

Results from SCOOT's Commercial Systems

The measured benefits of SCOOT depend on the efficiency of the previous method of control and on site factors, such as the distance between junctions and the flows of vehicles.

Early results showed that SCOOT achieved an average saving in delay of about 12% when compared with up-to-date TRANSYT fixed-time plans. This result was important because TRANSYT is used worldwide and known to set a high standard on which other traffic responsive systems have failed consistently to improve.

Research by Bell (1986) suggests that SCOOT is likely to achieve an extra 3% reduction in delay for every year that a fixed-time plan "ages". Further, the effects of incidents have been excluded from many of the survey results to ensure statistical validity. Since SCOOT is designed to adapt automatically to compensate for ageing and incident effects, it is reasonable to expect that, in many practical situations, SCOOT will achieve savings in delay of 20% or more.

The most recent survey results are listed results first.

- **SÃO PAULO 1997**

São Paulo are using SCOOT 2.4 and SCOOT 3.1 on different areas of the city. The survey was conducted by CET (Companhia de Engenharia de Tráfego) - the municipal traffic engineering company responsible for managing the city's traffic.

Results:

Rio Branco Avenue / Norma Gianotti Avenue: **SCOOT 2.4.**

<i>Period</i>	<i>% Delay Benefits over previous control method: TRANSYT</i>
06:00 - 09:00	40
17:00 - 20:00	0
Average Benefit	20

Alvarenga St / Camargo St: **SCOOT 3.1.**

<i>Period</i>	<i>% Delay Benefits over previous control method: TRANSYT</i>
06:00 - 10:00	41
10:00 - 16:00	53
16:00 - 20:00	0
20:00 - 23:00	43
Average Benefit	38

The annual financial benefits were also calculated for each area

<i>AREA</i>	<i>Annual Benefits in US \$</i>
Rio Branco Avenue / Norma Gianotti Avenue	637,000
Rio Alvarenga / Rio Camargo	976,000

• **NIJMEGEN 1997**

Witteveen+Bos Consulting Engineers carried out the Nijmegen trials in co-operation with the Transport Research Centre (AVV) and the Municipality of Nijmegen using SCOOT version 2.4. The SCOOT results were compared with those of fixed time plans and also with SCOOT+ (SCOOT+ incorporated split weighting).

	<i>% Benefits of SCOOT over Fixed Time Plans</i>	<i>% Benefits of SCOOT+ over SCOOT</i>
Travel Time Benefits	11	14
Delay Benefits	25	33

• **TORONTO 1993**

Metro-Transportation undertook a "before" and "after" study of Toronto's SCOOT system between May and June 1993. Toronto were using SCOOT 2.4 at the time.

<i>System: Toronto, Canada.</i>				
<i>Previous control: Fixed Time</i>				
% Reduction using SCOOT (average)				
Journey time	Delay	Stops	Fuel consumption	Emissions
8	17	22	5.7	3.7 (hydrocarbons) 5 (carbon monoxide)

• **SANTIAGO 1993**

Results of SCOOT (Version 2.4) field trials in Santiago, Chile are available although they are not expressed as % benefits and therefore not comparable with other results in this document. The survey took place during 1992 and 1993 and was carried out by Pontificia Universidad Catolica de Chile. The following three sub-networks were analysed for comparison:

- Providencia: heavy public transport flows, lots of bus-stops, high pedestrian flow, heavy congestion
- Apoquindo: moderate public transport flow, small number of bus-stops, moderate pedestrian flow and low degree of saturation
- Costanera: mostly used by cars on an arterial route.

The table below illustrates the economic benefits achieved by SCOOT after 1 year of operation.

<i>First year rate of return % (\$Benefits / \$Investment)</i>		
Providencia	Apoquindo	Costanera
0.98	126.4	210.4

- BELJING 1989**

SCOOT version 2.3 was installed in Beijing with the capability of controlling cycle traffic as well as motor vehicle. Previously Beijing's urban traffic control was uncoordinated. A survey was carried out by the Beijing Research Institute of Traffic Engineering (BRITE) to assess the benefits of this SCOOT system. The results were as follows:

<i>Time of day</i>	<i>% Reduction using SCOOT (average on all routes)</i>		
	Journey time	Delay (stopped time)	Stops
07:00 - 08:00 (bicycle peak)	7	41	26
08:00 - 09:00 (vehicle peak)	16	32	33
12:30 - 13:30 (off peak)	4	15	14
17:00 - 18:00 (bicycle/vehicle peak)	2	19	29

- WORCESTER 1986**

SCOOT was introduced in Worcester in the autumn of 1984. Soon after, the DoT and Hereford and Worcester County Council commissioned Transport Planning Associates to undertake an assessment of SCOOT over previous isolated VA control and TRANSYT fixed time plans.

<i>Previous Control</i>	<i>% Reduction in journey time using SCOOT</i>		<i>% Reduction in delay using SCOOT</i>				<i>% Reduction in fuel used</i>		
	AM Peak	OFF Peak	AM Peak	OFF Peak	PM Peak	PM Peak	AM Peak	OFF Peak	PM Peak
Fixed-time TRANSYT	5	3*	11	7*	20*	11*	5*	0	6
Isolated Vehicle Actuated	18*	7*	32*	15*	23*	13*	10*	4*	9*

*Results significant at the 95% confidence level.

The replacement of isolated signal control by SCOOT in Worcester was estimated to save 180,000 vehicle hours per annum or £750,000 p.a. at 1985 prices. The use of SCOOT rather than Fixed Time UTC also showed considerable saving which was estimated to be 83,000 vehicle hours or £357,000 p.a.

- LONDON 1985**

SCOOT operation began in early 1984 in London around the area of Westminster. An assessment of SCOOT was completed by GLC (Greater London Council) which showed that widespread implementation of SCOOT could be recommended.

<i>Previous Control</i>	<i>% Reduction in journey time using SCOOT</i>	<i>% Reduction in delay using SCOOT</i>	<i>% Reduction in stops using SCOOT</i>
Fixed-time	8 (cars), 6 (buses)	19	5

- SOUTHAMPTON 1985**

Hampshire County Council commissioned the Transportation Research Group (TRG) of the University of Southampton to carry out an assessment of SCOOT in the Portswood/St. Denys area in 1984/1985.

<i>Previous Control</i>	<i>% Reduction in journey time using SCOOT</i>			<i>% Reduction in delay using SCOOT</i>		
	AM Peak	OFF Peak	PM Peak	AM Peak	OFF Peak	PM Peak
Isolated Vehicle Actuated	18*		26*	39*	1	48*

*Results significant at the 95% confidence level.

Economic benefit, excluding accident and fire damage savings, amounted to approximately **£140,000 p.a.** for the Portswood/St. Denys area alone.

- COVENTRY 1981**

SCOOT was assessed in two areas in Coventry by TRL. Foleshill Road is a major arterial connecting the centre of Coventry with the M6. Spon End is a network of streets in the western suburbs of Coventry.

<i>System</i>	<i>Previous Control</i>	<i>% Reduction in journey time using SCOOT</i>			<i>% Reduction in delay using SCOOT</i>		
		<i>AM Peak</i>	<i>OFF Peak</i>	<i>PM Peak</i>	<i>AM Peak</i>	<i>OFF Peak</i>	<i>PM Peak</i>
<u>Coventry - Foleshill Rd</u>	Fixed-time TRANSYT	5	4*	8*	23	33*	22*
<u>Coventry - Spon End</u>	Fixed-time TRANSYT	3	0	1	8	0	4

*Results significant at the 95% confidence level.

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Bus Priority Survey Results

• LONDON 1996

The Transportation Research Group (TRG) carried bus priority field trials in areas of Camden Town and Edgware Road in London as part of the PROMPT project. The Camden network consisted of 11 nodes and 28 links. The Edgware Road site was a linear network consisting of 8 nodes and 2 pelican crossings.

The bus routes were surveyed for the periods 07:00 - 12:00 and 14:00 - 19:00.

<i>Site: <u>Camden Town</u></i>		
Strategy	<u>Reduction</u> in Bus Delay sec/bus/link	<u>Gain</u> in Veh delay sec/veh/link
Central Extensions	0.2 (1%)	1.7
C.E. + Recalls	3.7* (17%)	5.3*
Local Extensions	4.2* (19%)	0.4
L.E. + Recalls	4.8* (22%)	5.0*

* values are statistically significant (5% level).

Percentage changes in brackets

These results (50% saturation) show that greater benefits can be obtained where there is more spare capacity.

<i>Site: <u>Camden Town (Low saturation level: average 50%)</u></i>		
Strategy	<u>Reduction</u> in Bus Delay sec/bus/link	<u>Gain</u> in Veh delay sec/veh/link
Central Extensions	4.8* (44%)	-0.1
C.E. + Recalls	7.5* (68%)	-1.6
Local Extensions	7.5* (68%)	-1.2
L.E. + Recalls	7.8* (71%)	-0.6

* values are statistically significant (5% level).

Percentage changes in brackets

<i>Site: <u>Edgware Road</u></i>		
Strategy	<u>Reduction</u> in Bus Delay sec/bus/link	<u>Gain</u> in Veh delay sec/veh/link
Local Extensions	2.8* (33%)	-0.1
L.E. + Recalls	3.1* (35%)	4.0*

* values are statistically significant (5% level).

Percentage changes in brackets

• **SOUTHAMPTON (LANCES HILL) 1994/1995**

The trial for bus priority was carried out in the Bitterne area of Southampton at the junction of Lances Hill and Maybray King Way. The ROMANSE office of Hampshire County Council carried out the trial. Normal SCOOT operation (with no bus priority) was compared with SCOOT + Central Extensions and Recalls.

<i>Site: <u>Lances Hill - Southampton</u></i>	
Time Period	% Reduction in Journey time
Morning Peak	60.7
Off peak	3.6
Evening Peak	36.8
All Periods	41.7

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