

Making Sense of a Data Collection: “Historical” Engineering Data from the UCD School of Civil, Structural and Environmental Engineering

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Background: UCD Digital Library

- Created 2005-2009 as PRTL 3 project based in UCD Humanities Institute
- Organisational context reconceived following end of sponsored project
- Data model reconceived with digital preservation requirements in mind 2010-2011; data migrated to new technical infrastructure with official launch as “UCD Digital Library” in 2012
- A heterogeneous repository of cultural heritage and research data serving, primarily, the UCD community
- Awarded Data Seal of Approval in March 2015

Strategy to Support Research Data Management

- Modeling a research data management service
 - Metadata: special considerations (researcher identifiers, research roles, grant identification, dataset description)
 - Identifiers: DataCite DOIs, ORCID, linked data
 - Data: collection modeling (e.g., UCD Digital Library prototype, DSpace model, etc.)
- Engagement of research staff
 - Target successful, high-profile researchers with diverse funder support
 - Target data with high potential for secondary use

Urban Modeling Group, UCD

UCD School of Civil, Structural and Environmental Engineering

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About us

Pioneering technologies to manage and protect built heritage in urban settings'

The Urban Modelling Group (UMG) is based in the UCD School of Civil, Structural and Environmental Engineering at University College Dublin.

Professor Debra F Laefer heads this group and it formed in 2006 to bridge the efforts of the architectural heritage community and those of practising engineers by introducing, adapting, and generating new technologies to help safeguard built urban heritage.

In light of rapid increases in both urbanisation and subsurface construction, architectural heritage faces an unprecedented level of threat from tunnelling, adjacent excavation, blasting, dewatering, and vehicular vibration. To address these threats, Laefer's group of 14 researchers (three postdocs, ten doctoral students, and one master's student) comprise three teams: remote sensing, computational modelling, and technology development (currently focused on 3D printing).



European Research Council

Established by the European Commission



Fondúireacht Eolaíochta Éireann
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Options

Citation export >

Metadata >

laefer


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Urban Modelling Group (UMG)

Abstract: The Urban Modelling Group (UMG) is based in the UCD School of Civil, Structural and Environmental Engineering at University College Dublin. Professor Debra F Laefer heads this group and it formed in 2006 to bridge the efforts of the architectural heritage community and those of practising engineers by introducing, adapting, and generating new technologies to help safeguard built urban heritage.

Urban Modelling Group (UMG) [Host institution] (UCD School of Civil, Structural and Environmental Engineering)– Pioneering technologies to manage and protect built heritage in urban settings

University College Dublin  [Host institution]

Laefer, Debra L.   [Research team head] (University College Dublin)

Lynch, Eilish [Research manager]

Truong-Hong, Linh  [Research team member] (University College Dublin)

Al-Sabah, Salam  [Research team member] (University College Dublin)

Byrne, Jonathan  [Research team member] (University College Dublin)

Environmental Protection Agency  [Funder]– ERTDI Programme 2000-2006 Sub-Measure 2

European Research Council  [Funder]

Science Foundation Ireland  [Funder]– Principal Investigator Career Advancement (PICA) Programme

Heritage Council (Ireland)  [Funder]

Irish Research Council for Science, Engineering and Technology [Funder]

University College Dublin. Library  [Repository]



Collection contents ☰


1. Aerial laser scanning (ALS) data collected over an area of around 1 square km in Dublin city in 2007
2. Dataset describing attributes and condition of 449 buildings in Dublin, Ireland, compiled in 2013.
3. HIBERNIA
4. Dataset comprising photographic documentation of 444 buildings in Dublin, Ireland
5. Remote sensor imagery collected over an area of around 1 square km in Dublin city in 2007

Data types: observational data

- LiDAR (Light Detection and Ranging): LAS format
- Remote sensing imagery (Fugro FLI-MAP Flip-7 proprietary data + Enhanced Compression Wavelet (ECW) files
- Excel spreadsheets: building attributes from site survey
- Photoshop images: multi-layer image files in PSD format; primary image is a composite, orthorectified image of a building façade
- And then there is ...

Case Study: HIBERNIA

Historic Ireland's Built Environment and Road Network Inventory Access



HIBERNIA

Historic Ireland's Built Environment and Road Network Inventories Access

April 13, 2015 School of Architecture Landscape & Civil Engineering University College Dublin

- ▶ Inventory of Buildings
- ▶ Inventory of Streets
- ▶ HIBERNIA Help
- ▶ links
- ▶ contact

WELCOME TO HIBERNIA

Historic Ireland's Built Environment and Road Network Inventory Access (HIBERNIA) is a web enablement of two earlier inventories: the Dublin Environmental Inventory and the Dublin Docklands area master plan inventory (both undertaken by the School of Architecture, Landscape and Civil Engineering, University College Dublin). The combined inventories include historical, geographical, and architectural information collected from 1993 to 1995 for 1,280 of Dublin's buildings.

Information for each building is presented in a single record comprised of its location, orthogonally correct photographs, and a detailed descriptions of its history, architecture, unique features, as well as bibliographic references. The information was recovered from digital and paper archives and has been integrated into a queryable database. This new resource should be of significant interest to historians, planners, and design professionals, as well as the general public.

The inventories can be queried using all of the fields presented. This allows users to search for a particular address, a buildings from a particular period or construction type and evaluate heritage relevance.

<http://www.ucd.ie/hibernia/>

“... a web enablement of two earlier inventories: the Dublin Environmental Inventory and the Dublin Docklands area master plan inventory (both undertaken by the School of Architecture, Landscape and Civil Engineering, University College Dublin). The combined inventories include historical, geographical, and architectural information collected from 1993 to 1995 for 1,280 of Dublin’s buildings.”

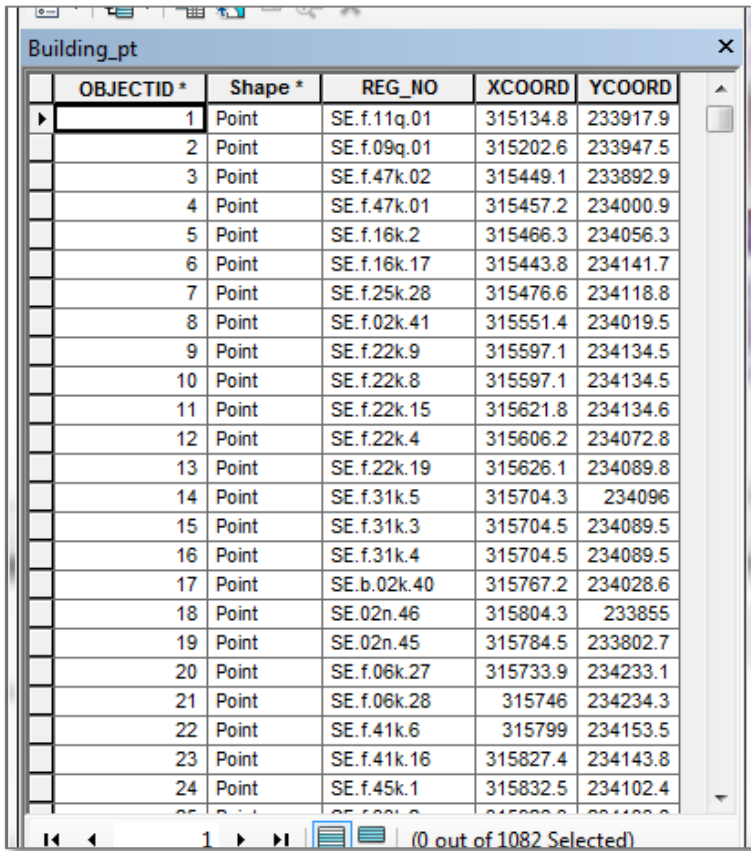
Access to Data Sources

- FMPro data source:
 - Issues with access to server resource, password access to FMPro
- Communications about data access and state of data were extensive
- Databases: FMPro 7, FMPro 12
 - Documentation of attributes of 1280 structures & 80 streets
- GIF and JPEG images
- Geospatial data

Evaluation of Data

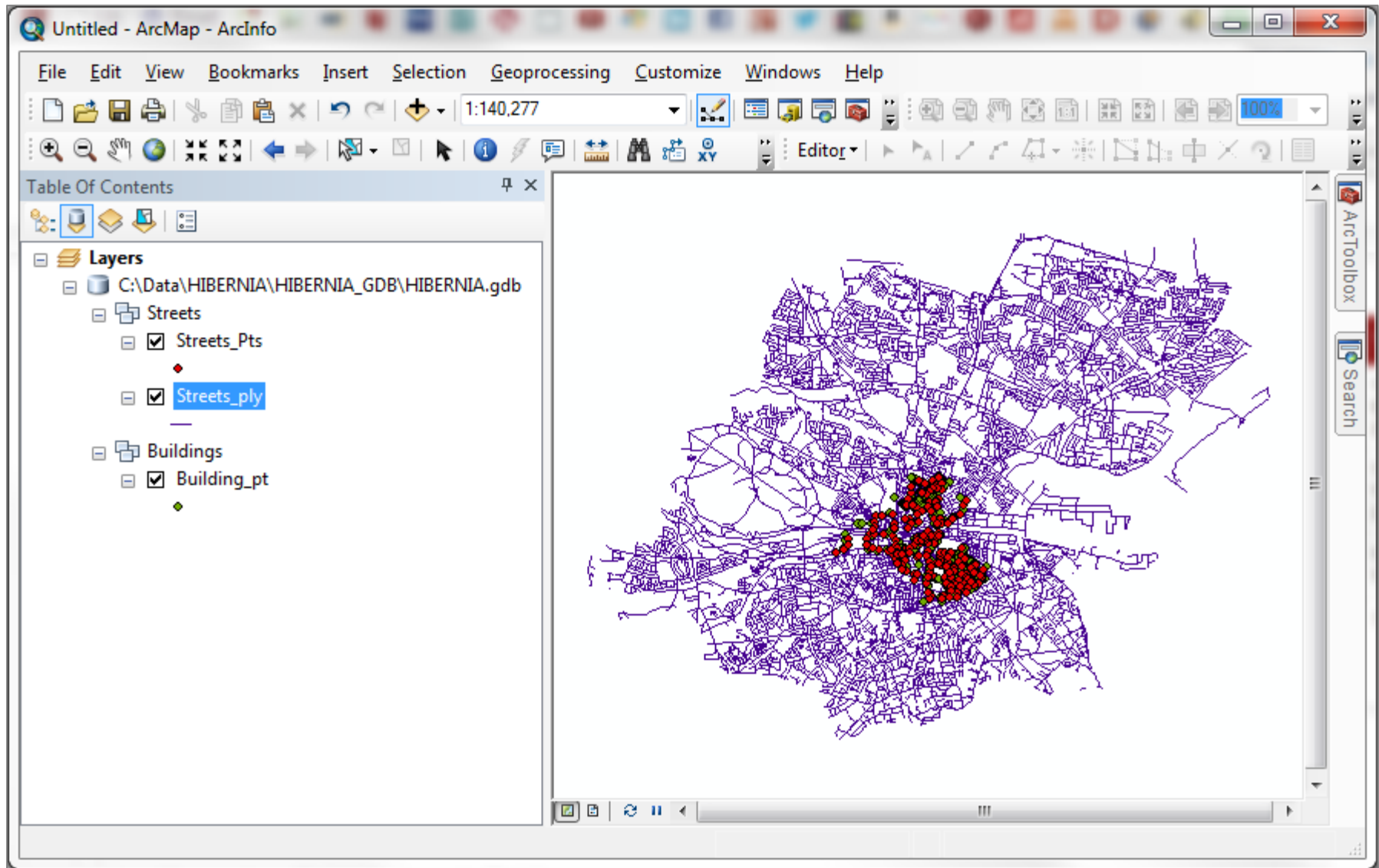
- FMPro data source:
 - Issues with access to server resource, password access to FMPro
 - Original database in FMPro 4 format, no longer available
- Descriptive metadata: issues of consistency
- Image Data: GIF and JPEG images
 - Images of 1059 of 1280 structures
 - Images are orthorectified and low resolution; infer that these were derived from other source images, now missing
 - No images of streets, presumed lost
 - Secondary source references images on photoCD
- Geospatial Data:
 - Street point, street lines and building points layers

logical linkages lost



OBJECTID*	Shape*	REG_NO	XCOORD	YCOORD
1	Point	SE.f.11q.01	315134.8	233917.9
2	Point	SE.f.09q.01	315202.6	233947.5
3	Point	SE.f.47k.02	315449.1	233892.9
4	Point	SE.f.47k.01	315457.2	234000.9
5	Point	SE.f.16k.2	315466.3	234056.3
6	Point	SE.f.16k.17	315443.8	234141.7
7	Point	SE.f.25k.28	315476.6	234118.8
8	Point	SE.f.02k.41	315551.4	234019.5
9	Point	SE.f.22k.9	315597.1	234134.5
10	Point	SE.f.22k.8	315597.1	234134.5
11	Point	SE.f.22k.15	315621.8	234134.6
12	Point	SE.f.22k.4	315606.2	234072.8
13	Point	SE.f.22k.19	315626.1	234089.8
14	Point	SE.f.31k.5	315704.3	234096
15	Point	SE.f.31k.3	315704.5	234089.5
16	Point	SE.f.31k.4	315704.5	234089.5
17	Point	SE.b.02k.40	315767.2	234028.6
18	Point	SE.02n.46	315804.3	233855
19	Point	SE.02n.45	315784.5	233802.7
20	Point	SE.f.06k.27	315733.9	234233.1
21	Point	SE.f.06k.28	315746	234234.3
22	Point	SE.f.41k.6	315799	234153.5
23	Point	SE.f.41k.16	315827.4	234143.8
24	Point	SE.f.45k.1	315832.5	234102.4

- No keys to interlink FMPro records with geodatabase (no column corresponding to REG_NO column in geodatabase)
- No metadata in FMPro database to provide pointers to image filenames
- Enquiries: these interlinking data lost in previous FMPro4 to FMPro 7 migration



what is the provenance of this dataset?

origins of the dataset

- Hint:
“a web enablement of two earlier inventories: the Dublin Environmental Inventory and the Dublin Docklands area master plan inventory “
- Research revealed that projects related to urban redevelopment had compiled significant data about urban buildings and streets via surveys, conservation assessment undertakings, photographic documentation; a GIS was reportedly created
- Projects had asserted the long-term benefits of the studies—creating benchmark data of urban infrastructure
- Most data cannot be accounted for: survey forms, GIS, etc.; some documentation in private archives

conclusions from evaluation

- Tabular data in FMPro database of historical value: unique documentation of building attributes from about a decade ago
- Image data: linking images with data would be a curation task; value depends on interlinkages
- Geospatial data: minimal value without record linking
- Clear relation with other datasets held suggests there would be value in further curation of the resource
- Further curation requires further research and could represent a significant effort with regard to staff time

preservation actions agreed

- Ingest source data (FMPro database files, file archive of image files) as received
- Derivatives from FMPro database:
 - XML file dump
 - CSV extract of database records
- Image files as received, downloadable in compressed file archive (Zip compressed)
- File manifest of image files

Options

[Citation export](#)[Metadata](#)

HIBERNIA : Buildings

Abstract: Information for 1,280 buildings in Dublin (Ireland) in various formats; also 1,074 associated orthorectified GIF and JPEG images in a single compressed file archive.

[UCD School of Architecture, Landscape, and Civil Engineering](#) [Sponsor]

[University College, Dublin. Library](#) ⓘ [Publisher]

[Heritage Council \(Ireland\)](#) ⓘ [Funder]

[University College, Dublin. Urban Institute Ireland](#) ⓘ [Funder]







[Morrish, Seán William](#) ⓘ [Compiler]

[Laefer, Debra L.](#) ⓘ ⓘ [Research team head]

[In collection →](#) [HIBERNIA](#)



Data available

#	Label	Extent	MIME type	Data
1	HIBERNIA : Buildings (tabular data, CSV format)	1 data file 1,934,837 bytes	text/csv	
2	HIBERNIA : Buildings (FileMaker Pro, version 7 XML dump)	1 data file 4,748,164 bytes	text/xml	
3	HIBERNIA : Buildings (FileMaker Pro database, version 7)	1 data file 1,581,450 bytes	application/zip application/octet-stream	
4	HIBERNIA : Buildings (FileMaker Pro database, version 12)	1 data file 1,599,106 bytes	application/zip application/octet-stream	
5	HIBERNIA : Buildings images (orthorectified image files)	1,074 digital still images 770,308,117 bytes	application/zip image/gif image/jpeg	
6	HIBERNIA : Buildings images (file manifest)	1 data file 64788 bytes	text/csv	

potential for further curation

- Collection issues:
 - Images made from film photography; source identified and new imaging work possible
 - Potential of restoring linkages between data tables and images
 - Potential for geocoding of locations
- Repository issues:
 - Interlinking related objects in other collections
 - References to related external documentation: registries of protected structures, historical monuments, geonames, OSM, etc.

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