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

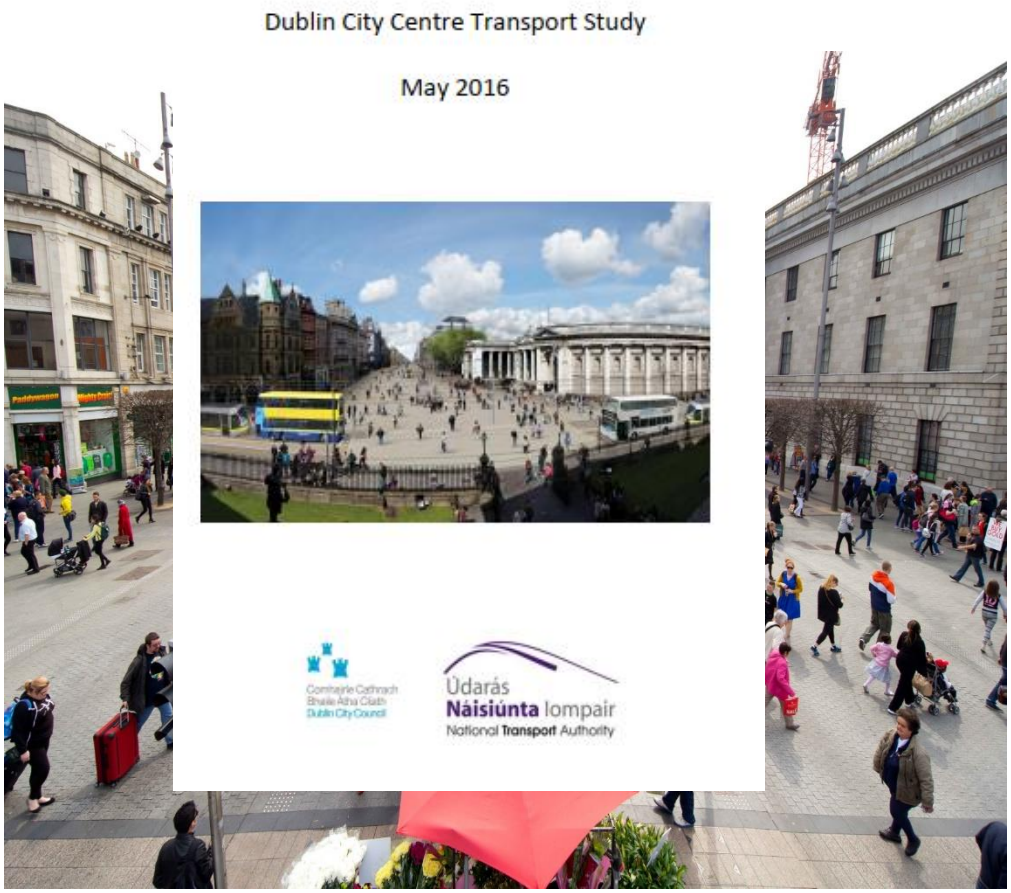
- Historic City Core
- Greater Dublin Area > 1.6 m
- Irelands Biggest Port 2km from Centre
- Public Transport = 53% mode share Car = 26 %
- Strict Car parking policy in City Centre
- **Policy decision in 1994 to not allow increase in private cars entering City Centre --- Final DTI report.**
  - Prioritise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

Regional transport strategy to 2035

Dublin City Council

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council

TRAFFIC DEPARTMENT



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

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Dublin City Council

Transport Infrastructure Ireland

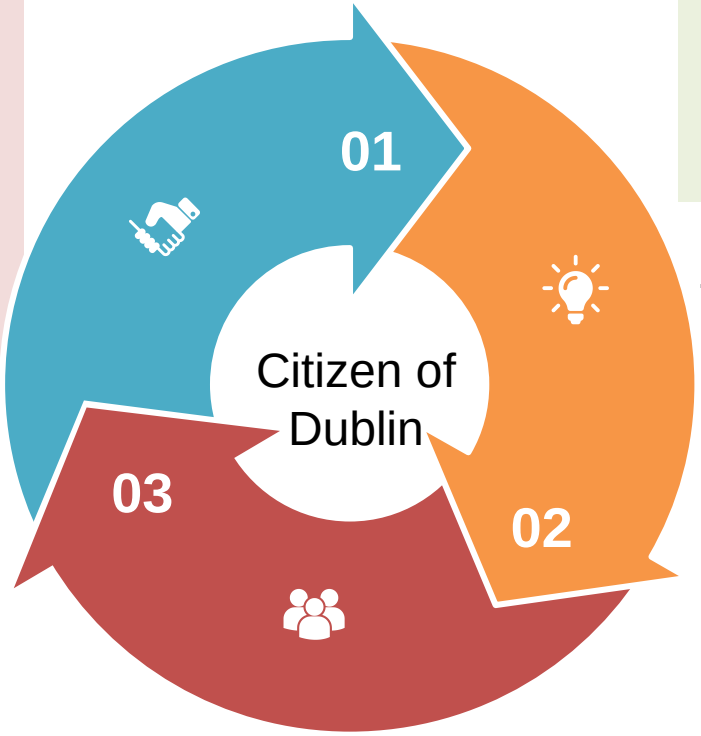
Builder and operator of Light Rail

Motorway network

Designer of new Metro

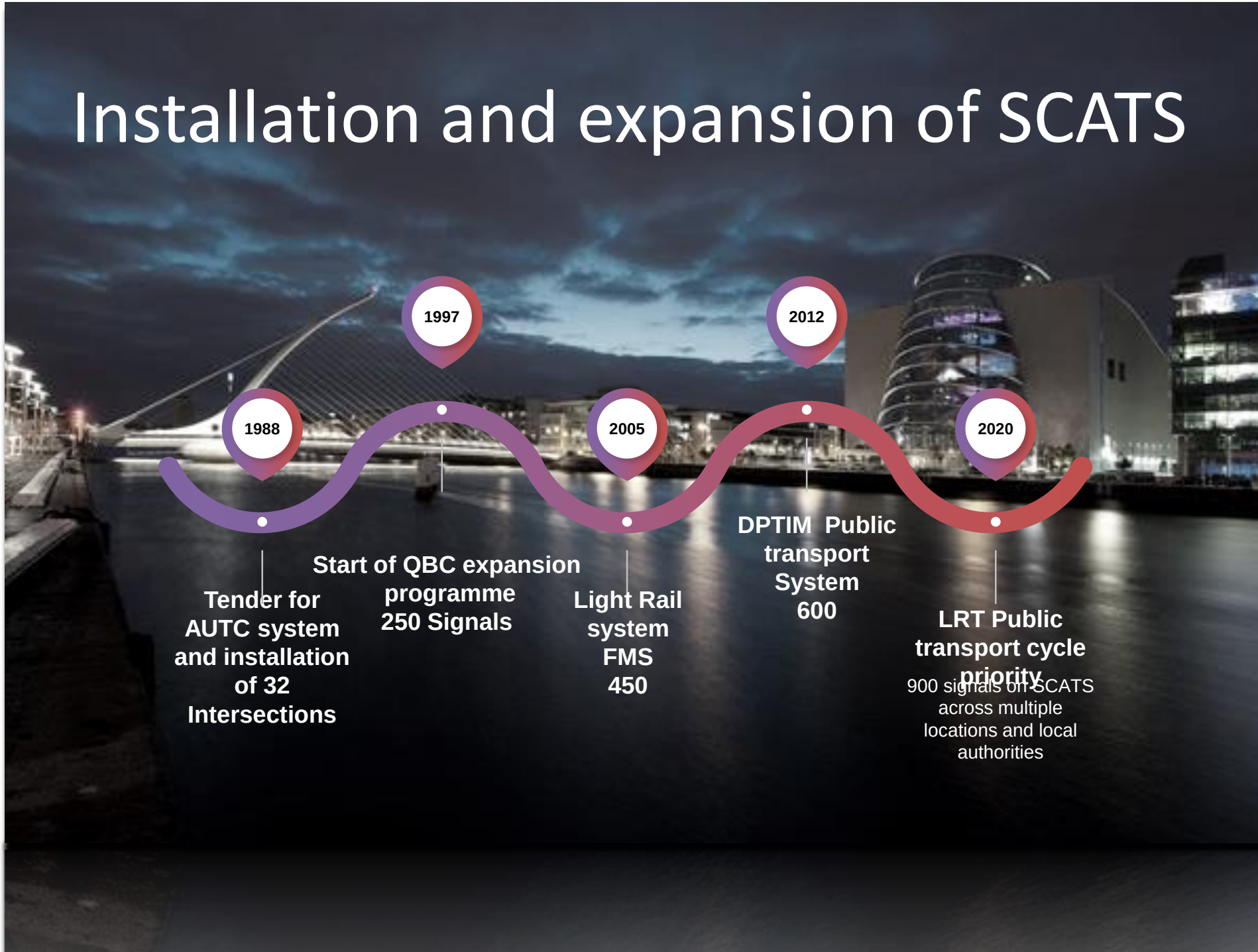
Government Body

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

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Dublin City Council

Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council

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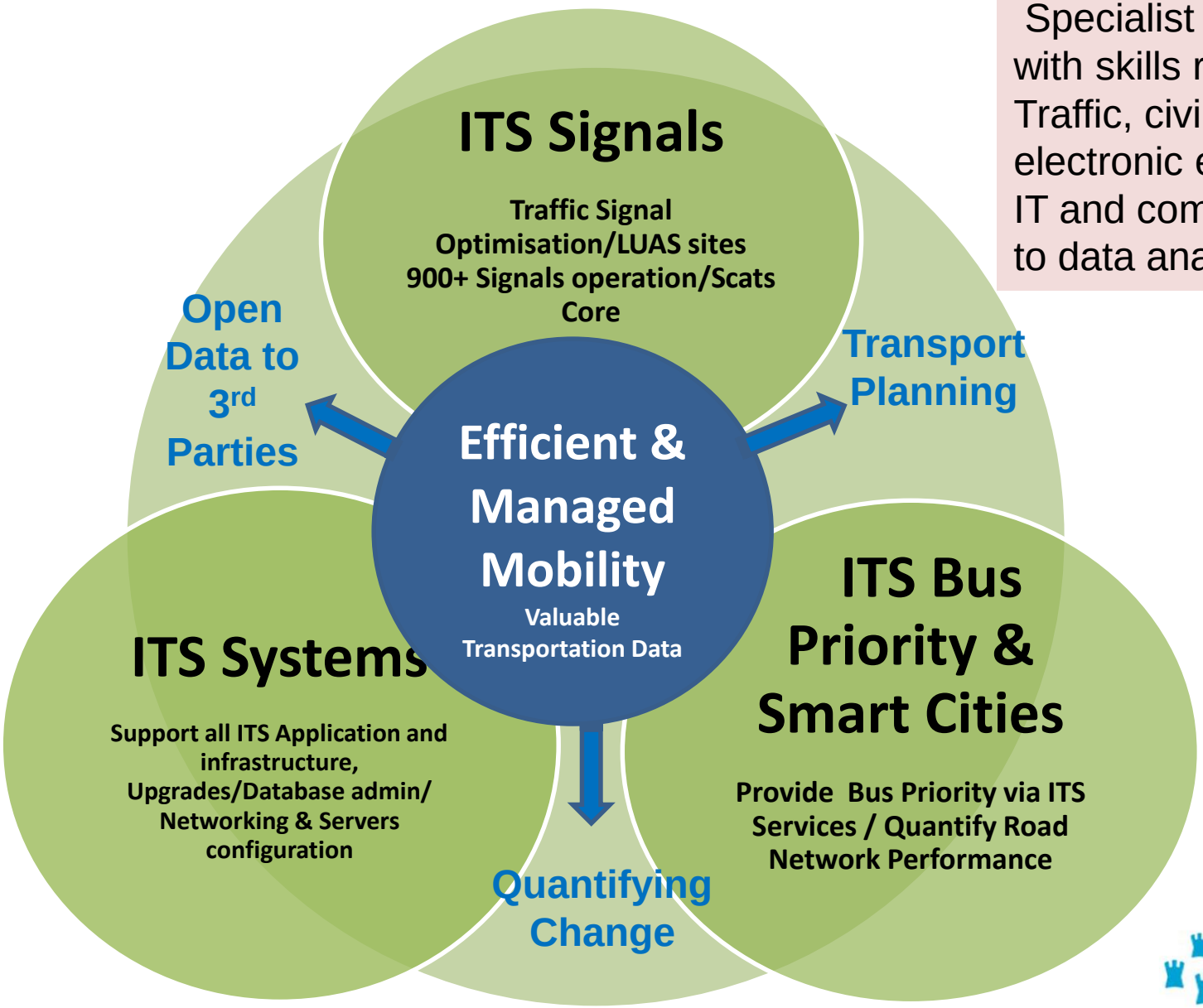
Dublin City Council

Intelligent Transportation Systems

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



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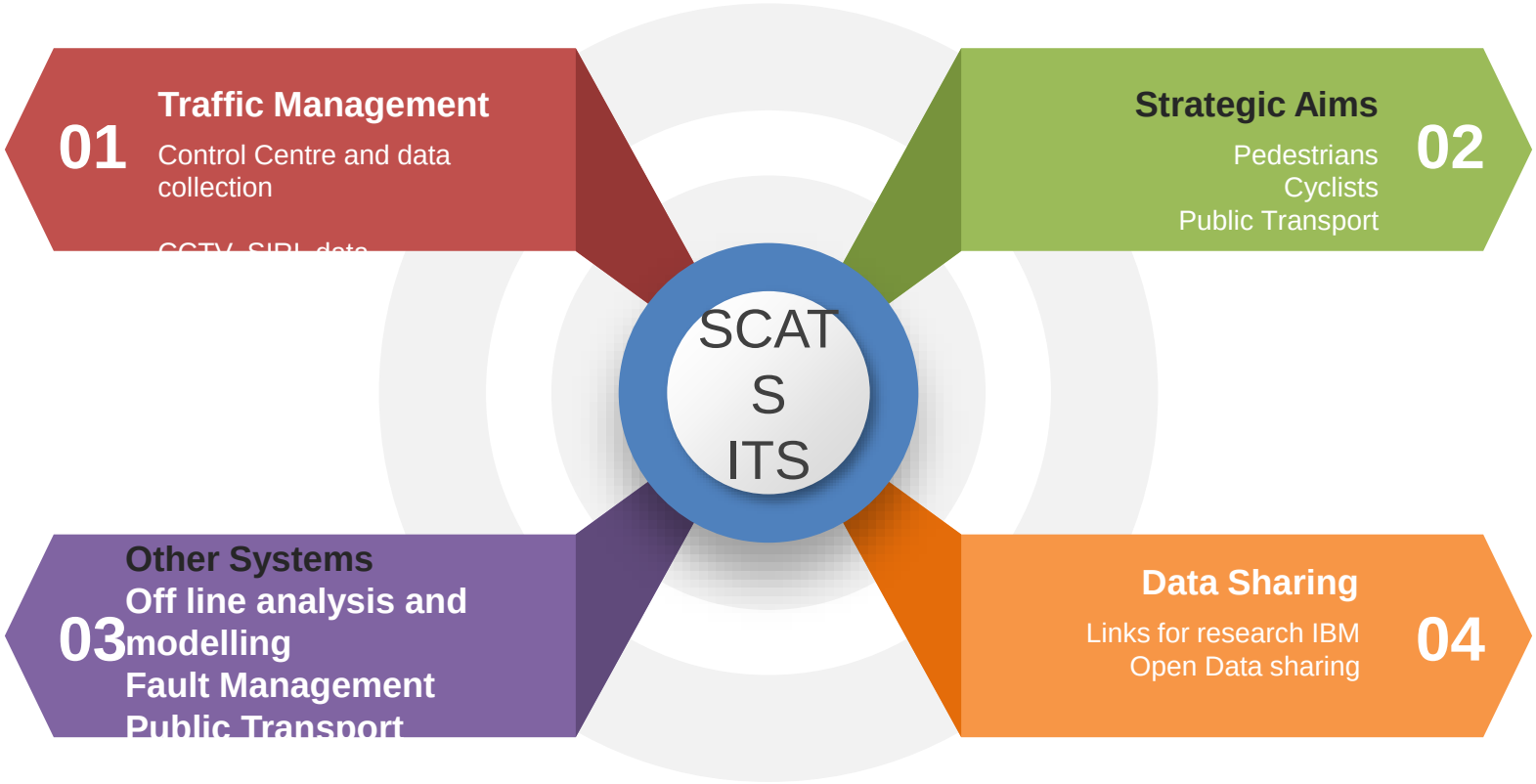
Dublin City Council

SCATS as the core of our ITS systems and Strategy



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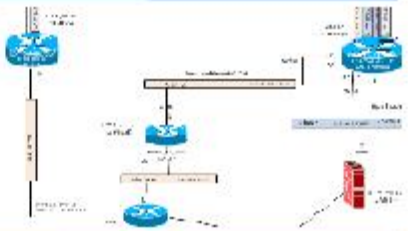
Dublin City Council

4th

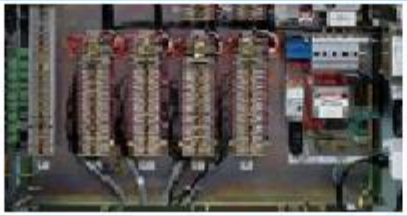


Network

3rd

Operations

2nd



Electrical

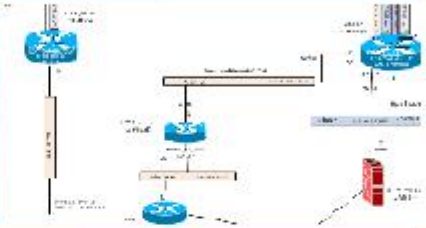
1st

Civils

SCATS

Coordination & Adaptation

4th



Network

3rd

Operations

2nd

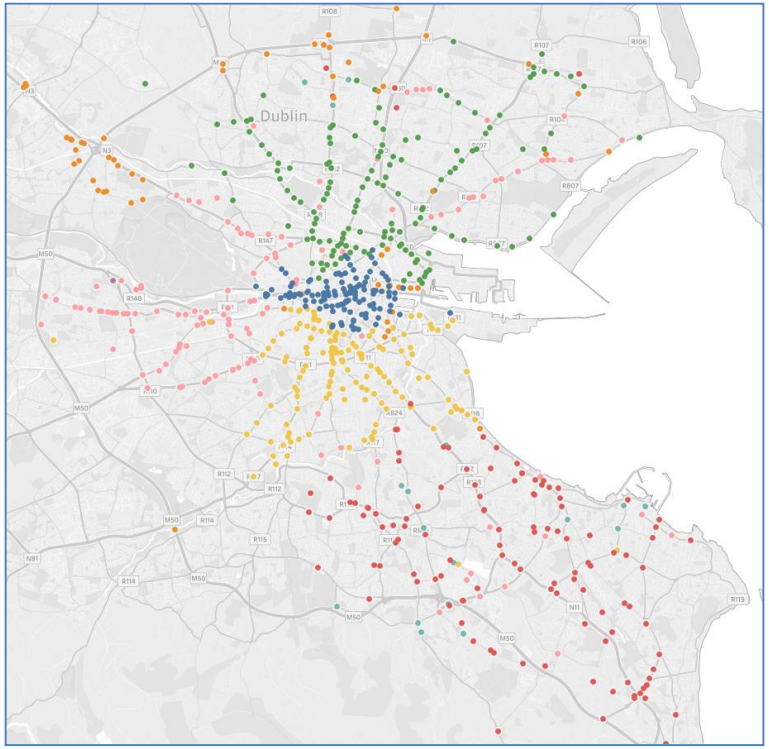
Electrical

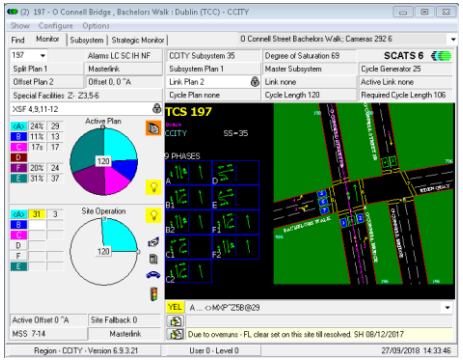
1st

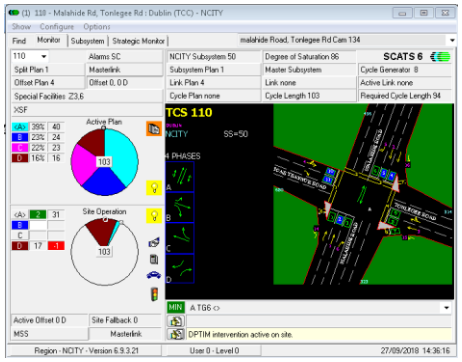
Civils

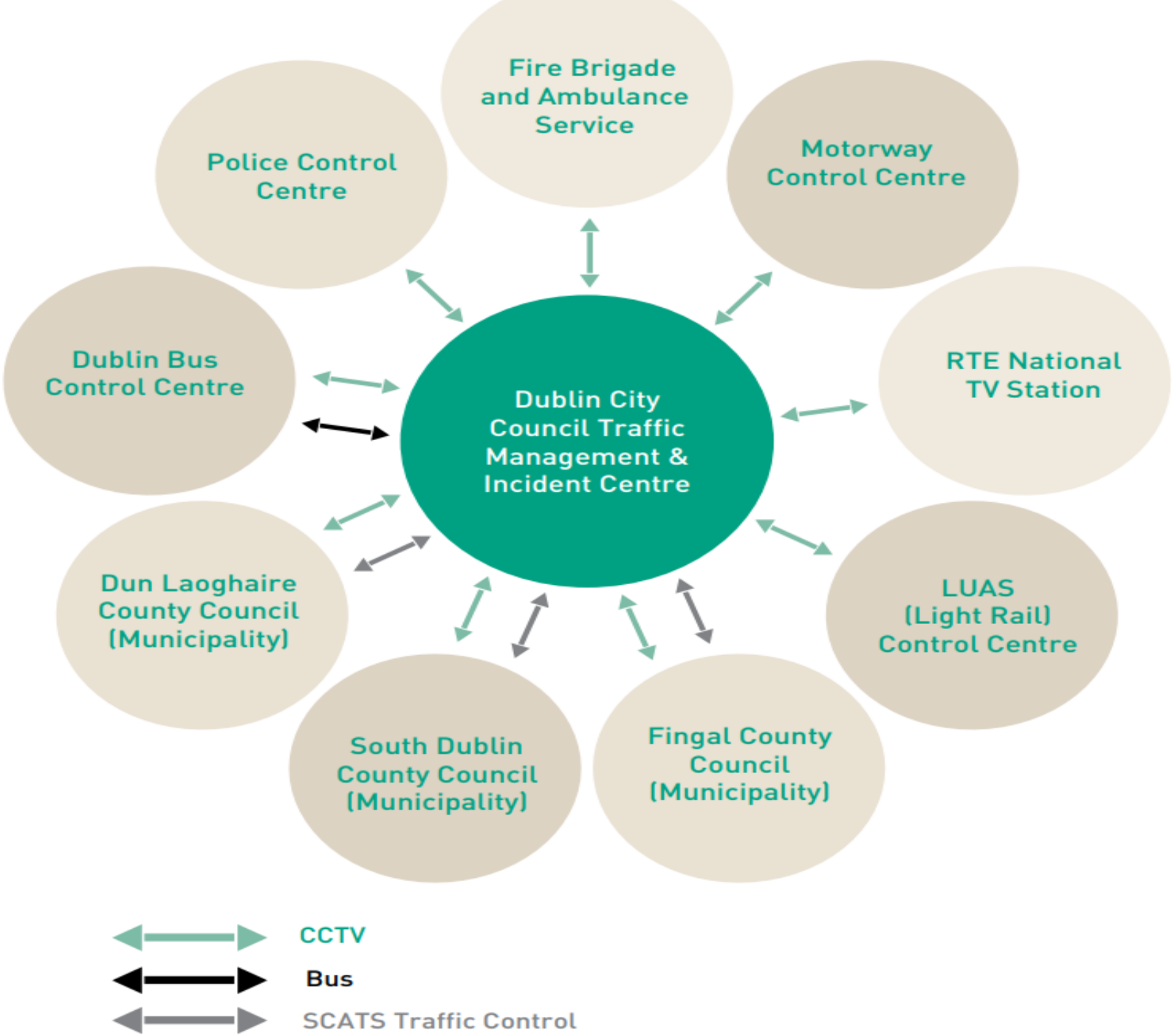
Traffic Signal Management in Dublin City

- 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








Fire Brigade and Ambulance Service
Police Control Centre
Motorway Control Centre
Dublin Bus Control Centre
Dublin City Council Traffic Management & Incident Centre
RTE National TV Station
Dun Laoghaire County Council (Municipality)
LUAS (Light Rail) Control Centre
South Dublin County Council (Municipality)
Fingal County Council (Municipality)
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

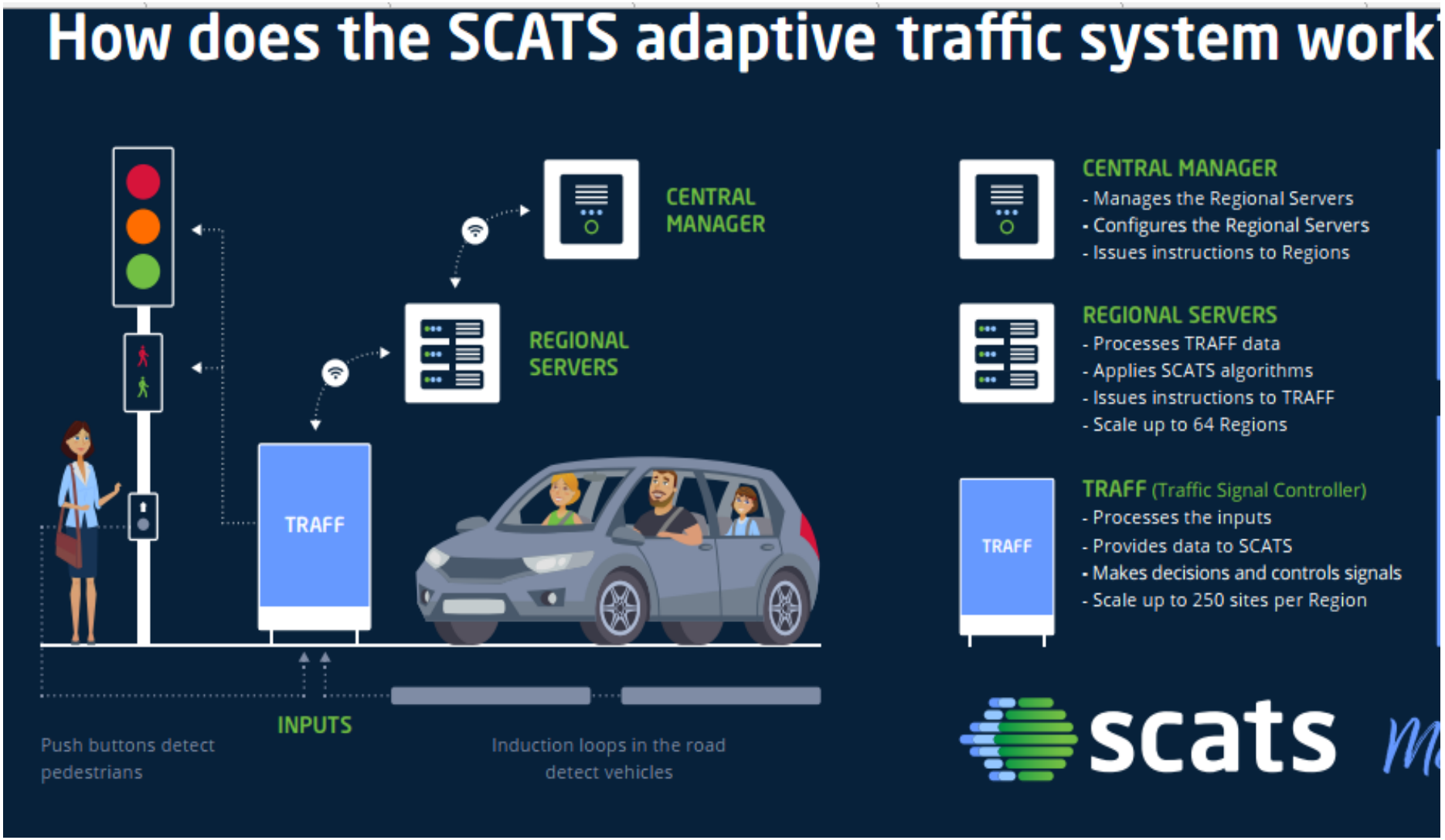
Communications by

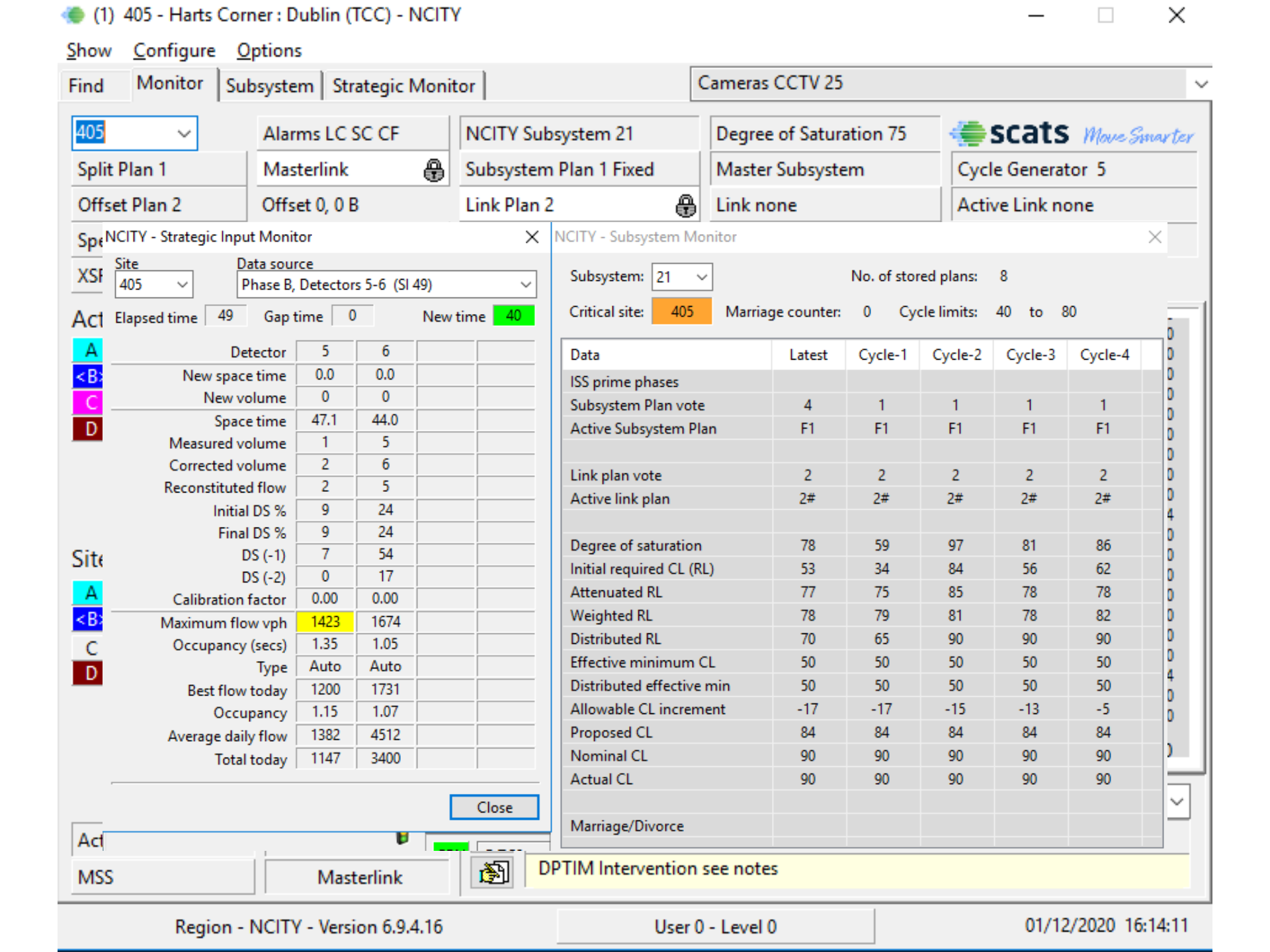
Fibre, cable, fixed and Mobile comms
Allows complete control on all aspects of operation
All data and faults are instantly returned to SCATS for distribution

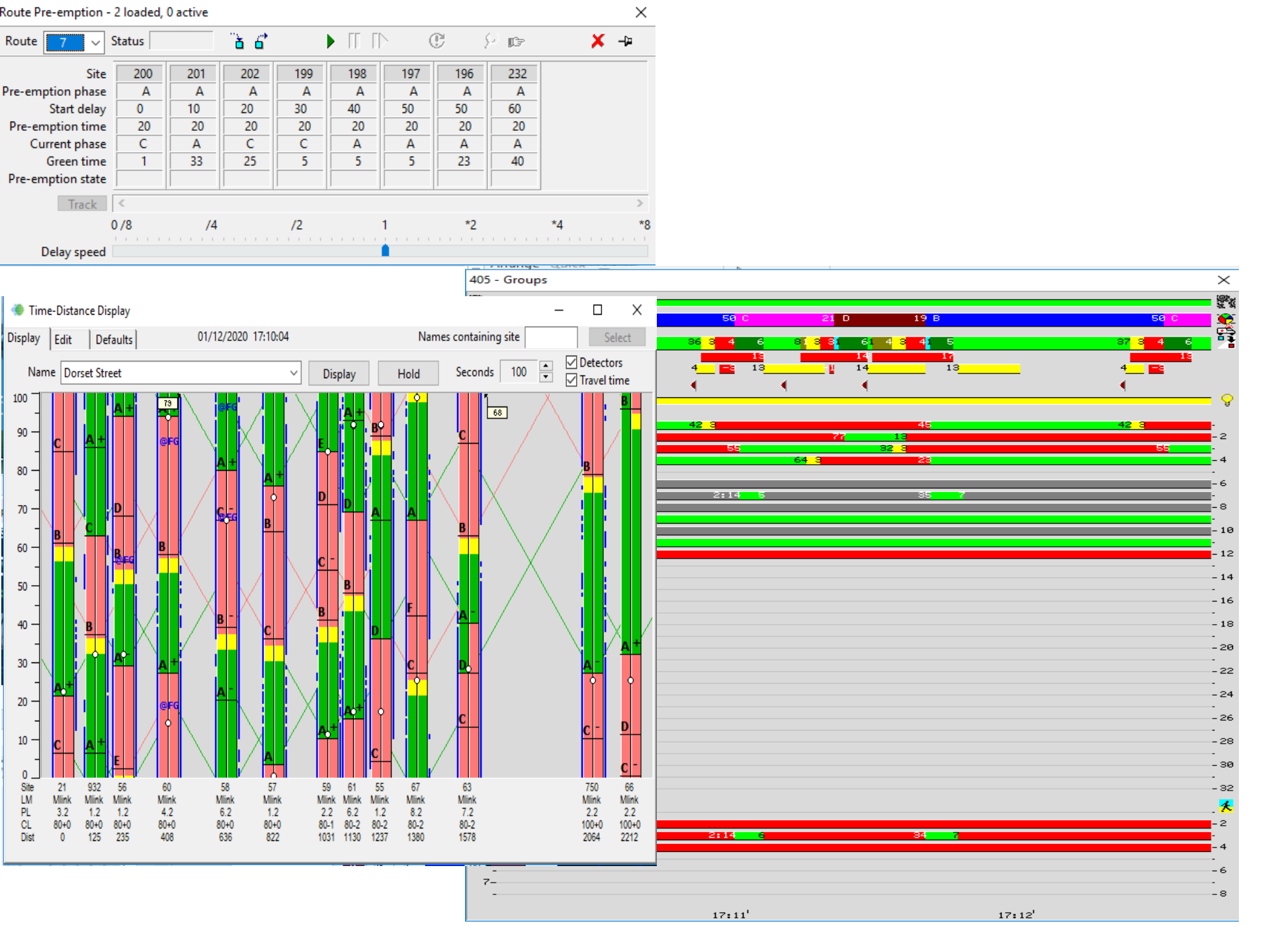
SCATS strategic layer

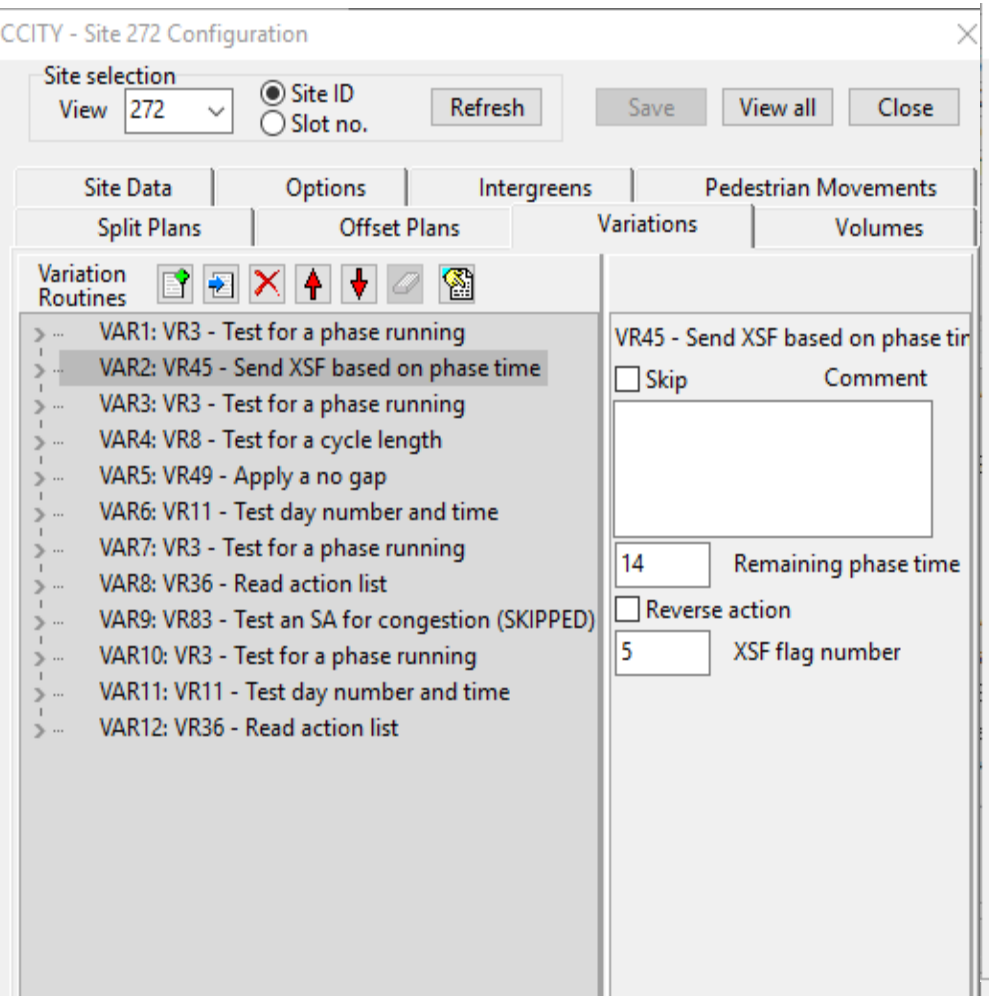
All junctions feed data into this layer
All data is available to any other junction
Each area can have different strategies
Areas can run independently
Access to different sets of signals can be controlled
ITS API ITSLINK

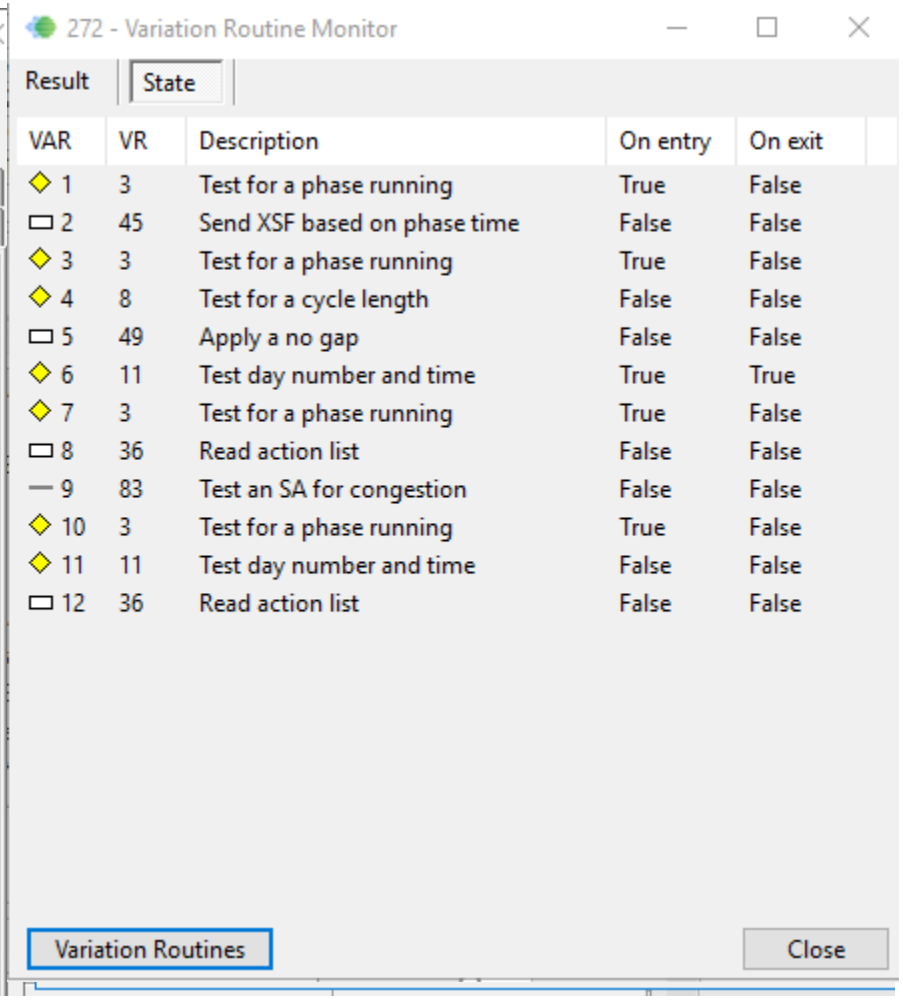
SCATS provides junction optimisation and network linking



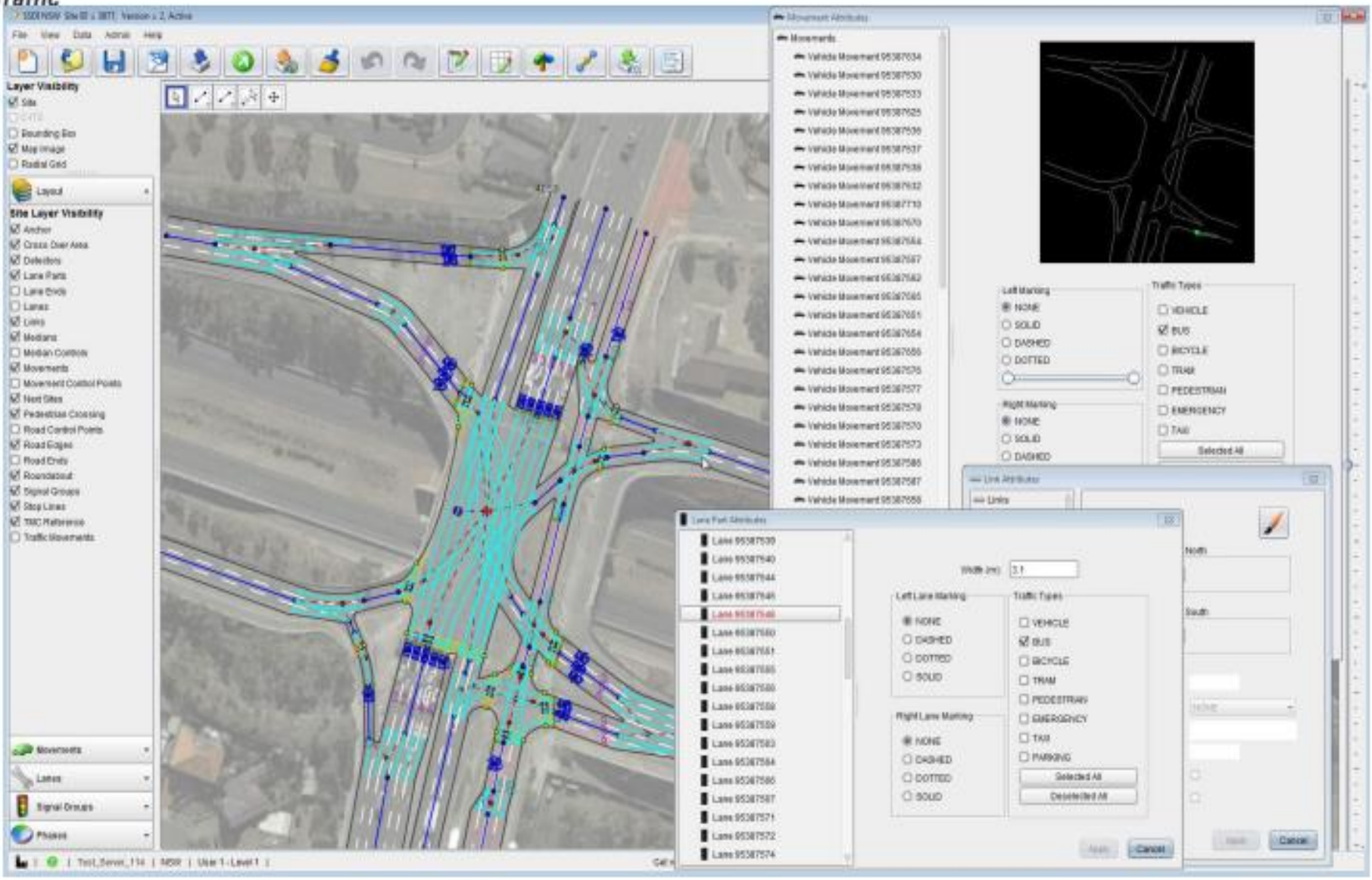

(1) 405 - Harts Corner : Dublin (TCC) - NCITY
Show Configure Options
Find Monitor Subsystem Strategic Monitor
Cameras CCTV 25
405
Alarms LC SC CF
NCITY Subsystem 21
Degree of Saturation 75
scats Move Smarter
Split Plan 1
Masterlink
Subsystem Plan 1 Fixed
Master Subsystem
Cycle Generator 5
Offset Plan 2
Offset 0, 0 B
Link Plan 2
Link none
Active Link none
NCITY - Strategic Input Monitor
Site
405
Data source
Phase B, Detectors 5-6 (SI 49)
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
MSS
Masterlink
DPTIM Intervention see notes
Region - NCITY - Version 6.9.4.16
User 0 - Level 0
01/12/2020 16:14:11

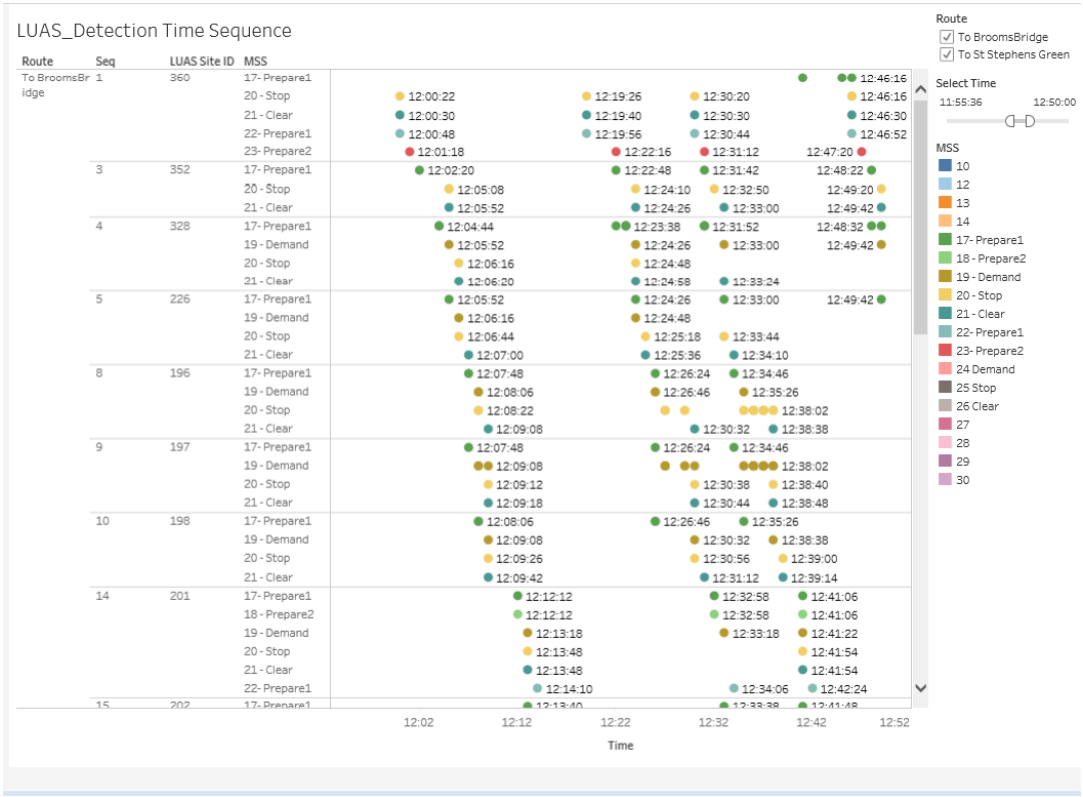

Route Pre-emption - 2 loaded, 0 active
Route 7
Status
Site 200 201 202 199 198 197 196 232
Pre-emption phase A A A A A A A A
Start delay 0 10 20 30 40 50 50 60
Pre-emption time 20 20 20 20 20 20 20 20
Current phase C A C C A A A A
Green time 1 33 25 5 5 5 23 40
Pre-emption state
Track
0/8 /4 /2 1 *2 *4 *8
Delay speed
405 - Groups
Time-Distance Display
Display Edit Defaults
01/12/2020 17:10:04
Names containing site
Select
Name Dorset Street
Display
Hold
Seconds 100
Detectors
Travel time
Site 21 932 56 60 58 57 59 61 55 67 63 750 66
LM Mlink Mlink Mlink Mlink Mlink Mlink Mlink Mlink Mlink Mlink Mlink Mlink Mlink
PL 3.2 1.2 1.2 4.2 6.2 1.2 2.2 6.2 1.2 8.2 7.2 2.2 2.2
CL 80+0 80+0 80+0 80+0 80+0 80+0 80-1 80-2 80-2 80-2 80-2 100+0 100+0
Dist 0 125 235 408 636 822 1031 1130 1237 1380 1578 2064 2212
17:11'
17:12'


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 tir
Skip
Comment
14
Remaining phase time
Reverse action
5
XSF flag number

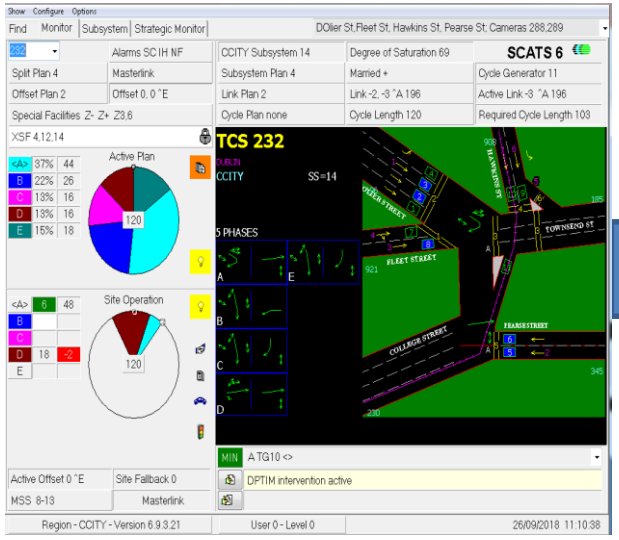

272 - Variation Routine Monitor
Result
State
VAR VR Description On entry On exit
1 3 Test for a phase running True False
2 45 Send XSF based on phase time False False
3 3 Test for a phase running True False
4 8 Test for a cycle length False False
5 49 Apply a no gap False False
6 11 Test day number and 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

SCATS Cornerstone



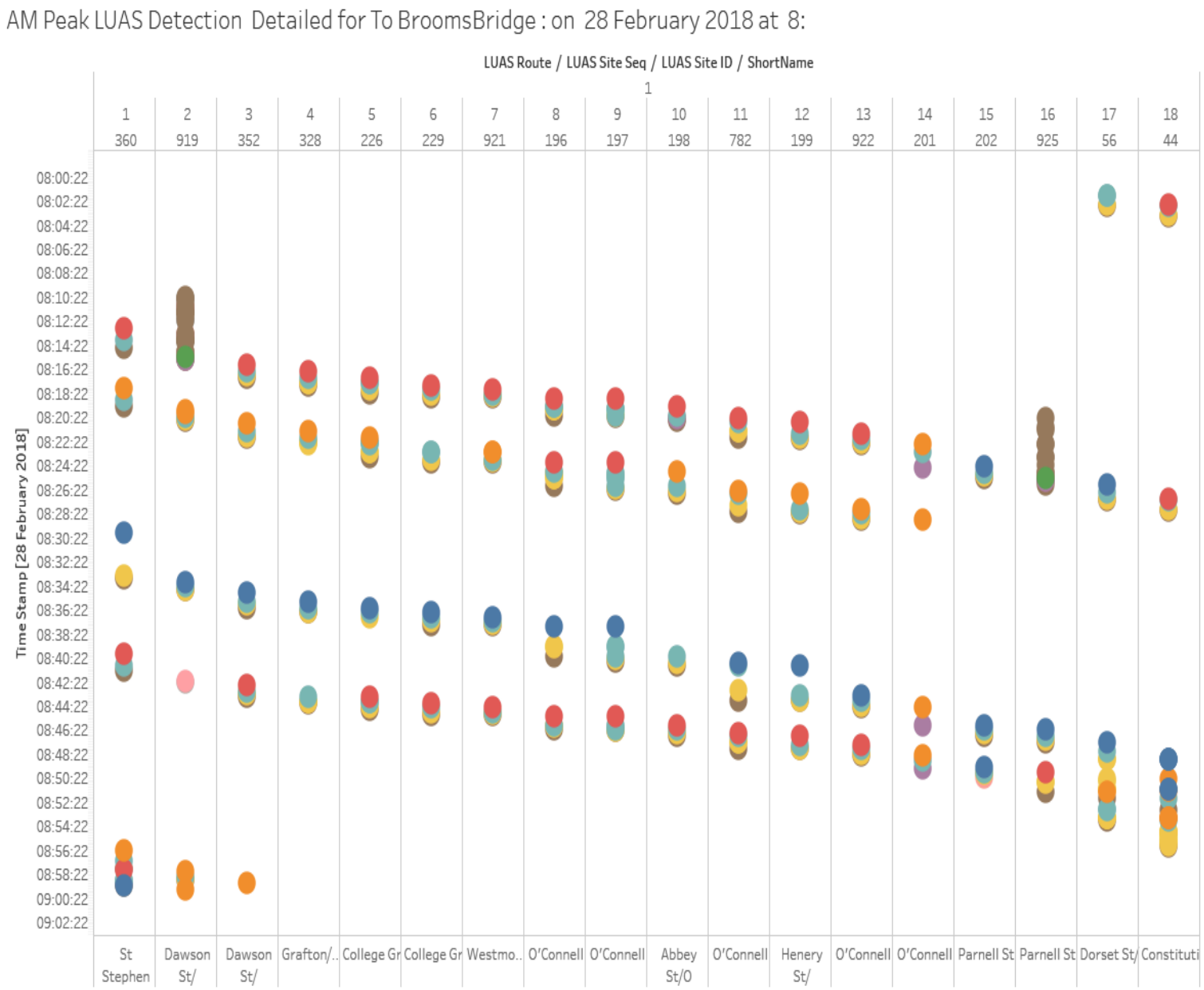

LUAS_Detection Time Sequence
Route
Seq
LUAS Site ID
MSS
To BroomsBridge
To St Stephens Green
Select Time
11:55:36
12:50:00
MSS
10
12
13
14
17- Prepare1
18 - Prepare2
19 - Demand
20 - Stop
21 - Clear
22- Prepare1
23- Prepare2
24 Demand
25 Stop
26 Clear
27
28
29
30
12:02
12:12
12:22
12:32
12:42
12:52
Time

tableau


SCATS 6
TCS 232
CCITY
5 PHASES
Active Plan
Site Operation
FLEET STREET
COLLEGE STREET
TOWNSEND ST
PEARSE STREET

DATABASE

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



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

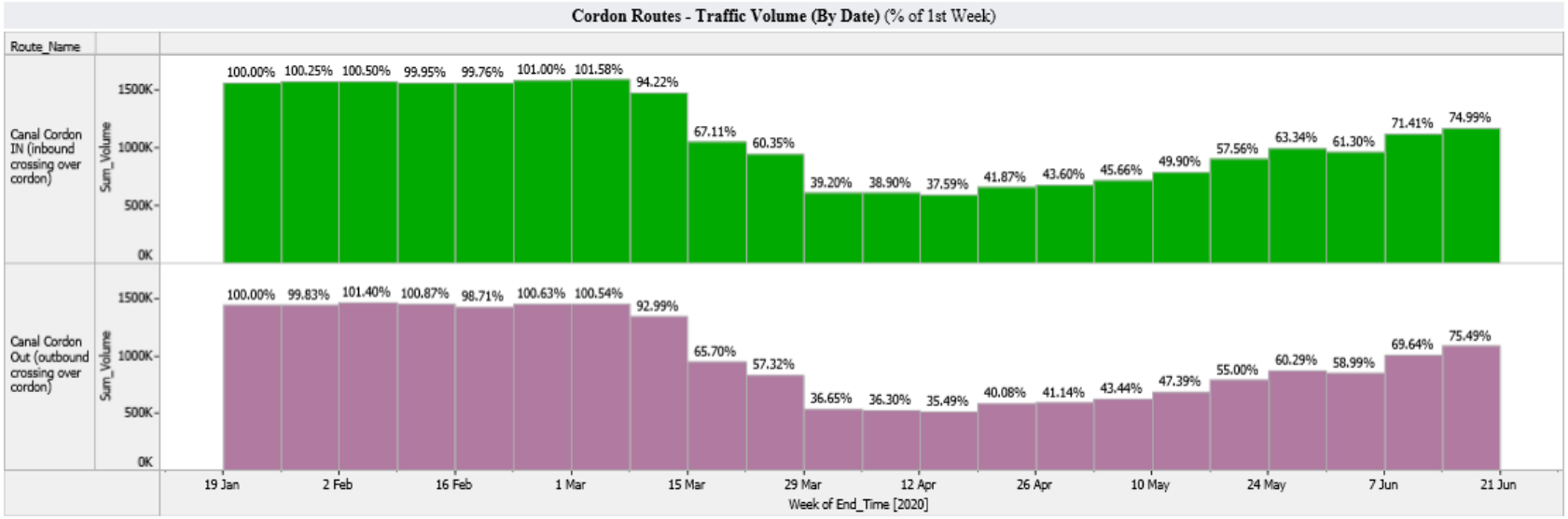
Rsf Bits Set

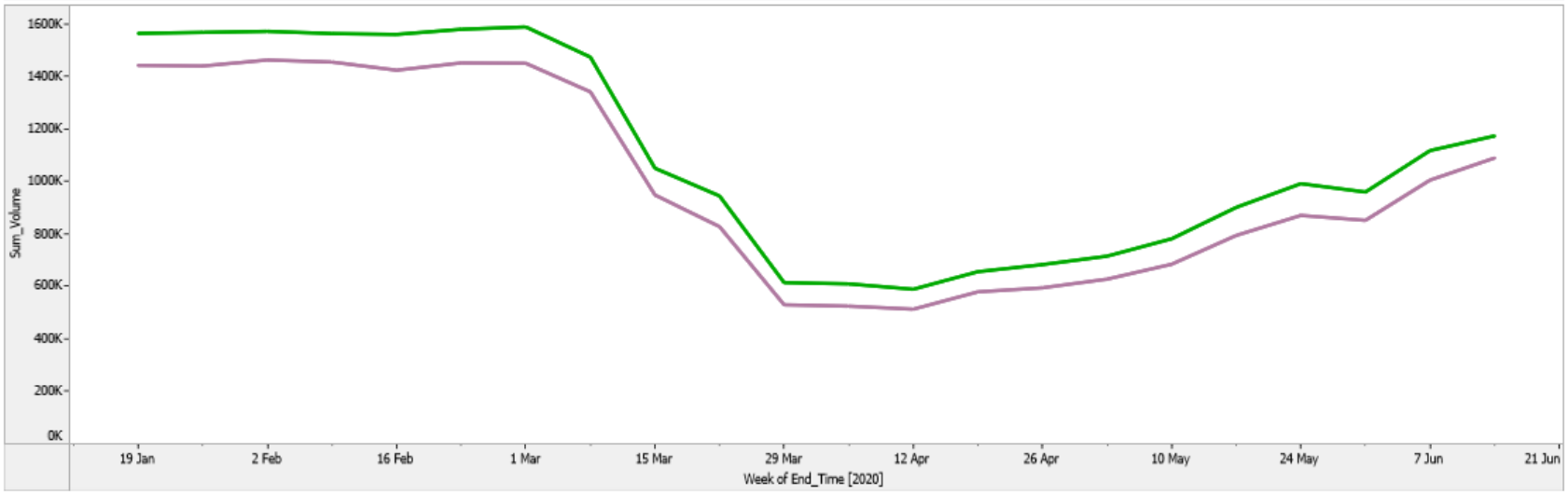
- RSF-1
- RSF-1 & RSF-2
- RSF-2
- RSF-3
- RSF-3 & RSF-5
- RSF-4
- RSF-4 & RSF-5

LUAS Site ID

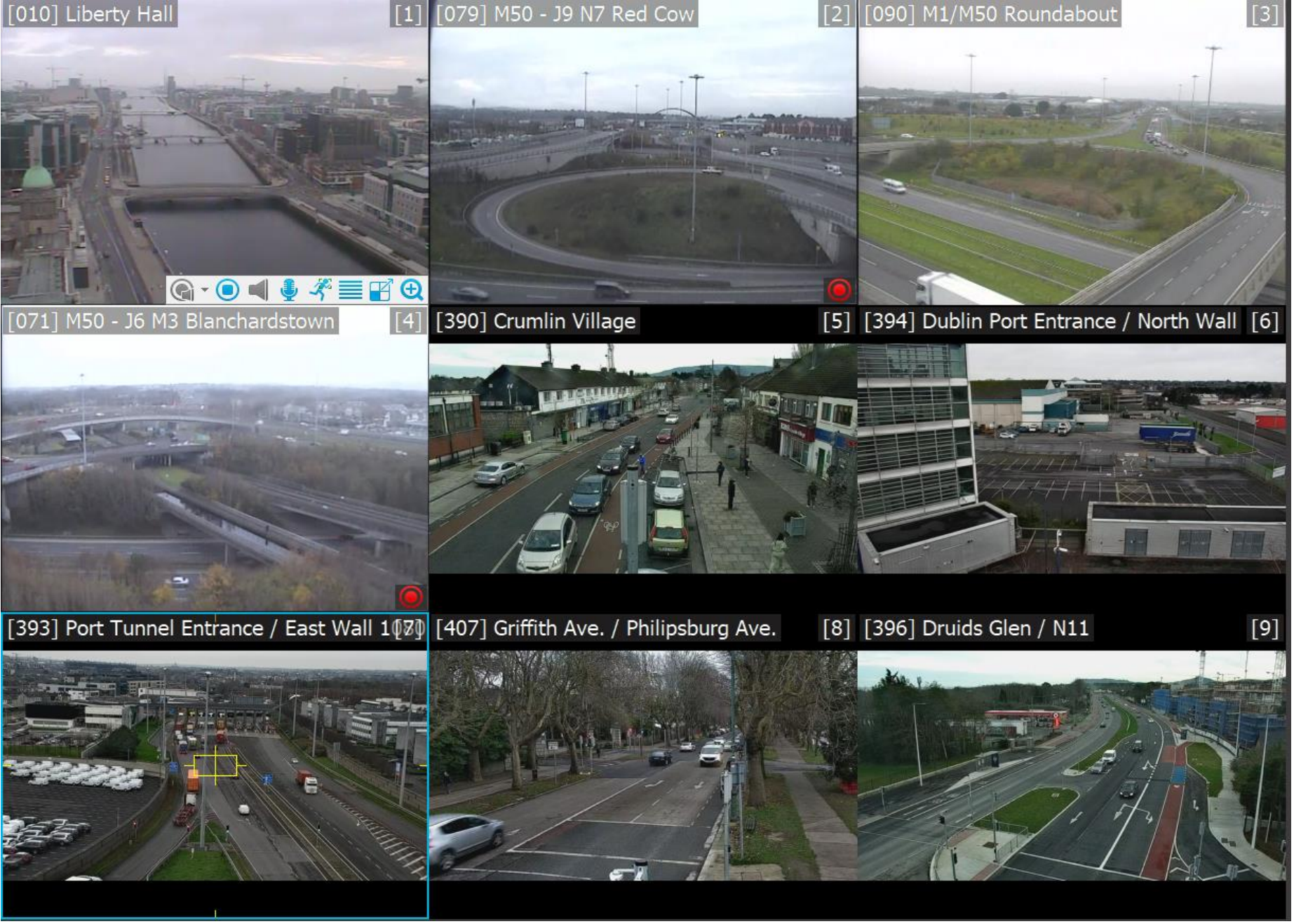
- (All)
- 44
- 56
- 196
- 197
- 198

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)
Sum_Volume
1500K
1000K
500K
0K
100.00% 100.25% 100.50% 99.95% 99.76% 101.00% 101.58% 94.22% 67.11% 60.35% 39.20% 38.90% 37.59% 41.87% 43.60% 45.66% 49.90% 57.56% 63.34% 61.30% 71.41% 74.99%
100.00% 99.83% 101.40% 100.87% 98.71% 100.63% 100.54% 92.99% 65.70% 57.32% 36.65% 36.30% 35.49% 40.08% 41.14% 43.44% 47.39% 55.00% 60.29% 58.99% 69.64% 75.49%
19 Jan 2 Feb 16 Feb 1 Mar 15 Mar 29 Mar 12 Apr 26 Apr 10 May 24 May 7 Jun 21 Jun
Week of End_Time [2020]


Cordon Routes - Traffic Volume (By Date)
Sum_Volume
1600K
1400K
1200K
1000K
800K
600K
400K
200K
0K
19 Jan 2 Feb 16 Feb 1 Mar 15 Mar 29 Mar 12 Apr 26 Apr 10 May 24 May 7 Jun 21 Jun
Week of End_Time [2020]

Route_Name
Canal Cordon IN (inboun...
Canal Cordon Out (outbo...
Week of End_Time
(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



350 cameras for Traffic management and incident management

ITS Systems – FMS Asset Management

Asset & Fault Management System

Asset No. 2200 | Type TSS (DCC - City) | Status Installed | Parent Asset No.

Tracking details

Manufacturer: Atc
Model: TC424-90
Serial No.: atc-1509-3637
External Ref.:
Condition: <Blank>

Asset Location details

Location ID: Signals_196
GIS N: 53.3468673 E: -6.2607669
Location: O'Connell Bridge @ Aston Quay
Road:
Direction:

Custom Fields

Name	Value
Alu Poles (2m)	0
Alu Poles (4m)	0
Alu Poles (7m)	1
Alu Poles (HA)	0
Alustar (Pedest...	15
Alustar (Traffic)	17
AT PBU	
Audio	
Bi Pin	0
Comms Details	IP 10.40.37.90

Remove

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

Asset Lifetime dates

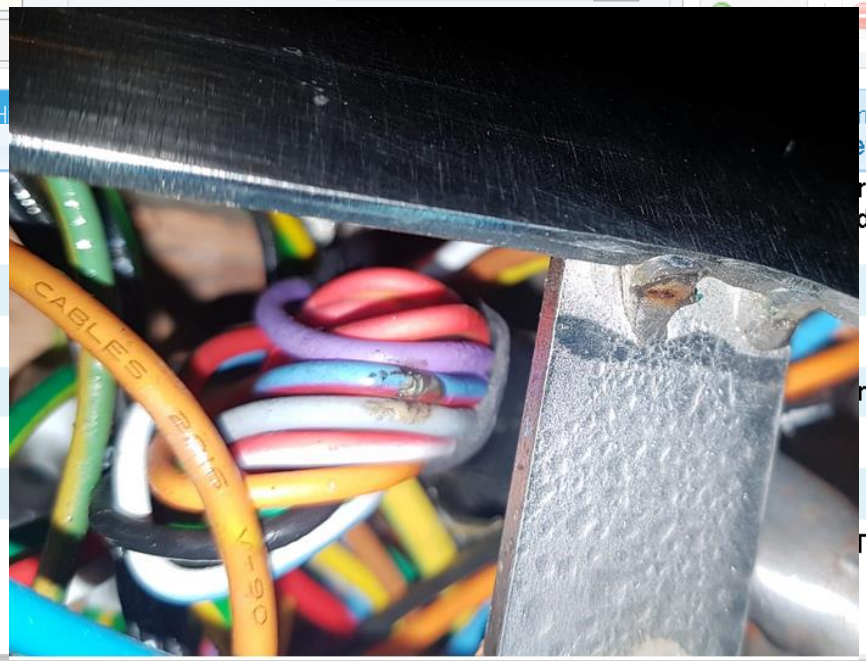
Installation date:
Manufactured date:
Commission date:
Warranty expiry date:
Last inspection date: 27/10/2017
Disposal date:

Asset Cost

Purchase: 0 €
Warranty: 0 €
Installation: 0 €
Installation Contract:

Description | Child Assets | Work H... | ...nents | Audit Trail

Date v	Entered By	...etails
31/7/2018, 00:48:56	System	...rival the lights were out due to a tripped rcd. I ...d core arcing off the pole. I remade off the 20
31/7/2018, 00:47:54	System	
30/7/2018, 23:58:58	System	
30/7/2018, 23:58:06	System	...ntly onsite
30/7/2018, 23:22:36	james.reilly	
30/7/2018, 23:13:51	System	
30/7/2018, 23:11:05	System	...TS region, Classification: Pending



ITS Systems – Application Support FMS

Coordination & Adaptation

4th

Network

3rd

Operations

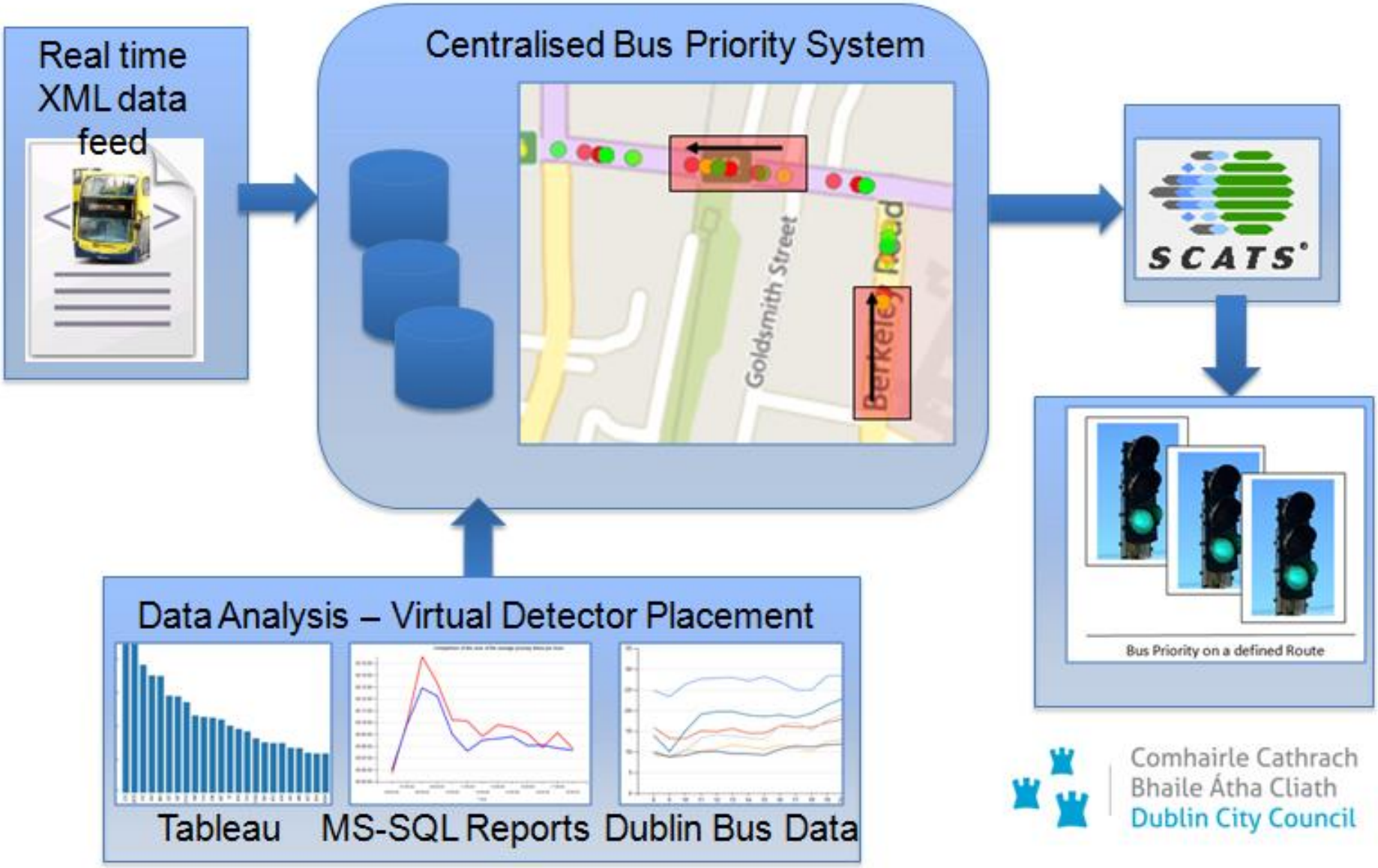
2nd

Electrical

1st

Civils

Centralised bus Priority – How does it work.



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Dublin City Council

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

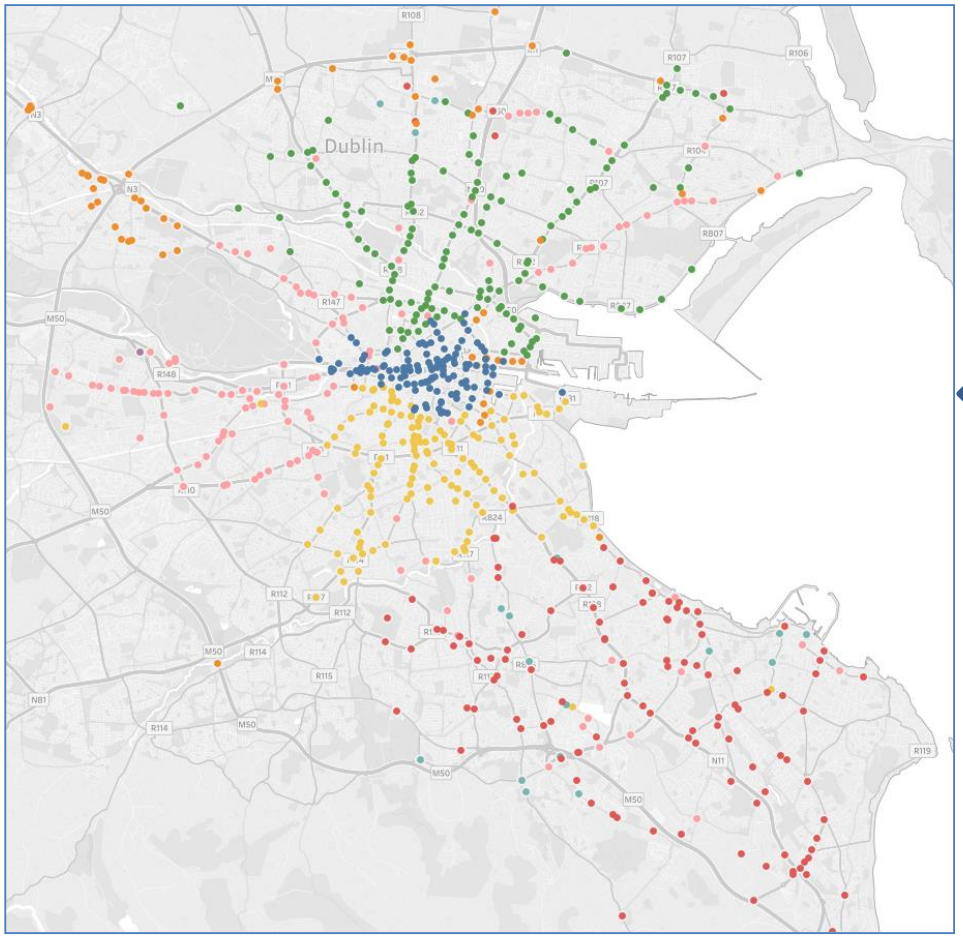
Data fusion

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

SCATS

Centralised Bus Priority

NICANDER
INTELLIGENT SOLUTIONS

Dashboards

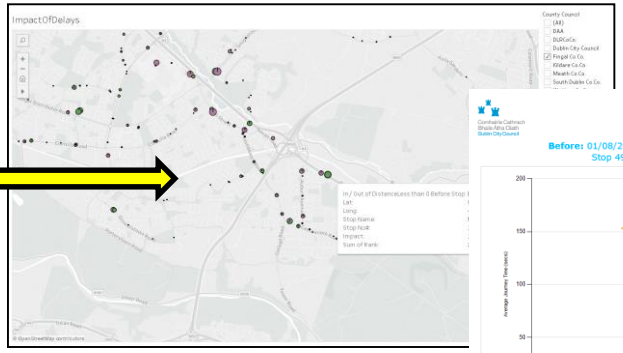
- Can be used to display many different datasets…
  - ➢ Congestion and stoppages
  - ➢ Stop-to-stop journey time
  - ➢ Bus stop impact score
  - ➢ Stop/trip percentage
- Very useful for visually presenting data
- Useful for comparison analysis
  - ➢ **Before/after bus priority measure were introduced**
  - ➢ **Different times of day**

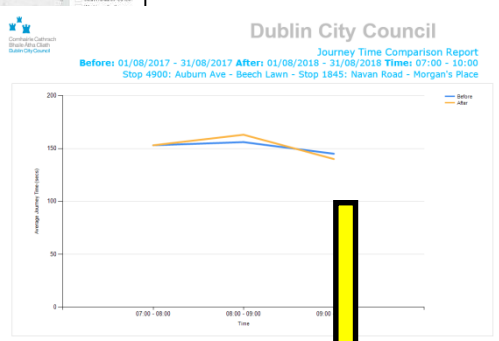
Informed decision making

Reports

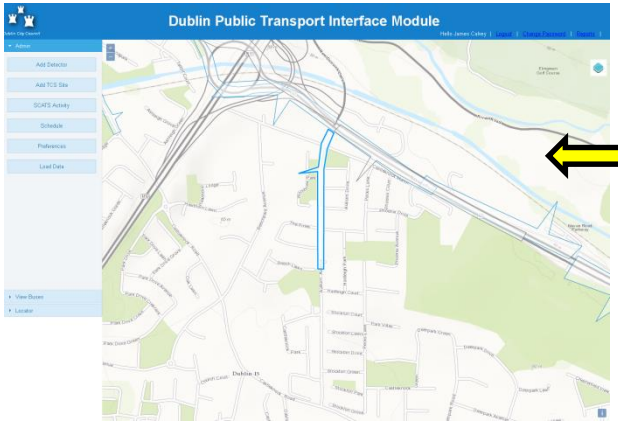
County Council	Month	Timeband	Rank	Stop Name	Stop No.	Stops	Trips	Percentage	Average S	Average D	Impact
Fingal Co.Co.	May'18	07:00-10:00	1	Swords Road Radisson Hotel (-)	3885	693	654	106	46	-395	31738
Fingal Co.Co.	May'18	07:00-10:00	2	Snugborough Road Garnish Square (+)	2338	204	713	29	122	238	24953
Fingal Co.Co.	May'18	07:00-10:00	3	Blanchardstown Ramor Park (+)	1814	233	415	56	94	269	21976
Fingal Co.Co.	May'18	07:00-10:00	4	Charlestown Rd Charlestown S.C. (+)	7132	355	708	50	61	85	21790
Fingal Co.Co.	May'18	07:00-10:00	5	Snugborough Road Waterville Row (-)	1816	169	672	25	123	-362	20784
Fingal Co.Co.	May'18	07:00-10:00	6	Dublin Rd Swords N1 Business Pk (+)	3675	251	517	49	71	119	17835
Fingal Co.Co.	May'18	07:00-10:00	7	Main Street Swords Fingal County Council (-)	3689	317	769	41	55	-73	17422
Fingal Co.Co.	May'18	07:00-10:00	8	Navan Road Morgan's Place (-)	1845	368	1368	27	44	-490	16214
Fingal Co.Co.	May'18	07:00-10:00	9	St. Margaret's Road Charlestown Centre (-)	6348	260	577	45	61	-100	15947
Fingal Co.Co.	May'18	07:00-10:00	10	Warrenstown Warrenstown Way (-)	4994	182	314	58	87	-293	15853
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	14202
Fingal Co.Co.	May'18	07:00-10:00	14	Huntstown Way Ashfield Park (+)	1866	252	794	32	56	65	14073
Fingal Co.Co.	May'18	07:00-10:00	15	Shelerin Road Ongar Road (-)	1898	200	694	29	70	-114	13932
Fingal Co.Co.	May'18	07:00-10:00	16	Swords Road Turnapin Lane (+)	1636	265	967	27	52	48	13679
Fingal Co.Co.	May'18	07:00-10:00	17	Harristown Bus Garage (+)	324	216	751	29	57	722	12270
Fingal Co.Co.	May'18	07:00-10:00	18	Blanchardstown Blanchardstown Town Centre (	4747	220	1395	16	55	369	12036
Fingal Co.Co.	May'18	07:00-10:00	19	Ballymun Road Silloge Golf Club (-)	327	212	506	42	56	-527	11819
Fingal Co.Co.	May'18	07:00-10:00	20	Swords Road ALSAA Sports Club (+)	1630	219	744	29	53	290	11584
Fingal Co.Co.	May'18	07:00-10:00	21	Diswellstown Rd Fernleigh Close (+)	4895	129	174	74	84	227	10787
Fingal Co.Co.	May'18	07:00-10:00	22	Navan Road River Road (-)	7389	170	558	30	61	-423	10307
Fingal Co.Co.	May'18	07:00-10:00	23	Shelerin Road Lohunda Road (+)	1899	127	332	38	80	36	10168
Fingal Co.Co.	May'18	07:00-10:00	24	IKEA St. Margaret's Rd (+)	7149	114	592	19	89	100	10116
Fingal Co.Co.	May'18	07:00-10:00	25	Old Navan Rd Castleknock Road (+)	1842	179	365	49	57	179	10115

Analysis

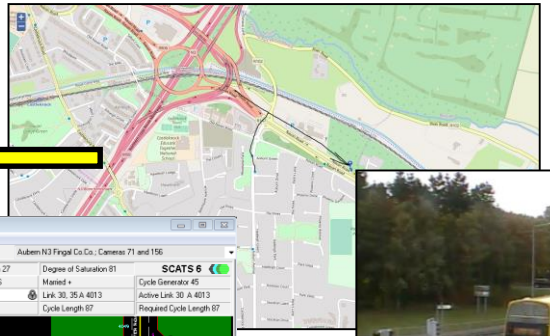


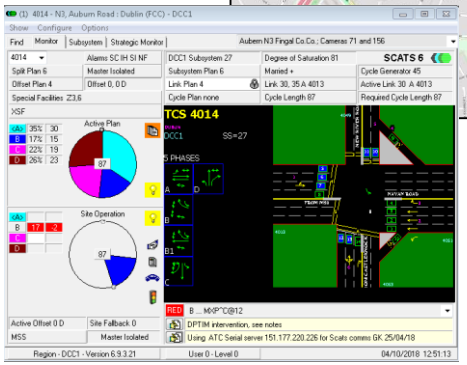


Priority



Review





Result example 1 AM Virtual Detector

- Bus has to makes 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

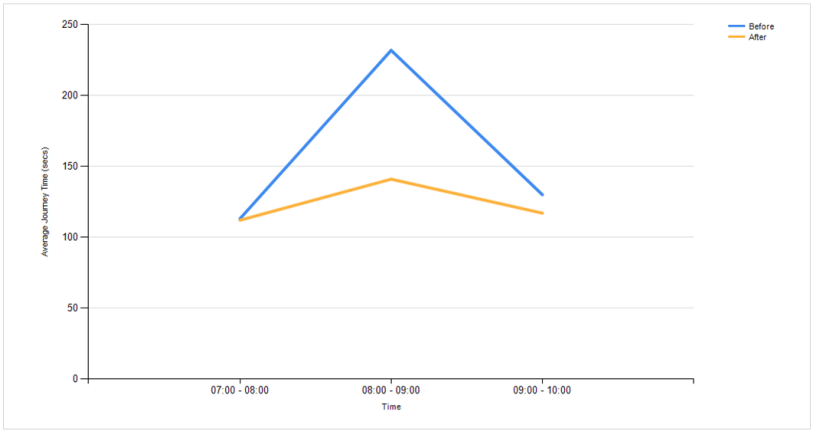
Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council

Dublin City Council

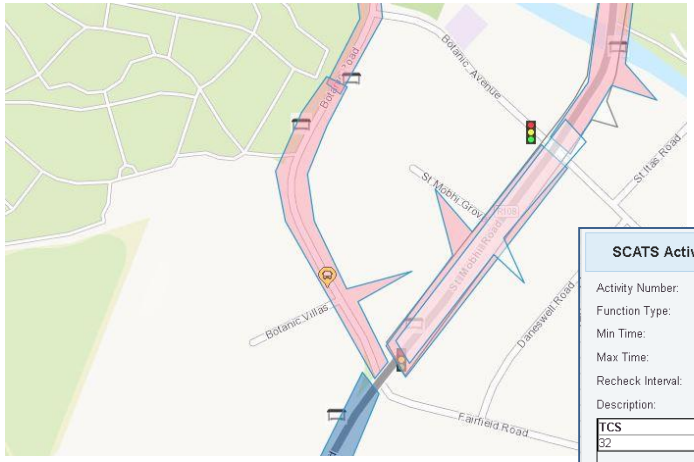
Journey Time Comparison Report

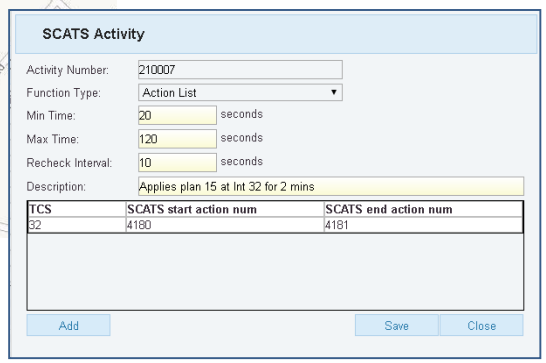
Before: 01/05/2017 - 31/05/2017 **After:** 01/05/2018 - 31/05/2018 **Time:** 07:00 - 10:00

Stop 183: Botanic Rd - Botanic Gardens - Stop 184: Botanic Rd - Cliftonville Road

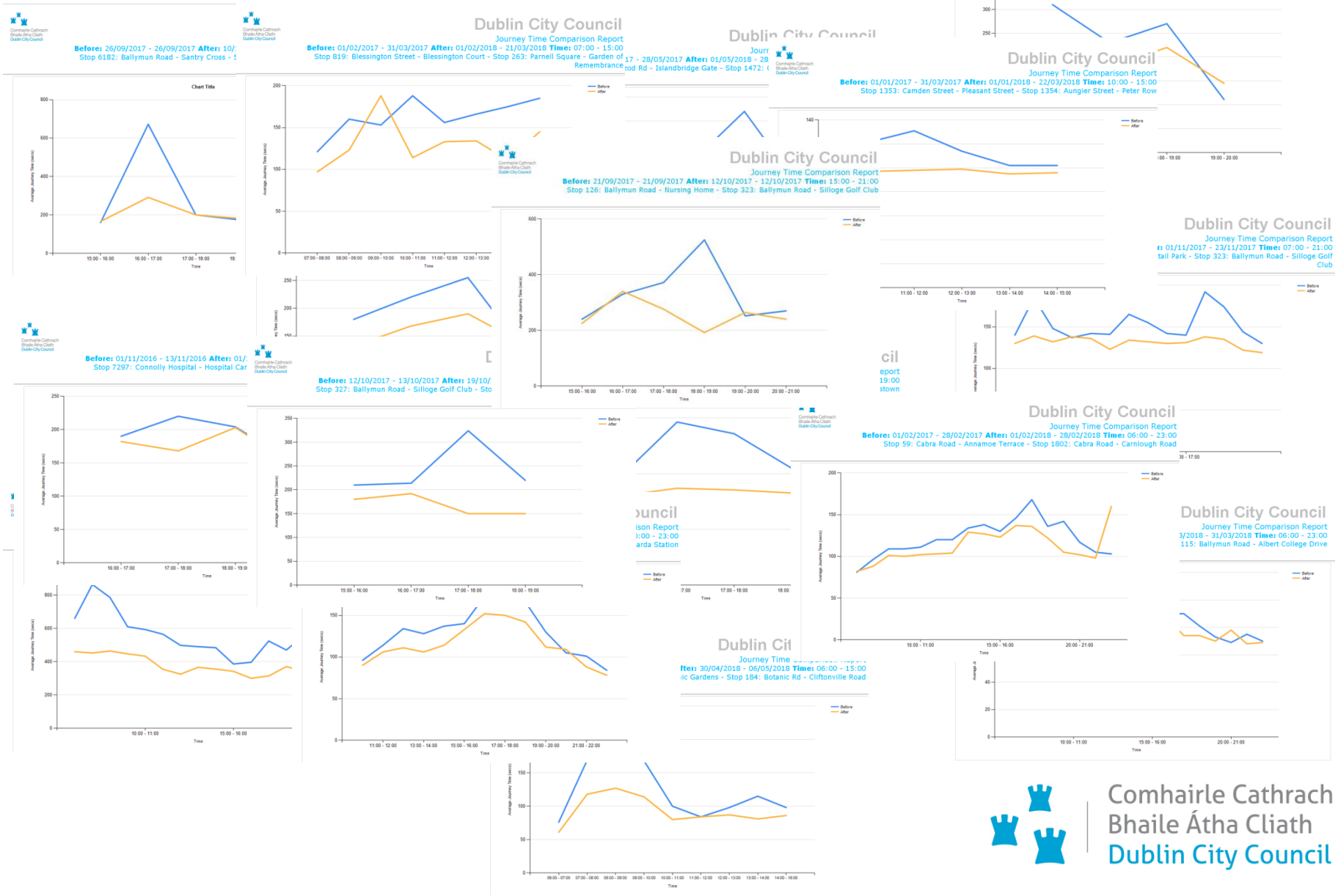


	Before		After		Comparison
Time Interval	Total No of Buses	Avg Journey Time	Total No of Buses	Avg Journey Time	% Difference
07:00 - 08:00	158	113	172	112	-0.88
08:00 - 09:00	180	232	180	141	-39.22
09:00 - 10:00	140	130	143	117	-10





Continual Assessment



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

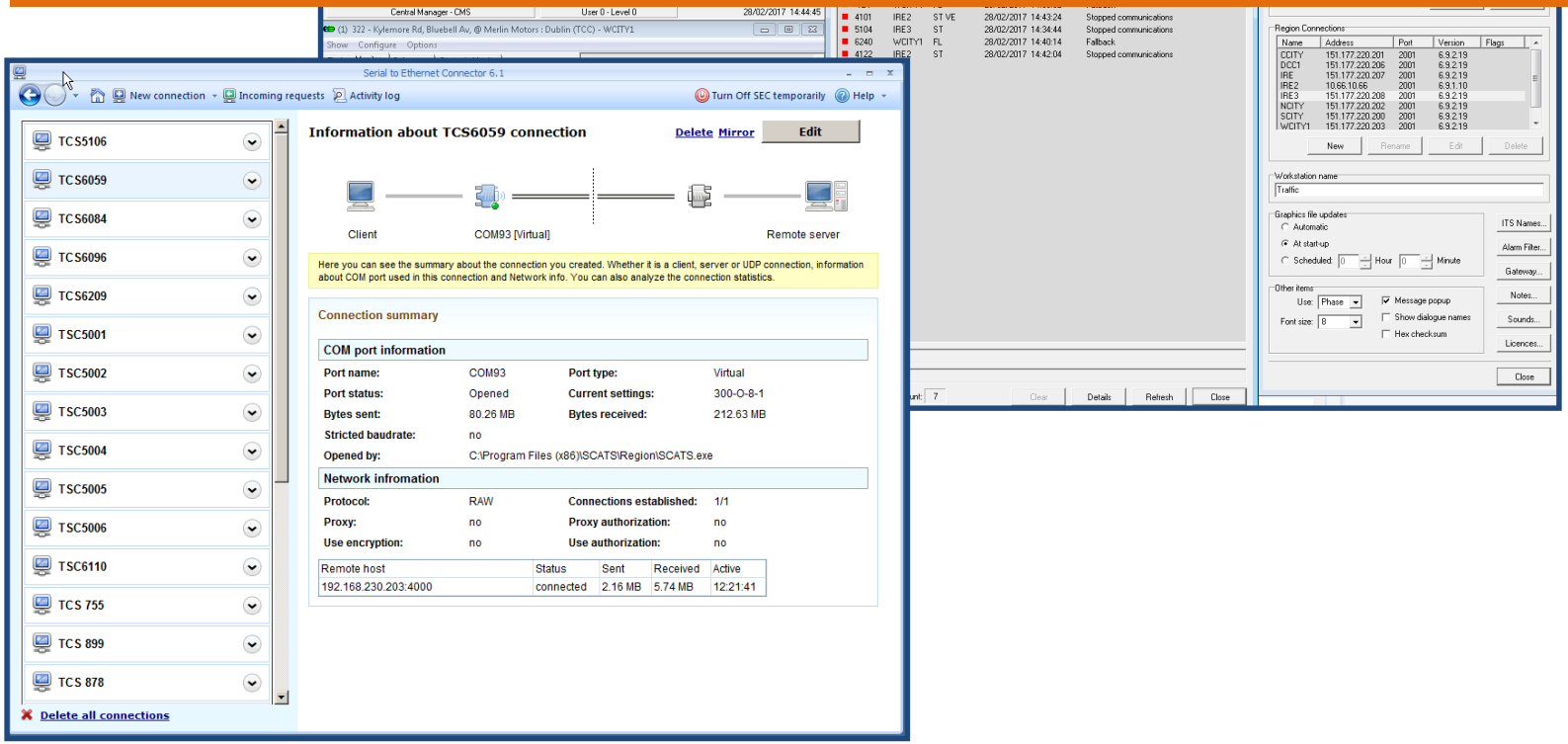
- Virtual detectors reduce the need for often expensive on-street measures
- Fast to install
- System can be used to maintain bus priority throughout the whole city
- Interventions can easily be tweaked
- Scheduler means priority can be given at specific times of the day

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



Thank You

Brendan.Obrien@dublincity.ie