



**Building
City
Dashboards**

Real-Time Smart City Data and the Future of Official Statistics

**Sam Stehle
Rob Kitchen**





Scheveningen Memorandum

eurostat 



eurostat 

 An Phríomh-Oifig Staidrimh
Central Statistics Office

 STATISTICS DENMARK



 Istat | Istituto Nazionale di Statistica

 KSH
HUNGARIAN CENTRAL STATISTICAL OFFICE

 CZECH STATISTICAL OFFICE



- Real-time
- High spatial detail
- Lower cost
- High response rate
- Comparable



Scheveningen Memorandum

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2013

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STATISTICS
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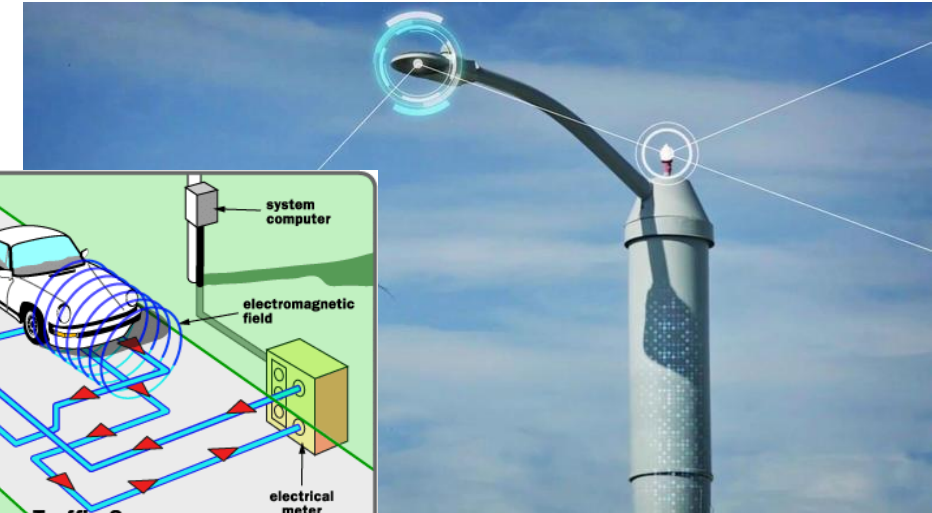
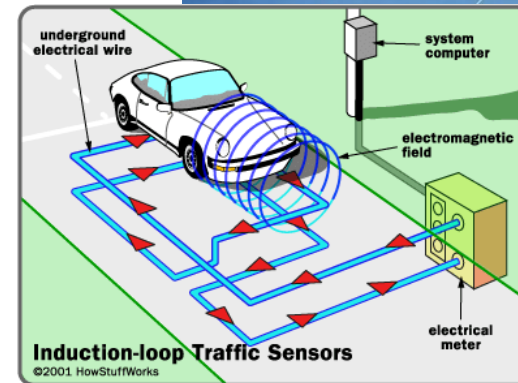
CZECH
STATISTICAL
OFFICE

SMART
DUBLIN

DATA.GOV.IE



- Real-time
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<https://www.zdnet.com/article/ge-at-t-ink-smart-city-deal-around-currents-cityiq-sensors/>
https://www.researchgate.net/publication/287003681_Wireless_based_Smart_Parking_System_using_Zigbee

Dublin open data	Access	Spatial Granularity	Spatial Coverage	Temporal Granularity	Methodological Transparency	Representativeness	Fidelity	Cleanliness	Consistency (within jurisdiction)	Consistency (across jurisdiction)	Completeness	Metadata	Privacy	Permanence	Relevance	Credibility
Public transport GPS																
Public transport by stops																
Roadway traversal time																
Car parks																
Inductive loops																
Flight locations																
Flight times																
Boat locations																
Bikeshare																
CCTV																
Sound																
Air quality																
Pollution																
Tide level																
River level																
weather																

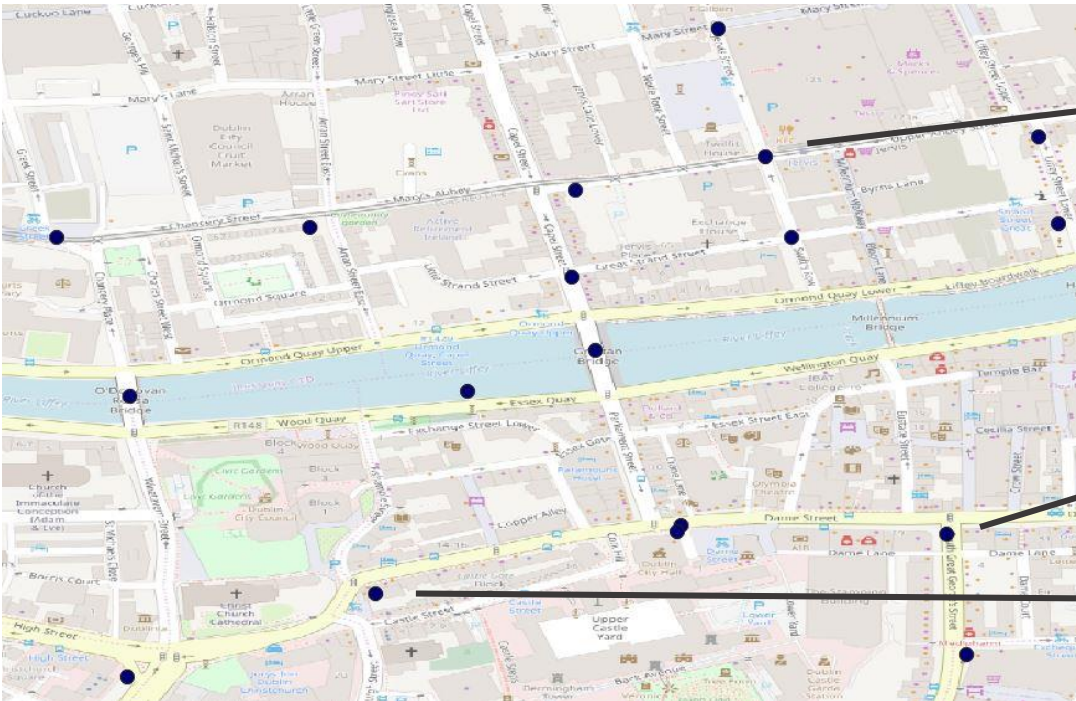






Metadata and Representativeness

- Missing metadata can make open data completely unusable



12 detectors
corresponding
to travel lanes

6 detectors

24 detectors



Credibility

- OECD: Measure of user trust in the producer of the data
- Dublin Bus users do not trust that 97% of busses arrive as stated on real-time displays
- Data producers and portals share in building credibility

API

Datasets without APIs (370)

Datasets with APIs (18)

RESOURCE FORMAT ⓘ

JSON-STAT (219)

PX (219)

CSV (66)

GTFS (51)

KML (28)

GEOJSON (19)

HTML (15)

ZIP (15)

ESRI REST (13)

XLS (13)



388 Results

Order by: Relevance

Theme: Transport x

Real-time Passenger Information (RTPI) for Dublin Bus, Bus Eireann, Luas and Irish rail

Transport

FEATURED

National Transport Authority

Public transport predictions and schedules RTPI REST Web Services API (RRWS API) provides REST interface to retrieve information on real time bus information, timetables and bus stops at <https://data.smartdublin.ie/cgi-bin/rtpi/realtimebusinformation>. Each method available in...

PDF HTML API
★★★★☆
17980 views

Wicklow County Council - Wicklow Prospects

Transport

Wicklow County Council

Sourced from the Co. Wicklow Development Plan 2016 - 2022

ESRI REST CSV KML SHAPE FILE GEOJSON
★★★★☆
13 views

Wicklow County Council - Greystones, Delgany, Kilcoole Prospects

Transport

Wicklow County Council

Sourced from the Greystones-Delgany & Kilcoole Local Area Plan 2013 - 2019

ESRI REST CSV KML SHAPE FILE GEOJSON
★★★★☆
12 views



From Data to Official Statistics

Key Performance Indicators (KPI)

- What the sensor measures
- Local to each sensor
- System-wide metrics can be calculated

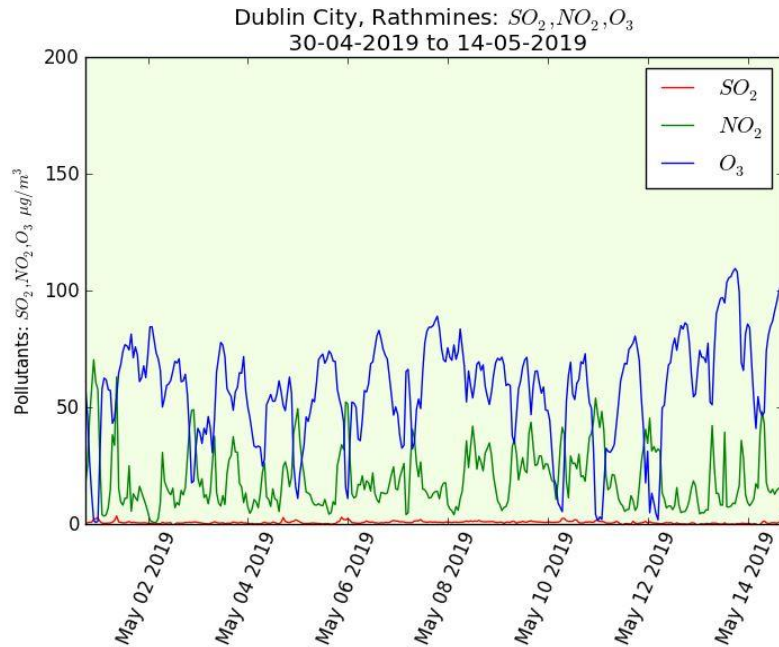
Official Statistic

- Comparable city-scale metric
- Derived from KPI
- Frequently evaluated against established thresholds for health, urban vitality



Pollution Sensing and Air Quality

Air Quality Index for Health (AQIH)



<http://www.epa.ie/air/quality/data/>

Air Quality Index for Health Map Legend



Opacity of the Index Region Select Local Authority To Zoom



WHO

SO_2 350 $\mu g/m^3/hr$
 NO_2 400 $\mu g/m^3/hr$
 O_3 150 $\mu g/m^3/hr$



How frequently are limits passed?

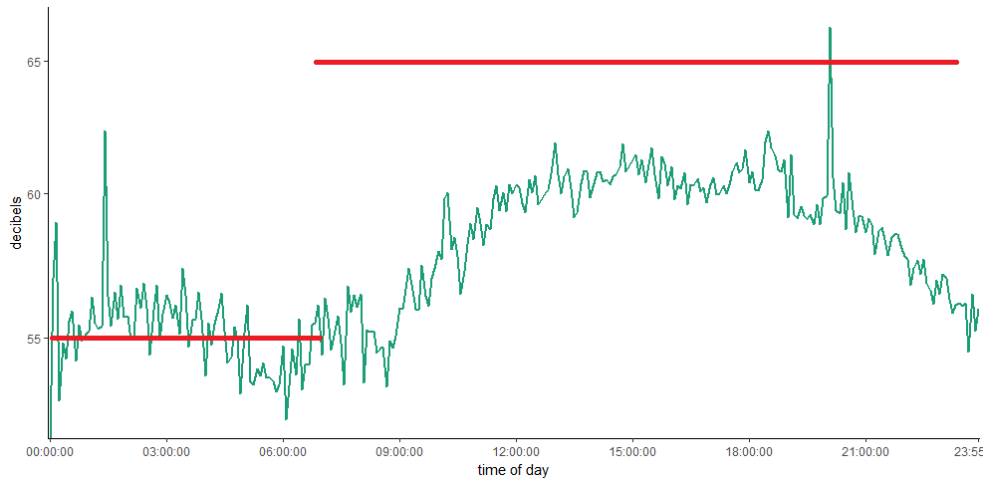


Using Official Standards

Official Aviation Guide Punctuality Report



WHO Unhealthy sound limits

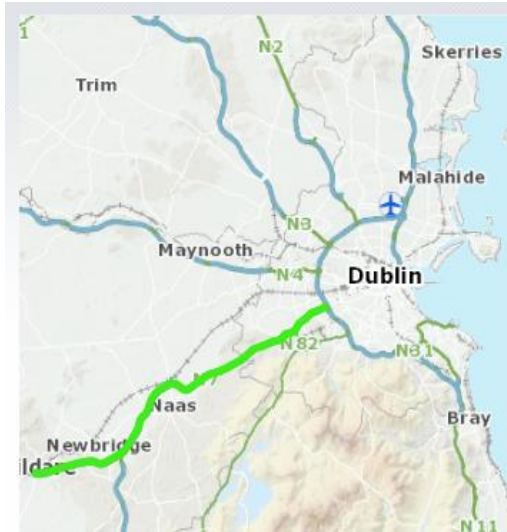


GLOBAL AIRPORT PERFORMANCE		On-time performance		No. flights	Size
	Airport	Departures	Rank		
SIP	Simferopol	98.4%	1	764	613
MSQ	Minsk International Apt	97.7%	2	1,880	346
ARI	Arica	97.6%	3	246	1,057
KRP	Karup	97.6%	4	311	986
USN	Ulsan	97.4%	5	351	939
TJM	Tyumen	96.9%	6	747	622
CCP	Carriel Sur Intl Apt	96.6%	7	477	808
VQS	Antonio Rivera Rodriguez Apt	96.6%	8	394	887
ROV	Rostov	96.2%	9	980	518
LDU	Lahad Datu	96.1%	10	155	1,183
TGU	Toncontin Intl Apt	95.8%	11	567	733
TTJ	Tottori	95.5%	12	155	1,185
YQH	Grande Prairie	95.4%	13	371	912

<https://www.oag.com/2019-airport-airline-on-time-performance-report>



Historical Record

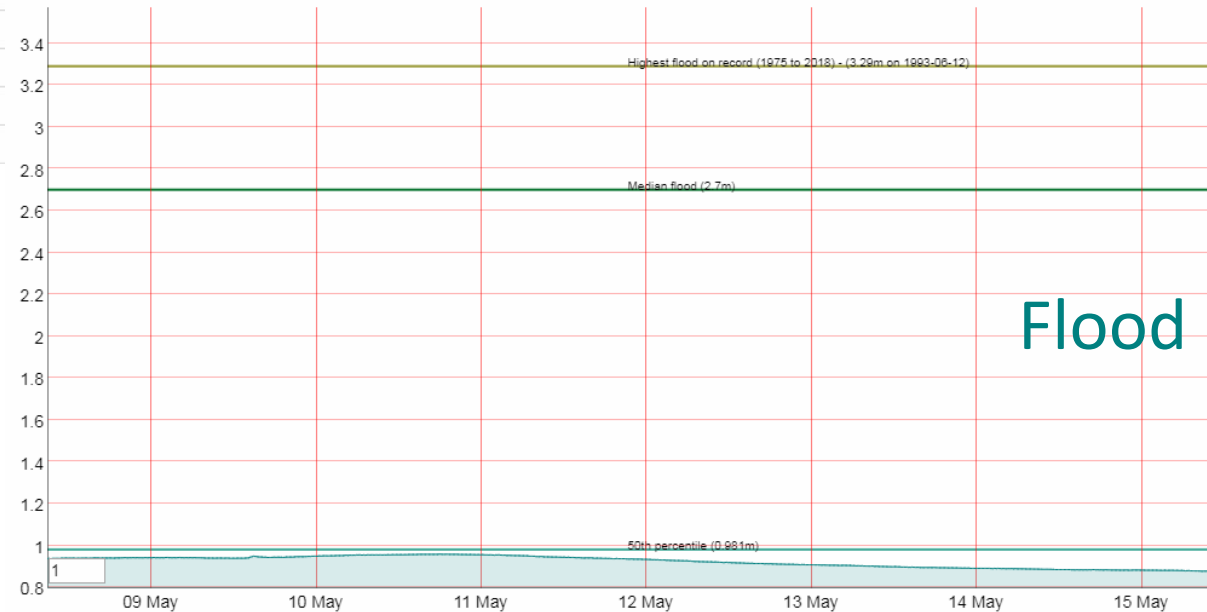


Travel Times

	M1	M2	M3	M4	M7	M50
M7					EASTBOUND WESTBOUND	
Status	From	To	Free-Flow Time	Current Time	Distance	
Light	J13 Kildare	J10 Naas South	9 min	12 min	17.02 km	
Light	J10 Naas South	J9 Naas North	4 min	8 min	6.80 km	
Light	J9 Naas North	J8 Johnstown	1 min	2 min	1.77 km	
Light	J8 Johnstown	J5 Athgoe	5 min	9 min	6.87 km	
Light	J5 Athgoe	J4 Rathcoole	3 min			
Light	J4 Rathcoole	J2 Kingswood	3 min			
Light	J2 Kingswood	J1 M50/N7	3 min			
Mild	J13 Kildare	J1 M50/N7	25 min			

Deviation from free-flow traffic time

Car park use



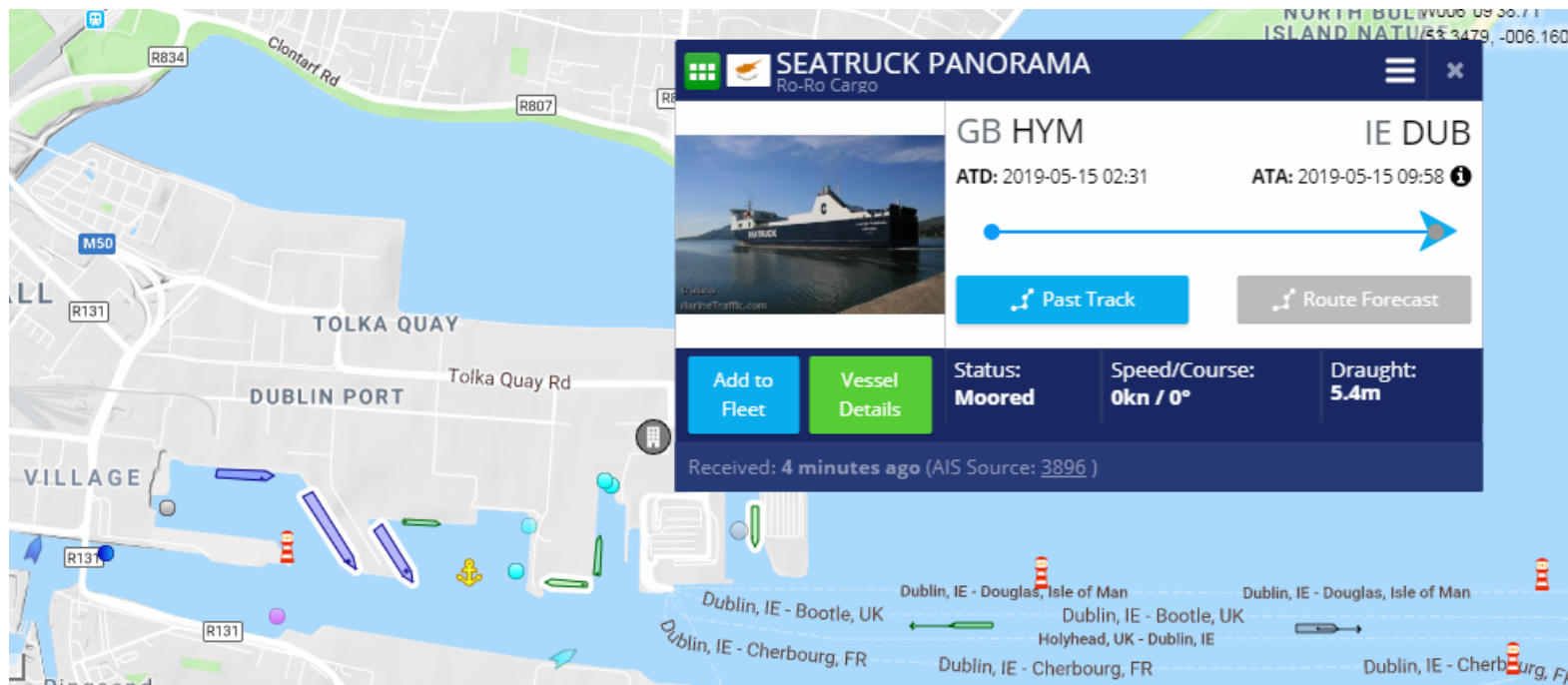
Flood level



Composite Statistics

Import/export activity

Green commuting



Marinetraffic.com

<http://smartdocklands.ie/project/forecasting-bike-movements-intelligent-reasoning/>



Conclusions

- Innovative + creative \neq suitable for official statistics
- Despite spatial detail, coverage is lacking
- Metadata standards (ISO, OGC, etc) are rarely followed
- Privacy is a minor issue, but...
- Pilot studies are done on data we have no access to
- Whose responsibility to maintain data quality?
- Collaboration between NSIs and data generators



We gratefully acknowledge funding from
Science Foundation Ireland
under the Investigator's Award Program.
Award number: 15/IA/3090



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A Note on CCTV

N11 / Trees Rd



Samuel Beckett Bridge



Dame St from Civic Offices

