# EPSRC Digital Economy

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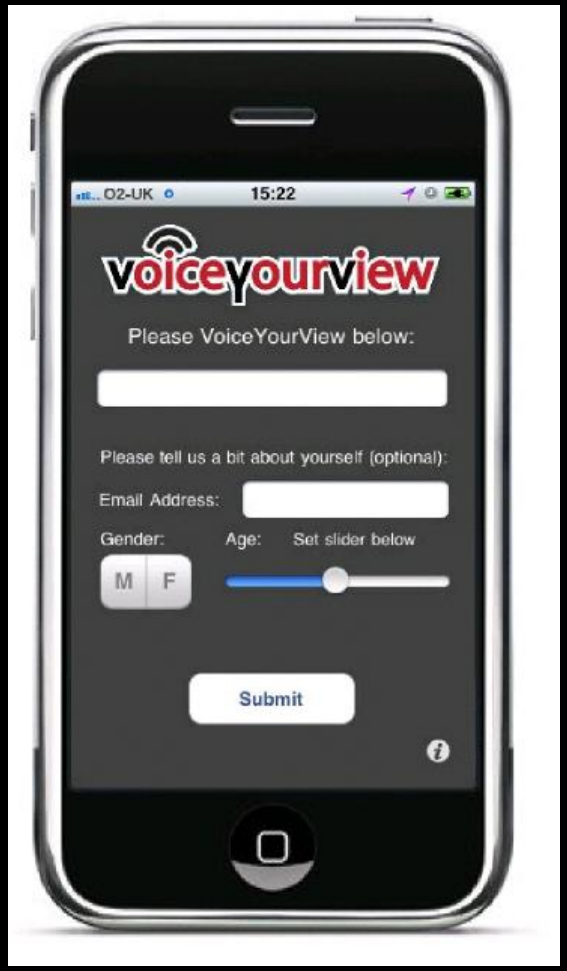
Lancaster University[2]

Made four calls to the police before they finally showed up
No police patrols – dangerous to go out at night

# Data Understanding

Create a conversation




speech recognition

natural language processing

theme, sentiment, actionability

instant feedback

# VYV trials @ Lancaster Library

6 Week Installation

SpinVox

Wmatrix

Comments processed live with speech to text and NLP

2000 comments from 600 people*

Live summaries (Themes+Sentiment) presented in location

*Photo by Nigel Slater, Lancaster Guardian

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# Include everyone

# *“Very helpful and friendly staff”*

```
<w pos="NN" svo="" lemma="staff"
sem="I3.1/S2">staff</w>
```

- Noun picked from POS = “Staff” sem tag I3.1

| | |
|---|---|
| I2.2 | Business: Selling |
| I3 | Work and employment |
| I3.1 | Work and employment: Generally |
| I3.2 | Work and employmeny: Professionalism |
| I4 | Industry |

- Secondary sem tag S2

| | |
|---|---|
| S1.2.5 | Toughness; strong/weak |
| S1.2.6 | Sensible |
| S2 | People |
| S2.1 | People:- Female |
| S2.2 | People:- Male |
| S3 | Relationship |

*USAS Semantic Tagset - http://ucrel.lancs.ac.uk/usas/

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# Sentiment Analysis

- Comment tagged as positive, due to presence of positives “helpful”, “friendly” and positive modifier “very”

```
<w pos="RG" svo="" lemma="very" sem="A13.3"> Very</w>
<w pos="JJ" svo="" lemma="helpful" sem="S8+">helpful</w>
<w pos="CC" svo="" lemma="and" sem="Z5">and</w>
<w pos="JJ" svo="" lemma="friendly"
sem="S1.2.1+">friendly</w>
<w pos="NN" svo="" lemma="staff" sem="I3.1/S2">staff</w>
```

# Technology Readiness

***"Improve your server, it's useless"***

$\notin$

*"Food and People"*

***"Rather clinical!"***

$\notin$

*"Medicines and medical treatment"*

Major challenge in context awareness is the **length of comment**. *There is very little information available to identify the context from the comments.*

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General Impression

Furnishing

Music

Ambient

I think the library is much lighter and fresher and brighter and easier to to see.

I think it's a shame that there is less stoc...

# Some research findings

traditional methods
versus VYV

→

no significant difference
in quality of data; but
VYV is *anytime,*
*anywhere*

Accuracy of auto-tagging: theme

→

70-78% acceptable

# Accuracy of auto-tagging: actionability

→

76% accurate

Accuracy of auto-tagging: sentiment

→

55% accurate

# Eliciting positive responses

→

VYV results in higher proportions of positive comments

# Benefits of VYV

→

Anytime, anywhere;
Automatic;
Two-way conversation

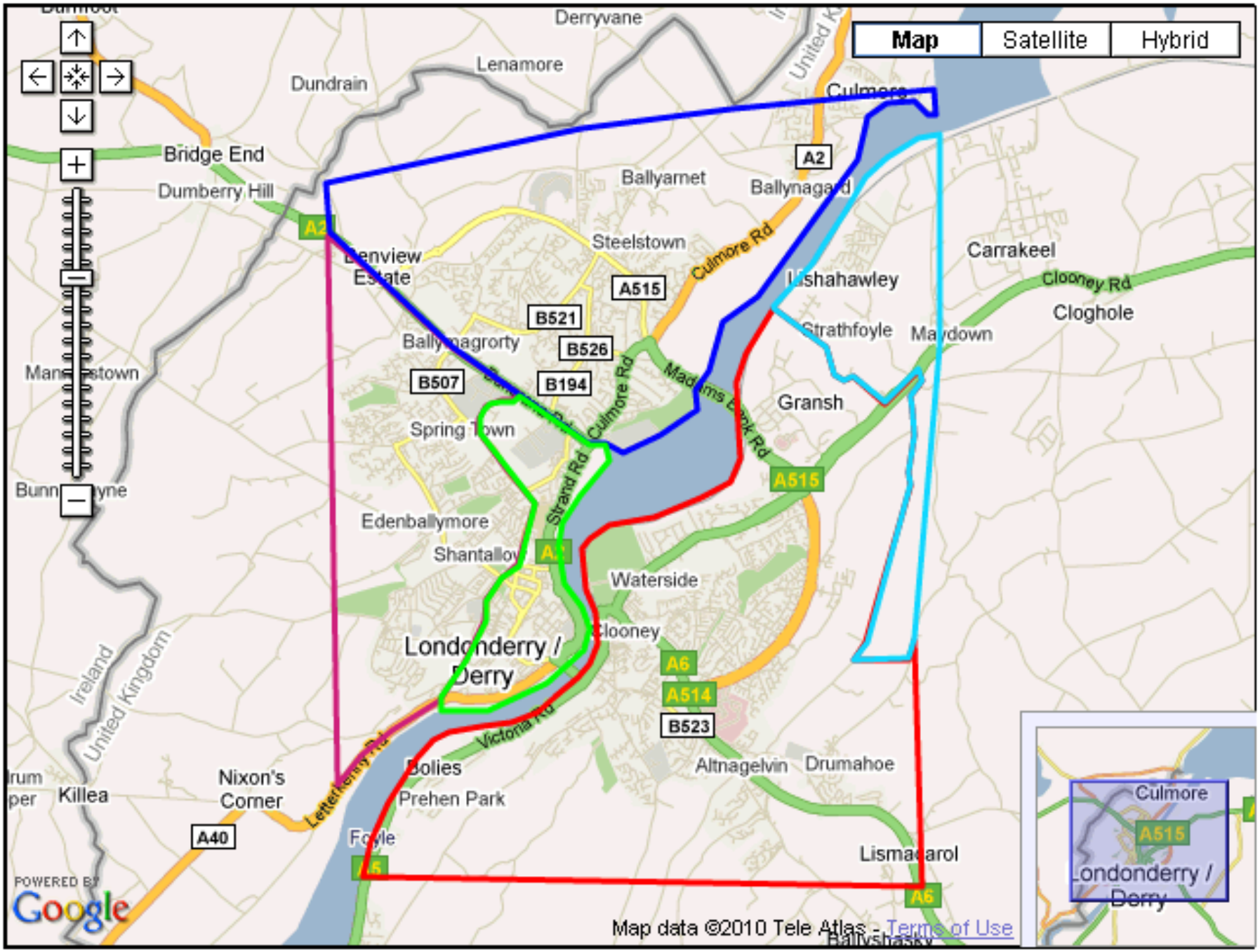
# Open questions

→

What motivates people to get involved;

How to encourage participation?

YOU
ARE NOW
ENTERING
FREE DERRY


Map
Satellite
Hybrid
Derryvane
Lenamore
Dundrain
Culmore
Bridge End
Dumberry Hill
Ballyarnet
Ballynagard
A2
Steelstown
Culmore Rd
Carrakeel
Clooney Rd
Cloghole
A515
B521
B526
B507
B194
Ballymagrorty
Strathfoyle
Maydown
Gransh
Spring Town
Madams Bank Rd
Strand Rd
Edenballymore
Shantallow
Waterside
Clooney
Londonderry / Derry
A6
A514
B523
Victoria Rd
Bolies
Prehen Park
Altnagelvin
Drumahoe
Killea
Nixon's Corner
A40
Foyle
Lismacarol
Ireland
United Kingdom
POWERED BY Google
Map data ©2010 Tele Atlas - Terms of Use
Culmore
A515
Londonderry / Derry

# DDPP Household Confidence & Satisfaction

moisten and seal

## CHAIRPERSON'S FOREWORD

Dear Householder,
I would be grateful if you would take a few minutes of your time to complete the attached questionnaire on satisfaction and confidence with the service currently provided by the PSNI.

The District Policing Partnership has secured the inclusion of a satisfaction and confidence baseline in this year's Local Policing Plan. I would encourage you to complete the survey and return to the DPP. This is a unique opportunity for you to have your say on local policing and inform both the PSNI and the DPP what type of police service is being provided in your area.

The Derry DPP will continue to challenge the police on issues raised by you thereby ensuring that your concerns are addressed.

The results of the survey will form the basis of the Local Policing Plan for Foyle for 2010 – 2011 and will inform the Area Commander where resources need to be allocated.

Thank you for taking the time to complete the questionnaire ensuring that local people shape local policing.

Please return the completed questionnaire (no stamp required) to the Freepost address by 31st August 2009. Anyone interested in being entered into the free prize draw should provide contact details in the space below (telephone no./e-mail address) please do not provide your name or postal address.

Cllr Elisha McLaughlin
Chairperson, Derry District Policing Partnership

moisten and seal

## SATISFACTION & CONFIDENCE SURVEY

1. Which of the following groups do you belong to?

Gender: Male ☐ Female ☐

Age Group: Under 16 ☐ 16-24 ☐ 25-40 ☐
41-60 ☐ 61 or over ☐

Religon: Protestant ☐ Catholic ☐
Other (please specify) ☐ None ☐

2. Which police neighbourhood do you live in?

Waterside Rural - Rural Areas of the Waterside ☐

Waterside Urban - Urban Areas of the Waterside ☐

City Centre - Bogside, Brandywell, Fountain, City Centre, University and Pennyburn ☐

City West - Creggan, Beechwood, Creevagh, Rosemount, Foyle Springs, Ballymagroarty, Coshquin, Hazelbank and Springtown ☐

City North - Galliagh, Culmore, Shantallow and Steelstown ☐

## SATISFACTION & CONFIDENCE SURVEY

3. How much confidence do you have in the police's ability to provide an ordinary day to day policing service for all the people of the Foyle area?

Total confidence ☐
A lot of confidence ☐
Some confidence ☐
Little confidence ☐
No confidence at all ☐
Don't know ☐

Reason for answer:

4. Do you think the PSNI are doing a good job in the Foyle Area?

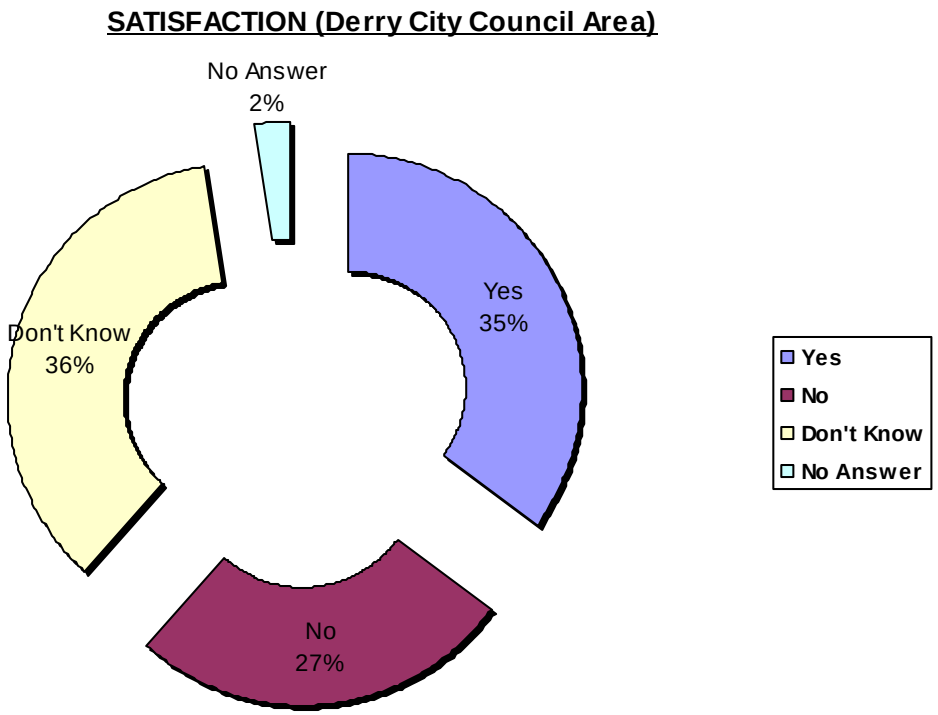
Yes ☐
No ☐
Don't know ☐

Reason for answer:

# Challenge: **How** do people feel…

- **36% of respondents**** answered ‘don’t know’ to the satisfaction question => How can the police ‘win’ the undecided?

- Understanding *‘Why’* people are undecided may help…




** diagram and figures from DDPP survey

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# VERBATIM ANSWERS

**Do you think the PSNI are doing a good job in the Foyle area?**

*Don't know – PSNI take too long to respond to a reported incident.*

*Don't Know* - They certainly don't appear to be able to curb the problems in my area of Culmore.

*Don't Know* -Because they let the young joy riders straight out again also they know all the drug dealers in the one area still they turn a blind eye.

# THEMES BY LOCATION

## Match Themes to Neighbourhoods

### Neighbourhood analysis of Satisfaction with Policing in Derry

| Themes (aggregated) | | Foyle City Centre | City North | Foyle City West | Waterside Rural | Waterside Urban | Total by Themes | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Freq. | % |
| General Impression | | 8 | 17 | 8 | 17 | 11 | **61** | **17.6** |
| Presence and Visibility | | 2 | 13 | 9 | 16 | 8 | **48** | **13.9** |
| Police Behaviour/political policing | | 4 | 13 | 7 | 13 | 9 | **46** | **13.3** |
| Offences and Crime Level | | 3 | 14 | 8 | 11 | 4 | **40** | **11.6** |
| Response Time and Quality | | 1 | 2 | 6 | 11 | 12 | **32** | **9.2** |
| Other | | 5 | 3 | 4 | 10 | 7 | **29** | **8.4** |
| Resources Incl. Admin | | 2 | 3 | 5 | 4 | 7 | **21** | **6.1** |
| People Behaviour | | 3 | 7 | 2 | 2 | 3 | **17** | **4.9** |
| Community Policing | | - | 5 | 3 | 3 | 3 | **14** | **4.0** |
| Specific Events/Location | | - | 4 | 2 | 5 | 3 | **14** | **4.0** |
| Complexity of Situation | | 3 | 2 | - | 4 | 1 | **10** | **2.9** |
| Authority/Law Enforcement | | - | 5 | 1 | 1 | 3 | **10** | **2.9** |
| Perceived Safety | | - | - | - | 4 | - | **4** | **1.2** |
| **Neighbourhood** | **Freq.** | **31** | **88** | **55** | **101** | **71** | **346** | **100.0** |
| | **%** | **9.0** | **25.4** | **15.9** | **29.2** | **20.5** | **100.0** | |

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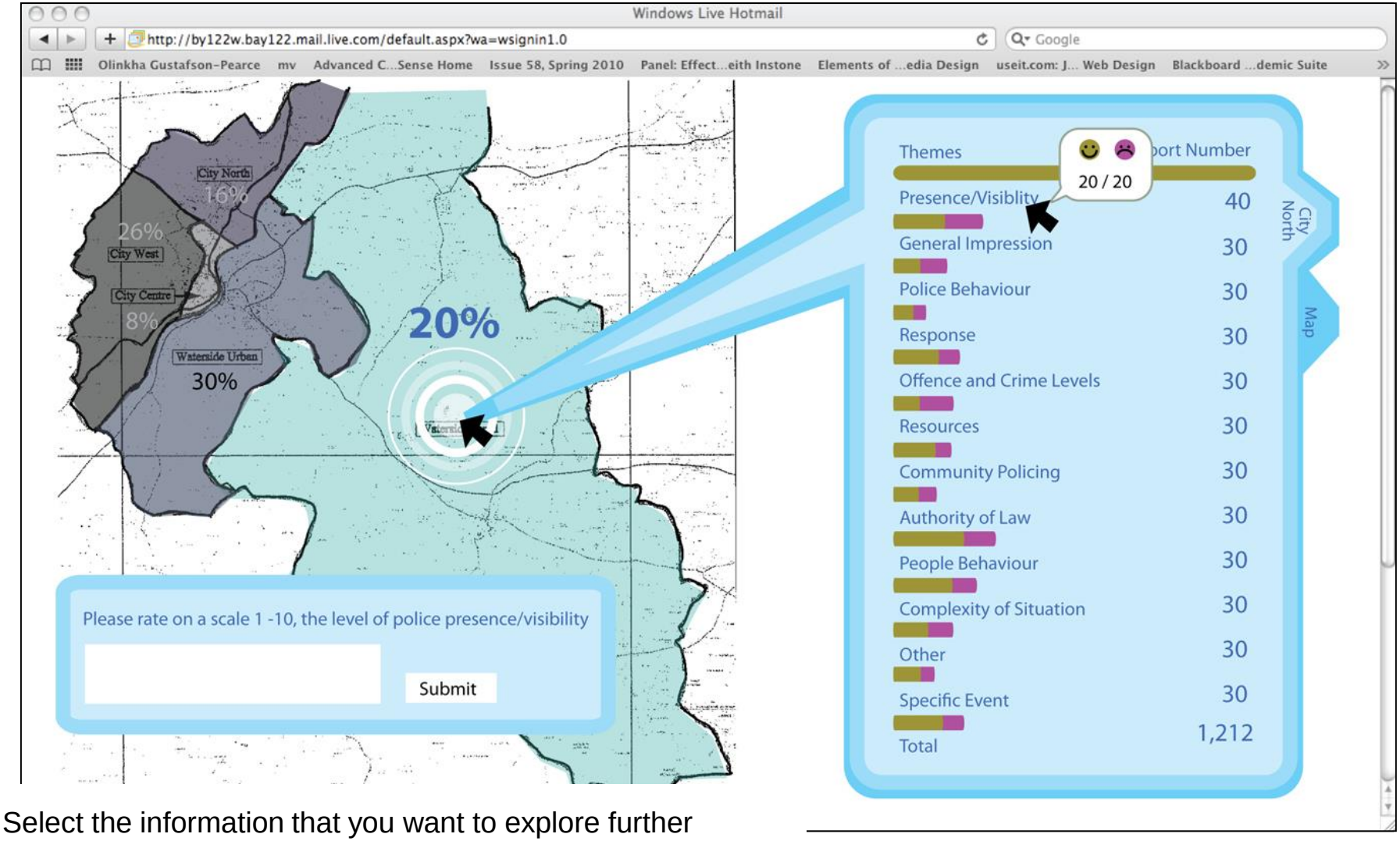
# StoryBoard




Select the information that you want to explore further

Place the cursor on the theme for actual figures

You also can rate your satisfaction level in this category

The sentiment charts will be updated automatically

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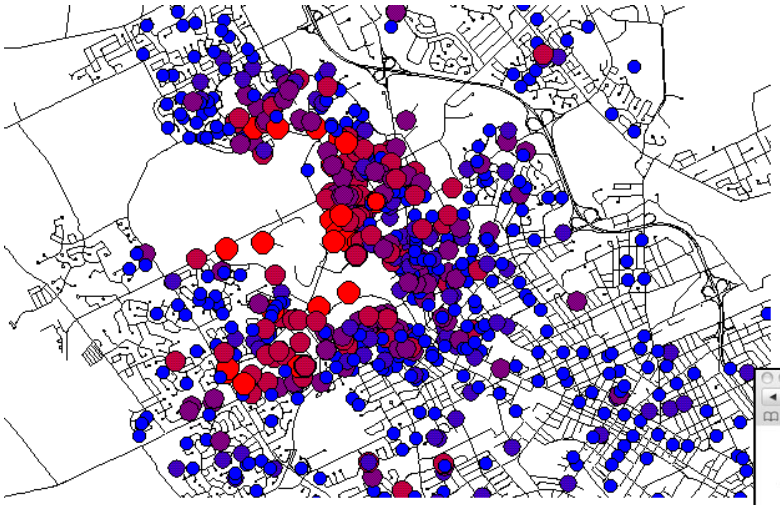
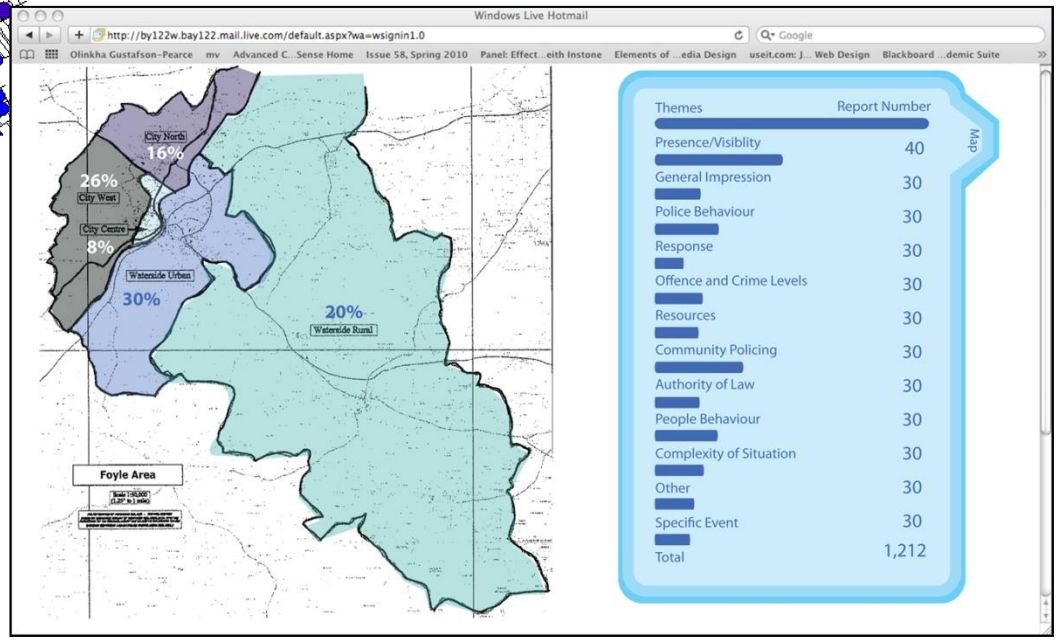
# Factual vs Perception Mapping



Map of actual crime statistics

Perceptions maps

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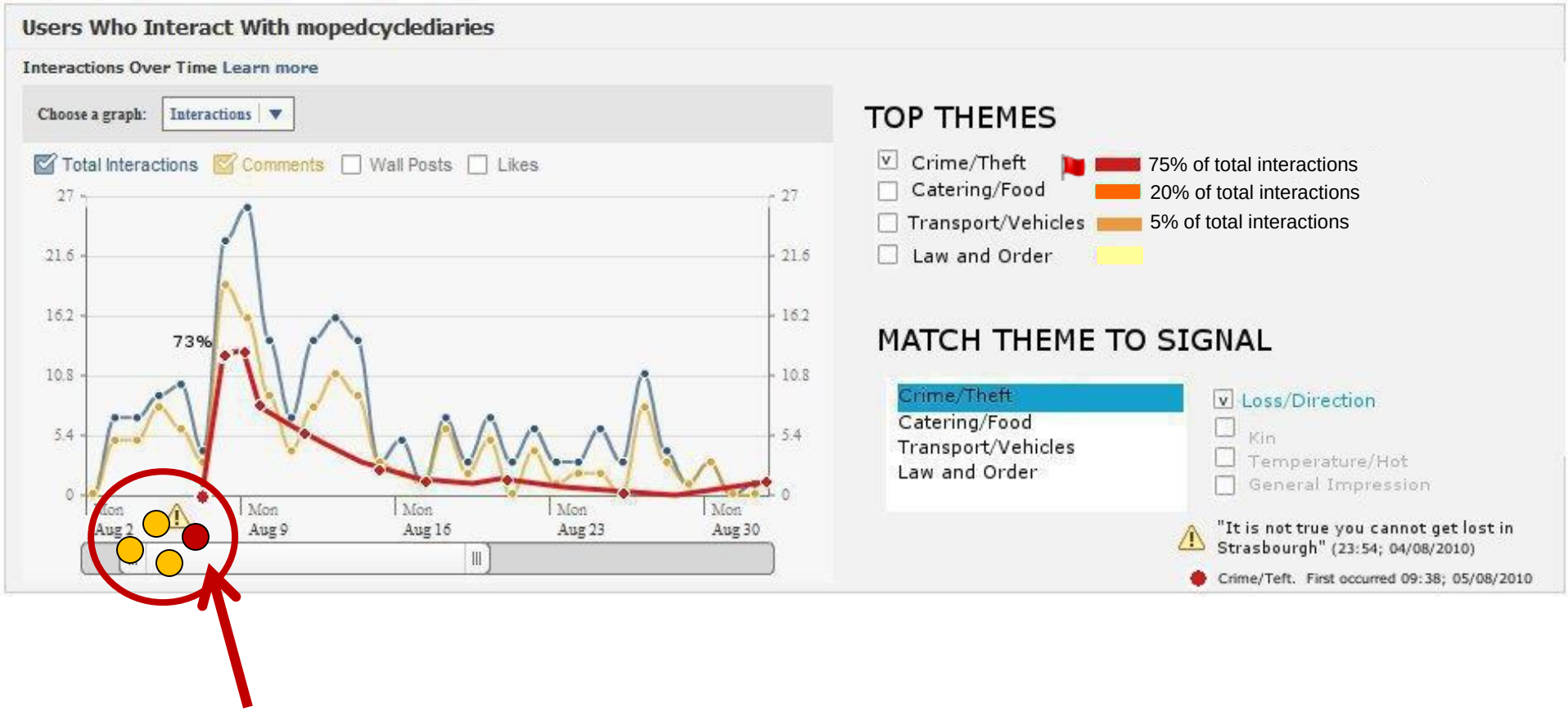
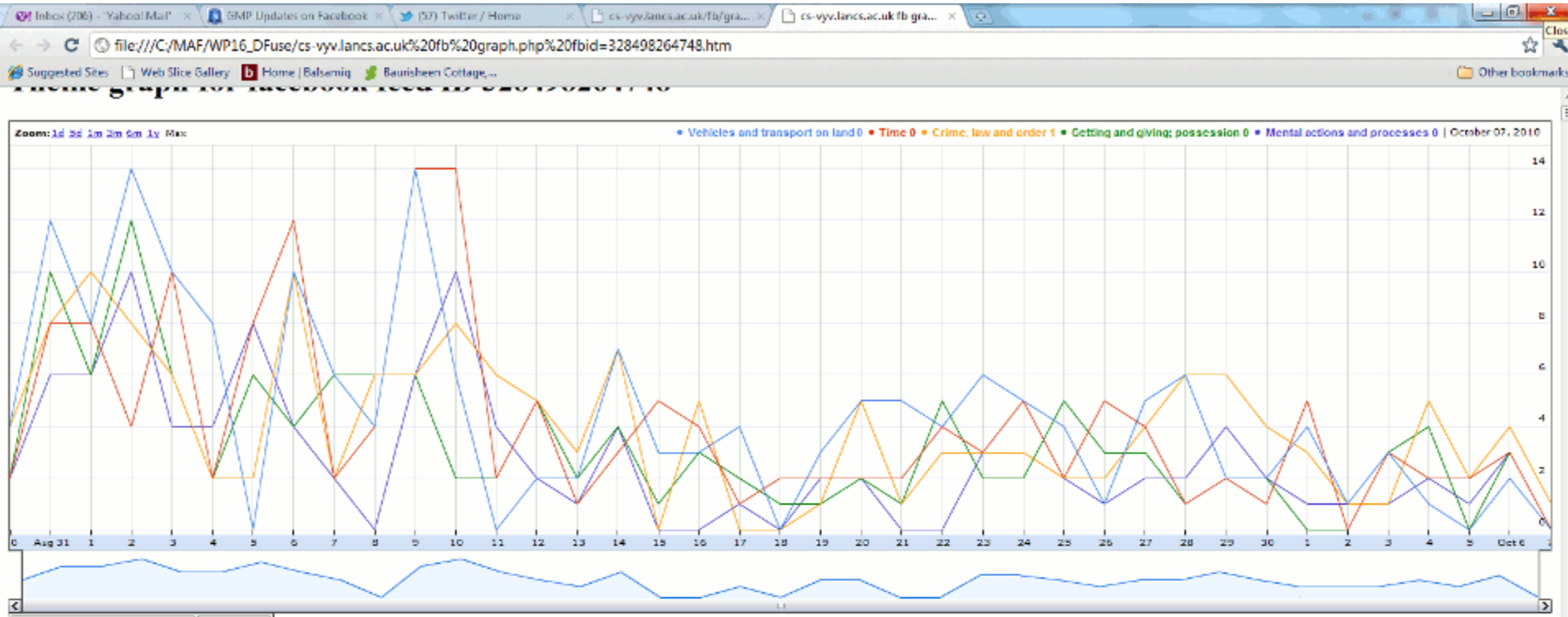
# Spikes and Triggers



# Theme/over Time::PSNI Bangor FB

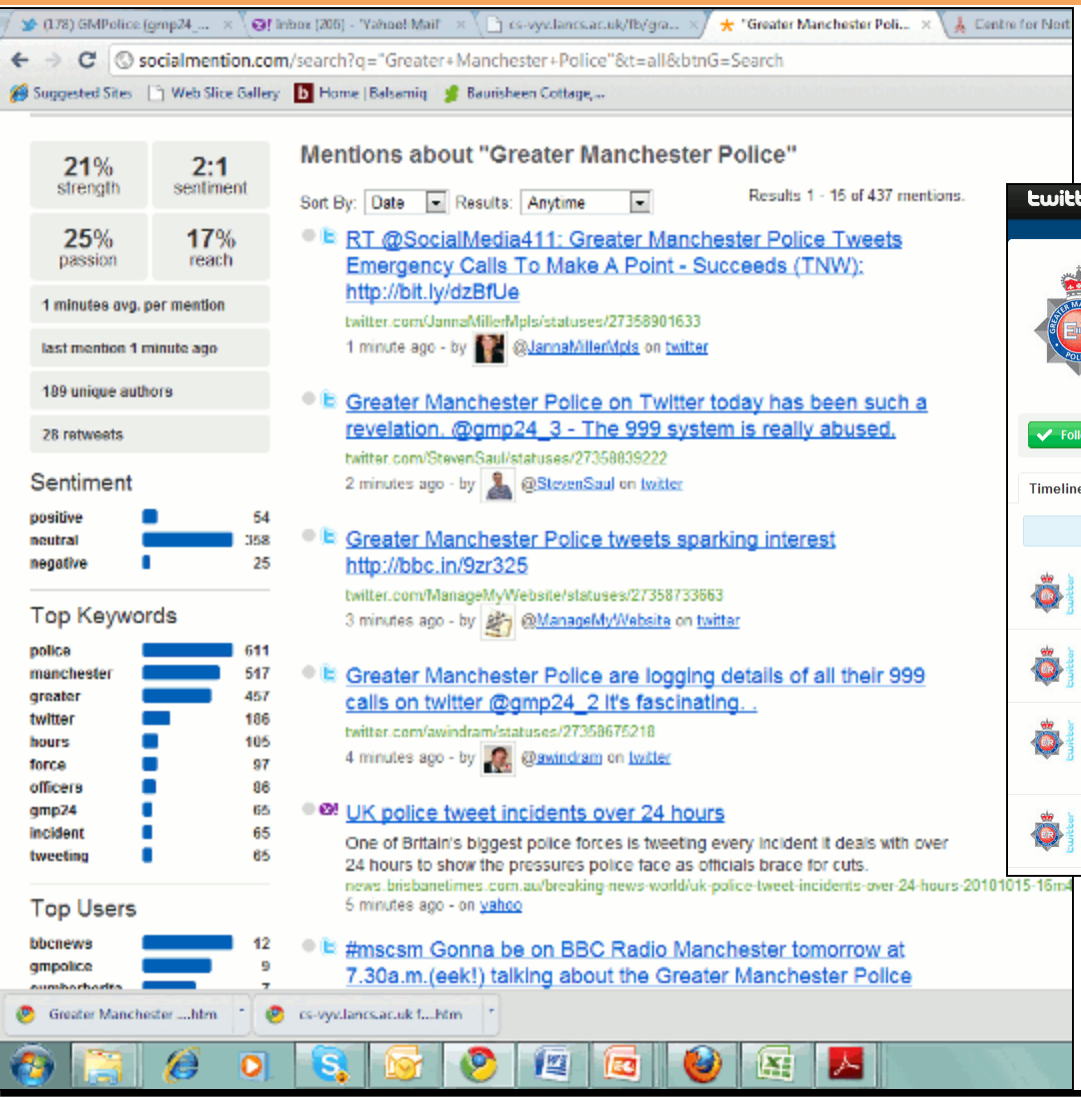



| Theme | Occurence |
|---|---|
| Vehicles and transport on land | 176 |
| Time | 159 |
| Crime, law and order | 155 |
| Getting and giving; possession | 127 |
| Mental actions and processes | 106 |

| Date | Message | T1 | T2 | T3 | T4 |
|---|---|---|---|---|---|

# L~Derry/NI – BREXIT?

# SocialMention...



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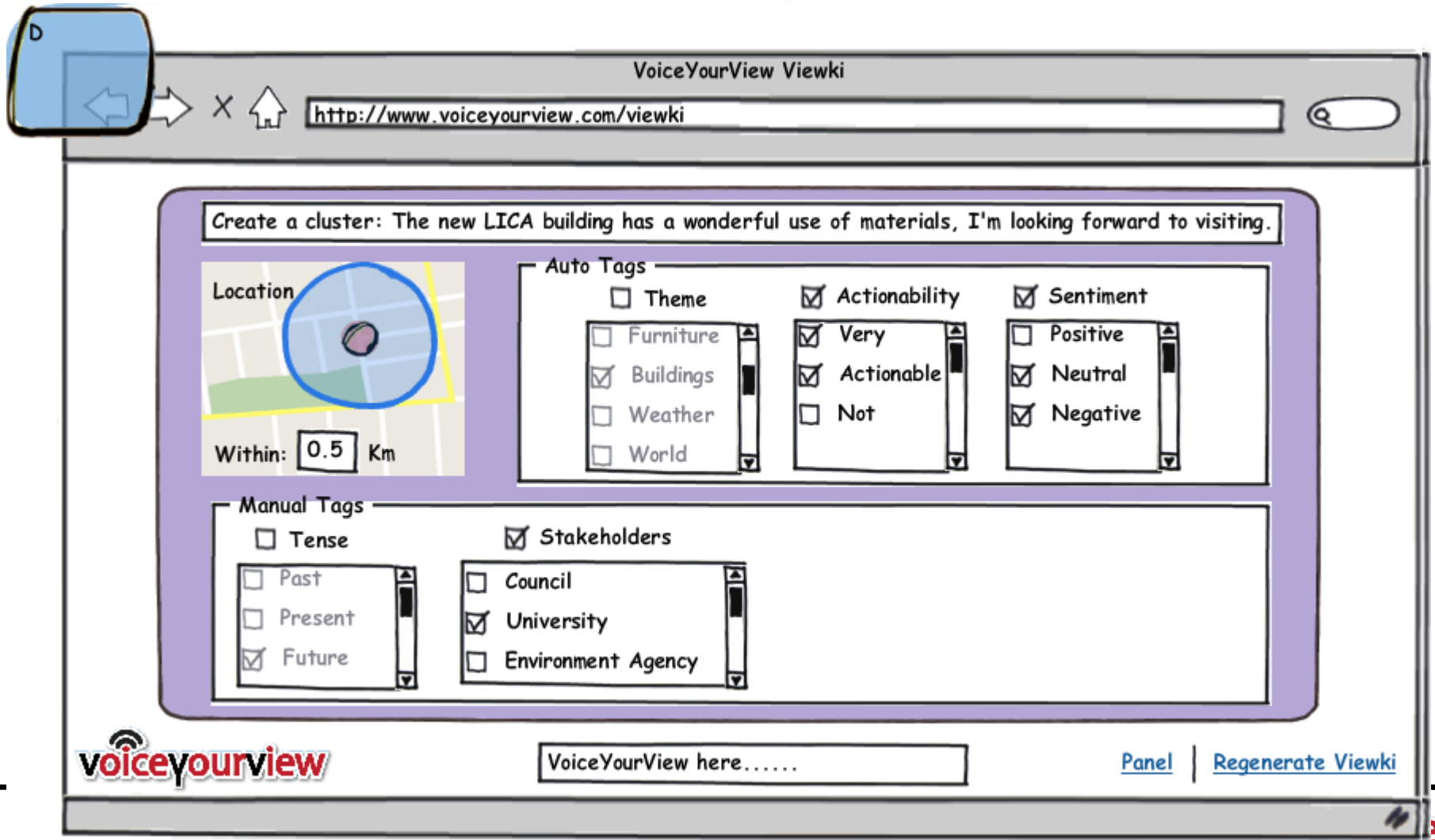
# viewki


VoiceYourView Viewki
http://www.voiceyourview.com/viewki
Create a cluster: The new LICA building has a wonderful use of materials, I'm looking forward to visiting.
Location
Within: 0.5 Km
Auto Tags
Theme
Furniture
Buildings
Weather
World
Actionability
Very
Actionable
Not
Sentiment
Positive
Neutral
Negative
Manual Tags
Tense
Past
Present
Future
Stakeholders
Council
University
Environment Agency
voiceyourview
VoiceYourView here.....
Panel
Regenerate Viewki

# A Semi-automated Display for Geotagged Text

Vincent A. Schmidt
Air Force Research Laboratory
Dayton, Ohio USA

Jane M. Binner
Sheffield Management School
University of Sheffield, UK

# The Goal

Provide first responders and other analysts a mechanism for quickly identifying and responding to trends in social media data that indicate the status of a catastrophe or crisis.

In general:
Determine how social timestamped and georeferenced textual data (such as the data available in social media) can be effectively displayed to a specific end-user or analyst.

# The Data

Source:
VAST 2011, Mini-Challenge 1 Characterization of an Epidemic Spread –
“determine the source of an epidemic disease and how it is spread throughout the community”

Interesting because:
a million uniquely identified records containing typical social networking data

Fields:
ID,Created_at,Location,text

3,5/18/2011 13:26,42.22717 93.33772,
this convention filled with technology could be
better don't plan on leaving  anytime soon

57,5/12/2011 21:08,42.23363 93.34164,
There's no point of trying if no one else i s...

73,5/16/2011 5:28,42.28818 93.33605,
sick of hearing bout the Oil Spill now like

127,5/10/2011 16:53,42.28051 93.34164,
I hope #inception is as good as everyone says  ten bux is ten bux...

238,5/9/2011 14:13,42.21771 93.33845,
...I agree  the most demanding task in our time is come to terms with space; so let time be our personal unit of confusion. ..

464,5/4/2011 20:04,42.28523 93.44908,
Isnt it weird that after all the hoopla about the TSA there was another 'near disaster' averted? Seems like it happens too  much.

# The Approach

Randomly choose 10000 records from the dataset

Find “conversations”: temporally close messages
Then, cluster “conversations” by location

Show how messages in a conversation inter-relate
Show geographic area, map conversations onto area

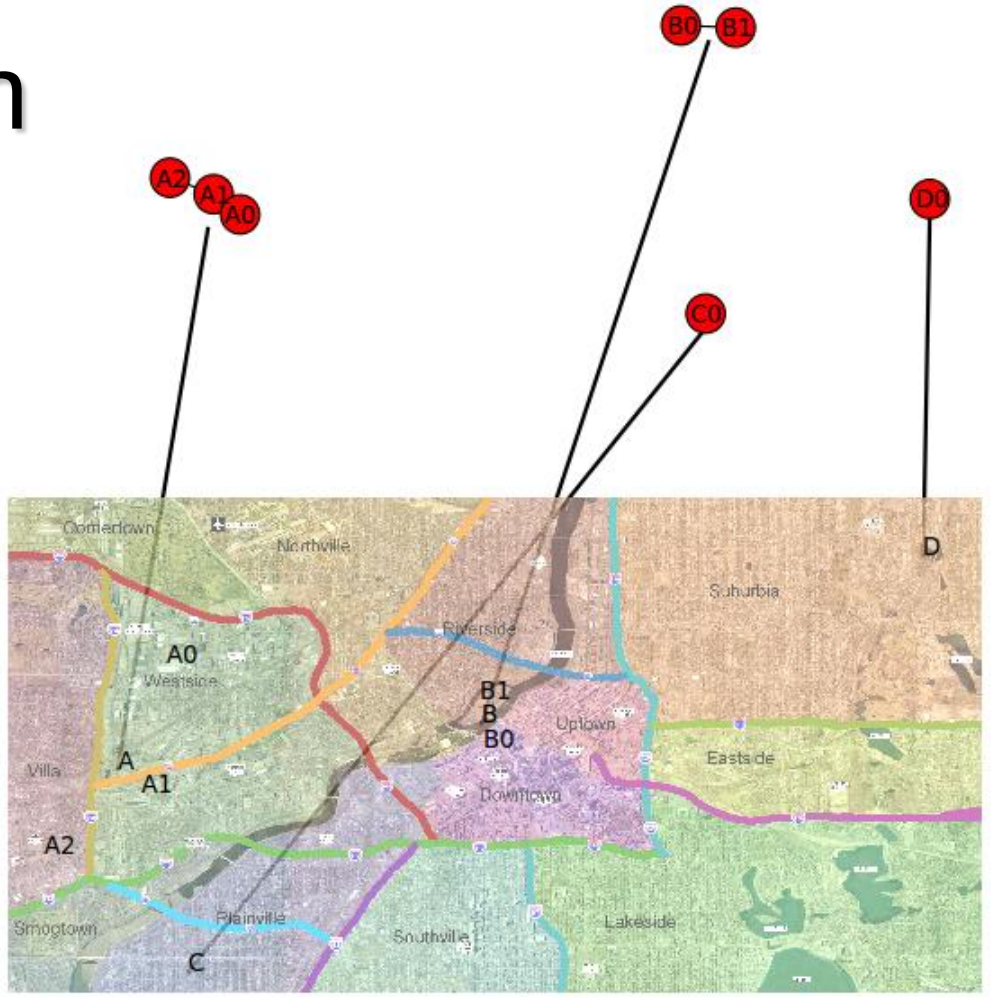
Allow user to examine conversation contents, message data, and message metadata

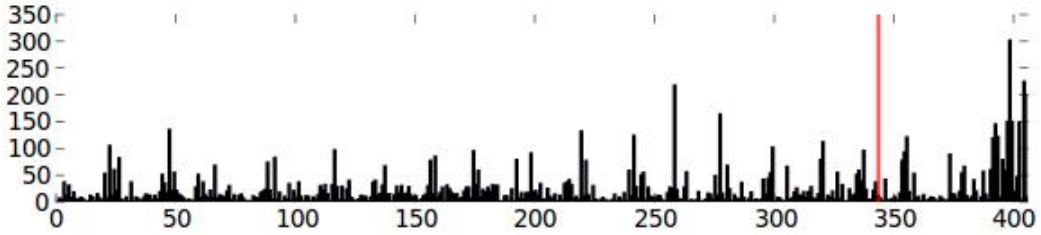
# The Visualization

Sections include:
1. message relationships
2. geospatial data
3. conversations

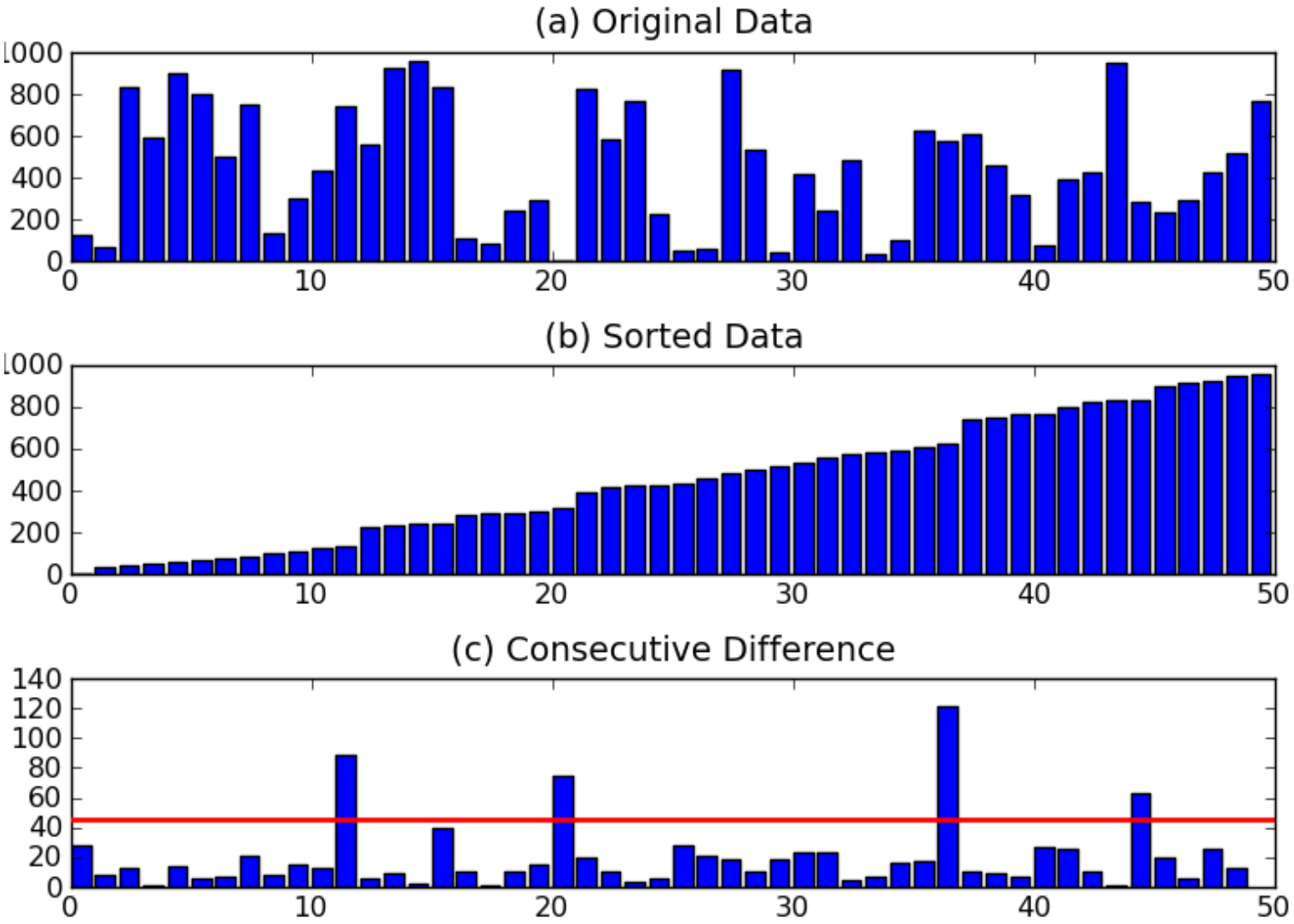
Hover over message to see message text

Hover over histogram to see number of messages in a conversation



# The Details: Clustering



# The Implementation

Python 2.7.x
– Multiplatform, rapid prototyping

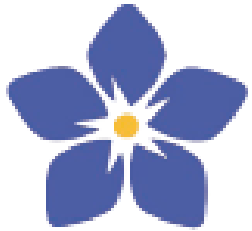
Networkx graph library (networkx.lanl.gov)
Matplotlib graphic library

GTK user interface library
NLTK semantic processing library

Latest revision is around 800 LOC

# Partners & Collaborators

www.voiceyourview.com



# Thank you: Any questions?

Safer Streets

SeeClickFix
power to the community

Directgov | innovate

CITY SOURCED

DC 311

GovMetric