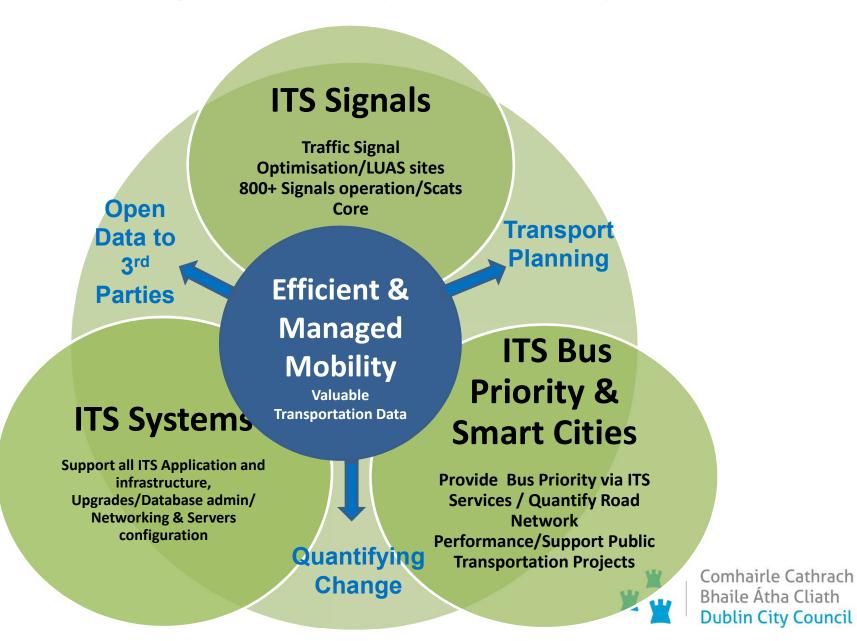


**Dublin City Council ITS Bus Priority** 



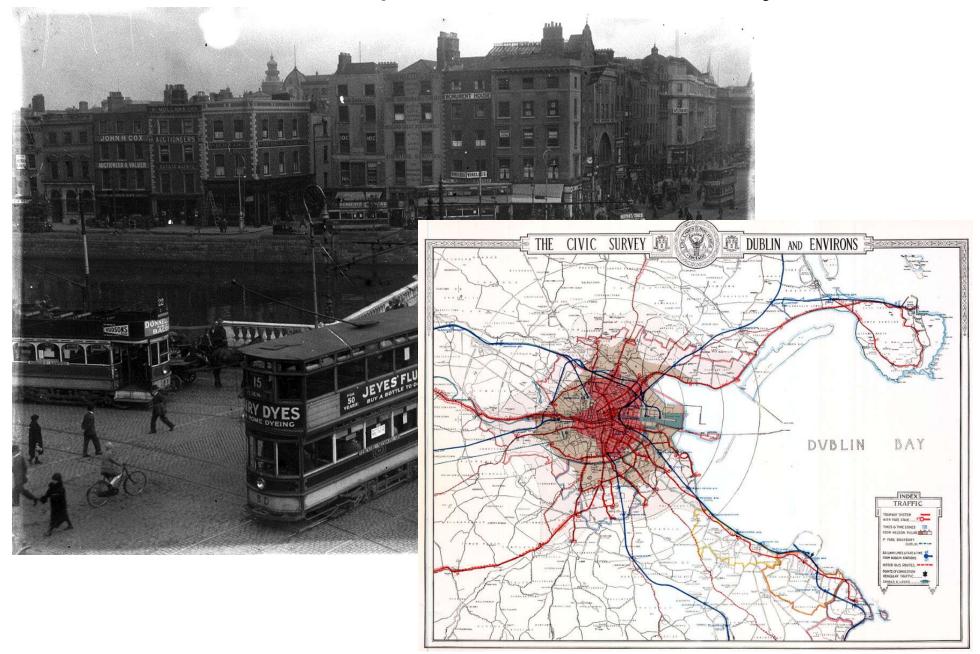
Comhairle Cathrach Bhaile Átha Cliath Dublin City Council

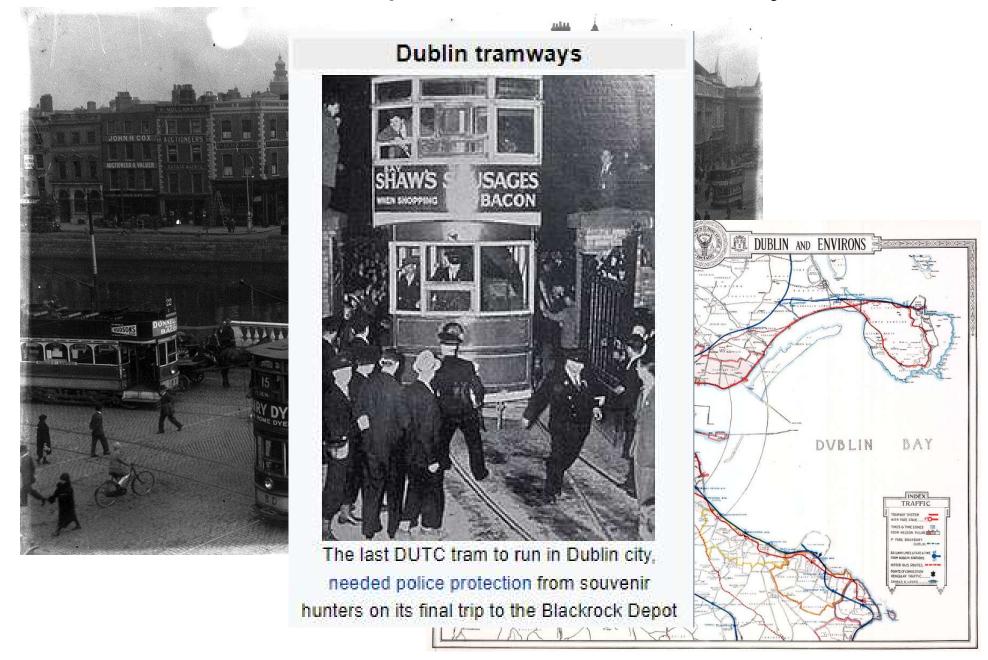
## Intelligent Transportation Systems









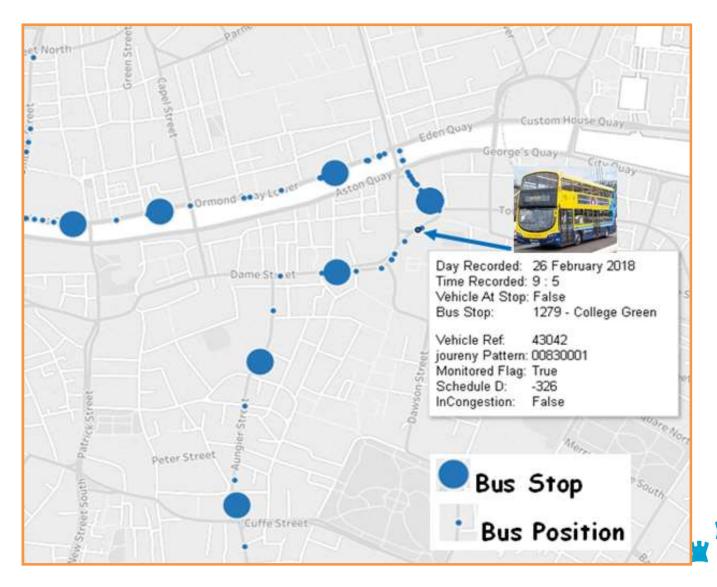








#### **Data Driven Decisions – Connected Vehicle**

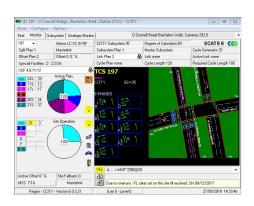




Comhairle Cathrach Bhaile Átha Cliath Dublin City Council

## **Traffic Signal Management in Dublin City**

- •Sydney Coordinated Adaptive Traffic System (SCATS)
- Adaptive system which reacts to traffic
- •Over 800 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









#### **Centralised Bus Priority**

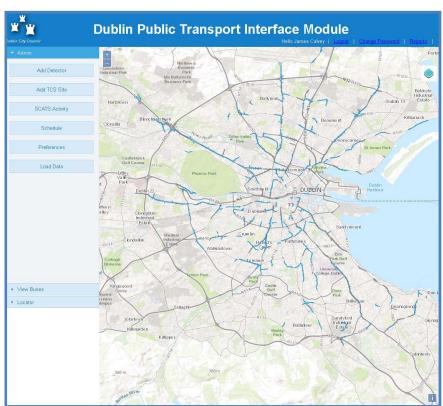
•Buses have equipped their fleets with GPS units to provide an Automatic Vehicle Location System (AVLS) Centralised Bus Priority System •The system tracks approximately 1000 buses in real time •This system is based on receiving location information per bus at 20 second intervals SCATS' •The 'Centralised Bus Priority System' has two directronnections ➤ Dublin Bus Automatic Vehicle Location System (AVLS) ➤ Dublin City Council's Traffic Management Control system (SCATS) •The SCATS traffic control system has an ITS port to allow a separate no interfaced Data Analysis - Virtual Detector Placement Bus Priority on a defined Route •Live 'bus position' information can interface with the traffic management control system in order to provide traffic signal priority to buses Bhaile Atha Cliath •Dublin Public Transport Interface Module (DPTIM)



### **Bus Priority In Dublin City**

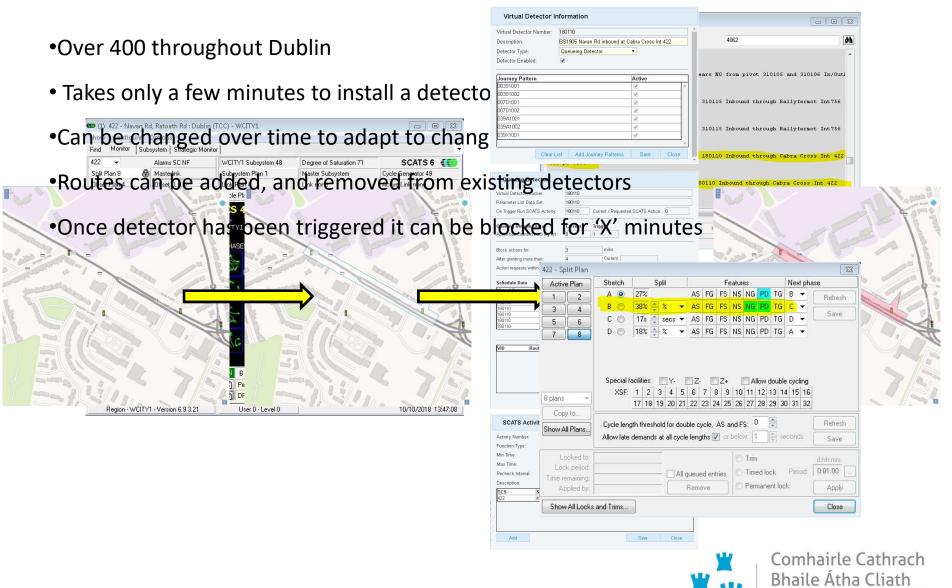
- Processes data outputs from bus feeds to SCATS
- •Map based display allows for virtual detectors to be installed that provide priority when a bus is within its defined area







#### **DPTIM Virtual Detectors**



**Dublin City Council** 

#### **Data Driven Bus Priority**

- Dublin Bus reports
  - ➤ Unscheduled stoppages reports
  - ➤ Unscheduled stoppages variance reports
- •Internal MS-SQL reports
  - ➤ Journey time comparison reports
- •Dashboards created in Tableau from data supplied by Dublin Bus and live bus feed
- •Informed decisions can be made, and appropriate measures can be taken



#### **Dashboards**

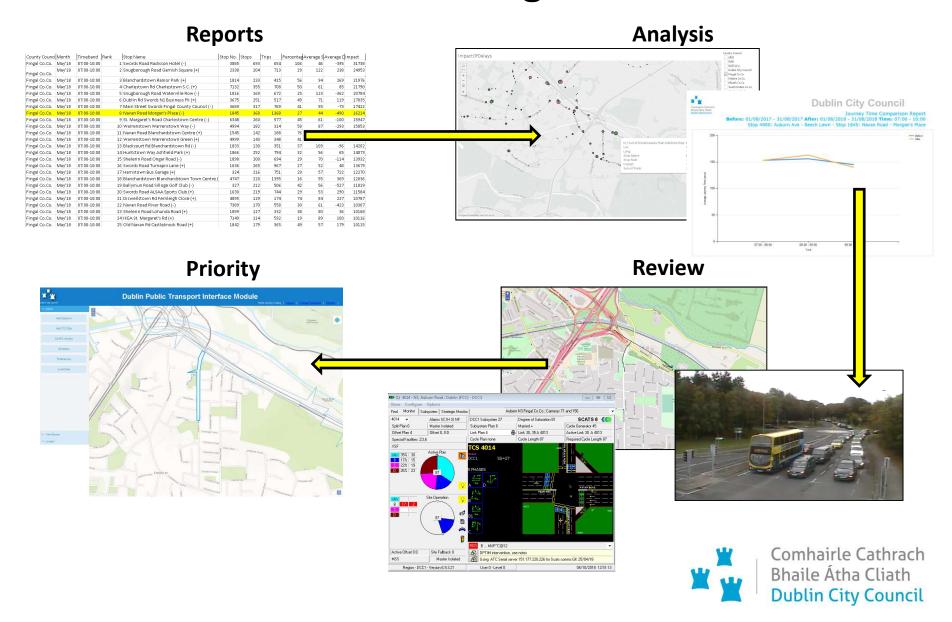
- •Can be used to display many different datasets...
  - ➤ Congestion and stoppages
  - ➤ Stop-to-stop journey time
  - ➤ Bus stop impact score
  - ➤ Stop/trip percentage
- Very useful for visually presenting data
- Useful for comparison analysis
  - ➤ Before/after bus priority measure were introduced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







### Informed decision making



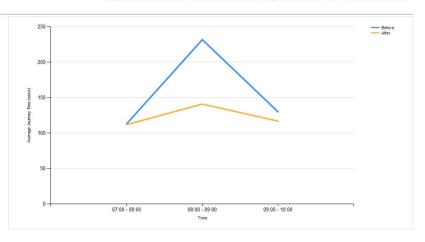
#### **Results AM Virtual Detector**

- •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



#### **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



Total No of Buses

172

180

|   |                   |                                      | Befo              | ге               | Γ |
|---|-------------------|--------------------------------------|-------------------|------------------|---|
| 710   |                   | Time Interval                        | Total No of Buses | Avg Journey Time |   |
|   | 4                 | 07:00 - 08:00                        | 158               | 113              |   |
|   | 18                | 08:00 - 09:00                        | 180               | 232              | L |
|   | , Rol             | 09:00 - 10:00                        | 140               | 130              |   |
| Serving Co.   | g Ha Road         |                                      |                   | 1                |   |
|   | SCATS Acti        |                                      |                   |                  |   |
|   | Activity Number:  | 210007                               |                   |                  |   |
| Somme Market Company of the Company | Function Type:    | Action List ▼                        |                   |                  |   |
| Botal   | Min Time:         | 20 seconds                           |                   |                  |   |
|   | Max Time:         | 120 seconds                          |                   |                  |   |
|   | Recheck Interval: | 10 seconds                           |                   |                  |   |
|   | Description:      | Applies plan 15 at Int 32 for 2 mins |                   |                  |   |
| Familia Road  | TCS               |                                      | end action num    |                  |   |
|   | 32                | 4180 4181                            |                   |                  |   |
|   | Add               |                                      | Save Close        |                  |   |
|   | waa               |                                      | Save Cluse        |                  | 1 |



Avg Journey Time

Comparison

% Difference

-0.88

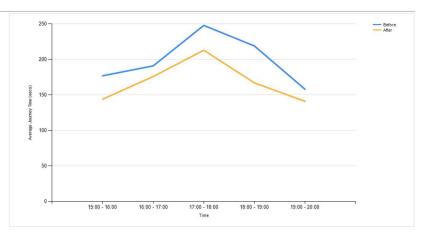
#### **Results PM Virtual Detector**

- •Bus must make right turn from Hospital onto Navan Rd, was experiencing delays
- •Applies plan 8 & NG to C Phase at SCATS site 4048
- •Scheduler set to run from 1500-2000
- •Consistent journey time reduction during PM peak

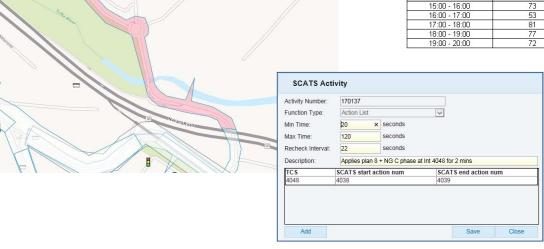


#### **Dublin City Council**

Before: 01/05/2017 - 31/05/2017 After: 01/05/2018 - 31/05/2018 Time: 15:00 - 20:00 Stop 7297: Connolly Hospital - Hospital Car Park - Stop 7389: Navan Road - River Road



|               | Before            |                  | After             |                  | Comparison   |
|---------------|-------------------|------------------|-------------------|------------------|--------------|
| Time Interval | Total No of Buses | Avg Journey Time | Total No of Buses | Avg Journey Time | % Difference |
| 15:00 - 16:00 | 73                | 177              | 100               | 144              | -18.64       |
| 16:00 - 17:00 | 53                | 191              | 84                | 176              | -7.85        |
| 17:00 - 18:00 | 81                | 248              | 100               | 213              | -14.11       |
| 18:00 - 19:00 | 77                | 219              | 103               | 167              | -23.74       |
| 19:00 - 20:00 | 72                | 158              | 104               | 141              | -10.76       |

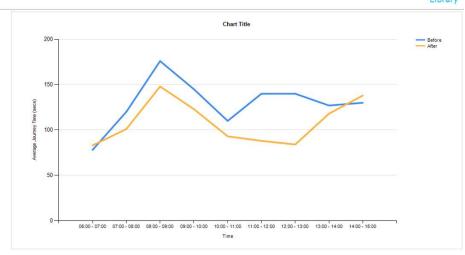




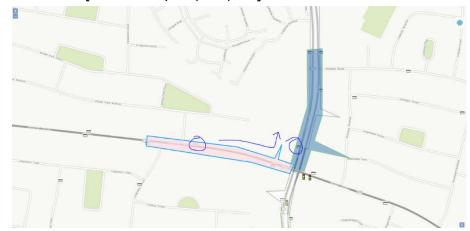


#### **Dublin City Council**

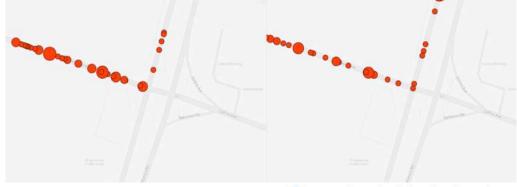
Journey Time Comparison Report Before: 21/03/2022 - 29/03/2022 After: 28/04/2022 - 09/05/2022 Time: 06:00 - 15:00 Stop 143: Glasnevin Avenue - Willow Park Avenue - Stop 92: Ballymun Road - Ballymun Library



Int 11
Detector 130105
Plan 13 [D Phase w/ FG, NG, PD]



|               | Before            |                  | After             |                  | Comparison   |
|---------------|-------------------|------------------|-------------------|------------------|--------------|
| Time Interval | Total No of Buses | Avg Journey Time | Total No of Buses | Avg Journey Time | % Difference |
| 06:00 - 07:00 | 16                | 78               | 13                | 83               | 6.41         |
| 07:00 - 08:00 | 25                | 120              | 26                | 101              | -15.83       |
| 08:00 - 09:00 | 30                | 176              | 32                | 148              | -15.91       |
| 09:00 - 10:00 | 33                | 145              | 37                | 123              | -15.17       |
| 10:00 - 11:00 | 19                | 110              | 27                | 93               | -15.45       |
| 11:00 - 12:00 | 15                | 140              | 23                | 88               | -37.14       |
| 12:00 - 13:00 | 23                | 140              | 27                | 84               | -40          |
| 13:00 - 14:00 | 31                | 127              | 37                | 118              | -7.09        |
| 14:00 - 15:00 | 29                | 130              | 36                | 138              | 6.15         |



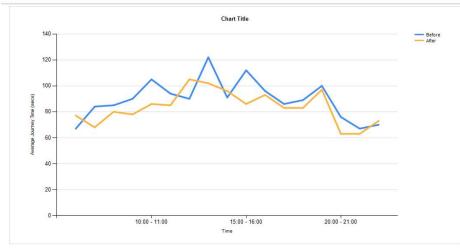




#### **Dublin City Council**

Journey Time Comparison Report Before: 21/03/2022 - 29/03/2022 After: 29/04/2022 - 09/05/2022 Time: 06:00 - 23:00 Stop 1001: Oscar Traynor Rd - Coolock Village - Stop 1002: Tonlegee Rd - Malahide Road

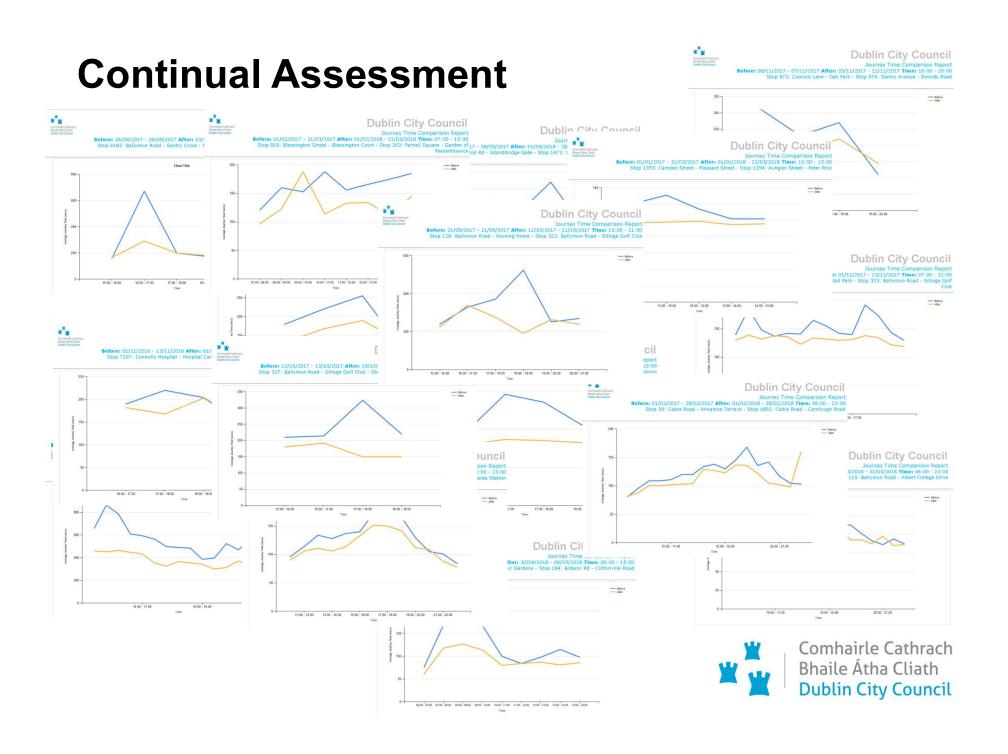
Int 110
Detector 120013
Plan 15 [B Phase w/ FG, NG, PD]



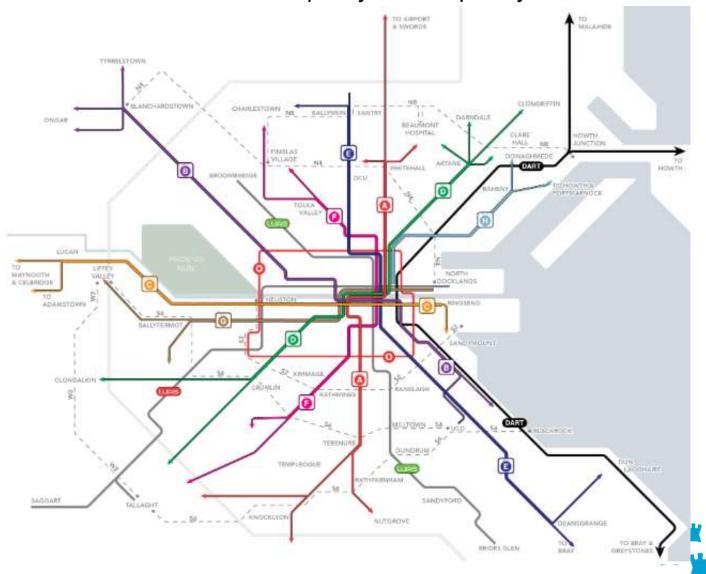


|               | Before            |                  | After             |                  | Comparison   |
|---------------|-------------------|------------------|-------------------|------------------|--------------|
| Time Interval | Total No of Buses | Avg Journey Time | Total No of Buses | Avg Journey Time | % Difference |
| 06:00 - 07:00 | 8                 | 67               | 7                 | 77               | 14.93        |
| 07:00 - 08:00 | 20                | 84               | 21                | 68               | -19.05       |
| 08:00 - 09:00 | 24                | 85               | 21                | 80               | -5.88        |
| 09:00 - 10:00 | 35                | 90               | 32                | 78               | -13.33       |
| 10:00 - 11:00 | 21                | 105              | 25                | 86               | -18.1        |
| 11:00 - 12:00 | 26                | 94               | 28                | 85               | -9.57        |
| 12:00 - 13:00 | 26                | 90               | 25                | 105              | 16.67        |
| 13:00 - 14:00 | 29                | 122              | 24                | 102              | -16.39       |
| 14:00 - 15:00 | 23                | 91               | 26                | 96               | 5.49         |
| 15:00 - 16:00 | 30                | 112              | 34                | 86               | -23.21       |
| 16:00 - 17:00 | 28                | 96               | 23                | 93               | -3.13        |
| 17:00 - 18:00 | 41                | 86               | 48                | 83               | -3.49        |
| 18:00 - 19:00 | 31                | 89               | 36                | 83               | -6.74        |
| 19:00 - 20:00 | 27                | 100              | 27                | 97               | -3           |
| 20:00 - 21:00 | 29                | 76               | 31                | 63               | -17.11       |
| 21:00 - 22:00 | 17                | 67               | 16                | 63               | -5.97        |
| 22:00 - 23:00 | 17                | 70               | 18                | 73               | 4.29         |



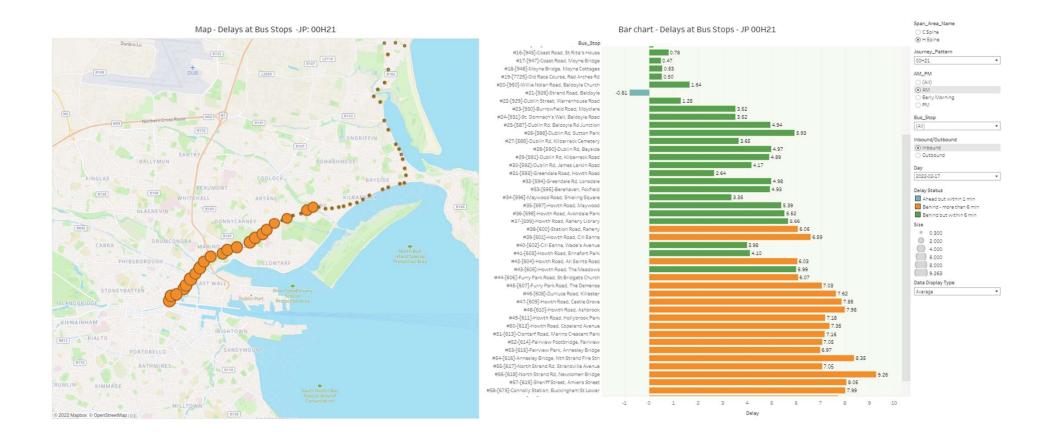


New Services -Increase in capacity and frequency.



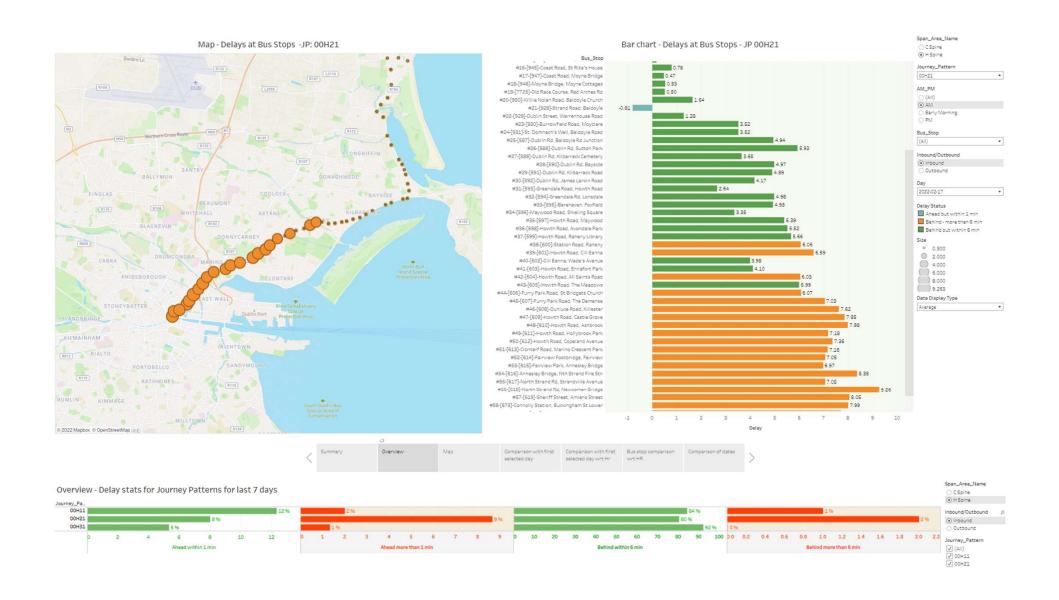
Comhairle Cathrach Bhaile Átha Cliath Dublin City Council

New Services -Increase in capacity and frequency.

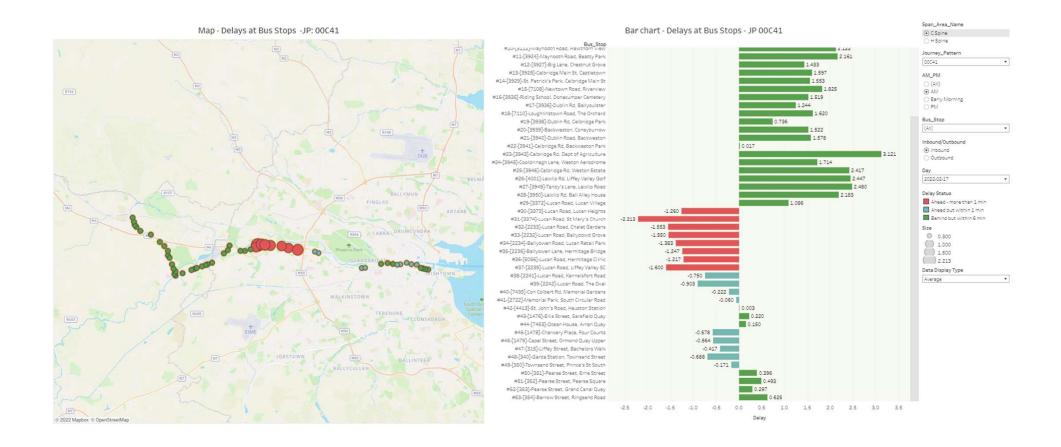




New Services -Increase in capacity and frequency.



New Services -Increase in capacity and frequency.



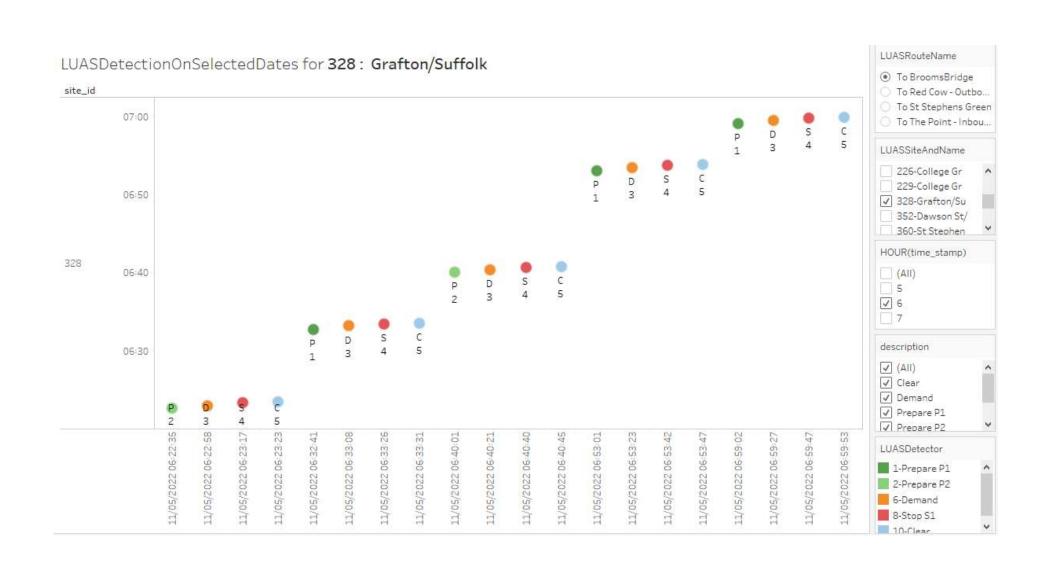


# **Public Transportation Priority – LUAS Tram**



#### **Public Transportation Priority – LUAS Tram**

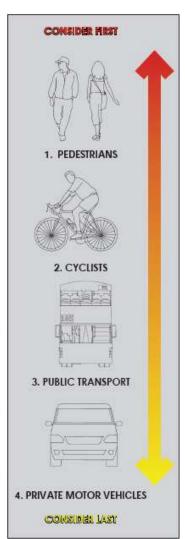
Data Captured from LUAS Detection loops (Prepare /Demand /Stop line /Clear)



#### **Data Driven Trigger Point Bus Priority**

- •Default Standard operation and optimise as per mobility priority.
- •Similar to LUAS real-time, accurate detection of buses when required.
- •Data Trigger points mapped to Traffic Signal Controls in SCATS.
- Provide a Green Wave/ Queue relocation / Immediate priority
- •No specialised On-street detection required. All configured via Centralised Bus Priority System and SCATS





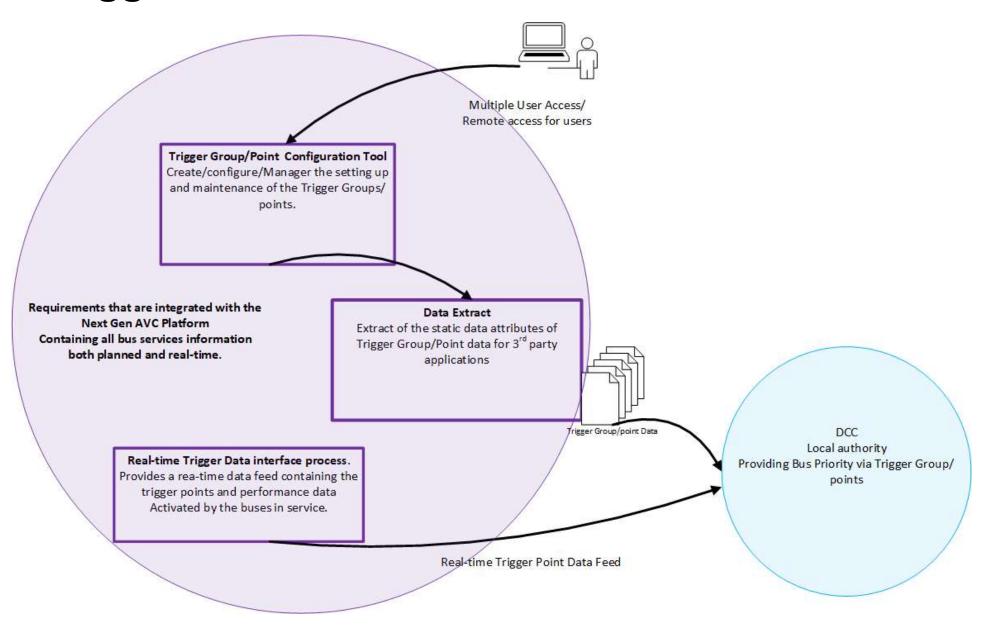


# Public Transportation Priority via Trigger Points





# Public Transportation Priority via Trigger Points



#### **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**

- •Data Driven Detection reduces 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



Before Friday 20th May











#### On Friday 20th May



**CAPEL STREET GOES TRAFFIC FREE** 



Image: Patricia Reidy, Olsín Devilly, Brendan O'Brien, Claire French, Liam O'Brien, Niamh Ní Cholmáin.



#### After Friday 20th May





On Friday 20<sup>th</sup> May

**Traffic Volume Data – Throughput per Junction** 

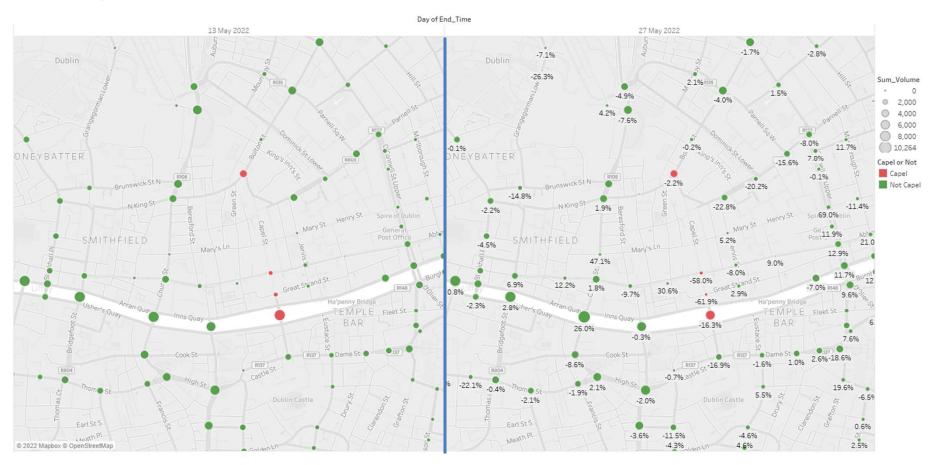
Comparing the Friday before 13th May to Friday 20th May – Day of the Launch of Traffic Free Street





#### Before/After Friday 20th May

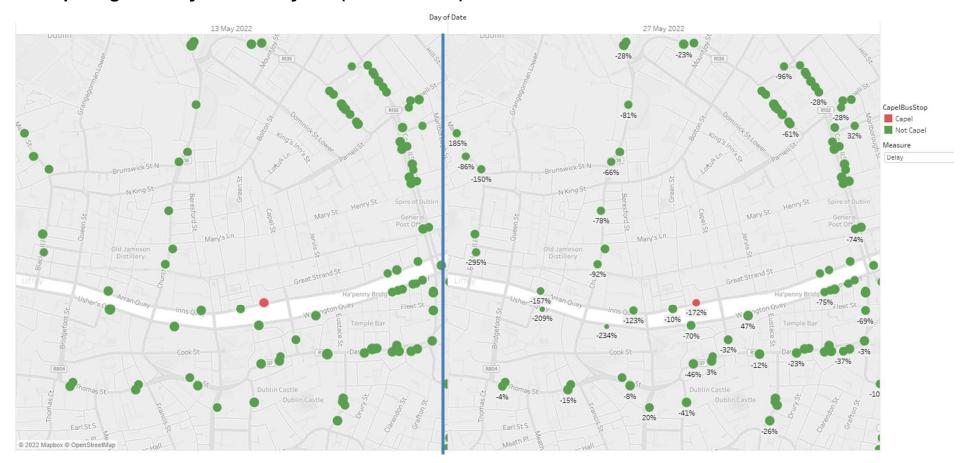
Comparing the Friday (Before) 13<sup>th</sup> May to Friday 27<sup>th</sup> May AM- Traffic settles down with increase on major orbital routes.





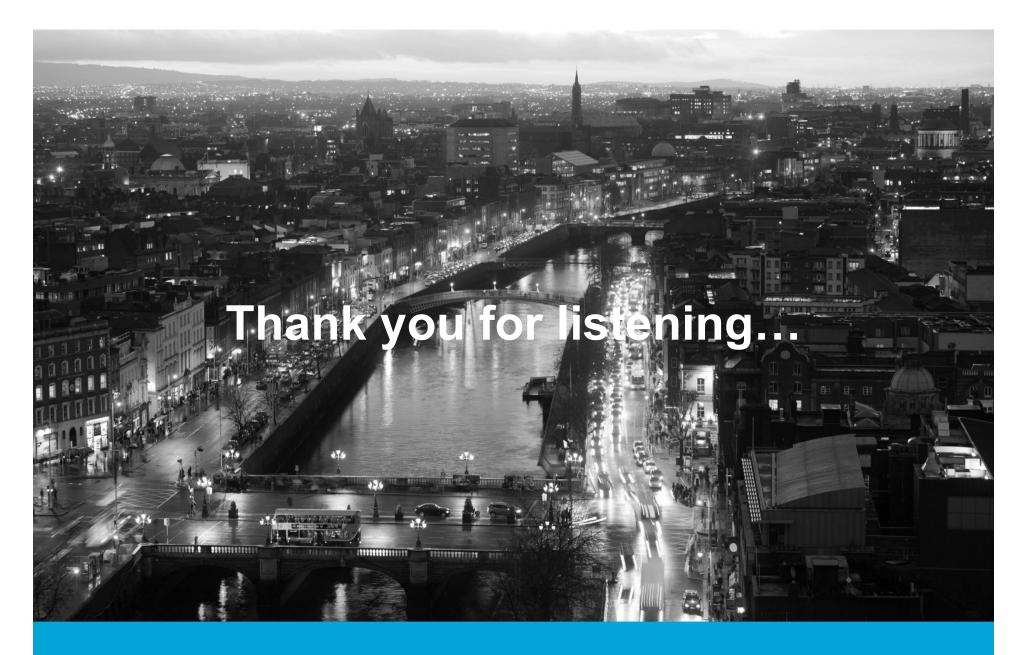
After Friday 20th May

Bus Performance
Are the buses getting delayed.?
Map shows at bus stops, accumulative Bus Delays as per their schedule.
Comparing 13<sup>th</sup> May to 27<sup>th</sup> May AM (7am to 10am).



Note: negative delay = improvement in service.





**Dublin City Council ITS Bus Priority** 



Comhairle Cathrach Bhaile Átha Cliath Dublin City Council