

Brendan O'Brien September COST Workshop



Dublin – World Class Location



- 5th Most Attractive European City for Inward Investment
- Strong **City Brand** 12th in Europe and 29th in the world
- Ireland is the 2nd most **Globalised** country in the world -
- 8th Cities in Europe for cycling and the second safest City .
- One of the most **liveable cities** in the world ahead of San Francisco, Helsinki, Boston, Madrid and Seattle.
- **Diversity** is main strength

Some Transportation Issues

 Historic City Core • City approx 500K Greater Dublin Area 1.4 m Majority of Irish imports/Exports through Port Situated within 2 Km of City Centre. Central Business District 30% by Car Outer areas 70-80% by Car Policy decision in 1994 not to build additional road capacity but to prioritise Public Transport





New Light Rail System LUAS



Port Tunnel



Dublin City

- Trucks Banned from City Centre
- Electronic Permit System
- HGVS reduced by
 97% in City
 Centre
- Very large Reduction in accidents.



- Large scale investment in ITS Systems
- Adaptive Traffic Systems
- CCTV
- VMS
- Parking Systems
- Footfall
 Counters
- Large Data Storage

Existing use of technology for efficient public services in Dublin

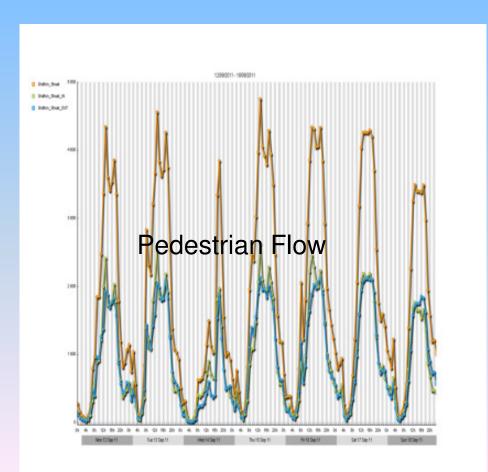


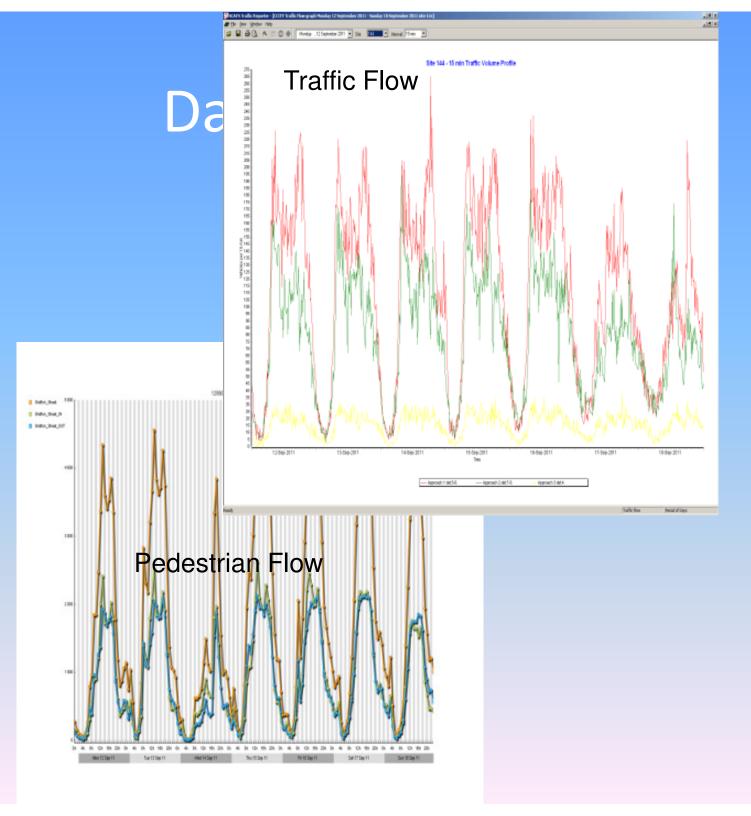
Real Time Passenger Information using open technology



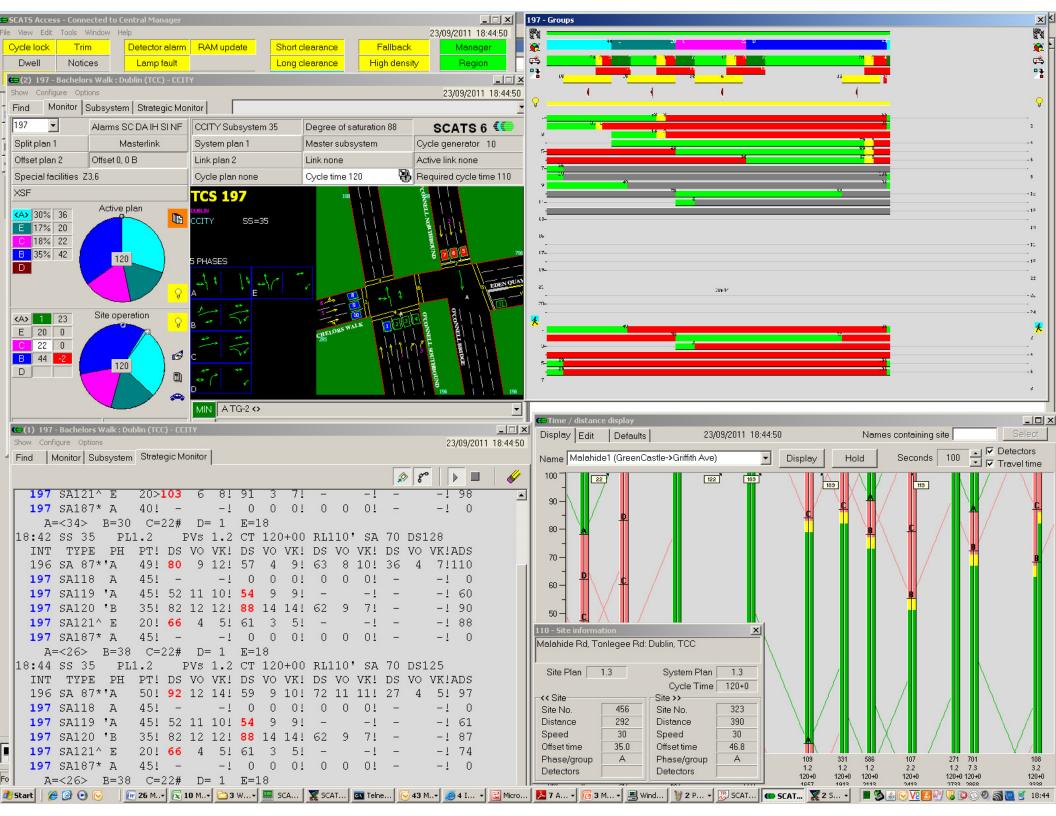


Data









Traffic Control

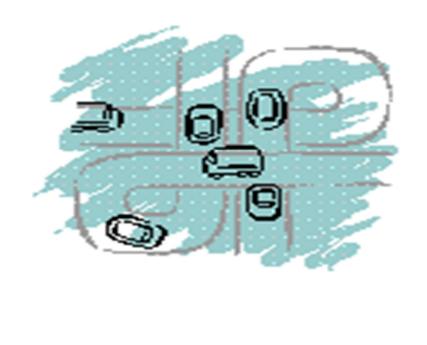
Large Amounts of Data

- Systems work well but are complex
- CCTV systems and VMS signage
- Why does traffic move so well today and not tomorrow.

Junction Optimisation

- Need control room Operators
- Great for incidents and accidents but Analysis.???
- Hmmm difficult to say could be too many cars. !!!

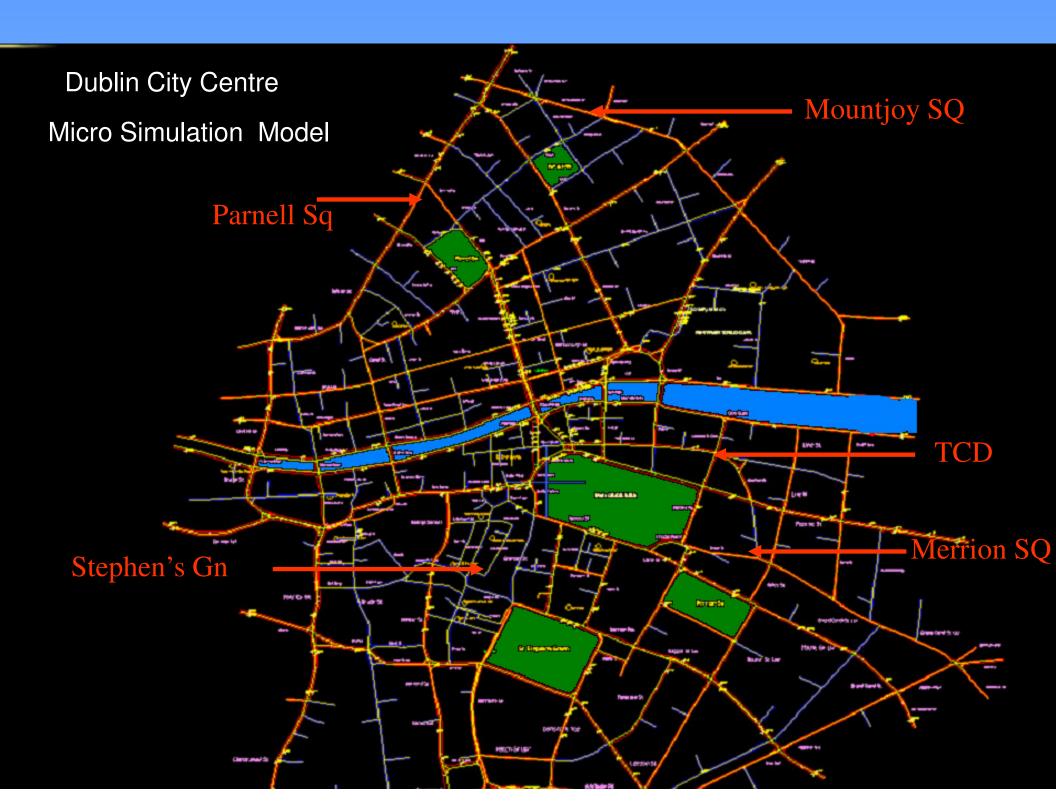
Traffic Control



Inction Optimisation

- Need control room Operators
- Great for incidents and accidents but Analysis.???
- Hmmm difficult to say could be too many cars. !!!

• Where is the investment needed.



Questions for a City

- How to Visualise all its data
- How to understand what is important
- How to intervene effectively
- Where to invest
- What functions it needs to undertake.
- What should it do with it's data.
- Should all data be available and how do we share real time data.

SmarterCities Technology Centre

IBM / Dublin Smart City projects launched in 2009 Location of **IBM's Global Smart City Technology Centre** in Dublin

> City as a Test-bed for international product & service innovation

Current Dublin Smart City Seed Projects

- -Water
- -Movement
- -Energy



SmarterCities Technology Centre

Dublin: IBM Research's First Smarter Cities Technology Centre

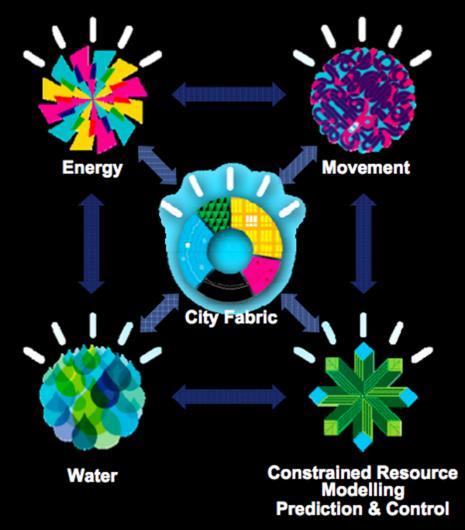
Developing Intelligent Solutions Across a System of Systems



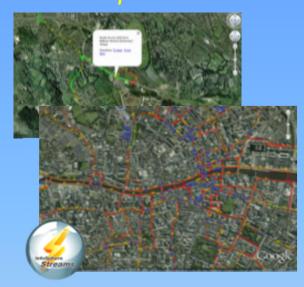
Optimization Forecasting Simulation

Predictive Modelling Driving New Economic Models Significant Collaborative R&D Skills Development & Growth Competitive Advantage

Seed Projects

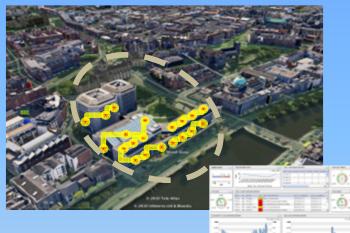


Examples of Collaborative Smarter Cities Seed Projects in Dublin Transportation



- Continuously assess the state of the public transport system
- Provides personalized, real-time advice to riders and dynamic loadbalancing opportunities to transit providers

Water and Energy



City Fabric



Dublinked

- Open Innovation Platform (Dublinked) for publishing and managing Dublin city's linked open data
- Positions Dublin as a hub for smarter city research, development, and innovation

- Collaborative sensing of water/energy consumption in public buildings
- Enables occupants and facility managers to manage and optimize resource usage, and utility providers to predict demand

Merrion Water Project – SMART water metering



Visualisation of high water consumption to support management and resource optimisation

Quo Deb

IBM Research

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DCC has Real Time data on Dublin Bus Fleet Allow IBM access to data and provide server space. 1000 vehicles provide location information every 20 – 30 Seconds

Provide Visualisation of data Allow a city wide view but also provide the means of seeing where problems are.

Handle verbose XML SIRI standard records.



IBM Research

DCC has Real Time data on Dublin Bus Fleet Allow IBM access to data and provide server space. 1000 vehicles provide location information every 20 – 30 Seconds

Bus 36002

On route: 464from Croffon Road, Dun Laoghaire Train Station to Nountjoy Sq Nith, Opposite Wountjoy Square Park Delay: 1095 Spead: 25.4 Km/h Last updated at: Fri Sep 23 17:32:43 IST 2011

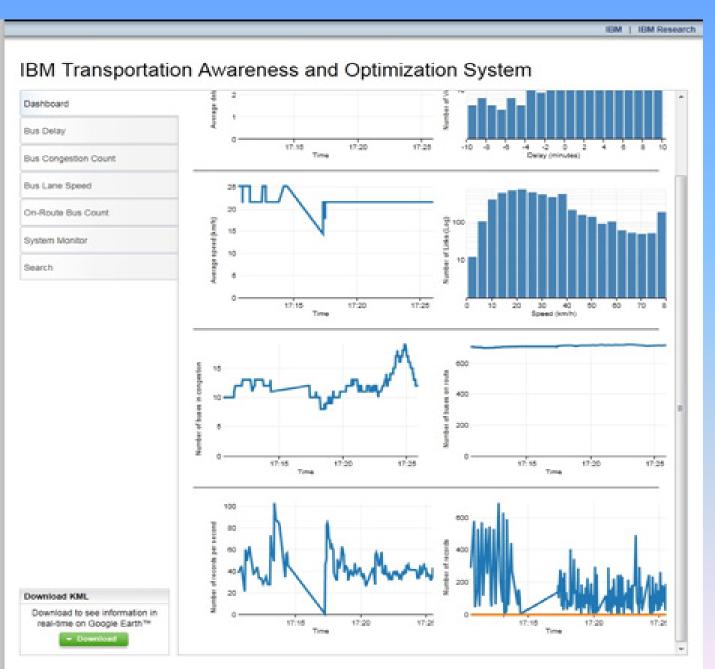
> mape © 2011 TerraNetrics O INCAALUS, Navy NGA GEBC 2011 Infotene Ltd & Bluesky

Provide Visualisation of data

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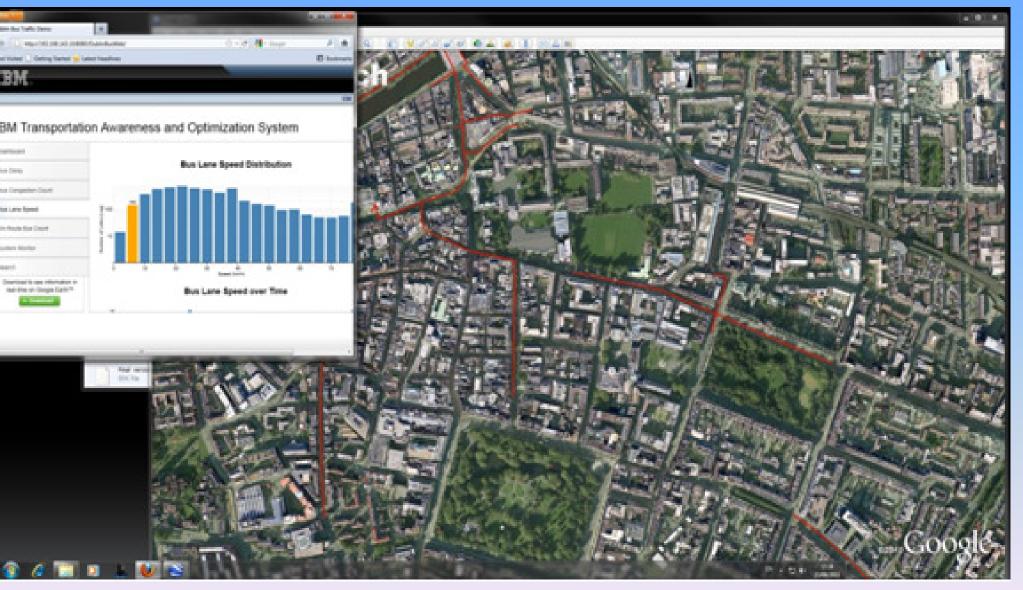


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- Dash Board type view
- Linked to visualisation using Google Earth
- Allows focusing in on data

Bus Lane Speed Over Time

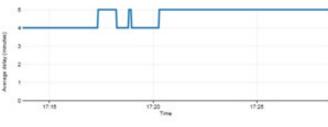


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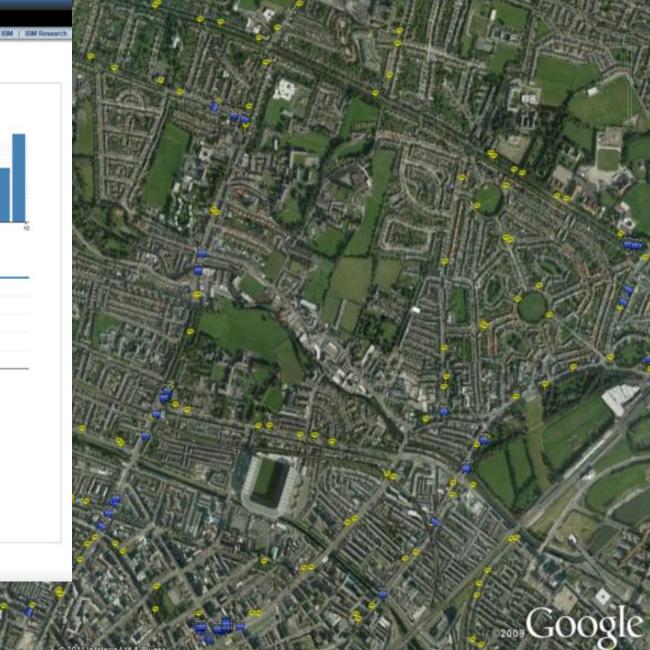
Buses and bus stop locations

Transportation Awareness and Optimization System





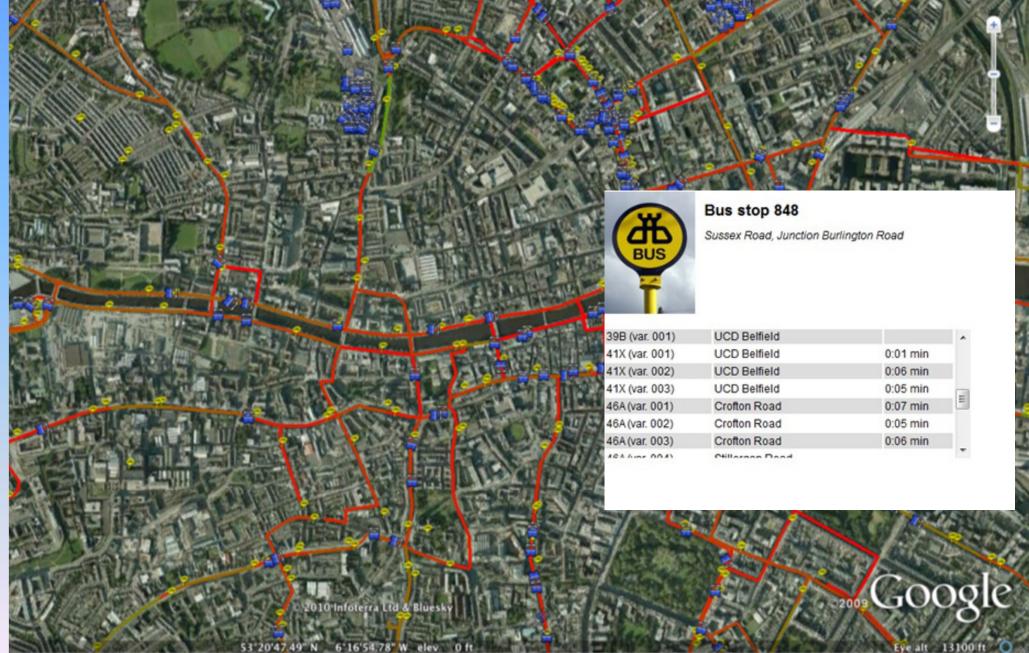
ad to see information in te on Google Earth^{te}



Bus Speeds on segments of routes

Segment between Lower Drumcondra Rd and Upper Drumcondra Rd Speed: 18.0 Km/h Travel time: 0:44 min

Data used for Bus arrival Predictions



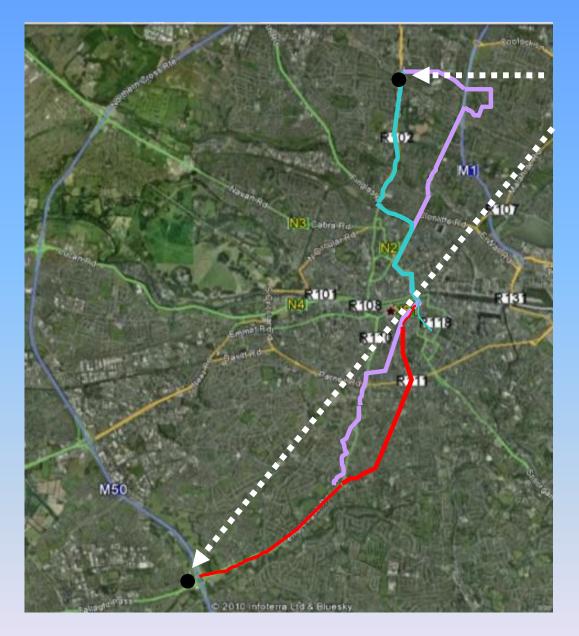
SIRI DATA

PublishedLineName>123</PublishedLineName> <OperatorRef>bac</OperatorRef> <DestinationRef>MARINO</DestinationRef> <DestinationName>Marino via O'Connell Street</DestinationName> <Monitored>true</Monitored> <InCongestion>false</InCongestion> <BlockRef>123006:31</BlockRef> <VehicleRef>28023</VehicleRef> = <MonitoredCall> <VisitNumber>28</VisitNumber> <VehicleAtStop>false</VehicleAtStop>

<u>AimedDepartureTime> 2011-09-08 T13:21:22 <</u>

<ExpectedDepartureTime> 2011-09-08 T13:22:42 <</pre>

TRANSPORTATION

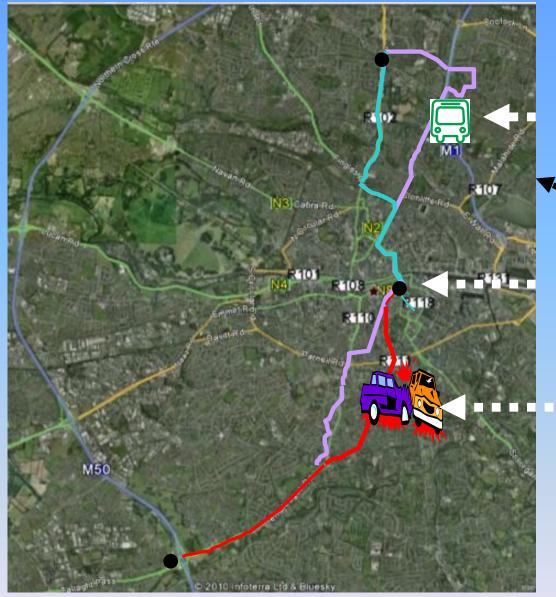


Suppose you want to go from here to here.

Many routes to accomplish the journey.

Each can involve connections, wait times, and uncertainty due to normal traffic patterns as well as unusual occurrences.

How should you make up your mind?



You are currently on a bus on the purple line,

Your plan is to transfer here

Five minutes ago, there was an accident on the red line

What if you had real time information about the status of the network and the value of your options?

SMART TRANSPORTATION SOLUTIONS

Your current route plan: > Purple line Bus #7a; Transfer to Red Line Bus #14 at

Trinity college

➤ Warning! Accident at Rathgar road.

➢ This route has a high probability of being significantly delayed! Explore alternates options?

Smart Cities Interface

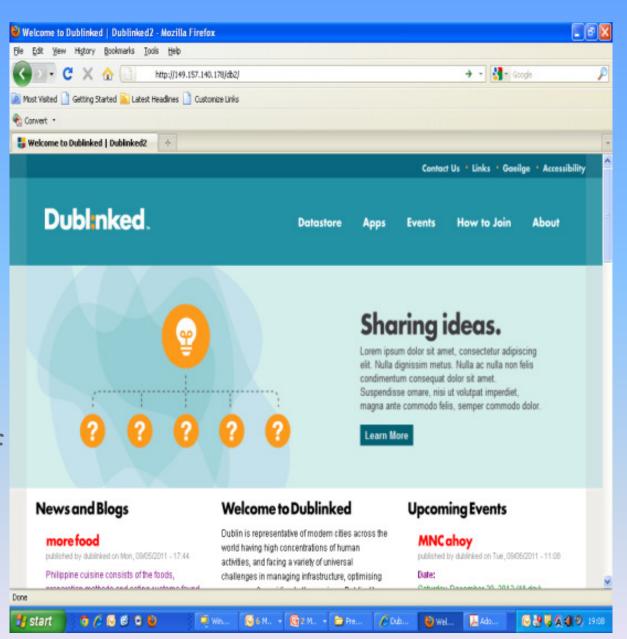
- Data is the key
- A Smart City Fabric is built on sensors.
- All systems in Dublin will have a "Smart Cities Interface "
- No systems should now be deployed that has no open interface.
- But large scale systems tend to have licences with high costs.
- SCATS / SIRI compliant systems licence per connection. (25 – 30 K per connection)

Dublinked

Open Data Sharing to support innovation & enterprise ecosystem

Led by the 4 Dublin Local Authorities Project managed by National University of Ireland Maynooth

Portal and technical support by IBM



Dublinked Data

🥹 Dublinked™ . Sharing Data, Information and Ideas - Mozilla Firef	DX .			
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Dublinked DataStore™				
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Enter Keywords	No category selected	No region selected	Search Now	
Request New DataSets				
Enter description		Add Extra Details	Request	

Description	Category	Region	Details
Water Usage Dec 2010	Water	Dublin Region	(click)
Electricity Usage Dec 2010	Electricity	Fingal County	(click)
Road Traffic Counts - Inner City Dec 2010	Transport	Dublin City Centre	(click)
Water Usage Dec 2010	Water	Dublin Region	(click)
Electricity Usage Dec 2010	Electricity	Fingal County	(click)
Road Traffic Counts - Inner City Dec 2010	Transport	Dublin City Centre	(click)
Water Usage Dec 2010	Water	Dublin Region	(click)
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Done

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IBM Dublin Research Lab - 2011

Datasets

Water consumption measured at DMA level - Every 15 minutes - For 1 month (April 2011)

Water consumption measured at household level

- Merrion road
- Every 15 minutes
- About 1 year

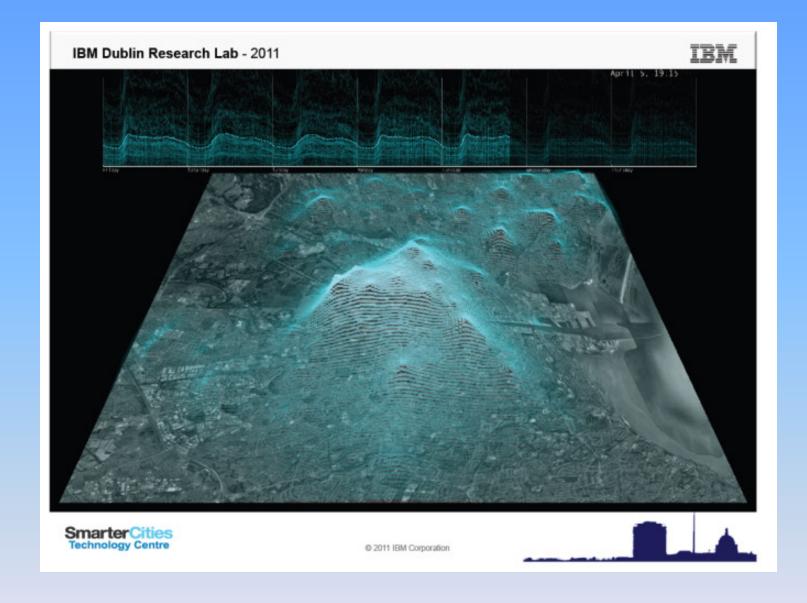








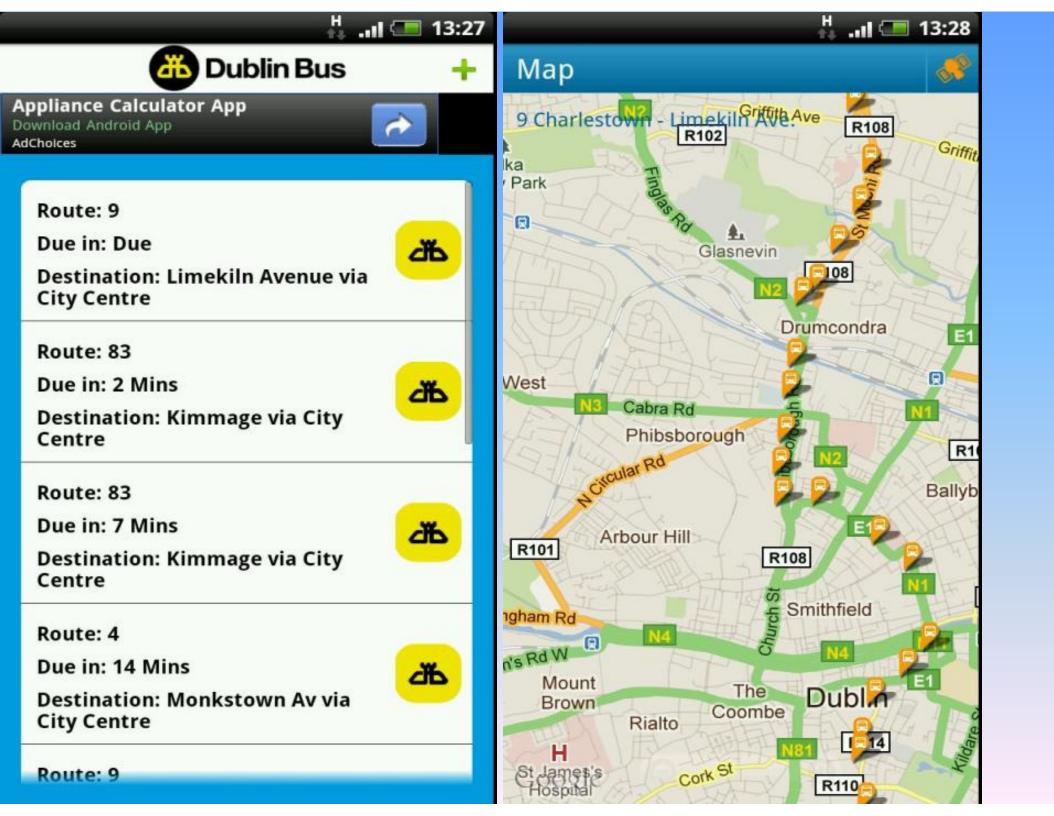
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Real Time Data

- Problems with Interfaces/ Licences
- Large data volumes and a possible one to many relationship for data distribution.
- "stale" data is not real data.
- Systems tend to present data in a way that often requires expertise to decipher.
- What happens if City Stops supporting a system





H ...I 🥌 13:29

Arrive Time

9

Phibsboro Road Junction Monck Place, Stop 197

Service	То	Time	Low Floor
140	IKEA via Phibsboro	3 Mins	
9	Charlestown via City Centre	7 Mins	
140	IKEA via Phibsboro	8 Mins	
83	Harristown	14 Mins	
140	IKEA via Phibsboro	18 Mins	
9	Charlestown via City Centre	20 Mins	
140	IKEA via Phibsboro	28 Mins	
83	Harristown	29 Mins	
9	Charlestown via City Centre	33 Mins	
4	Harristown via City Centre	34 Mins	
140	IKEA via Phibsboro	38 Mins	
83	Harristown	42 Mins	

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Arrive Time

9

Phibsboro Road, Junction Monck Place, Stop 197

Service	То	Time	Low Floor
140	IKEA via Phibsboro	3 Mins	
9	Charlestown via City Centre	7 Mins	
140	IKEA via Phibsboro	8 Mins	
83	Harristown	14 Mins	
140	IKEA via Phibsboro	18 Mins	
9	Charlestown via City Centre	20 Mins	
140	IKEA via Phibsboro	28 Mins	
83	Harristown	29 Mins	
9	Charlestown via City Centre	33 Mins	
4	Harristown via City Centre	34 Mins	
140	IKEA via Phibsboro	38 Mins	
83	Harristown	42 Mins	

Departure information for Phibsboro Road at 18:30

Stop Ref: 00197

Service	То	Time	Low Floor
83	Harristown	Due	
9	Charlestown via City Centre	Due	
140	IKEA via Phibsboro	4 Mins	
140	IKEA via Phibsboro	11 Mins	
83	Harristown	13 Mins	
9	Charlestown via City Centre	16 Mins	
140	IKEA via Phibsboro	18 Mins	
140	IKEA via Phibsboro	27 Mins	
83	Harristown	31 Mins	
9	Charlestown via City Centre	33 Mins	
4	Harristown via City Centre	35 Mins	

Later departures

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