Unplanned Rail Disruptions
Understanding customer perspectives and the role and use of social media

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Perth, West Australia

Agenda

1. Introduction
2. URDs
3. Passengers & URDs
4. Social Media
This paper overviews research on passenger experience, Unplanned Rail Disruptions (URDs) & Social Media...

- PTRG Monash have undertaken a number of research projects in the field of URDs:
  - PhD program (Brendan Pender) on approaches to managing URD’s
  - Contract research program with Metro Trains Melbourne on Improved Management and Reporting of Unplanned Rail Disruptions
  - Numerous research papers/presentations (see next)
  - FUTURE – Special URD session as part of the World Conference on Transport Research in Shanghai July 9th-15th 2016

- This paper overview research findings regarding URDs from the Passenger Perspective and the potential role of social media and issues for its implementation

...based on the following research publications...

PUBLISHED RESEARCH


UNPUBLISHED RESEARCH

..and is structured as follows

**Agenda**

1. Introduction
2. URDs
3. Passengers & URDs
4. Social Media
URDs can be a serious problem

- Singapore DEC 2011:
  - 3 train breakdowns in 1 week
  - Affected 350,000 people
  - Official said “public transport can paralyse the entire nation from what we have seen a few days ago”
  - CEO resigns

- UK/Netherlands (Boston) – serious national repurcussions of major rail failures in Winter/Snow

Melbourne, had 8,151 major URDs p.a. (2010-12)...

### Average Annual Frequency (2010-12)

- 8,151 per year
- 156 per week
- 22 per average day

### Average Incident Profile

- Trains Affected: 24
- Aggregate Minutes: 97
- Mins per Train: 5
- Aggregate PWM (PW Hours): 42,095
- Implied Passengers Affected: 701
- 431

Implies 3.5M Metro riders impacted p.a. or 1.5% of all boardings p.a.

Source: PTRG analysis of TOPS data 2010-2012. Only incidents with AWM of 20 mins and over included
...most impact is weekday AM peak

Implies 67% of major incidents, 77% trains affected and 76% PWM impact occurs in the peak

Source: PTRG analysis of TOPS data 2010-2012. Only incidents with AWM of 20 mins and over included

Many causes; rare incidents cause larger delay e.g. weather

Weather, Train Operations, Intrusions and Infrastructure Failure cause only 21% of incidents but have high PWM of delay

Weather (2 incidents a month) causes 24% of all PWM of delay

Source: PTRG analysis of TOPS data 2010-2012. Only incidents with AWM of 20 mins and over included
URD distribution is no even; Central dominates incident volume followed by Werribee and Frankston

Source: Based on TOPS data 2010-2012. Only incidents with AWM of 20 mins and over included.

Note: PTRG Corridor analysis double counts incidents in more than one corridor.

URD Response - Parallel PT considered viable in some cities; but not all – capacity constraints a major issue

Of URD Responses - Internal solutions are most popular notably bus replacement (bridging)

What Strategies Do You Employ During Rail Disruptions?


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International Study – 9 cities - disruptions rank high in all concerns about urban public transport

Average of ALL 9 Cities Studied
- San Francisco
- Toronto
- Boston
- New York
- London
- Perth
- Melbourne
- Sydney
- Brisbane

3.5
4.0
4.5
5.0
5.5
6.0
6.5

Safe at night
Reliability
Frequency
Safe during day
PT available where and when needed
Deal with disruptions quickly
Get to stops/stations
Quality of service
Make connections
Available on weekends
Available at night
Information to plan journey
Meet costs
Disruptions don’t happen often
Get information about PT

Boston
Brisbane
London
Melbourne
New York
Perth
San Francisco
Sydney
Toronto
Total Average

PERFORMANCE RATINGS
SPIRAL PLOT

Lowest Importance
Comfortable with strangers on PT
Travel time compared to car
Can make trips to new places on PT
Physical access
Staff courteous and friendly
Overcrowding
Ease of buying/using ticket
Available at night
People I care for can use it safely
Information to plan journey
Meet costs
Disruptions don’t happen often
Get information about PT

Boston
Brisbane
London
Melbourne
New York
Perth
San Francisco
Sydney
Toronto
Total Average

IMPORTANCE RATINGS
SPIRAL PLOT

Lowest Importance
Comfortable with strangers on PT
Travel time compared to car
Can make trips to new places on PT
Physical access
Staff courteous and friendly
Overcrowding
Ease of buying/using ticket
Available at night
People I care for can use it safely
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Meet costs
Disruptions don’t happen often
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Boston
Brisbane
London
Melbourne
New York
Perth
San Francisco
Sydney
Toronto
Total Average
URD experience in Melbourne reduces overall average customer satisfaction by 9%...

Note: Weighted Sample – Representative of the Market in terms of Ridership (frequent users have a higher weighting)
Source: Metro Trains Passenger Opinion Survey Nov 2013
Reducing URD length/number will broadly increase customer satisfaction by +1% for 10% reduction...

Decrease in URD length means an increase in satisfaction of...
- 0.4% with Metro
- 0.7% with URD response
- 1.2% with bus replacement

Decrease in number of disruptions means an increase in satisfaction of...
- 0.9% with Metro
- 1.1% with URD response
- 1.0% with bus replacement

Source: Metro Trains Passenger Opinion Survey Nov 2013

When replacement buses are used in URD’s; most users (68%) use bus, 28% find alternatives and 3% don’t travel

User Behavior During Bus Replacement

<table>
<thead>
<tr>
<th>Behavior</th>
<th>% Respondents Involved in Bus Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>wait for replacement buses (RB’s) and use them</td>
<td>49.4</td>
</tr>
<tr>
<td>RB’s already running - used them</td>
<td>18.3</td>
</tr>
<tr>
<td>didn’t wait for RBs - wait until trains resumed</td>
<td>2.9</td>
</tr>
<tr>
<td>didn’t wait for RB’s - used local route buses/trams</td>
<td>2.9</td>
</tr>
<tr>
<td>didn’t wait for RB’s - used my car</td>
<td>2.9</td>
</tr>
<tr>
<td>didn’t wait for RB’s - walked</td>
<td>3</td>
</tr>
<tr>
<td>didn’t wait for RB’s - got a taxi</td>
<td>7.1</td>
</tr>
<tr>
<td>didn’t wait for RB’s - friend/relative gave lift</td>
<td>1.1</td>
</tr>
<tr>
<td>didn’t complete my trip, I just abandoned travelling</td>
<td>1.1</td>
</tr>
<tr>
<td>didn’t complete my trip, I went back to work</td>
<td>0</td>
</tr>
<tr>
<td>didn’t complete my trip, I went back to home</td>
<td>1.5</td>
</tr>
<tr>
<td>Other (Please specify)</td>
<td>1.8</td>
</tr>
</tbody>
</table>

68% use Buses
28% find alternative transport mainly local public transport or lifts from friends/relatos.
3% don’t travel

Note: Weighted Sample – Representative of the Market in terms of Ridership (frequent users have a higher weighting).
Source: Metro Trains Passenger Opinion Survey Nov 2013
The no. 1 priority for passengers was better communications

**Priority 1: Improving passenger communication**
- Upgrade PA system
- Better social media protocols
- Encourage station staff to assist in URD management

**Priority 2: Better staff / internal communications / awareness**
- Multi-skill other staff (e.g. protective services officers, cleaners)
- Upgrade CCTV/PIDS
- Wider use of PIDS at unmanned stations – targeted resources

**Priority 3: Reducing URDs and their impact**
- Upgrade infrastructure (older signal boxes, faulty track, signals)
- Increase number of track crossovers
- Consider bus bridging

**Priority 4: Better URD reporting**
- Improve quality of reporting on incidents and bus replacement
- Standardise/consolidate reporting
- Review best use of staff time during URDs

Pre-trip URD info, removal from delayed trains & being updated on delay cause/progress are major passenger URD concerns

**Passenger Concerns During URD’s – Priorities of Importance and Performance (Satisfaction)**

<table>
<thead>
<tr>
<th>Code/Issue</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Being notified that rail services are disrupted before you leave home/work</td>
<td>1</td>
</tr>
<tr>
<td>7 Being quickly removed if you are delayed on a train not waiting at a station</td>
<td>2</td>
</tr>
<tr>
<td>8 Being kept up to date on progress about disruption recovery</td>
<td>3</td>
</tr>
<tr>
<td>2 Being informed in advance that a delay is expected in future</td>
<td>4</td>
</tr>
<tr>
<td>5 Being informed when services are expected to resume</td>
<td>5</td>
</tr>
<tr>
<td>1 Being quickly informed that a delay has occurred</td>
<td>6</td>
</tr>
<tr>
<td>6 Being informed about alternative options for travel</td>
<td>7</td>
</tr>
<tr>
<td>4 Being informed about the cause of delays</td>
<td>8</td>
</tr>
<tr>
<td>9 Being told when replacement buses will be arrive if they are being provided</td>
<td>9</td>
</tr>
<tr>
<td>10 Being able to contact friends/relatives to arrange alternative transport</td>
<td>10</td>
</tr>
<tr>
<td>11 Being able to contact friends/relatives to ensure they don’t worry about your delay</td>
<td>11</td>
</tr>
</tbody>
</table>

Note: Weighted Sample – Representative of the Market in terms of Ridership (frequent users have a higher weighting). Scores are ranked by importance score * performance score

Source: PTRG - Metro Trains Passenger Opinion Survey Nov 2013
Social Media – a two way user interface for unexpected events

Social Media – 3 research components

1. Social media utilisation during URDs
2. Advantages and disadvantages
3. Challenges and options for the future

The real-time nature of Twitter makes it for comms in URDs...

Types of Social Media Used for URD communications in cities

Source: Pender et al. (2013) ‘Social Media Utilisation during Unplanned Passenger Rail Disruption – What’s not to ‘Like’?’, Paper presented to 36th Australasian Transport Research Forum (ATRF), Brisbane, Australia
...however frequent urban service & parallel systems are good for SM applications

Figure 3. Social media utilisation according to network and disruption attributes.

<table>
<thead>
<tr>
<th>Social Media Utilisation during Unplanned Rail Transit Disruptions</th>
<th>Network Context</th>
<th>System Characteristics</th>
<th>Social Media Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Type (Coverage Area)</td>
<td>Network Context</td>
<td>System Characteristics</td>
<td>Social Media Usage</td>
</tr>
<tr>
<td>Rail Service Frequency</td>
<td>Network Type (Coverage Area)</td>
<td>Suburban Networks</td>
<td>Real-time and two-way sector and corridor messaging are beneficial</td>
</tr>
<tr>
<td>Location of Disruption</td>
<td>Rural/Country Networks</td>
<td>Rural/Country Networks</td>
<td>Resource intensive, making it hard to justify associated costs for such networks</td>
</tr>
<tr>
<td>Length/Type of Disruption</td>
<td>Operates &lt;60 mins</td>
<td>Operates &lt;60 mins</td>
<td>Plays an important role in complementing conventional approaches</td>
</tr>
<tr>
<td>Figure 3. Social media utilisation according to network and disruption attributes.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Social media enables pro-active comms...
...but planning and preparation is required

Advantages: Interactive nature is important...


Source: Pender et al. (2013) 'Social Media Utilisation during Unplanned Passenger Rail Disruption – What’s not to ‘Like’?', Paper presented to 36th Australasian Transport Research Forum (ATRF), Brisbane, Australia
Disadvantages: Very resource intensive...

Challenges and options for the future

- Social media is a victim of its success...
  - Increased level of expectation
  - Key challenge: complete organisation support
  - “Should we use social media if we cannot do it well?”

- Enhancing customer experiences...
  - Increased presence and interactivity
  - Increased prevalence of social media will create resultant need for greater transparency during URDs
  - Potential for crowd-sourcing, but issues with reliability & accuracy

Source: Pender et al. (2013) ‘Social Media Utilisation during Unplanned Passenger Rail Disruption – What’s not to ‘Like’?’, Paper presented to 36th Australasian Transport Research Forum (ATRF), Brisbane, Australia
Also:

New PTRG Website

PTRLG.INFO
Join the ITS (Monash) LinkedIn group to keep informed of our activities.
2. Impacts of track crossovers

- Increase in crossovers increases flexibility to ‘turn’ trains
- Limited number/location of crossovers impacts service recovery