



# TRANSPORTATION MANAGEMENT DUBLIN

Brendan O'Brien

# *Dublin Region*



4 municipal authorities

28% of population of Ireland

1.3 million in Greater Dublin Area

Economic driver

Knowledge hub

European and international gateway

The greater Dublin area is home to 40 per cent of the population, it is the engine of the economy with 53 per cent of GDP and it generates about 62 per cent of tax revenue



# Transportation Issues

- Historic City Core
- Greater Dublin Area > 1.6 m
- Irelands Biggest Port 2km from Centre
- Public Transport = 53% mode share Car = 26 %
- Strict Car parking policy in City Centre
- **Policy decision in 1994 to not allow increase in private cars entering City Centre --- Final DTI report.**
  - Prioritise investment in sustainable modes :
    - Light Rail Tram system
    - Bus Connects Quality Bus Corridors project.
    - Metro Link

Regional transport strategy to 2035

# TRAFFIC DEPARTMENT

Dublin City Centre Transport Study

May 2016



Responsible for how people, vehicles and goods move around and within the city

The aim of the department is to ensure the safety of all mobility users within the city

Mitigate the impact of traffic on people's health and wellbeing and the environment

Our responsibilities involve all aspects from major projects to Neighborhood issues



Transport Infrastructure Ireland

Builder and operator of Light Rail

Motorway network

Designer of new Metro

Government Body

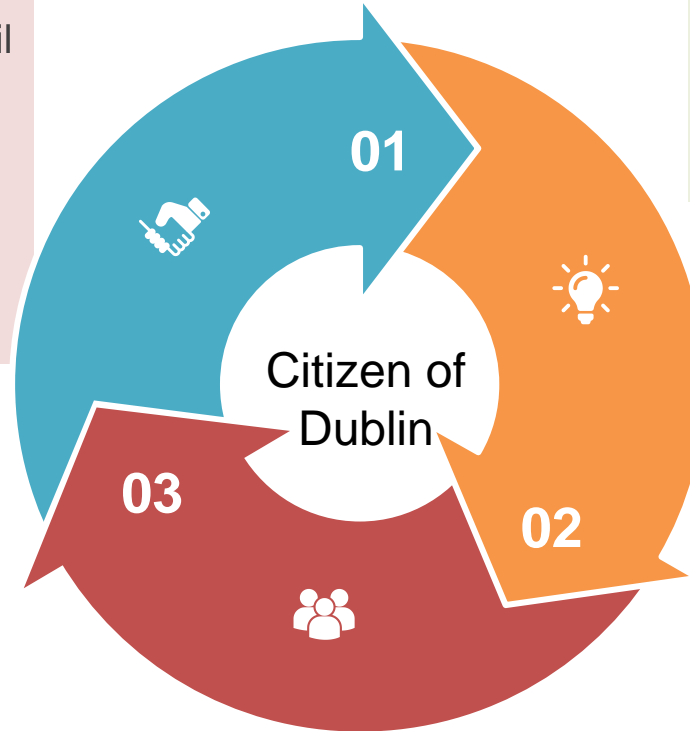
National Transport Authority

Public Transport regulator

Funding agency for transport

Projects

Government body



Dublin City Council

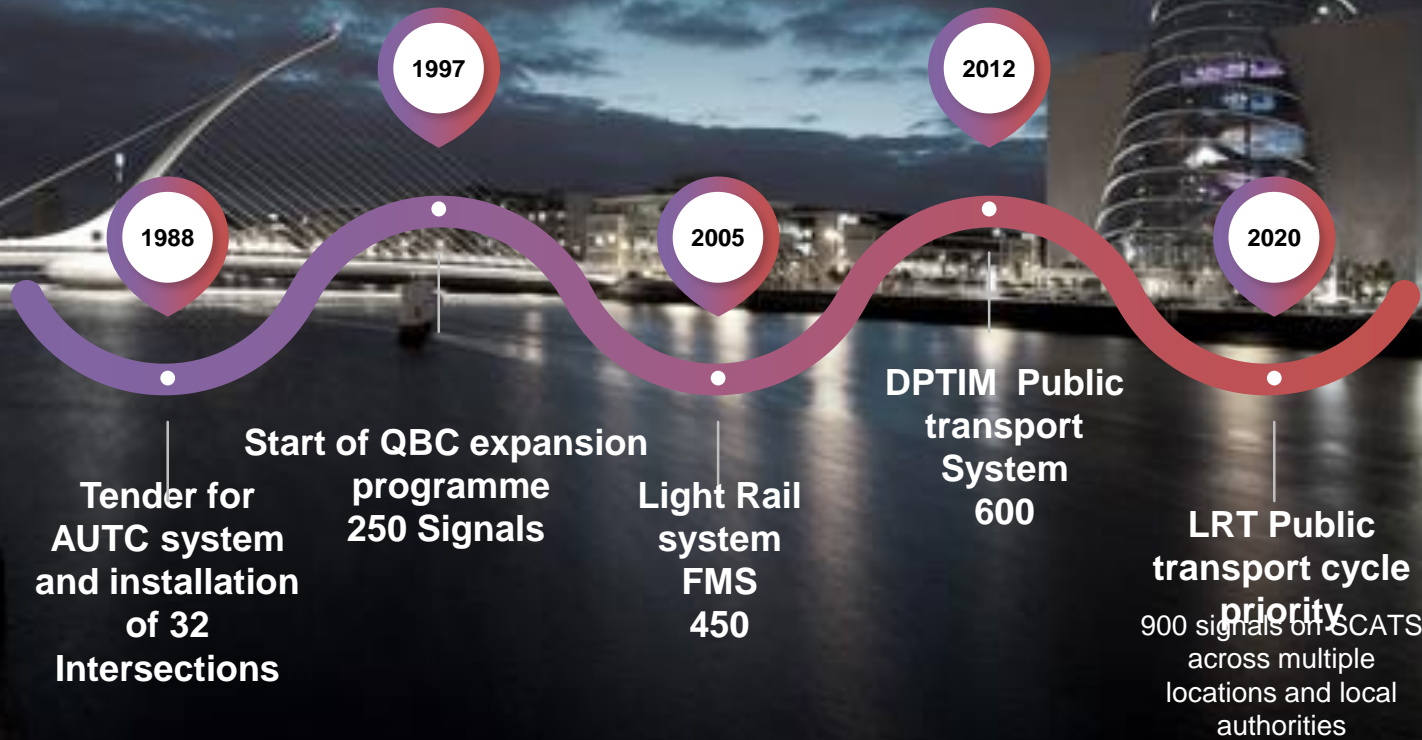
Road Authority and Traffic manager

Responsible for multiple City services

Elected Councillors .



# Installation and expansion of SCATS







Control centre open since 1980 with a fixed time UTC system

SCATS adaptive control introduced in 1989

# ITS – Traffic Control Room



Live Radio Traffic Updates

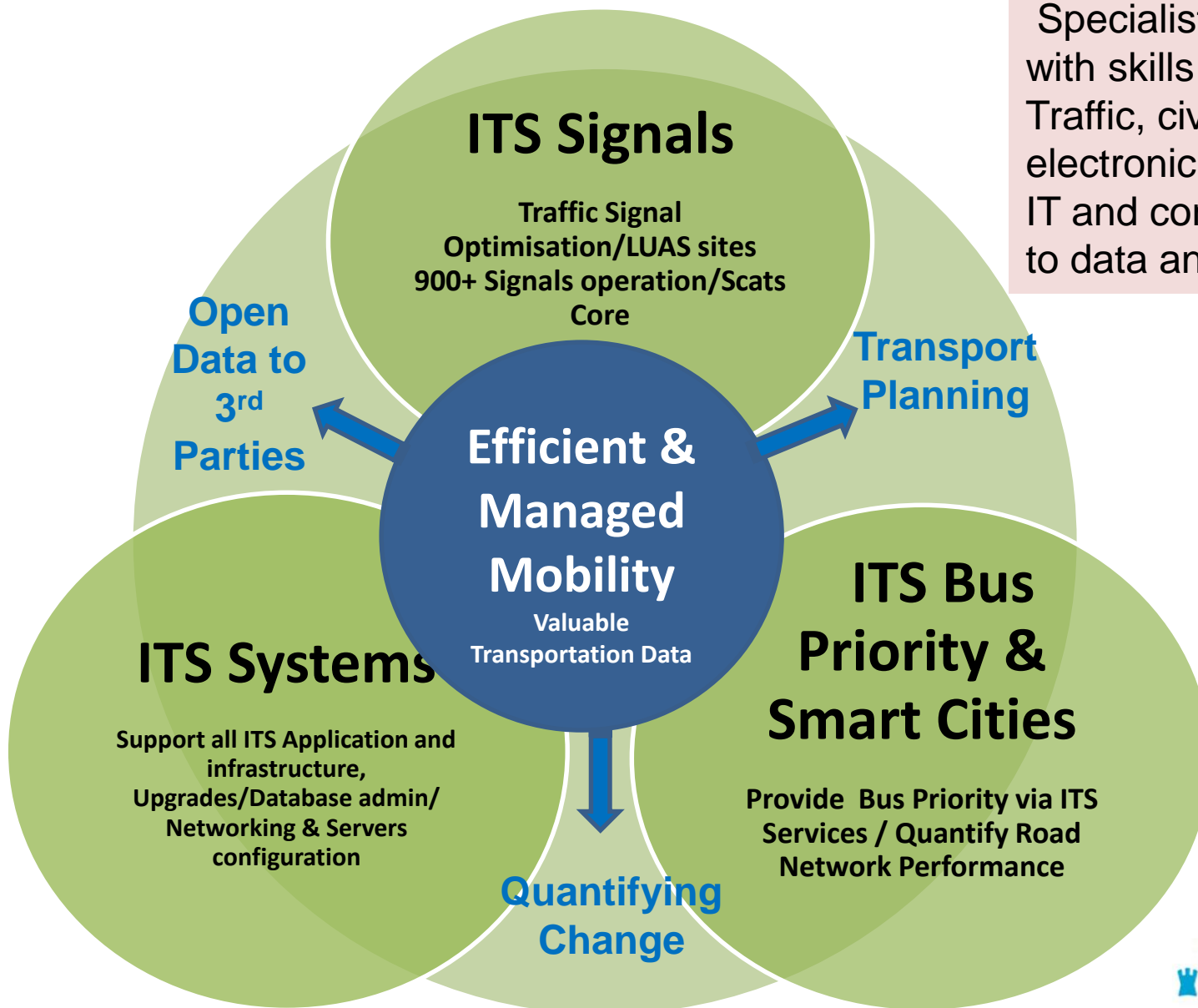




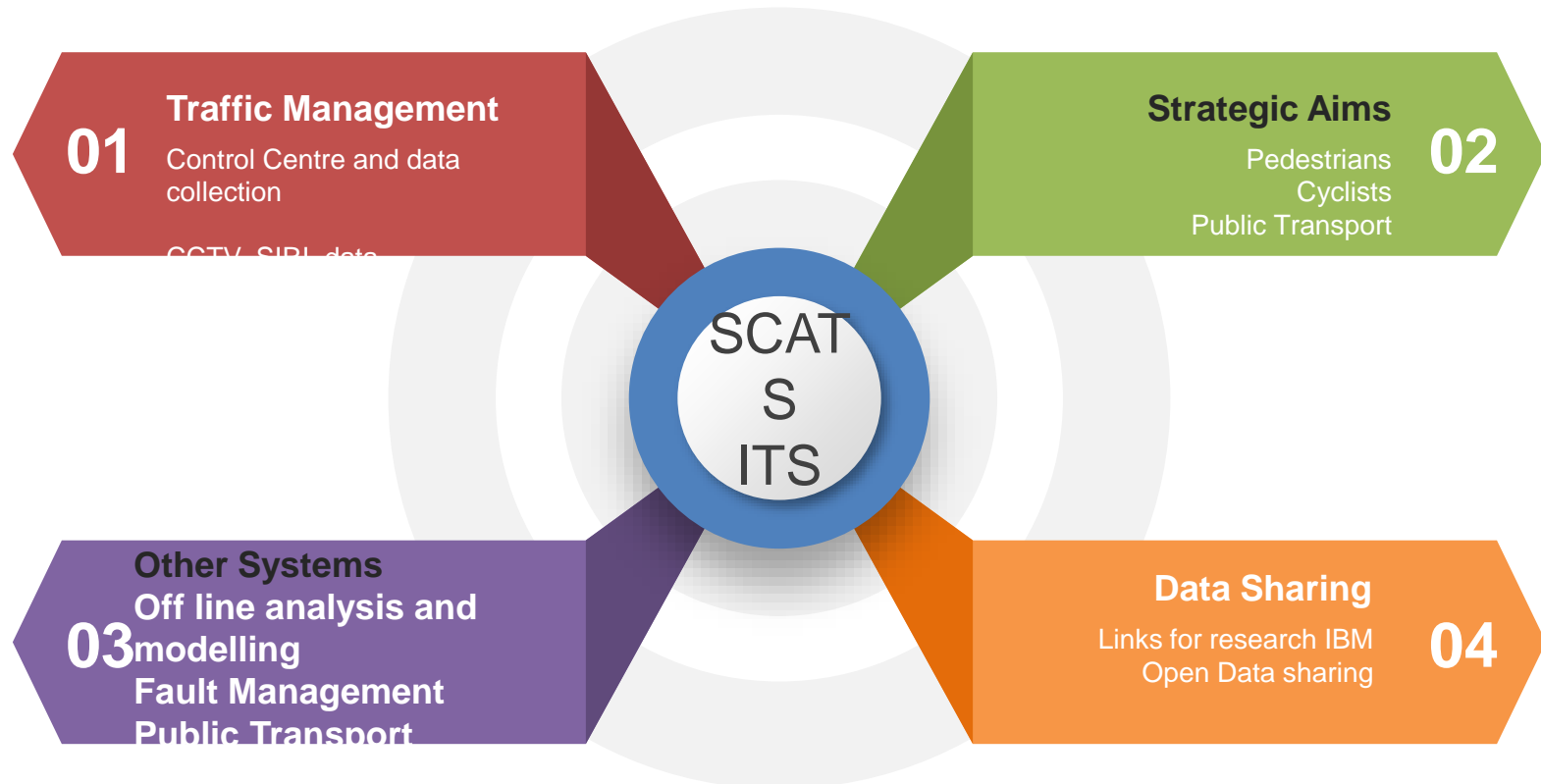


# Intelligent Transportation Systems

Specialist ITS staff with skills ranging from Traffic, civil and electronic engineering, IT and communications to data analytics



# SCATS as the core of our ITS systems and Strategy



4th



Network

3rd



Operations

2nd



Electrical

1st

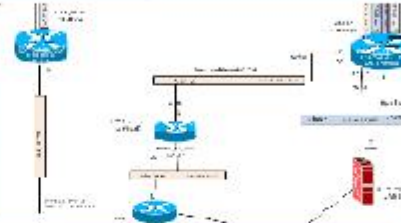


Civils



# Coordination & Adaptation

4th



Network

3rd



Operations

2nd



Electrical

1st

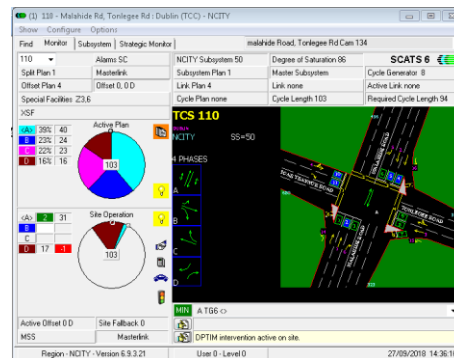
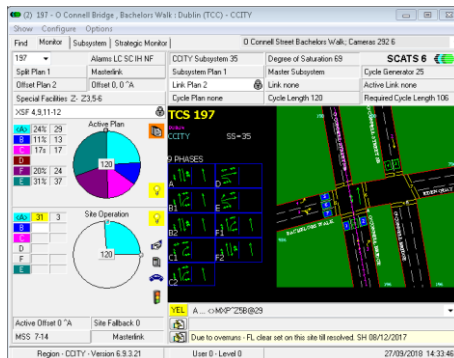
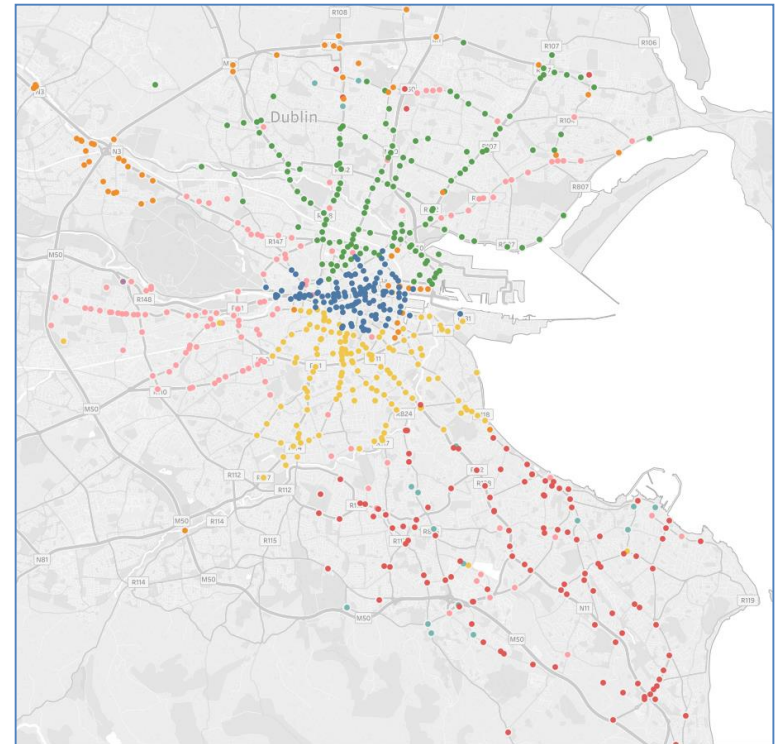


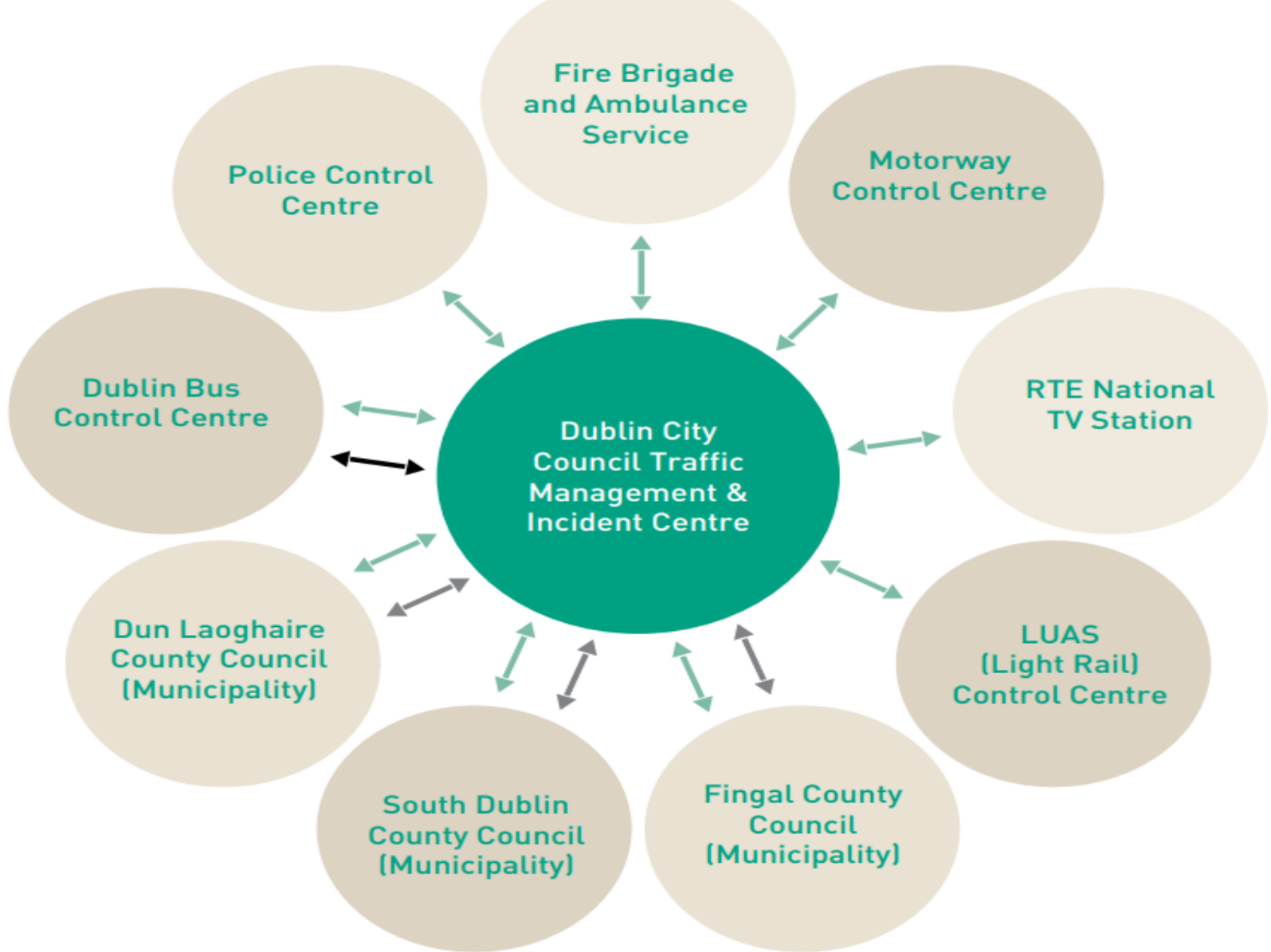
Civils



# Traffic Signal Management in Dublin City

- Sydney Coordinated Adaptive Traffic System (SCATS)
- Adaptive urban traffic control system
- Over 900 sites throughout Dublin
- Sites throughout Dublin City, as well as Fingal, Dun-Laoghaire, and South Dublin
- All sites on SCATS provide the opportunity for centralised bus priority, pedestrian and cycling priority as well as centralised fault reporting





- CCTV
- Bus
- SCATS Traffic Control



# SCATS in operation



## Junction optimiser

- Tactical control
- Variety of detection
  - Loops
  - Video
  - Infra red
  - Cyclist Detection
  - Pedestrian detection
  - Contact less buttons



## Network

- Communications by
  - Fibre, cable, fixed and Mobile comms
- Allows complete control on all aspects of operation
- All data and faults are instantly returned to SCATS for distribution



## SCATS strategic layer

- All junctions feed data into this layer
- All data is available to any other junction
- Each area can have different strategies
  - Areas can run independently
- Access to different sets of signals can be controlled
  - ITS API
  - ITSLINK


# SCATS provides junction optimisation and network linking


## How does the SCATS adaptive traffic system work




Show Configure Options

Find Monitor Subsystem Strategic Monitor Cameras CCTV 25

405 Alarms LC SC CF NCITY Subsystem 21 Degree of Saturation 75  Move Smarter

Split Plan 1 Masterlink  Subsystem Plan 1 Fixed Master Subsystem Cycle Generator 5

Offset Plan 2 Offset 0, 0 B Link Plan 2  Link none Active Link none

Spe NCITY - Strategic Input Monitor

XSF Site 405 Data source Phase B, Detectors 5-6 (SI 49)

Act Elapsed time 49 Gap time 0 New time 40


Detector	5	6		
New space time	0.0	0.0		
New volume	0	0		
Space time	47.1	44.0		
Measured volume	1	5		
Corrected volume	2	6		
Reconstituted flow	2	5		
Initial DS %	9	24		
Final DS %	9	24		
DS (-1)	7	54		
DS (-2)	0	17		
Calibration factor	0.00	0.00		
Maximum flow vph	1423	1674		
Occupancy (secs)	1.35	1.05		
Type	Auto	Auto		
Best flow today	1200	1731		
Occupancy	1.15	1.07		
Average daily flow	1382	4512		
Total today	1147	3400		

Close

NCITY - Subsystem Monitor

Subsystem: 21 No. of stored plans: 8  
Critical site: 405 Marriage counter: 0 Cycle limits: 40 to 80

Data	Latest	Cycle-1	Cycle-2	Cycle-3	Cycle-4
ISS prime phases					
Subsystem Plan vote	4	1	1	1	1
Active Subsystem Plan	F1	F1	F1	F1	F1
Link plan vote	2	2	2	2	2
Active link plan	2#	2#	2#	2#	2#
Degree of saturation	78	59	97	81	86
Initial required CL (RL)	53	34	84	56	62
Attenuated RL	77	75	85	78	78
Weighted RL	78	79	81	78	82
Distributed RL	70	65	90	90	90
Effective minimum CL	50	50	50	50	50
Distributed effective min	50	50	50	50	50
Allowable CL increment	-17	-17	-15	-13	-5
Proposed CL	84	84	84	84	84
Nominal CL	90	90	90	90	90
Actual CL	90	90	90	90	90
Marriage/Divorce					

Act MSS Masterlink 

DPTIM Intervention see notes

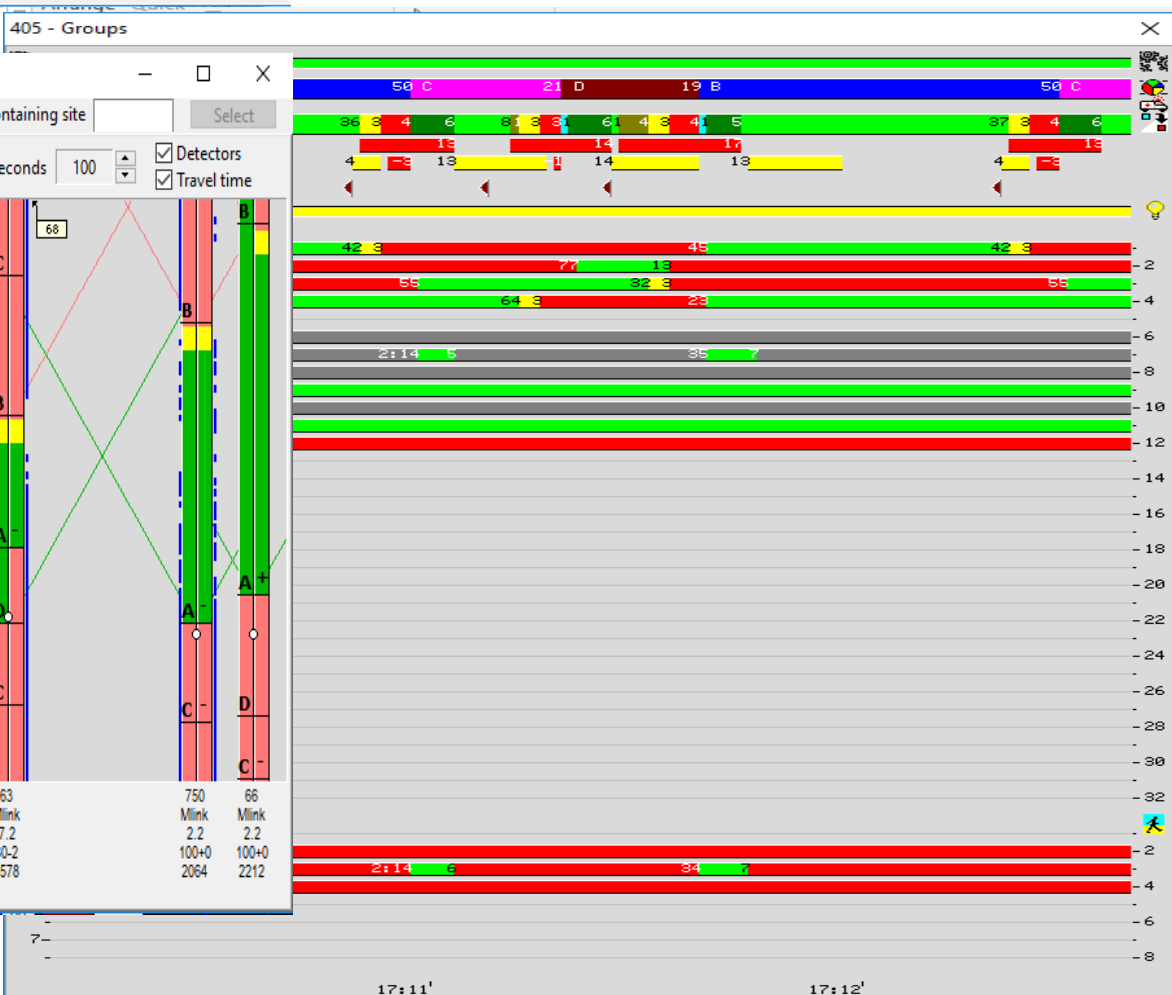
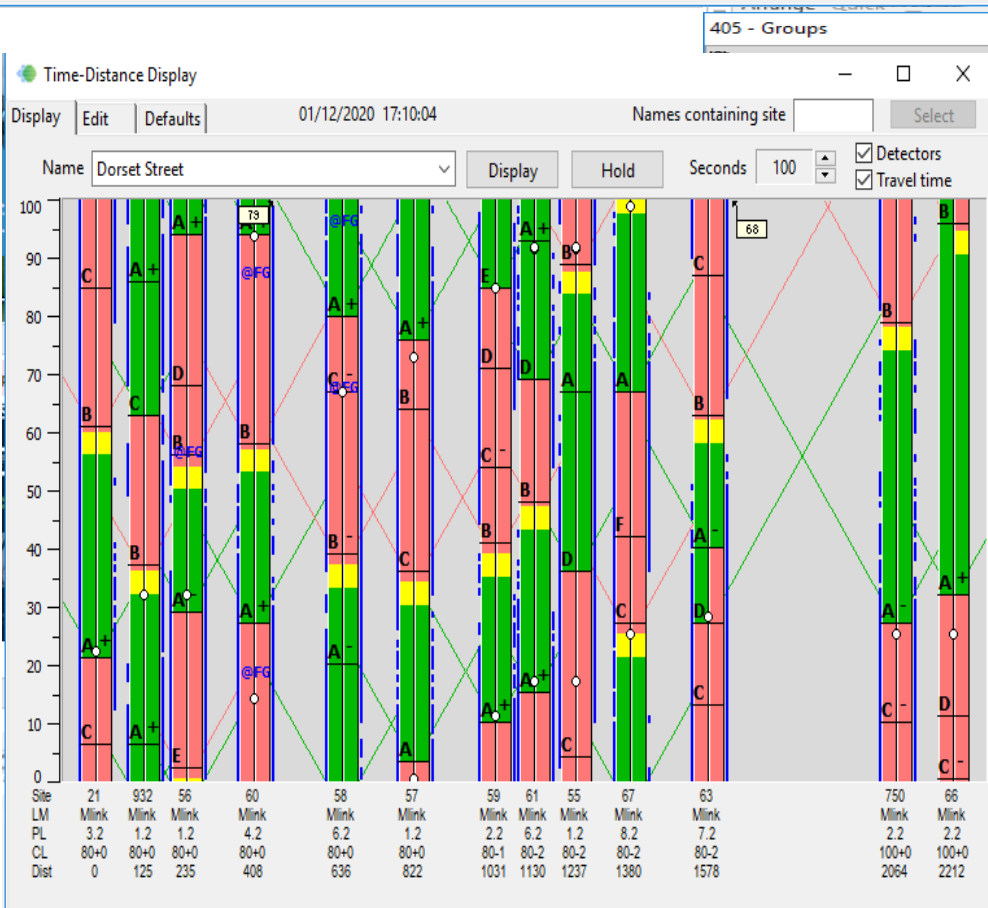
Route Pre-emption - 2 loaded, 0 active

Route **7** Status ● ●

Site	200	201	202	199	198	197	196	232
Pre-emption phase	A	A	A	A	A	A	A	A
Start delay	0	10	20	30	40	50	50	60
Pre-emption time	20	20	20	20	20	20	20	20
Current phase	C	A	C	C	A	A	A	A
Green time	1	33	25	5	5	5	23	40
Pre-emption state								

Track < 0/8 /4 /2 1 \*2 \*4 \*8

Delay speed ■



CCITY - Site 272 Configuration

Site selection  
View 272  Site ID  Slot no. Refresh Save View all Close

Site Data Options Intergreens Pedestrian Movements  
Split Plans Offset Plans Variations Volumes

Variation Routines

- > ... VAR1: VR3 - Test for a phase running
- > ... **VAR2: VR45 - Send XSF based on phase time**
- > ... VAR3: VR3 - Test for a phase running
- > ... VAR4: VR8 - Test for a cycle length
- > ... VAR5: VR49 - Apply a no gap
- > ... VAR6: VR11 - Test day number and time
- > ... VAR7: VR3 - Test for a phase running
- > ... VAR8: VR36 - Read action list
- > ... VAR9: VR83 - Test an SA for congestion (SKIPPED)
- > ... VAR10: VR3 - Test for a phase running
- > ... VAR11: VR11 - Test day number and time
- > ... VAR12: VR36 - Read action list

VR45 - Send XSF based on phase time

Skip Comment

14 Remaining phase time

Reverse action

5 XSF flag number

272 - Variation Routine Monitor

VAR	VR	Description	On entry	On exit
◆ 1	3	Test for a phase running	True	False
□ 2	45	Send XSF based on phase time	False	False
◆ 3	3	Test for a phase running	True	False
◆ 4	8	Test for a cycle length	False	False
□ 5	49	Apply a no gap	False	False
◆ 6	11	Test day number and time	True	True
◆ 7	3	Test for a phase running	True	False
□ 8	36	Read action list	False	False
— 9	83	Test an SA for congestion	False	False
◆ 10	3	Test for a phase running	True	False
◆ 11	11	Test day number and time	False	False
□ 12	36	Read action list	False	False

Variation Routines Close



100059V - Site (1:30T) - Version 1.2 Active

File View Data Admin Help

Layer Visibility

- Site
  - DTM
  - Bounding Box
  - Map Image
  - Roadal Grid
- Layout
- Site Layer Visibility
  - Anchor
  - Cross Over Area
  - Delimiters
  - Lane Path
  - Lane Ends
  - Lanes
  - Links
  - Medians
  - Median Control
  - Movements
  - Movement Control Points
  - Next Sites
  - Pedestrian Crossing
  - Road Control Points
  - Road Edges
  - Road Only
  - Roundabout
  - Signal Groups
  - Stop Lines
  - TMC Reference
  - Traffic Movements
- Movements
- Lanes
- Signal Groups
- Phases

Movements Attributes

Movements

- Vehicle Movement 95387034
- Vehicle Movement 95387030
- Vehicle Movement 95387033
- Vehicle Movement 95387025
- Vehicle Movement 95387036
- Vehicle Movement 95387037
- Vehicle Movement 95387038
- Vehicle Movement 95387032
- Vehicle Movement 95387710
- Vehicle Movement 95387070
- Vehicle Movement 95387054
- Vehicle Movement 95387067
- Vehicle Movement 95387062
- Vehicle Movement 95387066
- Vehicle Movement 95387061
- Vehicle Movement 95387064
- Vehicle Movement 95387068
- Vehicle Movement 95387075
- Vehicle Movement 95387077
- Vehicle Movement 95387078
- Vehicle Movement 95387070
- Vehicle Movement 95387073
- Vehicle Movement 95387080
- Vehicle Movement 95387087
- Vehicle Movement 95387058

Left Marking

- NONE
- SOLID
- DASHED
- DOTTED

Right Marking

- NONE
- SOLID
- DASHED

Traffic Types

- VEHICLE
- BUS
- BICYCLE
- TRAM
- PEDESTRIAN
- EMERGENCY
- TAXI

Selected All

Lane Path Attributes

Lanes

- Lane 95387030
- Lane 95387040
- Lane 95387044
- Lane 95387045
- Lane 95387046**
- Lane 95387060
- Lane 95387061
- Lane 95387066
- Lane 95387066
- Lane 95387068
- Lane 95387069
- Lane 95387080
- Lane 95387084
- Lane 95387086
- Lane 95387087
- Lane 95387071
- Lane 95387072
- Lane 95387074

Width (m): 3.1

Left Lane Marking

- NONE
- DASHED
- DOTTED
- SOLID

Right Lane Marking

- NONE
- DASHED
- DOTTED
- SOLID

Traffic Types

- VEHICLE
- BUS
- BICYCLE
- TRAM
- PEDESTRIAN
- EMERGENCY
- TAXI
- PARKING

Selected All

Defaulted All

North

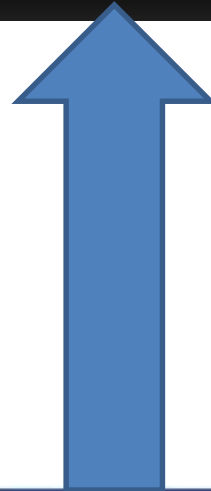
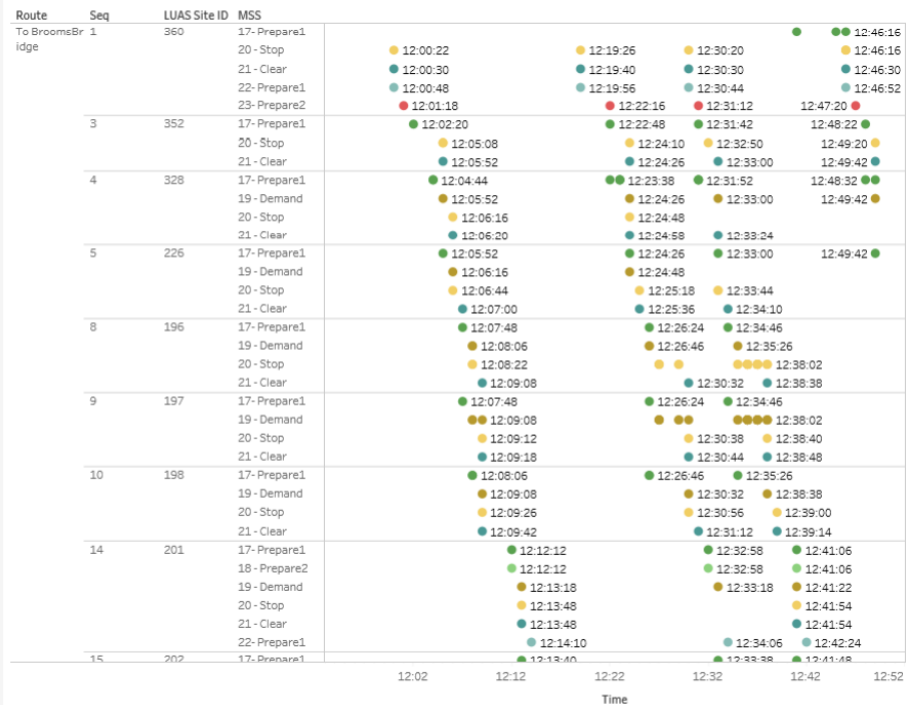
South

OK Cancel

Test\_Serv\_114 | A000 | User 1 - Layer 1



# LUAS\_Detection Time Sequence



SCATS 6

CCITY Subsystem 14 Degree of Saturation 69

Subsystem Plan 4 Married + Cycle Generator 11

Link Plan 2 Link -2 -3 \*A 196 Active Link -3 \*A 196

Cycle Plan none Cycle Length 120 Required Cycle Length 103

Active Plan

Site Operation

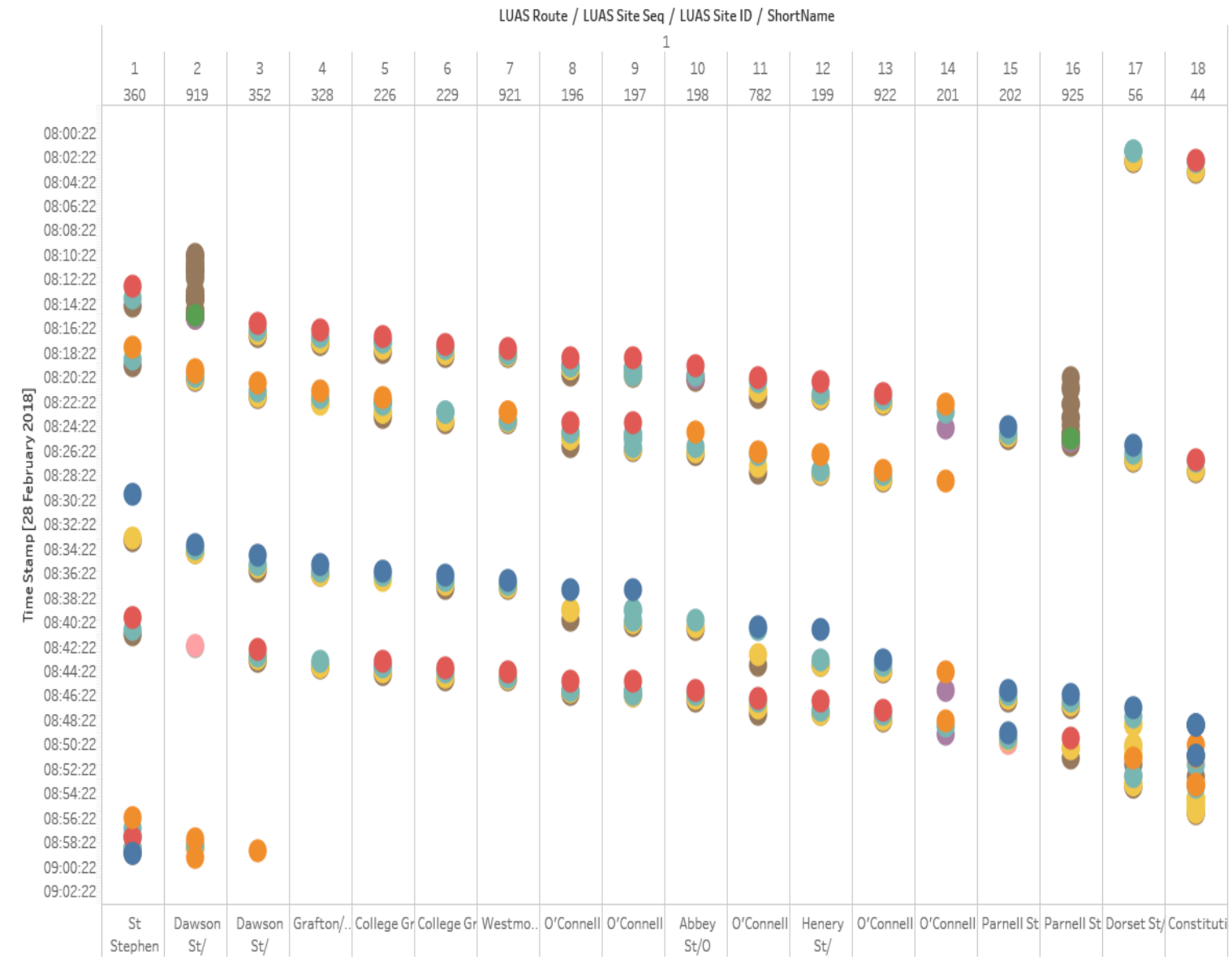
MIN A TG10 <>

DPTIM intervention active

Region - CCITY - Version 6.9.3.21 User 0 - Level 0 26/09/2018 11:10:38

Just to note the detection data shows only 4 trams this morning between 8am to 9am.

### AM Peak LUAS Detection Detailed for To BroomsBridge : on 28 February 2018 at 8:



**Route&Name**

1 - To BroomsBridge

2 - To St Stephens G...

---

**HOUR(Time Stamp)**

(All)

6

7

8

9

10

Cancel Apply

---

**MINUTE(Time Stamp)**

(All)

0

1

2

3

4

Cancel Apply

---

**Rsf Bits Set**

RSF-1

RSF-1 & RSF-2

RSF-2

RSF-3

RSF-3 & RSF-5

RSF-4

RSF-4 & RSF-5

---

**LUAS Site ID**

(All)

44

56

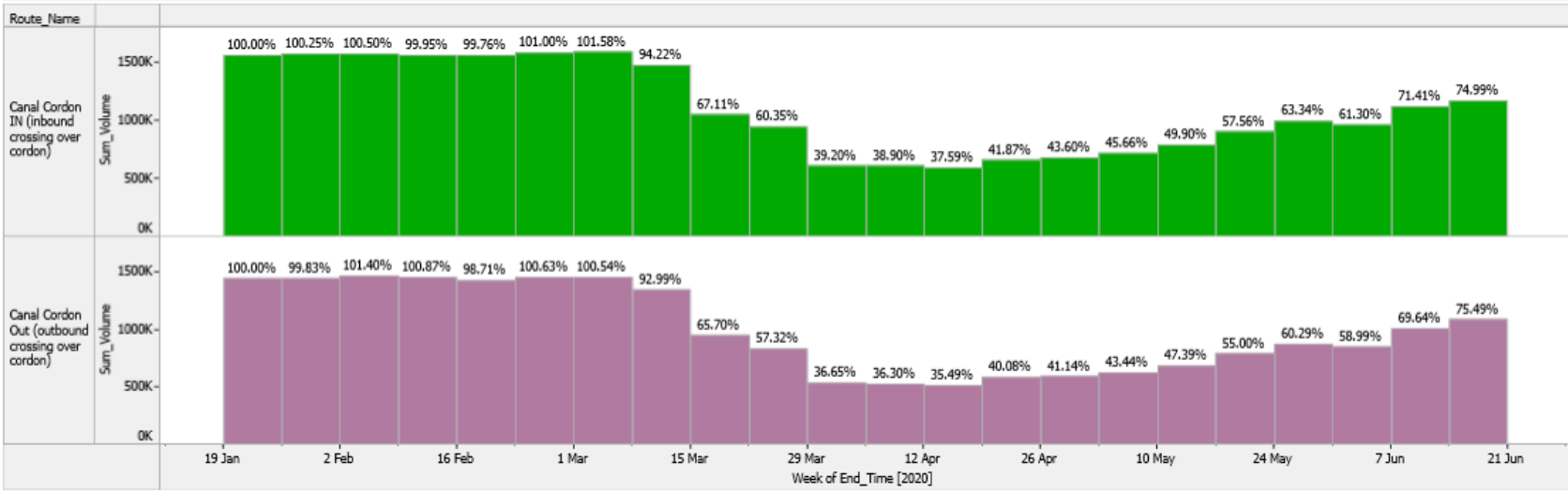
196

197

198

Cancel Apply

**Cordon Routes - Traffic Volume (By Date) (% of 1st Week)**



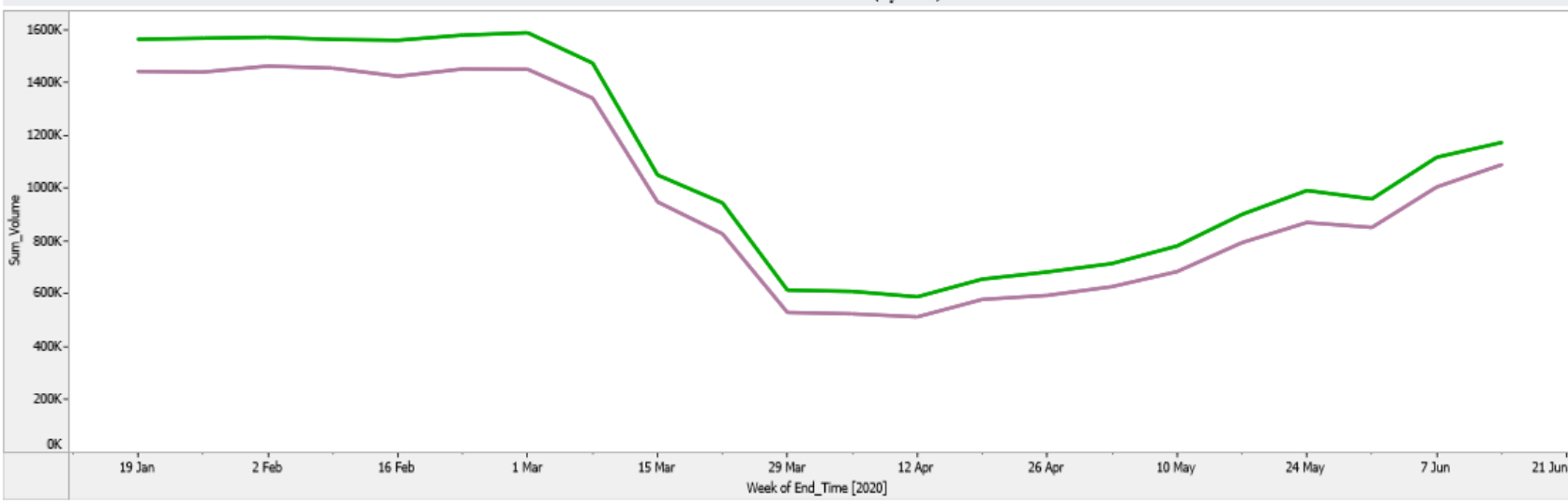
**Route\_Name**

- Canal Cordon IN (inbound crossing over cordon)
- Canal Cordon Out (outbound crossing over cordon)

**Week of End Time [2020]**

- (All)
- Week 1
- Week 2
- Week 3
- Week 4
- Week 5
- Week 6
- Week 7
- Week 8
- Week 9
- Week 10
- Week 11
- Week 12
- Week 13
- Week 14
- Week 15
- Week 16
- Week 17
- Week 18
- Week 19
- Week 20
- Week 21
- Week 22
- Week 23
- Week 24
- Week 25
- Week 26

**Cordon Routes - Traffic Volume (By Date)**





350 cameras for Traffic management and incident management

# ITS Systems – FMS Asset Management

Asset & Fault Management System

Dublin City Council
Hello Maggie O'Donnell for DCC ITS | [Home](#) | [Logout](#) | [Change Password](#) | [Help](#)

[Faults](#) | [Equipment](#) | [Pending Faults](#)

[Assets](#) | [Faults](#) | [Reports](#)

**Equipment Type**

- All Equipment
- ANPR System
- Automatic Bollard System
- Axle Counters
- CCTV System
- Connector
- Control Room
- Dialogue Display Signs
- Fibre Cable
- Fibre Equipment
- Fibre Joints
- Fibre ODF
- Fibre Transmission
- FMS System
- Illuminated Bollards
- Other Termination Points
- PGMS Signs
- PGMS System
- RTPi Signs Cork
- RTPi Signs Dublin
- RTPi Signs Dublin Airport
- RTPi Signs Galway
- RTPi Signs Kildare
- RTPi Signs Limerick
- RTPi Signs Louth
- RTPi Signs Meath
- RTPi Signs Waterford
- RTPi Signs Wicklow

**Equipment State**

- All States
- In Service
- Maintenance Mode
- Out of Service

TSS (DCC - City), TSS (DLR - Regional)

Equipment ↑	Priority	Location	Asset No.	Fault Count
Signals_18		NCR @ Berkeley Rd	2184	0
Signals_180		Swords Rd @ Larkhill Rd	2185	0
Signals_181		Swords Rd @ Shanowen Rd	2186	0
Signals_182		Gardiner St @ Talbot St	2187	0
Signals_183	HP	Tara St @ Georges Quay	2188	0

**Map**

View Details

View Asset

View in IMS

Historic Faults

New Fault

New Work Order

New Planned Maintenance

Change State

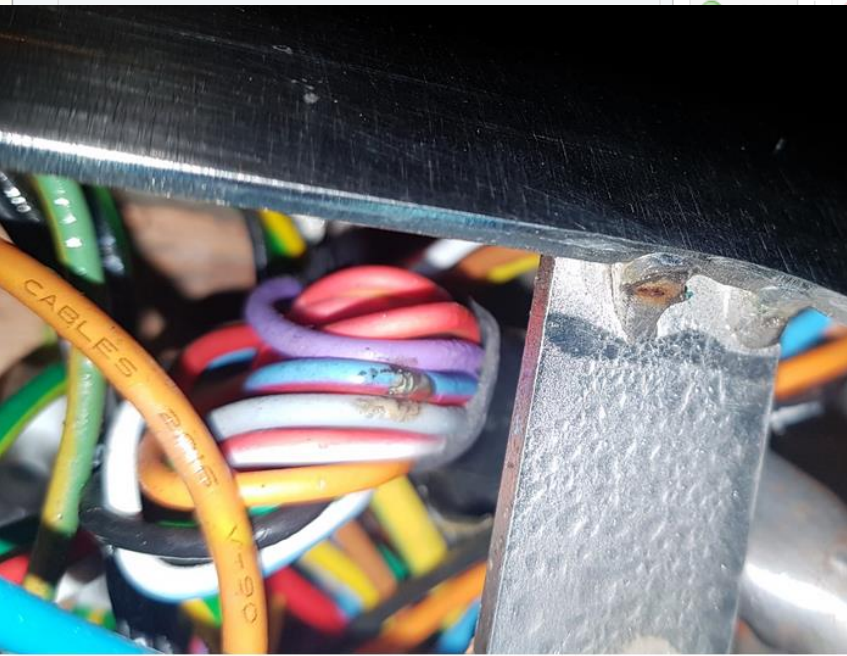
# Asset & Fault Management System


**Asset No.** 
**Type** 
**Status** 
**Parent Asset No.**

Tracking details		Asset Location details		Custom Fields	
<b>Manufacturer</b>	<input type="text" value="Atc"/>	<b>Location ID</b>	<input type="text" value="Signals_196"/>	<b>Name ↑</b>	<b>Value</b>
<b>Model</b>	<input type="text" value="TC424-90"/>	<b>GIS</b>	N <input type="text" value="53.3468673"/> E <input type="text" value="-6.2607669"/>	Alu Poles (2m)	0
<b>Serial No.</b>	<input type="text" value="atc-1509-3637"/>	<b>Location</b>	<input type="text" value="O'Connell Bridge @ Aston Quay"/>	Alu Poles (4m)	0
<b>External Ref.</b>	<input type="text"/>	<b>Road</b>	<input type="text"/>	Alu Poles (7m)	1
<b>Condition</b>	<input type="text" value="&lt;Blank&gt;"/>	<b>Direction</b>	<input type="text"/>	Alu Poles (HA)	0
<b>Asset Lifetime dates</b>		<b>Asset Cost</b>		Alustar (Pedest...)	15
<b>Installation date</b>	<input type="text"/>	<b>Purchase</b>	<input type="text" value="0"/> €	Alustar (Traffic)	17
<b>Manufactured date</b>	<input type="text"/>	<b>Warranty</b>	<input type="text" value="0"/> €	AT PBU	
<b>Commission date</b>	<input type="text"/>	<b>Installation</b>	<input type="text" value="0"/> €	Audio	
<b>Warranty expiry date</b>	<input type="text"/>	<b>Installation Contract</b>	<input type="text"/>	Bi Pin	0
<b>Last inspection date</b>	<input type="text" value="27/10/2017"/>			Comms Details	IP 10.40.37.90
<b>Disposal date</b>	<input type="text"/>				

- Show on Map
- Asset History
- Print Preview
- Delete Asset
- New Asset
- Go Back
- Apply

Description	Child Assets	Work H
Date v	Entered By	
31/7/2018, 00:48:56	System	
31/7/2018, 00:47:54	System	
30/7/2018, 23:58:58	System	
30/7/2018, 23:58:06	System	
30/7/2018, 23:22:36	james.reilly	
30/7/2018, 23:13:51	System	
30/7/2018, 23:11:05	System	



[Details](#)
[Audit Trail](#)

arrival the lights were out due to a tripped rcd. I  
 d core arcing off the pole. I remade off the 20

ntly onsite

TS region, Classification: Pending

# ITS Systems – Application Support FMS

Asset & Fault Management System

Dublin City Council
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Faults
Equipment
Pending Faults

Equipment Type

- Connector
- Control Room
- Dialogue Display Signs
- Fibre Cable
- Fibre Equipment
- Fibre Joints
- Fibre ODF
- Fibre Transmission
- FMS System
- Illuminated Bollards
- Other Termination Points
- PGMS Signs
- PGMS System
- RTPi Signs Cork
- RTPi Signs Dublin
- RTPi Signs Dublin Airport
- RTPi Signs Galway
- RTPi Signs Kildare
- RTPi Signs Limerick

Fault Class

- Class 1 (0)
- Class 2 (44)
- Class 3 (56)
- Loop Fault (87)

Fault State

- All Fault States
- Raised
- Acknowledged
- Attended
- Fixed and Cleared
- Request Transfer
- Transferred
- Request On-Hold
- On-Hold
- Cancelled

TSS (DCC - City), TSS (DLR - Regional)
New Fault  View From:

Equipment	State	Location	Fault Type	Description	Ack'd By	Raised Time ↓
Signals_162	Raised	Mobhi Rd @ Griffith Av	SCATS communications stopped			28/02/2017 14:17
Signals_761	Cleared	Blackhall St Bridge @ Ellis Quay (Joyce Bridge N...	Controller watchdog alarm			28/02/2017 14:01
Signals_761	Cleared	Blackhall St Bridge @ Ellis Quay (Joyce Bridge N...	Lamps blacked out	'SCATS communications stopped' fault also raise...		28/02/2017 14:01
Signals_6066	Raised	Leopardstown Rd/Brewery Rd/Burton Hall Rd	Faulty detector 17			28/02/2017 14:00
Signals_6066	Cleared	Leopardstown Rd/Brewery Rd/Burton Hall Rd	Faulty detector 21			28/02/2017 14:00
Signals_120	Raised	Mount St Bridge @ Warrington Pl	Faulty detector 9			28/02/2017 13:00
Signals_6066	Cleared	Leopardstown Rd/Brewery Rd/Burton Hall Rd	Faulty detector 16			28/02/2017 13:00
Signals_6067	Cleared	Ballyogan Road @ Glencairn Crescent	Faulty detector 7			28/02/2017 13:00
Signals_640	Cleared	Collins Ave @ DCU	Faulty push button 2			28/02/2017 13:00
Signals_629	Raised	Crumlin Rd @ Ratters Rd	Faulty detector 2			28/02/2017 12:00
Signals_465	Cleared	Merrion Sq @ Mount St Upr	Faulty detector 7			28/02/2017 12:00
Signals_6064	Cleared	Pottery Rd @ Amgen	Faulty detector 11			28/02/2017 12:00
Signals_259	Cleared	Harolds Cross Rd @ Park View Av	No carrier from controller	'SCATS communications stopped' fault also raise...		28/02/2017 11:16
Signals_416	Cleared	Gardiner Pl @ Temple St	Head fault general	Report of optics hanging.	darran.b...	28/02/2017 11:03
Signals_229	Cleared	Westmoreland St @ College St	Faulty detector 10			28/02/2017 11:00
Signals_229	Cleared	Westmoreland St @ College St	Faulty detector 11	Associated faults: 6098553 (Type: Detector Faults),		28/02/2017 11:00
Signals_72	Cleared	Fairview @ Fairview Strand (Edges Corner)	Faulty push button 2			28/02/2017 11:00
Signals_72	Cleared	Fairview @ Fairview Strand (Edges Corner)	Faulty push button 3	Associated faults: 6098551 (Type: Push Button F...		28/02/2017 11:00
Signals_44	Cleared	Constitution Hill @ Western Way	Faulty detector 4			28/02/2017 11:00
Signals_765	Cleared	Mount St @ Love Lane	SCATS communications stopped			28/02/2017 10:20
Signals_6085	Ack'd	Drummartin Link@Kilmacud Road Upper(T557)	Inspection Request	Attend site in the PM peek and observe the opera...	darran.b...	28/02/2017 10:07
Signals_692	Cleared	Kylemore Rd @ Landon Rd	SCATS communications stopped			28/02/2017 10:03
Signals_629	Cleared	Crumlin Rd @ Ratters Rd	Faulty detector 2			28/02/2017 10:00
Signals_528	Cleared	Finglas Rd @ Tolka Valley Rd	Faulty detector 8			28/02/2017 10:00
Signals_416	Cleared	Gardiner Pl @ Temple St	Faulty lamp			28/02/2017 09:51
Signals_6172	Cleared	Deansgrange Rd@Stradbrook Rd(T119)	No carrier from controller		darran.b...	28/02/2017 09:09
Signals_765	Cleared	Mount St @ Love Lane	SCATS communications stopped	'No carrier from controller' fault also raised on this...		28/02/2017 09:09

Show Map 
Current Fault Count: 191



Coordination & Adaptation

4th



Network

3rd



Operations

2nd



Electrical

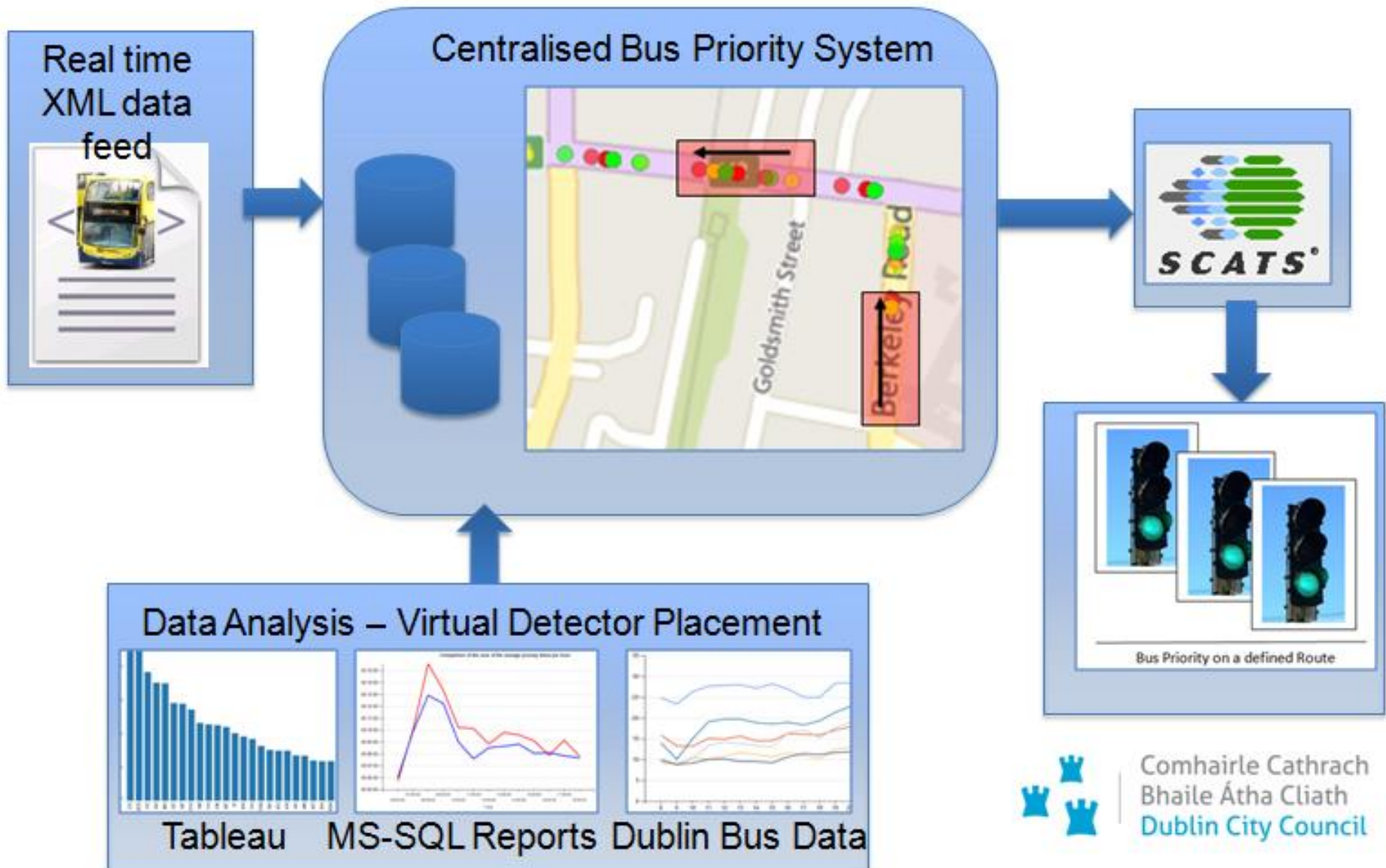
1st



Civils



# Centralised bus Priority – How does it work.



# DPTIM

- **Inputs:**
  - SIRI data feed for 20 second bus position data 1000 buses
  - Bus route Network Data
  - Scats network
  - Unscheduled stops report
  - Tram Data
- Fuses bus and traffic data
- Virtualised loops = no additional roadside infrastructure
- Map-based user interface
- Drawing interface to map-out virtual loops, configured for route patterns and threshold values.
- Data Base for all bus data
- **Outputs**
  - Connects to SCATS via ITS Port when thresholds are met.
  - Priority requested in real time
    - Single junction
    - Entire routes



# *Good Data--- Useful Information*



Bus  
Data



Data fusion



Traffic  
Signals

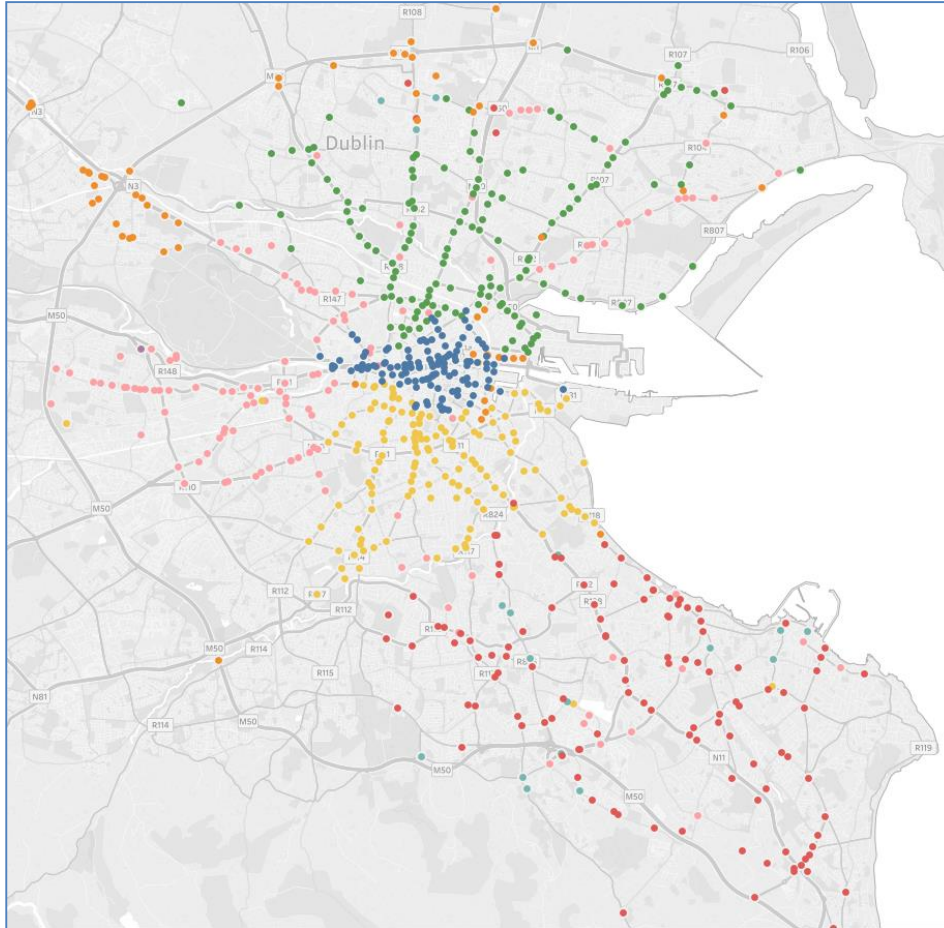


# Good Information not just Data

- *Bus provides perfect data*
- **Bus Route / Journey Patterns**
  - *Where its going*
  - *Its complete route*
- **Identify Pinch-Points**
  - Time of day
  - Multiple causes
- **Data Warehouse**



# Bus priority system - Coverage in Dublin



Coordination & Adaptation



Centralised Bus Priority



# Dashboards

- Can be used to display many different datasets...

- Congestion and stoppages
- Stop-to-stop journey time
- Bus stop impact score
- Stop/trip percentage

- Very useful for visually presenting data

- Useful for comparison analysis

- **Before/after bus priority measure were introduced**
- **Different times of day**

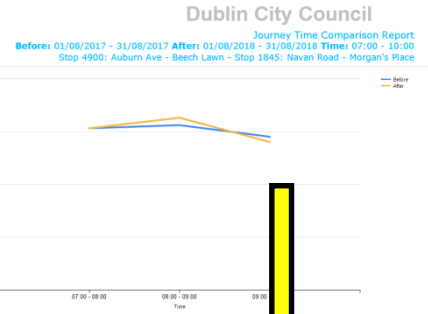
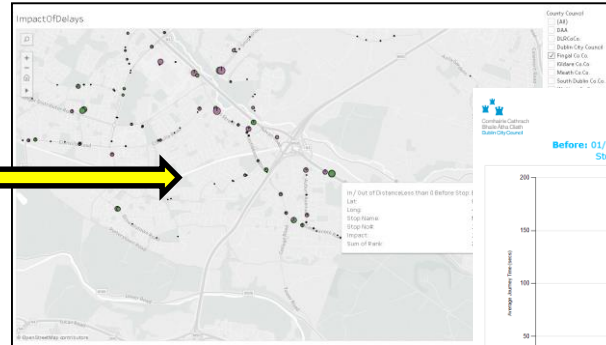


# Informed decision making

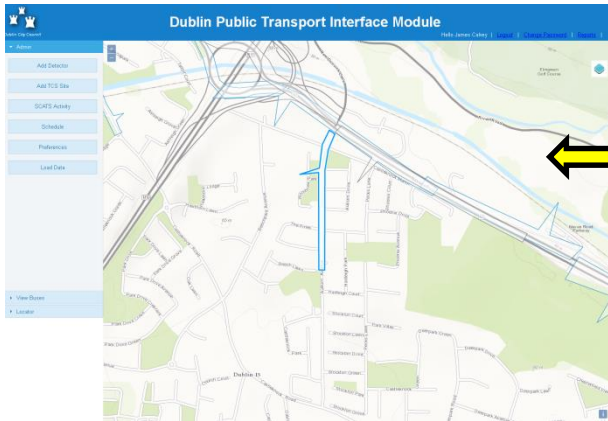
## Reports

County/Council	Month	Timeband	Rank	Stop Name	Stop No.	Stops	Trips	Percentage	Average Delay	Average Impact
Fingal Co. Co.	May'18	07:00-10:00	1	Swords Road Radisson Hotel (-)	3885	633	454	106	36	395
Fingal Co. Co.	May'18	07:00-10:00	2	Snugborough Road Garnish Square (+)	2338	204	713	29	122	238
Fingal Co. Co.	May'18	07:00-10:00	3	Blanchardstown Ramor Park (+)	1814	233	415	56	94	269
Fingal Co. Co.	May'18	07:00-10:00	4	Charlestown Rd Charlestown S.C. (+)	7132	395	708	50	61	85
Fingal Co. Co.	May'18	07:00-10:00	5	Snugborough Road Waterville Row (-)	1816	169	672	25	123	-362
Fingal Co. Co.	May'18	07:00-10:00	6	Dublin Rd Swords NL Business Pk (+)	3675	251	517	49	71	119
Fingal Co. Co.	May'18	07:00-10:00	7	Main Street Swords Fingal County Council (-)	3689	317	769	41	55	-73
Fingal Co. Co.	May'18	07:00-10:00	8	Navan Road Morgan's Place (-)	1845	369	1369	27	44	-496
Fingal Co. Co.	May'18	07:00-10:00	9	St. Margaret's Road Charlestown Centre (-)	4148	260	577	40	61	-100
Fingal Co. Co.	May'18	07:00-10:00	10	Warrenstown Warrenstown Way (-)	4994	182	314	58	87	-293
Fingal Co. Co.	May'18	07:00-10:00	11	Navan Road Blanchardstown Centre (+)	1545	142	188	76		
Fingal Co. Co.	May'18	07:00-10:00	12	Warrenstown Warrenstown Green (+)	4999	143	348	41		
Fingal Co. Co.	May'18	07:00-10:00	13	Blackcourt Rd Blanchardstown Rd (-)	1833	130	351	37	109	-96
Fingal Co. Co.	May'18	07:00-10:00	14	Huntstown Way Ashfield Park (+)	1866	252	794	32	56	65
Fingal Co. Co.	May'18	07:00-10:00	15	Shelrin Road Ongar Road (+)	1899	200	694	29	70	-114
Fingal Co. Co.	May'18	07:00-10:00	16	Swords Road Turnpin Lane (+)	1636	265	967	27	52	40
Fingal Co. Co.	May'18	07:00-10:00	17	Harristown Bus Garage (+)	324	216	751	29	57	722
Fingal Co. Co.	May'18	07:00-10:00	18	Blanchardstown Blanchardstown Town Centre (-)	4747	220	1395	16	55	369
Fingal Co. Co.	May'18	07:00-10:00	19	Ballymun Road Silloge Golf Club (-)	327	212	506	42	56	-527
Fingal Co. Co.	May'18	07:00-10:00	20	Swords Road ALSIA Sports Club (+)	1630	219	744	29	53	290
Fingal Co. Co.	May'18	07:00-10:00	21	Diswellstown Rd Fernleigh Close (+)	4895	129	174	74	84	227
Fingal Co. Co.	May'18	07:00-10:00	22	Navan Road River Road (-)	7389	170	558	30	61	-423
Fingal Co. Co.	May'18	07:00-10:00	23	Shelrin Road Lohunda Road (+)	1899	127	332	38	80	36
Fingal Co. Co.	May'18	07:00-10:00	24	IKEA St. Margaret's Rd (+)	7149	114	592	19	89	100
Fingal Co. Co.	May'18	07:00-10:00	25	Old Navan Rd Castleknock Road (+)	1842	179	365	49	57	179

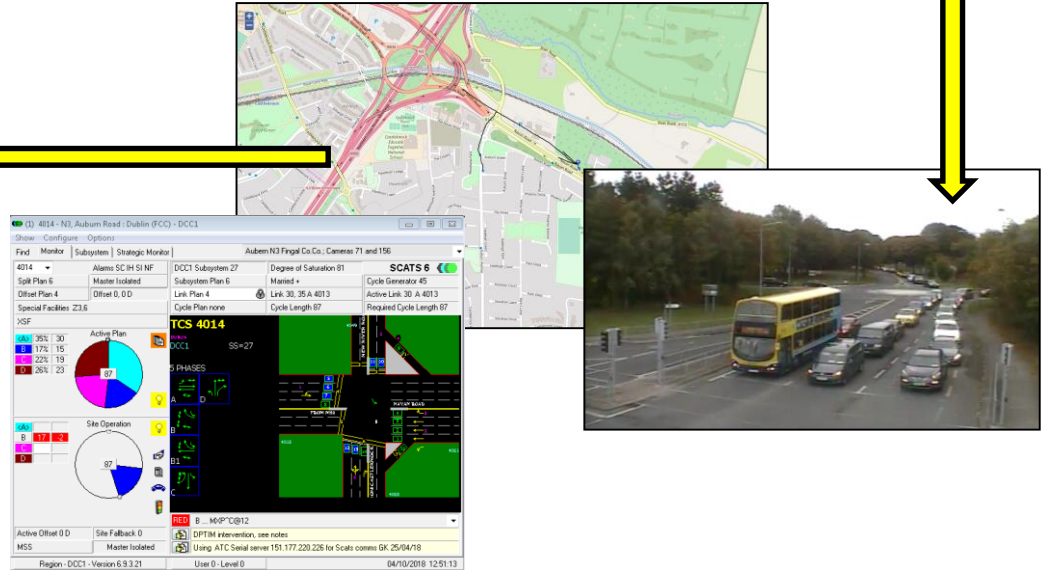
## Analysis



## Priority



## Review



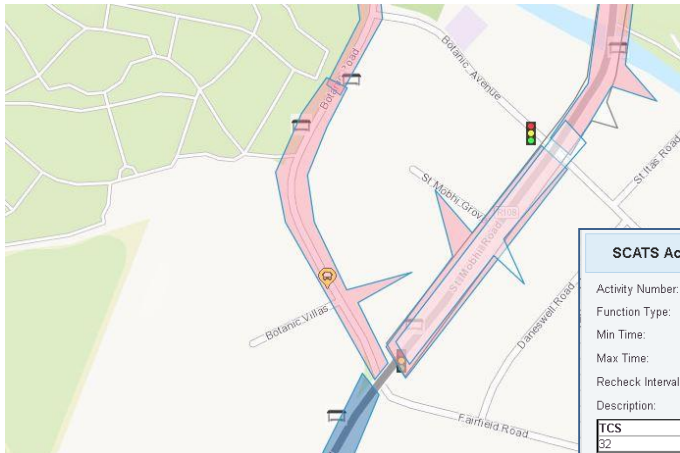
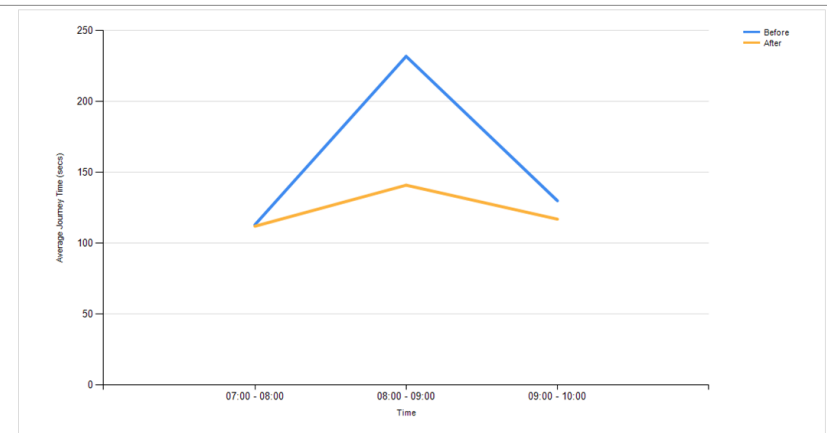
# Result example 1 AM Virtual Detector

- Bus has to make a right turn and was experiencing delays
- Applies plan 15 to B phase at SCATS site 32
- Scheduler set to from 0700-1000
- 39% reduction in journey time between 0800-0900



Dublin City Council

Journey Time Comparison Report  
 Before: 01/05/2017 - 31/05/2017 After: 01/05/2018 - 31/05/2018 Time: 07:00 - 10:00  
 Stop 183: Botanic Rd - Botanic Gardens - Stop 184: Botanic Rd - Cliftonville Road



Time Interval	Before		After		Comparison
	Total No of Buses	Avg Journey Time	Total No of Buses	Avg Journey Time	
07:00 - 08:00	158	113	172	112	-0.88
08:00 - 09:00	180	232	180	141	-39.22
09:00 - 10:00	140	130	143	117	-10

**SCATS Activity**

Activity Number:

Function Type:

Min Time:  seconds

Max Time:  seconds

Recheck Interval:  seconds

Description:

TCS	SCATS start action num	SCATS end action num
32	4180	4181

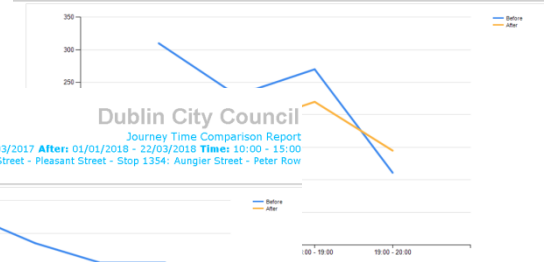


# Continual Assessment



Dublin City Council

Journey Time Comparison Report  
 Before: 06/11/2017 - 07/11/2017 After: 20/11/2017 - 21/11/2017 Times: 16:00 - 20:00  
 Stop 973: Coolock Lane - Oak Park - Stop 974: Santry Avenue - Swords Road



Dublin City Council  
 Journey Time Comparison Report  
 Before: 01/01/2017 - 31/03/2017 After: 01/01/2018 - 22/03/2018 Times: 10:00 - 15:00  
 Stop 1353: Camden Street - Pleasant Street - Stop 1354: Aungier Street - Peter Row



Dublin City Council

Journey Time Comparison Report  
 Before: 01/11/2017 - 23/11/2017 Times: 07:00 - 21:00  
 Stop 323: Ballymun Road - Silloge Golf Club



Dublin City Council

Journey Time Comparison Report  
 Before: 01/02/2017 - 28/02/2017 After: 01/02/2018 - 28/02/2018 Times: 06:00 - 23:00  
 Stop 59: Cabra Road - Annamoe Terrace - Stop 1802: Cabra Road - Carnlough Road



Dublin City Council

Journey Time Comparison Report  
 Before: 09/2018 - 31/03/2018 Times: 06:00 - 23:00  
 Stop 115: Ballymun Road - Albert College Drive



Dublin City Council

Journey Time Comparison Report  
 Before: 30/04/2018 - 06/05/2018 Times: 06:00 - 15:00  
 Stop 184: Botanic Rd - Cliftonville Road

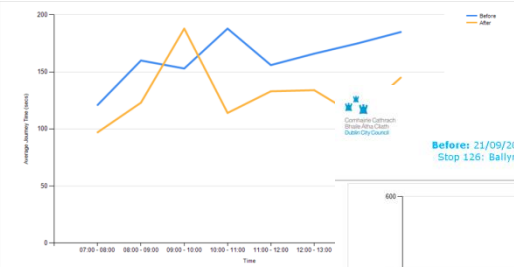


Dublin City Council

Dublin City Council

Journey Time Comparison Report

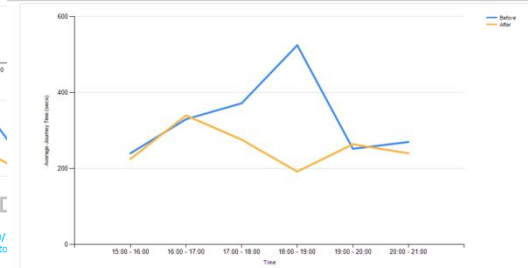
Before: 01/02/2017 - 31/03/2017 After: 01/02/2018 - 21/03/2018 Times: 07:00 - 15:00  
 Stop 819: Blessington Street - Blessington Court - Stop 263: Parnell Square - Garden of Remembrance - Stop 147: Botanic Rd - Islandbridge Gate - Stop 1472: ...



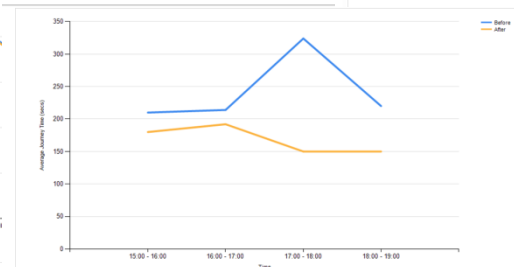
Dublin City Council

Dublin City Council

Journey Time Comparison Report  
 Before: 21/09/2017 - 21/09/2017 After: 12/10/2017 - 12/10/2017 Times: 15:00 - 21:00  
 Stop 126: Ballymun Road - Nursing Home - Stop 923: Ballymun Road - Silloge Golf Club



Before: 12/10/2017 - 13/10/2017 After: 19/10/2017 - 20/10/2017 Times: 07:00 - 21:00  
 Stop 327: Ballymun Road - Silloge Golf Club - Stop ...



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son Report

0:00 - 23:00

arda Station

Time

Before

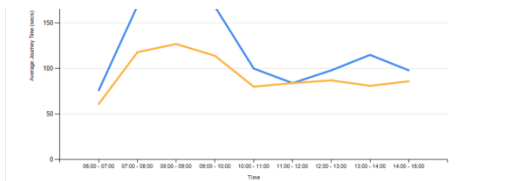
After

Time

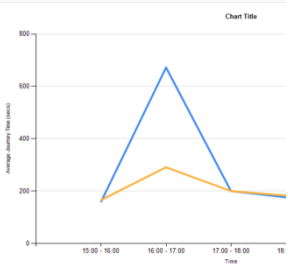
Dublin Cit

Journey Time

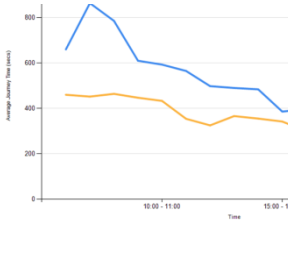
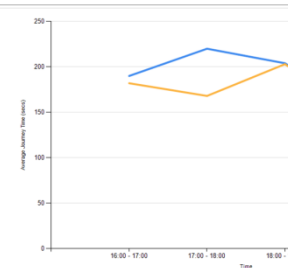
Before: 30/04/2018 - 06/05/2018 Times: 06:00 - 15:00  
 Stop 184: Botanic Rd - Cliftonville Road



Before: 26/09/2017 - 26/09/2017 After: 10/10/2017 - 10/10/2017 Times: 07:00 - 15:00  
 Stop 6182: Ballymun Road - Santry Cross - Stop ...



Before: 01/11/2016 - 13/11/2016 After: 01/12/2016 - 01/12/2016 Times: 07:00 - 21:00  
 Stop 7297: Connolly Hospital - Hospital Car ...



Comhairle Cathrach  
 Bhaile Átha Cliath  
 Dublin City Council

# Summary

## **The Effect of Bus Priority**

- Increased level of service of public transport
- Encourage modal shift from private car
- Environmental sustainability

## **Advantages of centralised bus priority**

- Virtual detectors reduce the need for often expensive on-street measures
- Fast to install
- System can be used to maintain bus priority throughout the whole city
- Interventions can easily be tweaked
- Scheduler means priority can be given at specific times of the day



# ITS Systems – SCATS Infrastructure Support

EU The Directive on security of network and information systems (NIS Directive)

**Ireland** The companies and utilities that have been officially designated as Operators of Essential Services are now subject to a set of security requirements as set out in Regulation 17 of SI No. 360 of 2018.

The DCC SCATS Installation is officially designated under this legislation

The screenshot displays the SCATS Central Manager - CMS interface. The main window shows 'Information about TCS6059 connection' with a diagram of a Client connected to a Remote server via a COM93 [Virtual] port. Below the diagram is a 'Connection summary' section with the following details:

COM port information			
Port name:	COM93	Port type:	Virtual
Port status:	Opened	Current settings:	300-O-8-1
Bytes sent:	80.26 MB	Bytes received:	212.63 MB
Stricted baudrate:	no		
Opened by:	C:\Program Files (x86)\SCATS\Region\SCATS.exe		

Below the connection summary is a 'Network information' section:

Network information			
Protocol:	RAW	Connections established:	1/1
Proxy:	no	Proxy authorization:	no
Use encryption:	no	Use authorization:	no

A table at the bottom of the network information section shows connection statistics:

Remote host	Status	Sent	Received	Active
192.168.230.203:4000	connected	2.16 MB	5.74 MB	12:21:41

The interface also includes a 'Region Connections' table in the background:

Name	Address	Port	Version	Flags
DCITY	151.177.220.201	2001	6.9.2.19	
DCCI	151.177.220.206	2001	6.9.2.19	
IRE	151.177.220.207	2001	6.9.2.19	
IRE2	10.98.10.98	2001	6.9.1.10	
IRE3	151.177.220.208	2001	6.9.2.19	
NCITY	151.177.220.202	2001	6.9.2.19	
SCITY	151.177.220.200	2001	6.9.2.19	
WCITY1	151.177.220.203	2001	6.9.2.19	



Thank You

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