Real-time crowdsourced information and technology in transport

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Research Objectives

• Do NZ’s legal and policy frameworks support crowdsourcing of data for use by government?
• What is the value of real-time crowdsourced data for transport applications and to what extent can crowdsourced data contribute to better service delivery for the travelling public and the NZ Transport Agency?
• What is the role of the NZ Transport Agency in supporting crowdsourcing in transport?
Crowdsourcing defined:

“Enlisting the services of an undefined group of people, via web technologies, to provide information or input that would otherwise be too difficult using traditional data collection or outsourcing methods.”

Users knowingly contribute information on quality or condition of transport network.
Passive Crowdsourcing
(eg Google Maps)
Active Crowdsourcing (Waze)
Public Transport (eg Moovit)

- Real-time PT service tracking
- Report real-time line conditions (not yet in NZ)
- Community contributions
Stakeholder Engagement

Stakeholder interviews: NZ Transport Agency, Ministry of Transport, PT operations (Akl, Chch), Auckland Transport, TOCs, transport user groups and technology firms

Key messages re crowdsourcing:
• is inseparable from customer information delivery
• supports transport user engagement/empowerment
• helps to ‘fill the gaps’ in the network (more eyes on the road)
• provides contextual information (extent, cause or severity of problem)
“We tried crowdsourcing the data, but the crowd turned into an angry mob and threw bogus data at us instead.”
Stakeholder Engagement – key messages

Trust and validation:

- Reports currently assessed on potential severity/impact and quality of information/source
- Multiple reports not necessarily an indicator of criticality
- For road users, unverified information is better than no information
Stakeholder Engagement – key messages

• Privacy concerns not a barrier, but safety might be
• Avoid financial or prize-based incentives – contributions should be based on goodwill
Stakeholder Engagement – priority information needs

Real-time
• PT service occupancy and capacity
• Congestion
• Large event monitoring (all modes)
• Incident reporting

Other:
• Origin-destination (all modes)
• Cycle incident reporting
Trial – Queenstown-Lakes District

- Undertaken July-September 2015 to understand winter/rural road events:
  - Custom web application and map viewer
  - Social media monitoring
  - Social media (Twitter) mining
Web application

Users:
- submit reports (QLDC Road Reporter)
- view the road conditions map

QLDC staff:
- update corridor status daily (map)
- check/verify public reports
- add verified reports
Reporting form

- Select report type
- Add details
- Add contact info *(optional)*
- Add photo *(optional)*
- Select location from device, address or map select

Submit
Facebook

- 7000+ followers
- Push and receive road reports
- Trusted/timely source of road information
- Site usage (reach) peaked around severe weather events
- Provides forum for other users to discuss road conditions
Twitter mining

- Small subset of Tweets available through free Twitter API
- Few are geotagged (~2%)
- Simple keyword filtering unreliable, eg ice = “ice hockey”, “ice cream”

Learnings:
- Require a larger feed (to be purchased)
- Use more sophisticated wordset algorithms and semantic analysis to understand location and context
- More suited to a dense urban environment, ie Auckland?
**Recommendations / Learnings**

For specific applications:
- Consider crowdsourced reporting options alongside traveller information service delivery (and vice versa)
- Privacy is not a barrier, but must be addressed at the outset
- Consult with Ministry of Transport regarding safety
- Follow open data principles

General recommendations:
- Need for a ‘best practice’ guidance document for crowdsourcing
- Follow social media developments and new/emerging applications
Recommendations / Learnings - data validation

- Can be a mix of human judgment and automated trust modelling
- No one-size-fits-all model for validation – flexibility required

Resources ($/time)
Frequency of reports
Who uses/sees the data
What (if any) personal data is collected
Application type/design
How location is recorded
Validation policy
Winter Journeys trial:
- Includes SH TREIS feed
- Local RCAs can also provide updates
- Public reports display as unverified
Any questions?

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