

Visualising City Data on the Web with FOSS

Liam O'Sullivan

Building City Dashboards

National Centre for Geocomputation, MU



Building City Dashboards

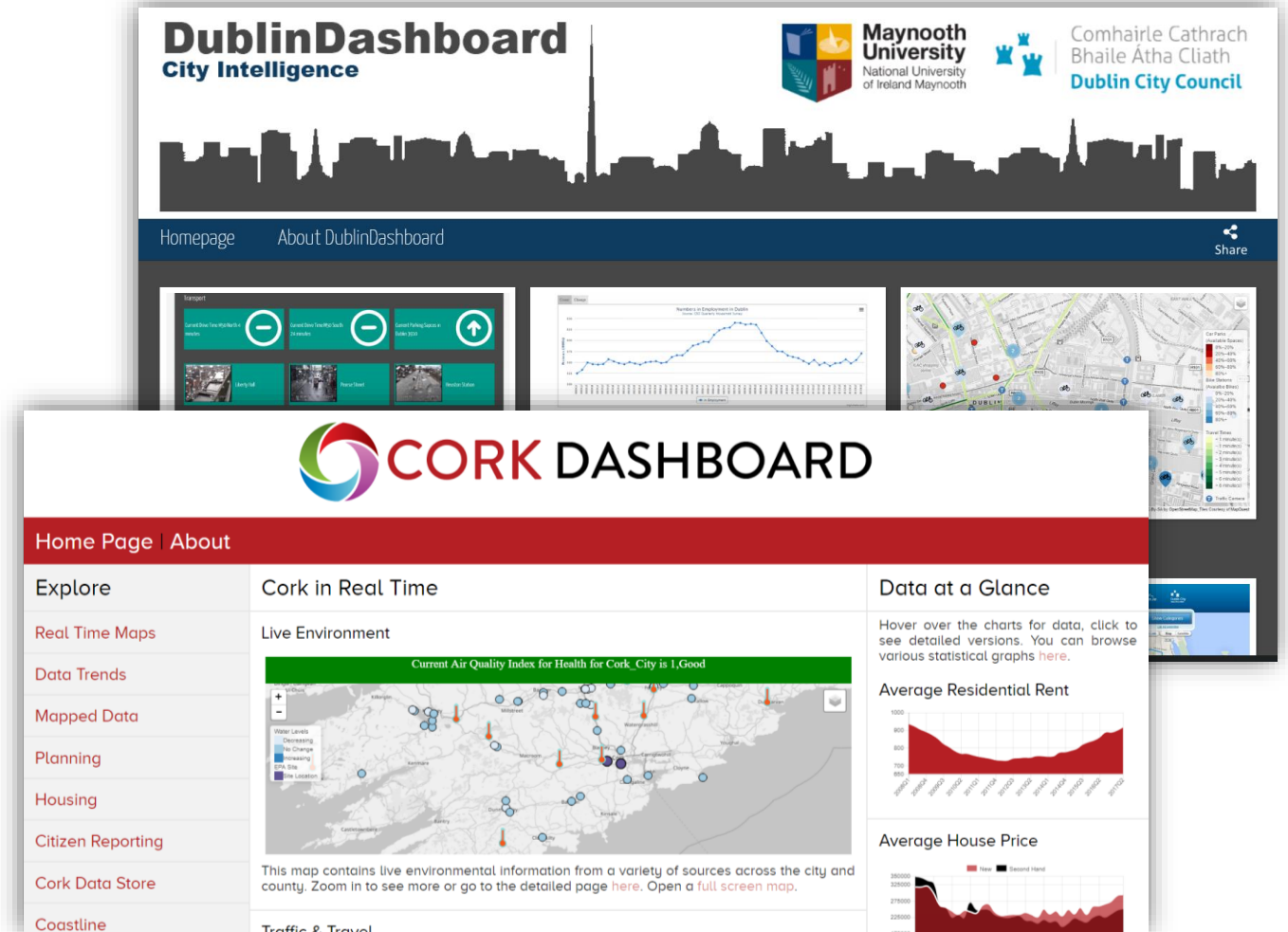
Data | **Visualization & Interaction** | Analytics & Modelling

Goal: distributable FOSS
codebase to facilitate rapid
prototyping of custom city
dashboards

Low cost, low maintenance

Inform best practice

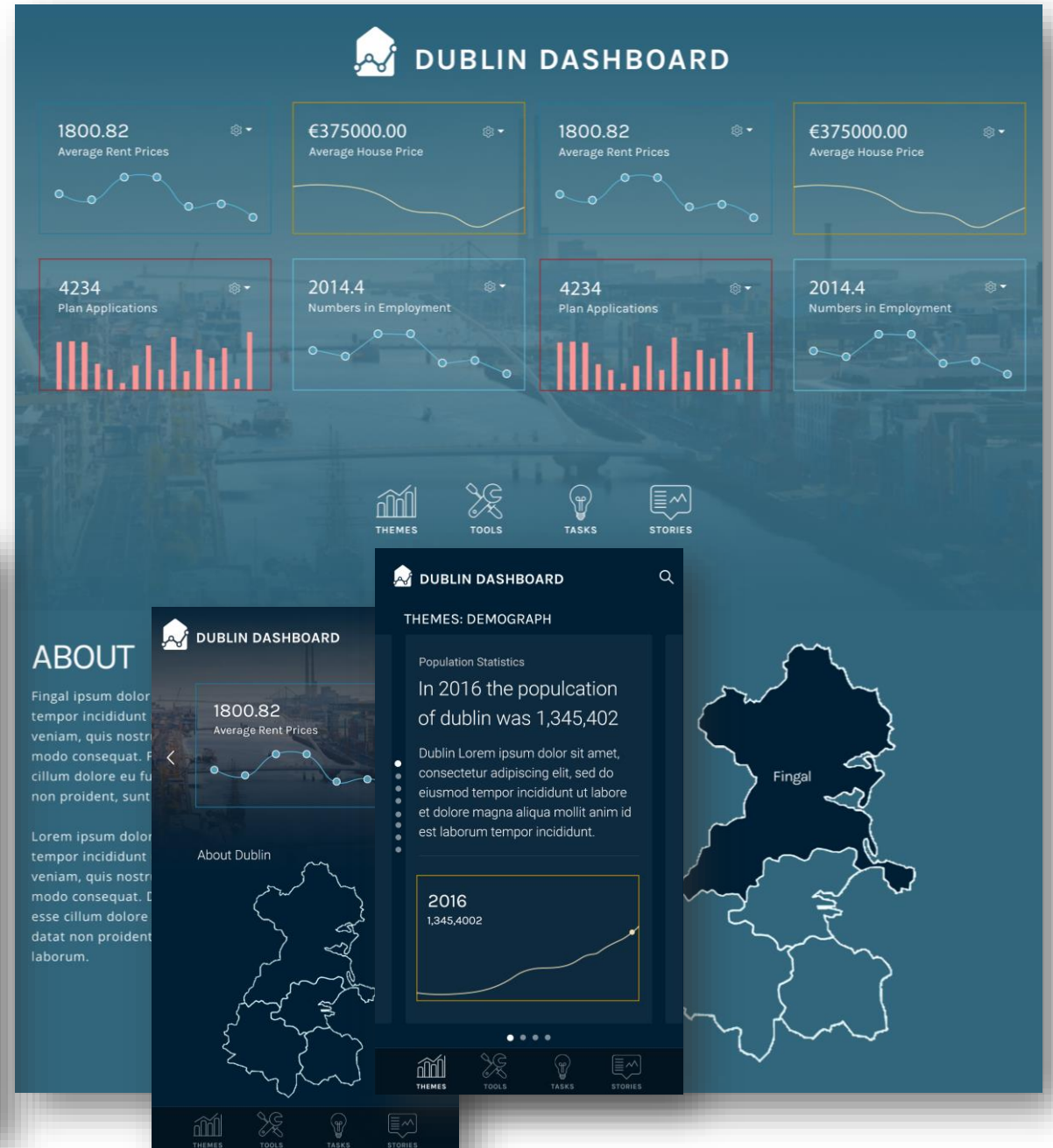
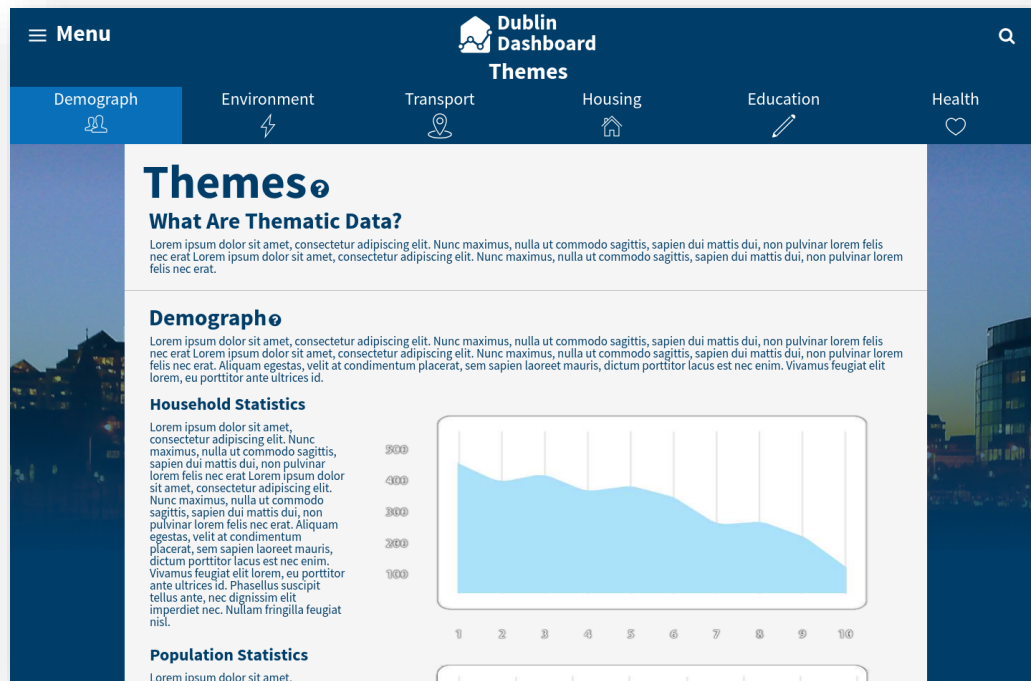
Specify framework



Dashboards Redesign

Informed by user research

Modular visualization components fit within the overall website structure



Design

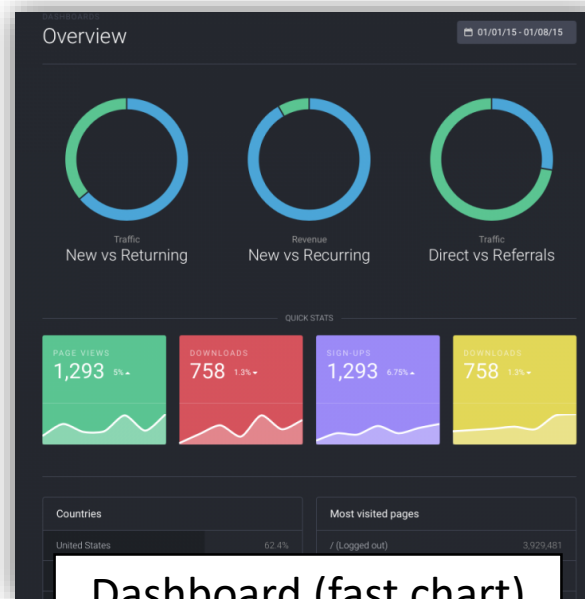
*Explanative
(communication of insights)*



Data stories

Novice | Casual

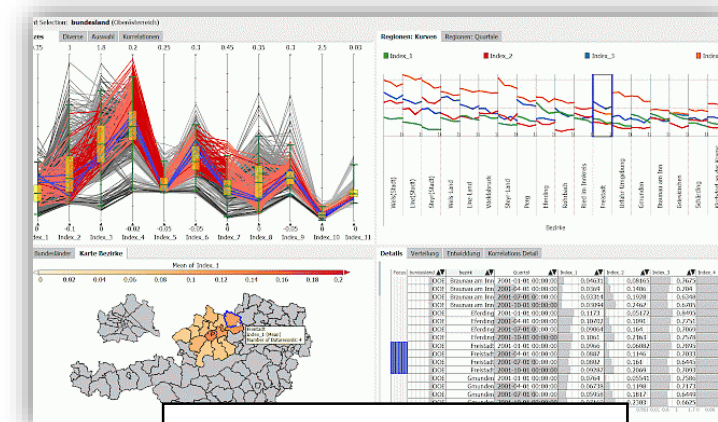
Increasing Visualization Complexity



Dashboard (fast chart)

End-user | Professional

*Explorative
(discovery of patterns)*



Analytic (slow chart)

Advanced | Professional

Increasing Contextual Information

Approach

- Linked interactive visualizations of various types including maps and geospatial, with contextual information in the form of adaptive text.
- Levels of complexity/ sophistication to cater to multiple user types and tasks.
- A single common programming technology; client-side rendering with JavaScript (offers benefits for small teams e.g. JS software stack)

Dublin Health Centers

The map shows the locations of a variety of health service types across the county, including hospitals, pharmacies, dentists etc.

Currently showing

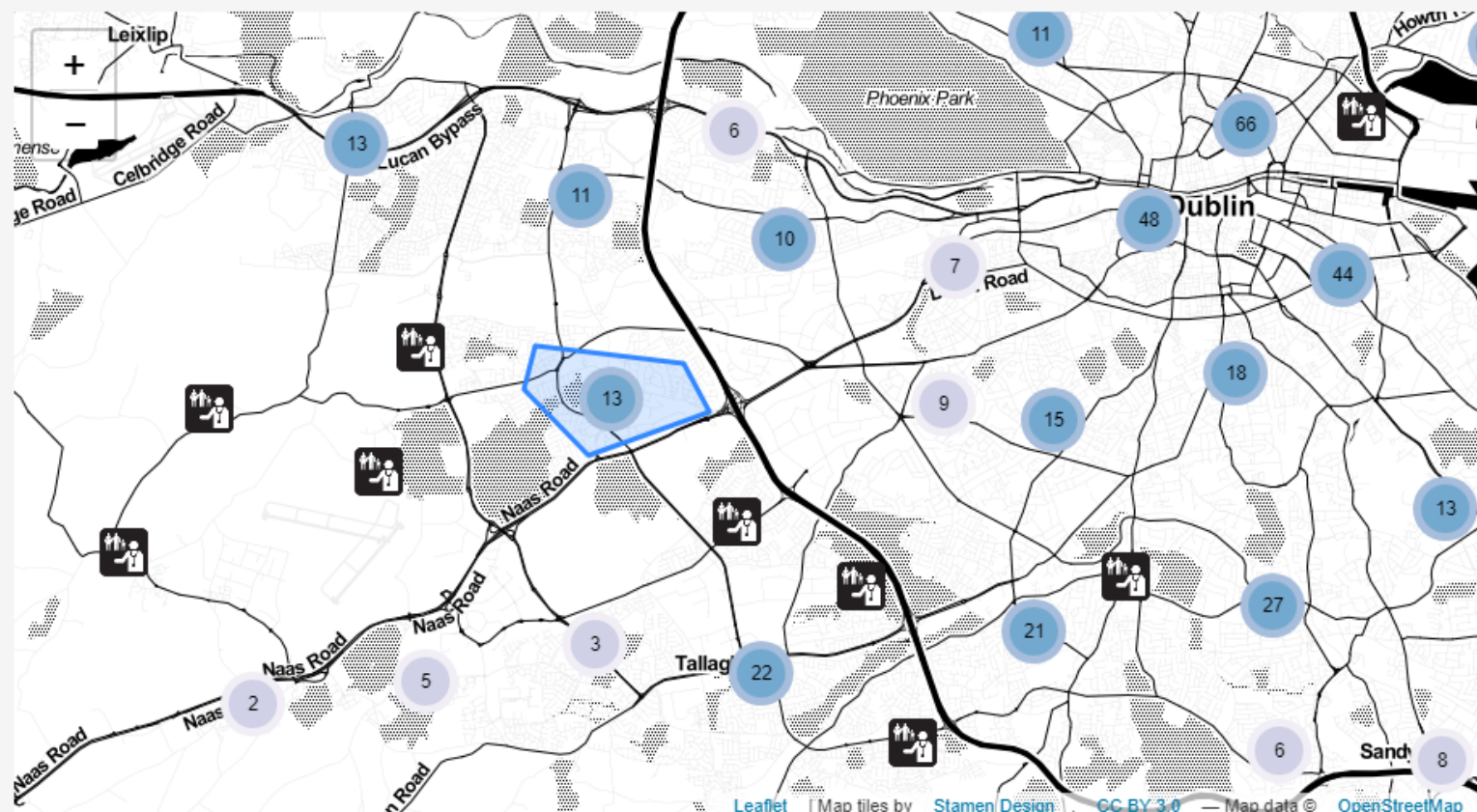
638

**general
practitioners**

out of a total of

1,463

health locations.



Hospital



General Practice



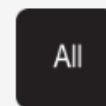
Dentist



Pharmacy



Health Center



Show All

Dublin Hospital Waiting Lists

The chart currently shows waiting periods over time for **Diabetes Mellitus**, at **St. James's Hospital**, for patients **aged 16-64 years**.

Do you have an upcoming treatment or procedure? You can see how long people have waited for it by selecting options from the menus below.

Choose your treatment type or specialization:

[Reset](#)

Diabetes Mellitus: 210 ▼

Choose your age range below:

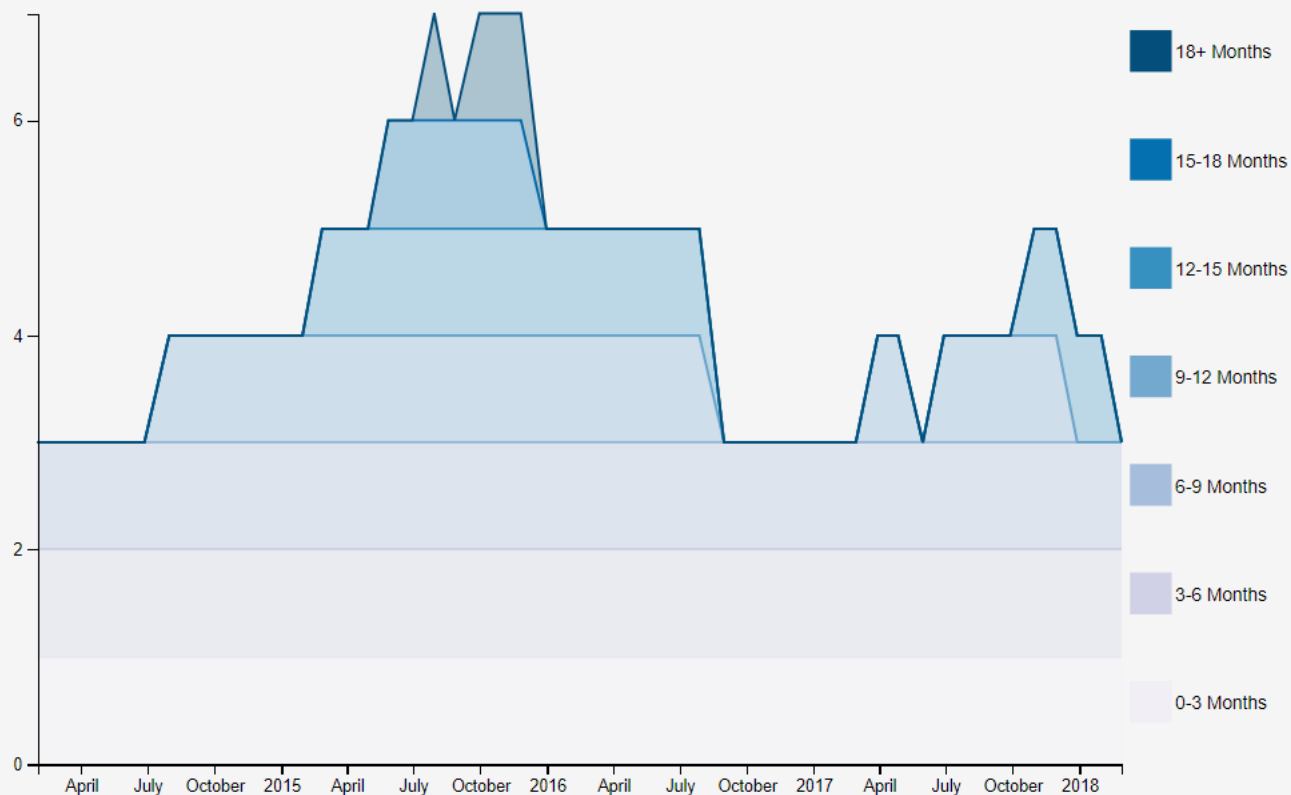
[Reset](#)

16-64: 210 ▼

Choose a hospital:

[Reset](#)

St. James's Hospital: 210 ▼



Workflow for Client-Side Prototyping

Offline data cleaning and preparation – **OpenRefine**

Data import – **d3.js, AJAX**

Data manipulation – **d3.js, crossfilter.js**

Map creation – **Leaflet, OpenStreetMap**

Chart creation – **d3.js, dc.js, chart.js, plotly.js**

Styling, layout, interaction – **HTML, CSS (grid), JavaScript**

The Good

FOSS

High quality graphics and interaction

Extensibility, 'leaky abstractions', SVG and JS underpinning

Community

The Bad

Learning curve, requires JavaScript and web knowledge

Versioning; often deprecates features, breaks older code (e.g. D3)

Crossfilter and dc.js;

- Not easy to create charts which are not part of the standard set

- Limited documentation

- Data-wrangling e.g. NaNs in your dataset will cause problems.

Resources

Crossfilter & dc.js

<https://github.com/crossfilter/crossfilter/wiki>

<https://github.com/crossfilter/crossfilter/wiki/Crossfilter-Gotchas>

<http://animateddata.co.uk/articles/crossfilter/>

<https://dc-js.github.io/dc.js/docs/stock.html>

<https://www.codeproject.com/Articles/693841/Making-Dashboards-with-Dc-js-Part-1-Using-Crossfil>

D3.js

<https://d3js.org/>

liam.osullivan@mu.ie

@ffrink  @dashbuild

Coming soon:

<https://dashboards.maynoothuniversity.ie/#the-blog>

Thanks!