Shaping the Future of Water Services

Building an Intelligence-based Water Industry

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Comhshaol, Pobal agus Rialtas Áitiúil
Environment, Community and Local Government

Introduction

- Background
- Drivers
- Making Information Work
- Systems
- Integration
- Current Status

Background

- Information age
- New technologies, intelligence is available
- Use the information, utility management, customer service
- Industry norms
- 2000 plants
- Fragmented network
- Central repository

Background

- Build on what's there
  - SCADA
  - Telemetry
  - MapInfo
  - CIS
  - GIS
  - AMR
- Consolidate
- Gather information once
- Develop expertise
- Manage and take control of change

Drivers

- Diminishing budgets, increased expectation
- Staffing, capture institutional knowledge
- Inventory management
- Inform decision making
- Customer focus
- Social media

Drivers

- Forward planning
  - Drinking Water Safety Plans
  - Emergency response, e.g. storm Darwin
  - Water Framework Directive
  - Development plans
- Stakeholder Expectation
  - EPA
  - CER
  - HSE
  - DECLG
  - Customers, domestic and non-domestic

Making Information Work For Us

- Operations and maintenance
- Asset management
- Catchment management
- Incident management
- Customer information, advice
- Above ground, plants
- Below ground, networks

Requirements – Above Ground

- Plant maintenance, planned
- Plant alarms, monitoring
- KPI's, real time information
- Quality control
- Compliance, managing, reporting
- Operating performance, costs, optimisation
- Energy management
- DW demand management
- Storm flows management
- Investment intervention, planning

Requirements – below ground

- Network management
- Pressure, flows, bursts, blockages, overflows
- Metering, DMAs
- Water Conservation
- Industrial inputs
- Mapping
- Investment intervention, planning
- Facilitate development, housing, employment

Key Systems

- Telemetry/SCADA
  - *Monitoring*
  - *Alarms*
  - *Control*
  - *Remote Asset Management*
- Asset Management System - Maximo.
  - *Work Order generation and tracking*
  - *Maintenance Tracking – Planned & Reactive*
  - *Repository of Information on Assets (Above Ground)*
- Modelling.
  - *Wastewater*
  - *Water*
- GIS – Arc GIS for Water Utilities (AG4WU).
  - *Repository for Information on Assets (Below Ground)*
  - *Visualisation & Reporting – Work, Incidents, Bursts, any Spatial Data.*
  - *Closely integrated with Maximo.*

Telemetry/SCADA

- Initial Phase - Connecting into many County-wide SCADA systems and Dublin Region Telemetry System – view initially
- Approx. 6 Suppliers, cover/partly cover 32 out of 34 LAs
- Establish National Control Centre - Operations
- Next Phase – extract data from these systems and input to IW Database – produce reports National/Regional/County/Site
- In parallel - Engaging with Telemetry Expert Consultant to define strategy for National solution
- Develop National system

- **Operational View; Incident Management; Alarms; Automation; Asset Performance.**

Maximo

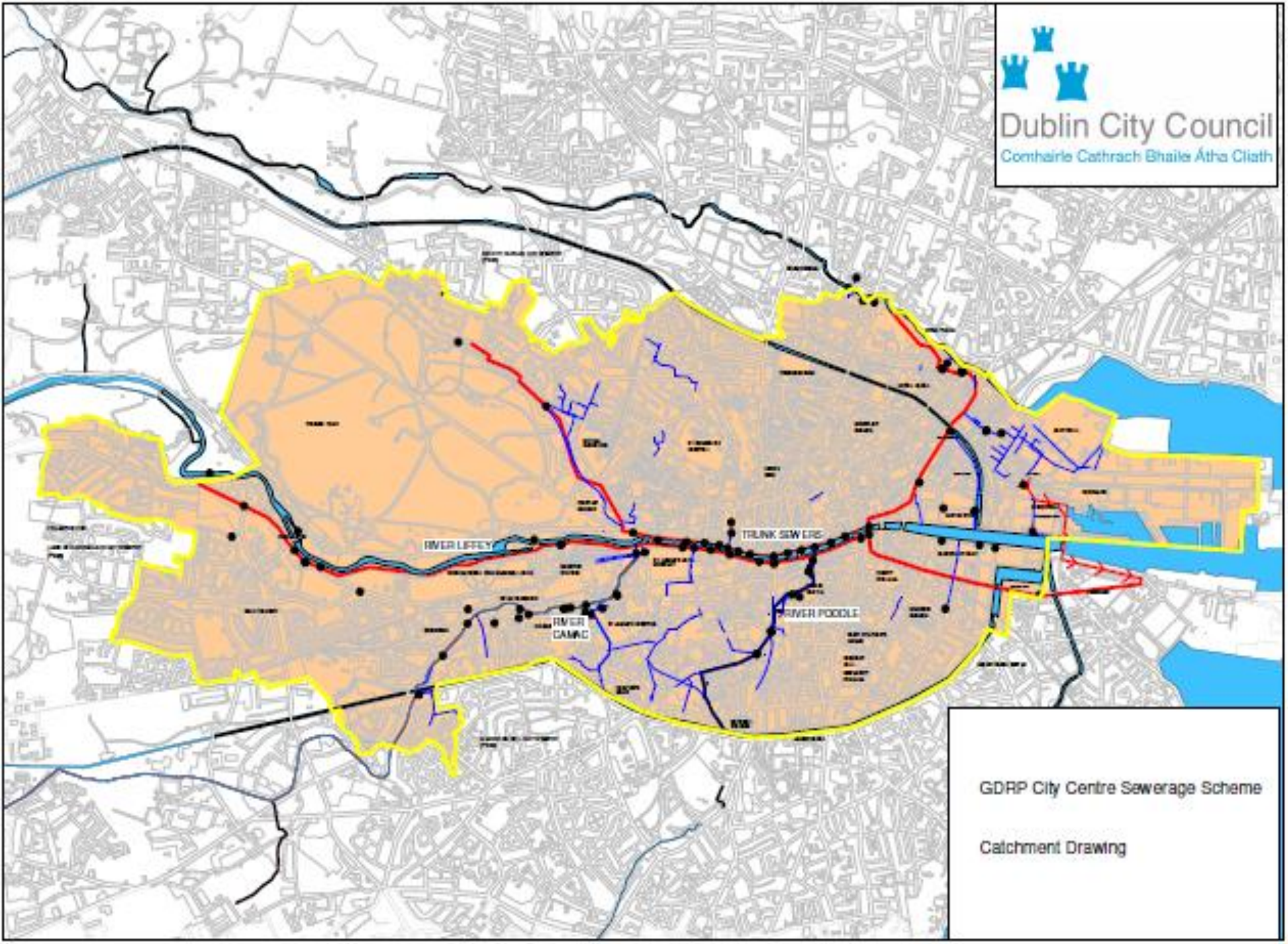
- Has gone live with all LAs
- 5 Pilot Counties currently gathering Asset Information (Cavan, Fingal, Cork City, Carlow, Westmeath)
- Hand-held units being trialled – easier data collection – X-Y co-ordinates.
- Preventative Maintenance plans being collected/prepared.
- Aligning this with GIS data model

- **>7,700 Above Ground Asset (Installations)**
- **Manage Work and Monitor Asset Performance**

Modelling

- Two Specialist Modellers – One Water & One Wastewater.
- Three Modeller each at present
- Already working on
  - *Updating of Dublin Region Water Models*
  - *Rathmines & Pembroke Sewer brief*
  - *Dublin City Centre Drainage models – involved in brief & auditing*
- Cataloguing models submitted in Fact Finding
  - *154 Water Models.*
  - *110 Wastewater Models*

- **Supports Planning/New Connections**
- **New Investments**
- **Risk Assessment**


Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath
RIVER LIFFEY
TRUNK SEWERS
RIVER CAMAC
RIVER POODLE
GDRP City Centre Sewerage Scheme
Catchment Drawing

Irish Water Enduring GIS – - High Level Overview

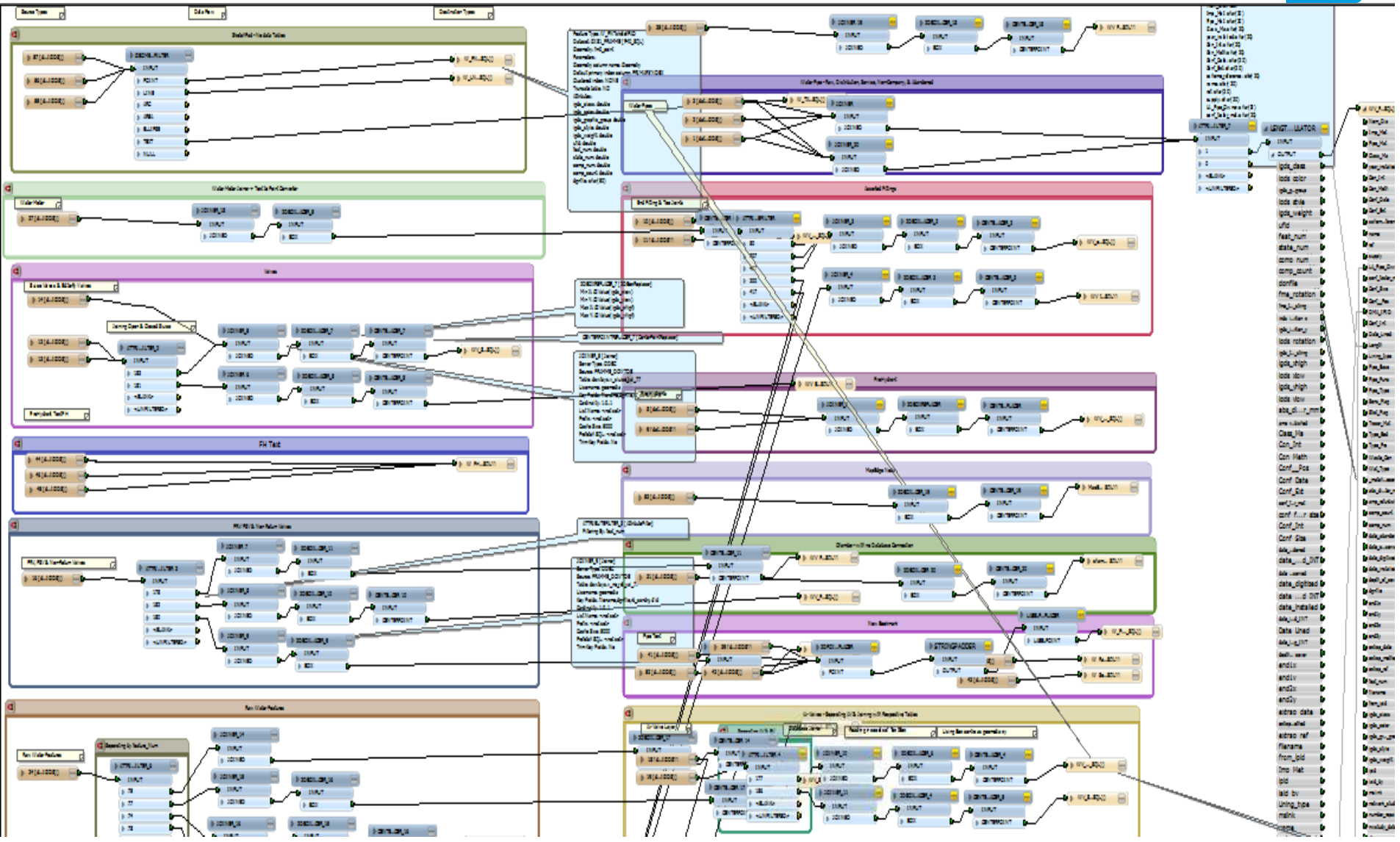
- The solution is ESRIs ArcGIS for Water Utilities; a water utility configuration that sits on top of the ESRI ArcGIS platform.
- The solution is a Commercial off the shelf (COTS) product.
- The solution caters for Drinking Water, Waste Water and Storm Water GIS assets.
- The solution is an Enterprise GIS comprised of Desktop, Mobile and Web Based Applications (web maps). Extensive use will be made of the ArcGIS Online Portal.
- The solution went live on 25th August and is available to Water Services in all Local Authorities.

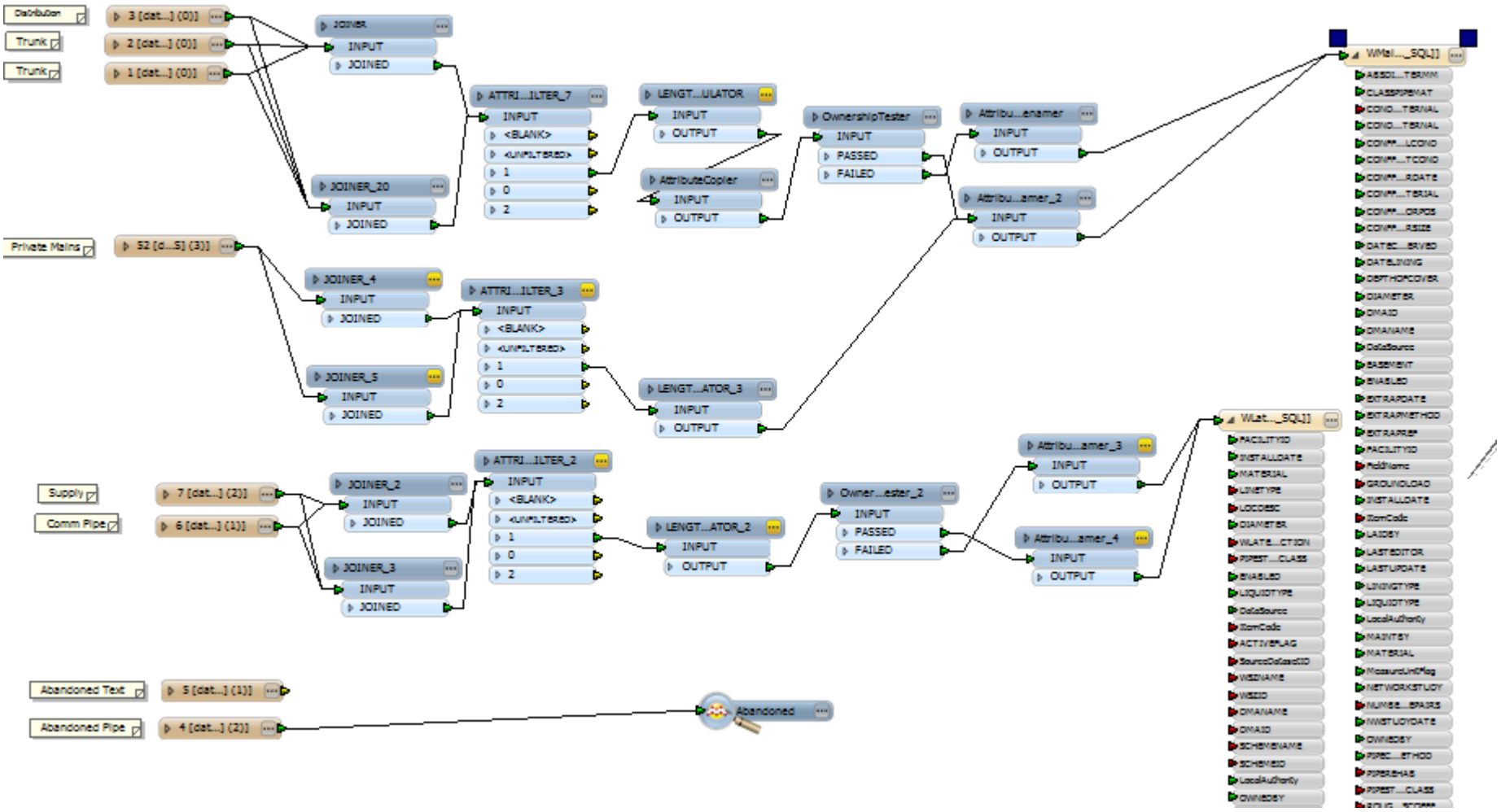
GIS - Data

- Data Migration
  - *Based on data submitted up to 2nd May 2014*
  - *34 LAs; 11 different formats Water; 10 formats Drainag*
  - *CIS 2 & 4, Mapdrain, FRAMME, SuS25, etc*
- Collected Drainage data from Survey Contractors
  - *USA, Precision, Environmental Techniques, McAllister*
- Integration of GIS & Maximo data

- **Supports all Operational activities**
  - ***Leakage***
  - ***Metering***
  - ***Planned Maintenance***
  - ***e.g. Age of mains – planned replacement***

UISCE ÉIREANN : IRISH WATER

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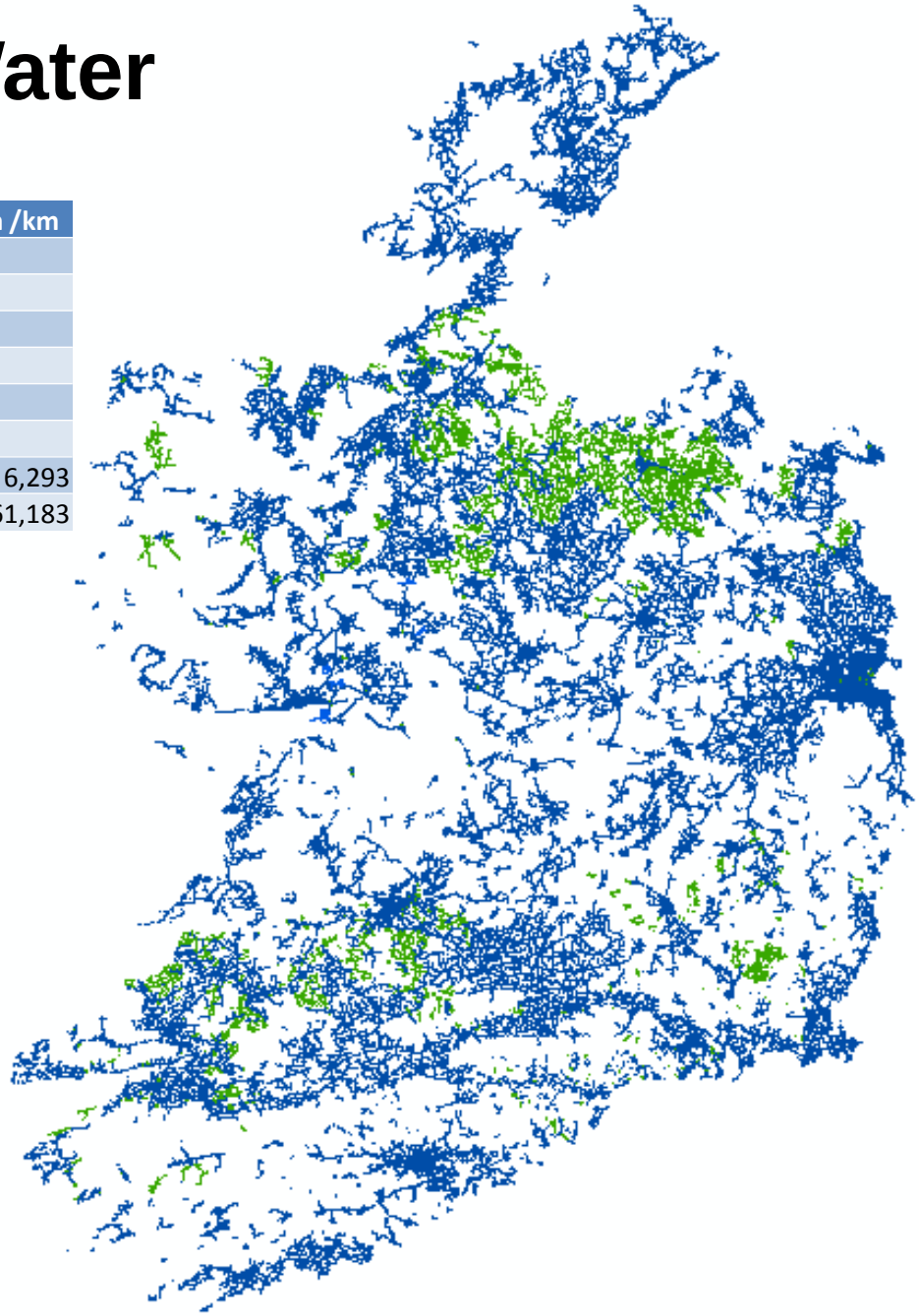
GIS Team – Post Go-Live

- Top Priority – updating Agglomerations, WSZs and DMAs.
- Engage with LAs for data collection/updating
  - *Dealing with Digitising backlog – data freeze – RPS Digitising Team lined up – already on Framework*
  - *Missing Data/Poor Quality data – Source/Survey*
  - *Training the LA Digitising Teams*
  - *Day to Day Support*
  - *QA/QC of all digitised Data*
  - *Set up LA User Group*
- Engage with IW Business for GIS-Related Services
  - *Set Up IW User Group*
  - *Service Requests for spatial data*
  - *Advice/Support for Data Mining and Presentation of Data*

Feature Counts -Water

Water Below Ground

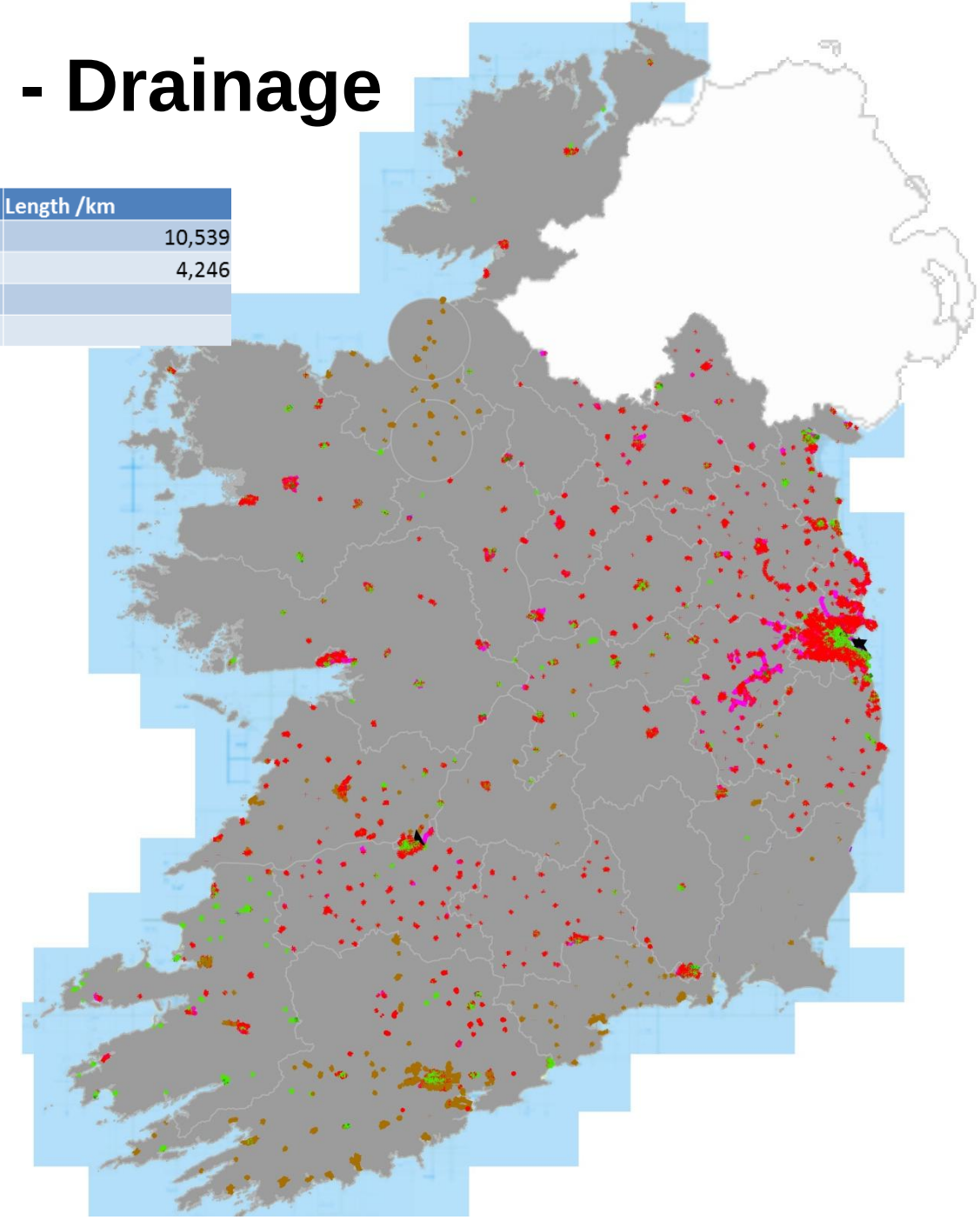
Selected Feature Class	Feature Count	Length /km
Air Valve	34,479	
Fittings	493,798	
Flow Control Valves	2,932	
Hydrants	148,451	
Network Meters	28,221	
System Valves	229,623	
Laterals (Service/Comm)	307,003	6,293
Water Mains (of which 6,055Km Private)	713,390	61,183



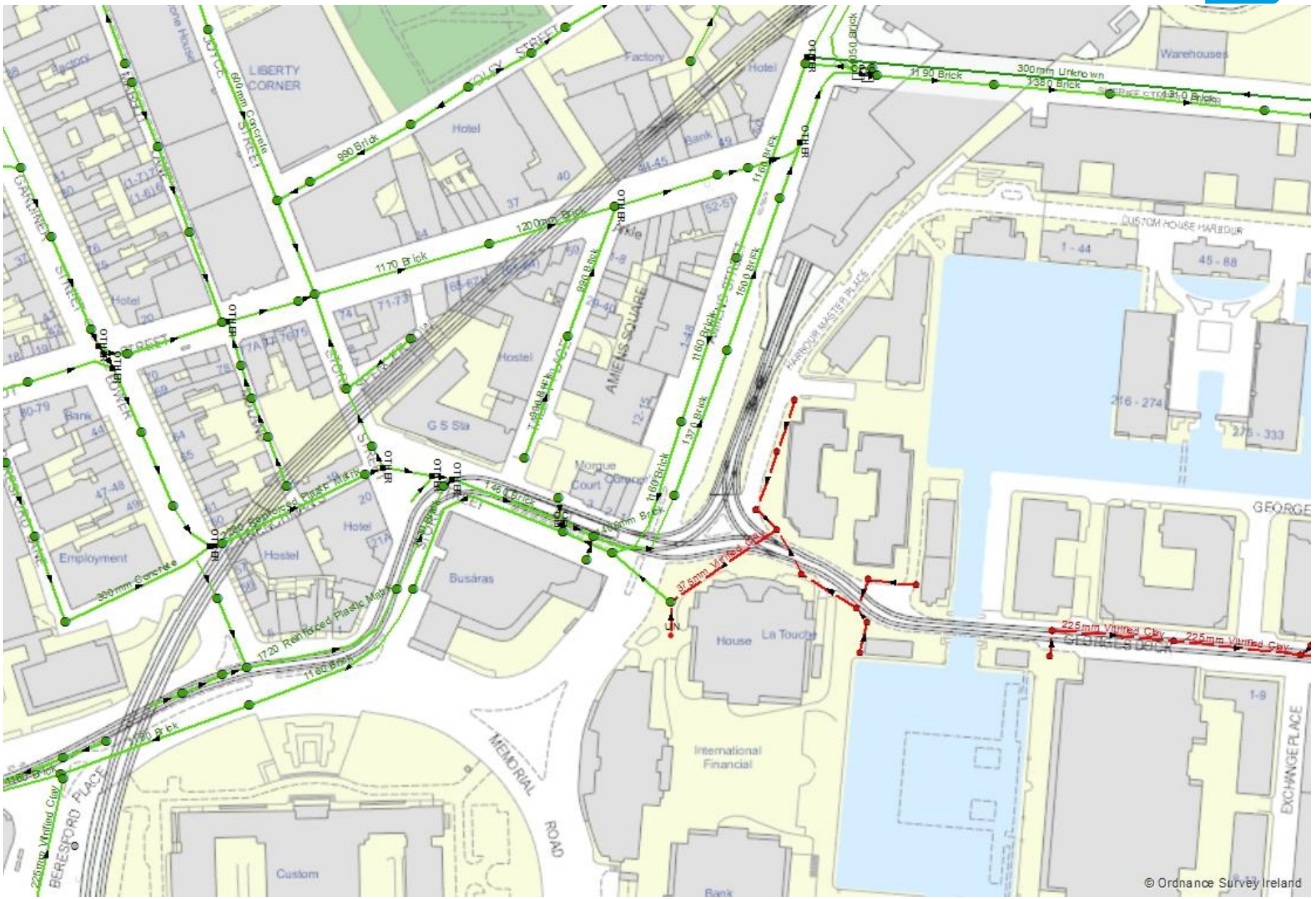
Feature Counts - Drainage

Waste & Surface Below Gorund

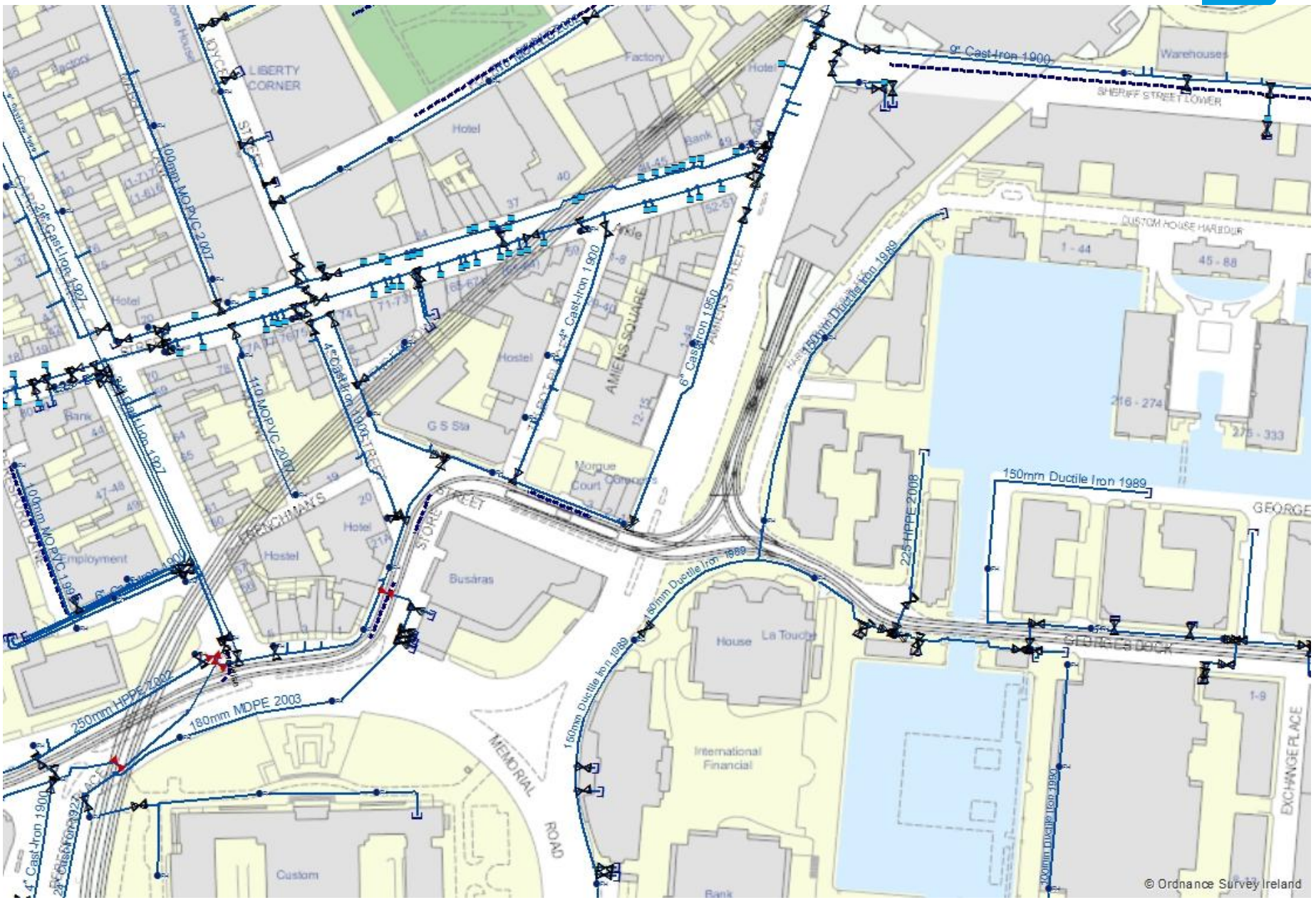
Selected Feature Class	Feature Count	Length /km
Combined & Foul Sewer	248,525	10,539
Surface Water Sewer	113,952	4,246
Combined & Foul Manholes	253,642	
Surface Water Manholes	102,543	



Foul & Combined Data



Watermain Data



Water Distribution Material & Decade

Sum of Length	Column Labels									
Material	<1930	1930-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	>=2000	Unknown	Total length (m)
Asbestos	5,442,067	97,313	363,937	329,083	753,755	569,004	97,110	376,373		8,028,642
Cast-Iron	2,682,256	838,517	626,900	428,186	229,132	48,175	31,641	204,509		5,089,317
Cast-Iron Cement Lined		7				17				24
Concrete	16,895	17,409	124	12,014	9,763	32,720	284	174		89,384
Copper	487	72	161	23	15		18	6		781
Ductile Iron	608,611	6,247	4,625	5,101	71,774	111,977	313,238	925,414	725	2,047,712
Ductile Iron - Lined	550	27	61	353	16,973	75,632	44,446	98,057		236,099
GRP	3,574		1,788				62	1,215		6,638
Gun Metal	59		2,895	78	4,914	8	443			8,396
HDPE	2,426,382	3,971	16,574	80,096	437,885	532,279	386,340	1,954,616		5,838,144
Hepworth PE	786							6,595		7,381
HPPE	212,517	1	153	654	1,758	173	12,500	967,202		1,194,957
Lead	3,038	2,762	2,829	425	140			350		9,544
MDPE	96,248	862	1,586	27,942	18,744	19,084	45,861	142,191		352,518
MOPVC	22,377				4		33,626	375,366		431,374
PE	5,364		1,273	59	20	930	247	28,658		36,552
Profuse PE	3							926		928
PSC/PCC	8,100		1	109	3,610		343	31,695		43,858
PV	3,655							4,069		7,724
PVC-A	458							56,308		56,766
PVC-O								209		209
PVC-u	9,805		5,369	3,513	2,877	6,053	50,362	22,910		100,889
Spun Iron	12,382	348	7,421	17,785	964	892		97		39,888
Steel	12,419	10,949	5,551	6,690	580	812	400	1,042		38,443
Unknown	4,363,808	5,927	9,082	46,721	121,906	168,502	90,458	1,301,907		6,108,311
uPVC	12,283,157	68,627	479,810	1,906,992	3,656,125	2,959,720	2,873,122	6,499,339	333	30,727,227
GI - Galvanised Steel	756	182	359							1,297
HPPE/PE100					1			8,133		8,134
Total length (m)	**28,215,753**	**1,053,221**	**1,530,500**	**2,865,823**	**5,330,944**	**4,525,975**	**3,980,500**	**13,007,361**	**1,058**	**60,511,136**

Conclusions

- Many systems needed to deliver on Intelligence-Based Water Industry
- Vital for service delivery into the Future
- Good start has been made, but…
- A long way to go yet
  - *Data Poor/Missing - Data Gathering – never ending*
  - *Reliability – good quality & reliable flow*
  - *Data we can all depend on.*