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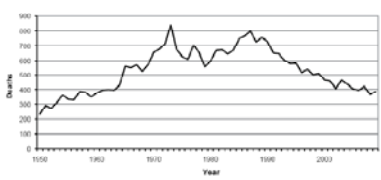
Improving the Identification of Intersections for Investigation and Intervention


3M Traffic Safety Award Applicants: Paul Durdin, Kurt Janssen

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Identifying the Need


- Road safety record has stagnated
- 'Safer Journeys' requires the industry to perform better
- Value for money




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Engineering Approach

- 1 Identify an area of the transport network for treatment
- 2 Identify an appropriate treatment
- 3 Implement the treatment

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Traditional Approach


- Treating high crash occurrence sites
- Reactive approach 
- Diminishing safety benefits when treating crash locations
- Underlying crash rate not taken into account

Importance of Innovation 


"If we try to solve today's problems with yesterday's solutions we will seek the future by looking through yesterday's eyes"

(Jack Collis, 2007)

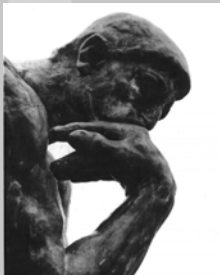


Recent Approaches 

- Crash prediction modelling ✓
- Risk analysis ✓
- Proactive approach ✓
- Data intensive, time consuming, costly ✗

Contemplation 

- How to maximise the benefit of road safety investments?
- How to undertake a citywide study with micro level analysis and keep it affordable?
- How to maximise the usefulness of existing data sources?



Our Approach 

Aim: To generate a prioritised list of intersections for investigation and intervention

How: By comparing crash history and crash predictions

Why: To maximise investment potential and minimise lost opportunities

It's about looking in the right place first

Making it Affordable

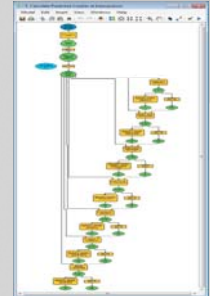
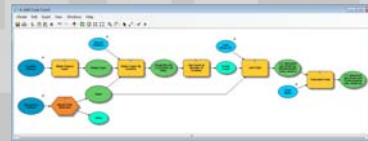


- ArcGIS Network Analyst
- Input Requirements:
 - Crash Prediction Models:
 - Intersection type
 - Speed limit
 - Traffic volume
 - ArcGIS:
 - A spatial reference = road centreline
 - Crash prediction modelling equations
 - Smarts!

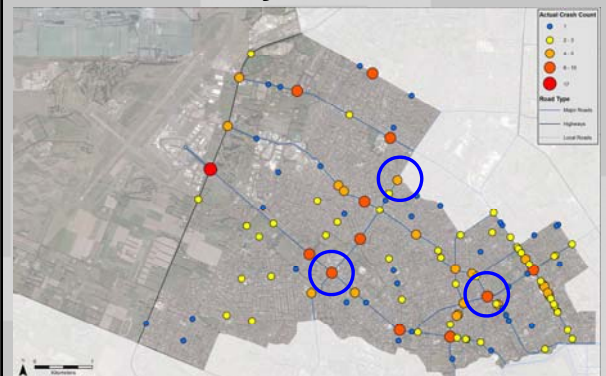
Innovative Technology



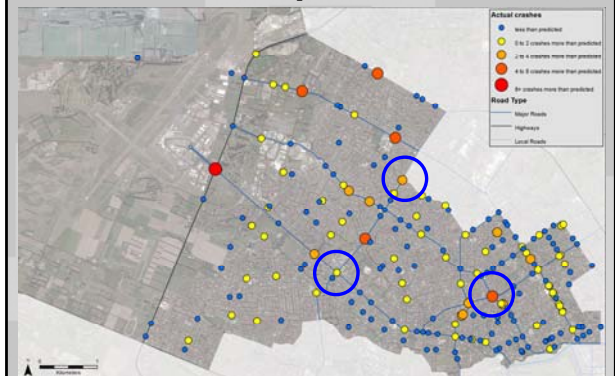
- Platform for network-based spatial analysis
- Assigned attributes to road centrelines
- Ran spatial queries

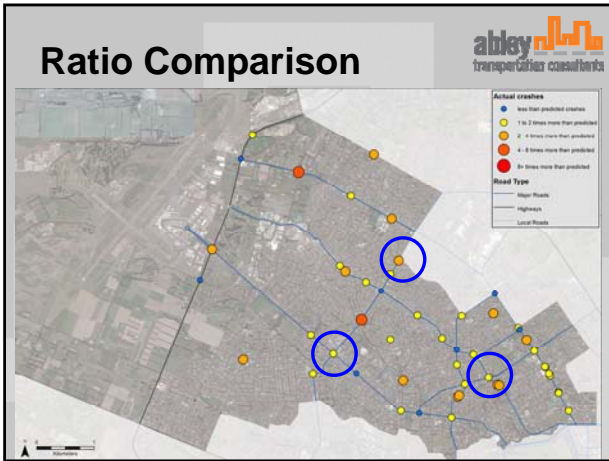


Crash History



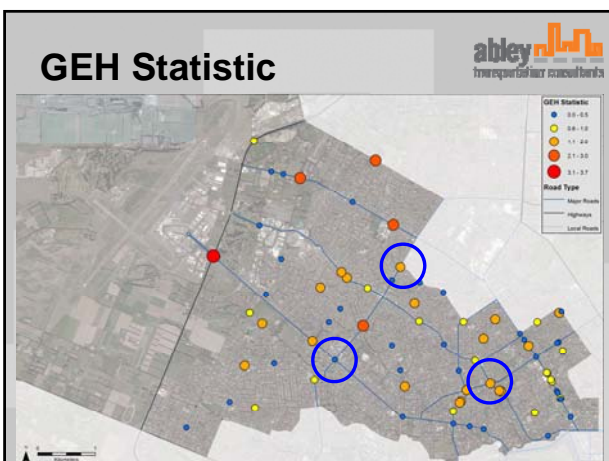
Absolute Comparison





Preferred Ranking Method

- GEH Statistic
- Chi Squared Test
- Used in traffic modelling to compare observed and modelled traffic volumes
- More tolerant of larger differences at sites with a low observation

$$GEH = \sqrt{\frac{2(M - C)^2}{M + C}}$$


Prioritised Lists

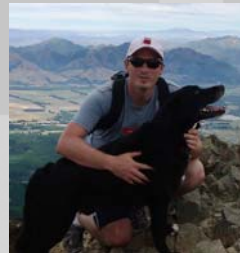
Rank	Intersection	Intersection Type	Road Controlling Authority	Actual Number of Injury Crashes	Predicted Number of Injury Crashes	GEH
1	Cashel / Fitzgerald	Traffic Signals	CCC	22	6.66	4.4
2	Marshfield / Queen Elizabeth II	Roundabout	NZTA	21	6.68	4.2
3	Memorial / Russley	Roundabout	NZTA	17	4.78	3.7
4	River / Stanmore *	Priority X	CCC	10	1.29	3.7
5	Manukau / North Parade / Shirley *	Traffic Signals	CCC	14	3.30	3.6
6	Avonside / Linwood / Woodham *	Priority X	CCC	11	1.87	3.6
7	Main North / Northcote / Queen Elizabeth *	Traffic Signals	NZTA	21	7.44	3.6
8	Aldwins / Buckleys / Linwood	Traffic Signals	CCC	18	6.11	3.4
9	Kiri / Waterloo *	Priority T	CCC	9	0.83	3.4
10	Brougham / Burlington / Gasson	Traffic Signals	NZTA	17	6.22	3.2

Benefits



- Affordable
 - 1,148 intersections analysed and prioritised for less than \$15 per intersection
- Focussed
 - Maximises the potential for road safety benefits by looking in the right place first.
 - More likely to provide value for money
- Easy to update and enhance
- Transferable

Contact



Paul Durdin
paul@abley.com



Kurt Janssen
kurt@abley.com