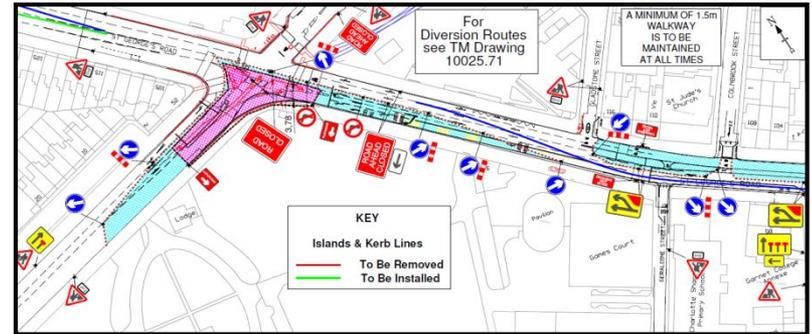
## Construction

- Review traffic management
- UTC Temps
- Monitor network
- Active Traffic Management

## Optimisation for Cyclists

- Cycle SCOOT
- Cycle stage lengths
- Cycle offsets
- Dynamic signal timings

## Questions





## Contact

Outcomes Delivery,  
Palestra House,  
197 Blackfriars Road  
London SE1 8NJ

**Matt Standell**  
MatthewStandell@tfl.gov.uk  
**Chris Blucke**  
ChristopherBlucke@tfl.gov.uk

