



THE UNIVERSITY
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CENTRE FOR AUTOMOTIVE
SAFETY RESEARCH



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Analysis of the effect of dual purpose safety cameras at signalised intersections in Adelaide

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seek LIGHT

Safety cameras considered

- Only considering safety cameras at signalised intersections
- This does not include:
 - Safety cameras located at midblocks
 - Safety cameras located at pedestrian crossings
 - Mobile speed cameras
 - Hand-held laser gun speed detection



Types of safety camera

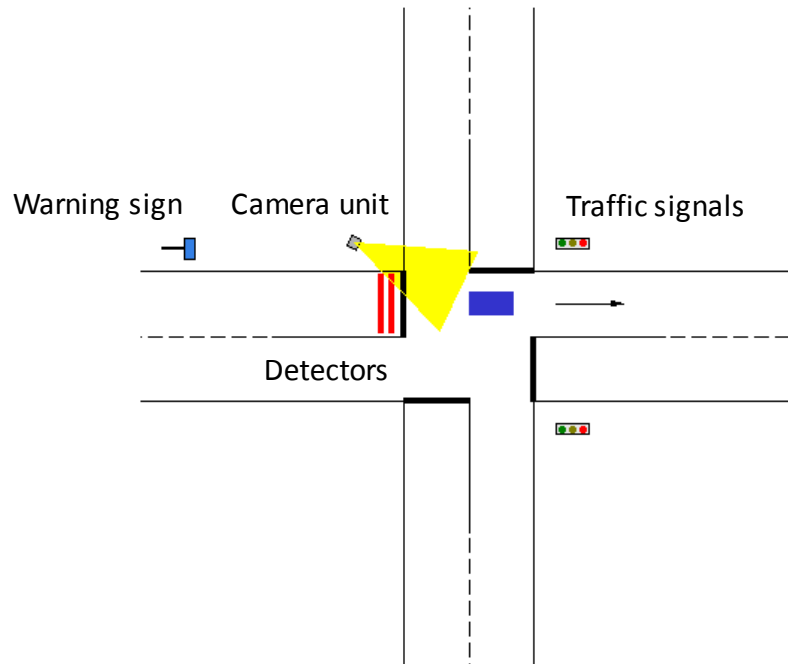
Technology type

- Wet film
 - Removable internal camera
 - Removed for processing
- Digital
 - Permanent internal camera
 - Downloaded for processing

Infringement type

- Red light
 - Red signal infringements
 - No speed detection
- Dual purpose
 - Red signal infringements
 - Speeding infringements

Safety camera layout and function



History of safety camera installation

- 102 safety camera installations were identified between July 1988 and June 2009
 - 15 wet film, red light cameras in 1988
 - Later decommissioned
 - 4 wet film, red light cameras in 1997
 - Later decommissioned
 - 26 wet film, red light cameras in 2001
 - Most were upgraded to dual purpose cameras from 2003 to 2005
 - 57 digital, dual purpose cameras from 2006 to June 2009
- Beyond June 2009, further safety cameras have been installed but were not part of this study

Infringement data

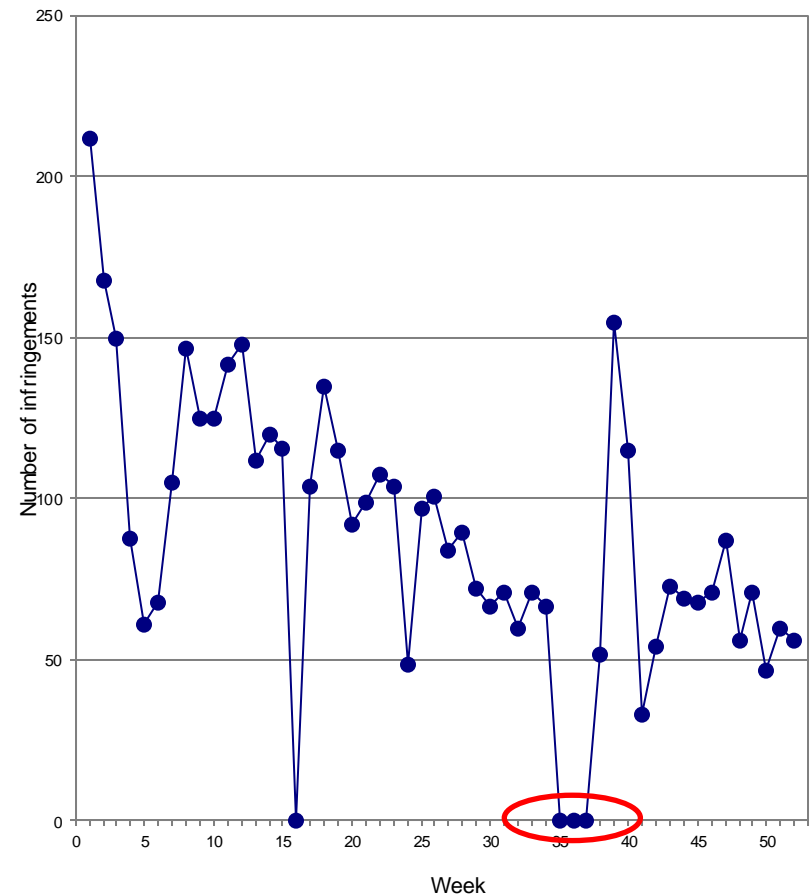
- De-identified infringement records for all safety cameras installed from 2001 onwards was supplied by South Australia Police
- The following information was supplied for each recorded infringement:
 - Site location
 - Date
 - Time
 - Type (red signal or speeding)
 - Speed of infringing vehicle (if speeding)

Analysis details

- The aim of the analysis was to investigate the change in the number of infringements over the first year of operation
 - This provided consistency across sites and controlled for seasonal effects
- The number of infringements per week was used as the unit of measure
 - The number of daily infringements at each site was low

Selecting sites for analysis

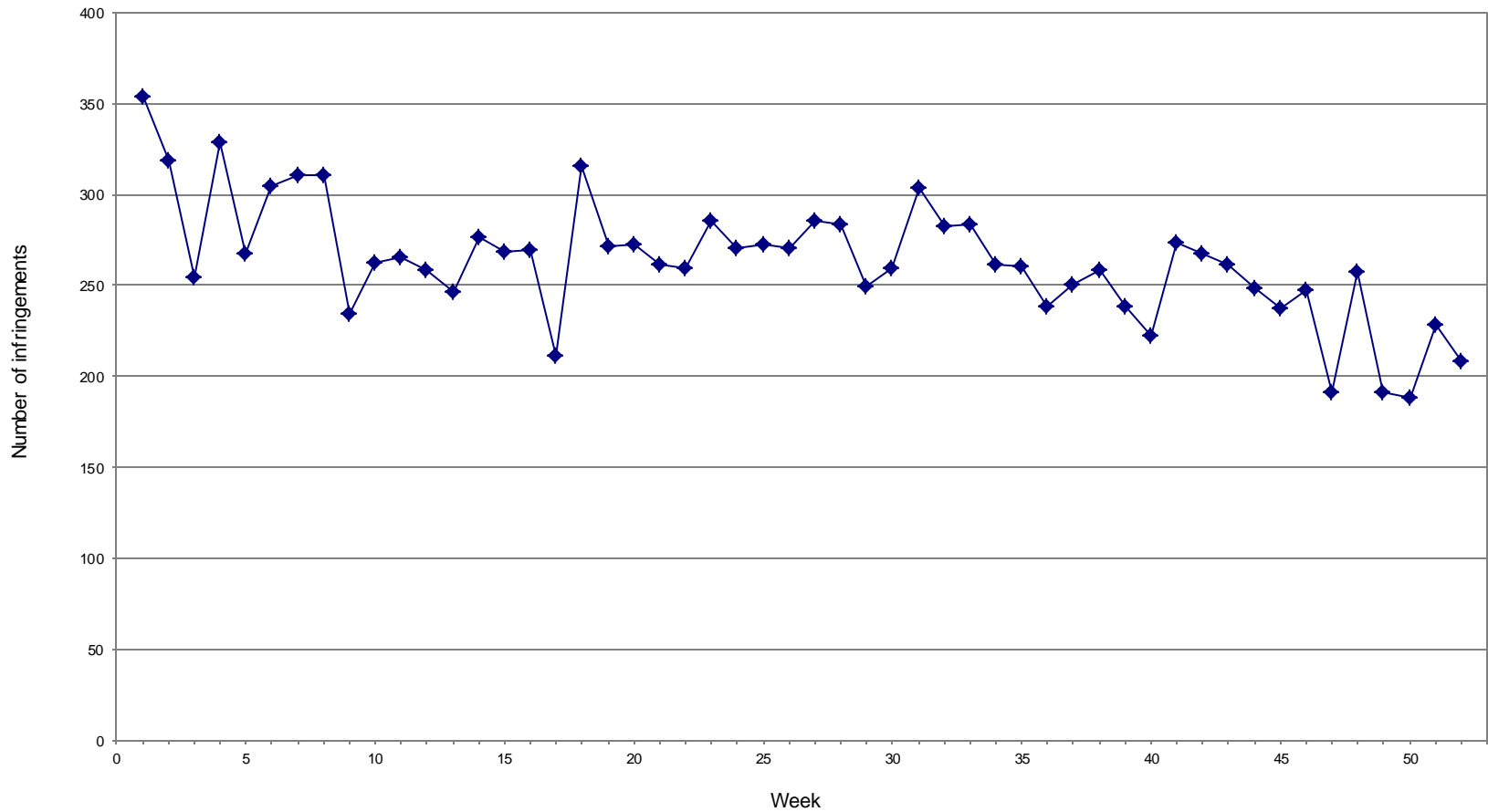
- The following sites were removed from the analysis:
 - Red light only sites
 - Country sites
 - Sites without a full year of data
 - Sites with significant gaps in recorded infringements
- This left a total of 21 sites for analysis



Sites used in the analysis

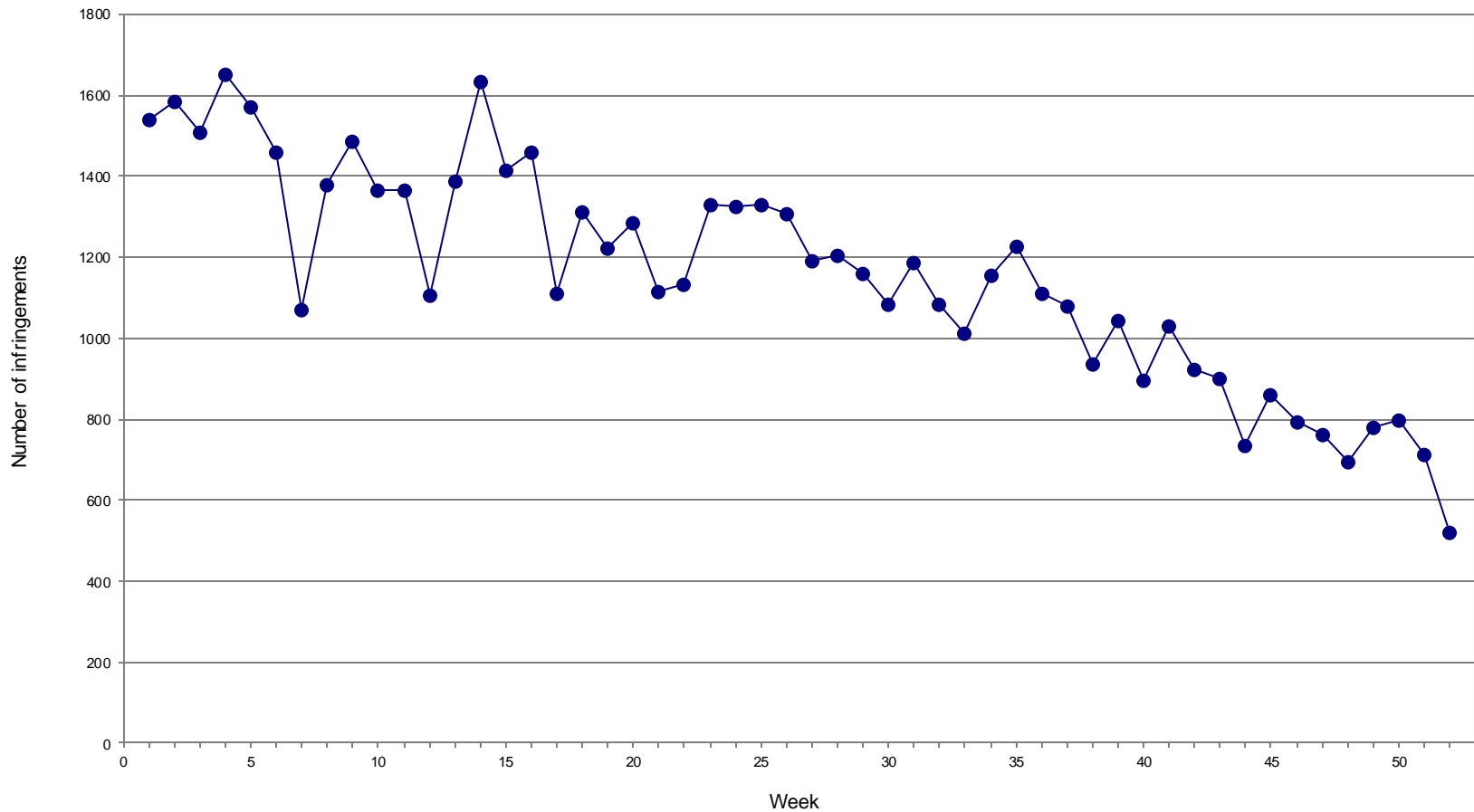
| Site | Speed limit | Lanes | Average daily traffic | Commissioning date |
|------|-------------|-------|-----------------------|--------------------|
| 1 | 60 | 3 | 16,750 | 16/02/2006 |
| 2 | 60 | 3 | 14,775 | 17/02/2006 |
| 3 | 60 | 3 | 12,800 | 17/02/2006 |
| 4 | 50 | 3 | - | 07/03/2006 |
| 5 | 50 | 3 | - | 21/03/2006 |
| 6 | 80 | 3 | 10,750 | 02/05/2006 |
| 7 | 60 | 3 | - | 05/05/2006 |
| 8 | 60 | 3 | 15,625 | 09/05/2006 |
| 9 | 60 | 3 | 10,225 | 05/10/2006 |
| 10 | 60 | 2 | 15,375 | 09/10/2006 |
| 11 | 60 | 2 | 14,650 | 12/10/2006 |
| 12 | 60 | 2 | 16,800 | 06/12/2006 |
| 13 | 50 | 3 | - | 26/03/2007 |
| 14 | 60 | 3 | - | 26/03/2007 |
| 15 | 60 | 4 | 15,400 | 27/03/2007 |
| 16 | 60 | 4 | 12,250 | 27/03/2007 |
| 17 | 70 | 3 | 17,675 | 30/03/2007 |
| 18 | 60 | 3 | 11,550 | 03/04/2007 |
| 19 | 60 | 3 | 20,325 | 09/04/2007 |
| 20 | 60 | 3 | 16,550 | 09/04/2007 |
| 21 | 60 | 3 | 16,200 | 12/04/2007 |

Results – Red signal infringements



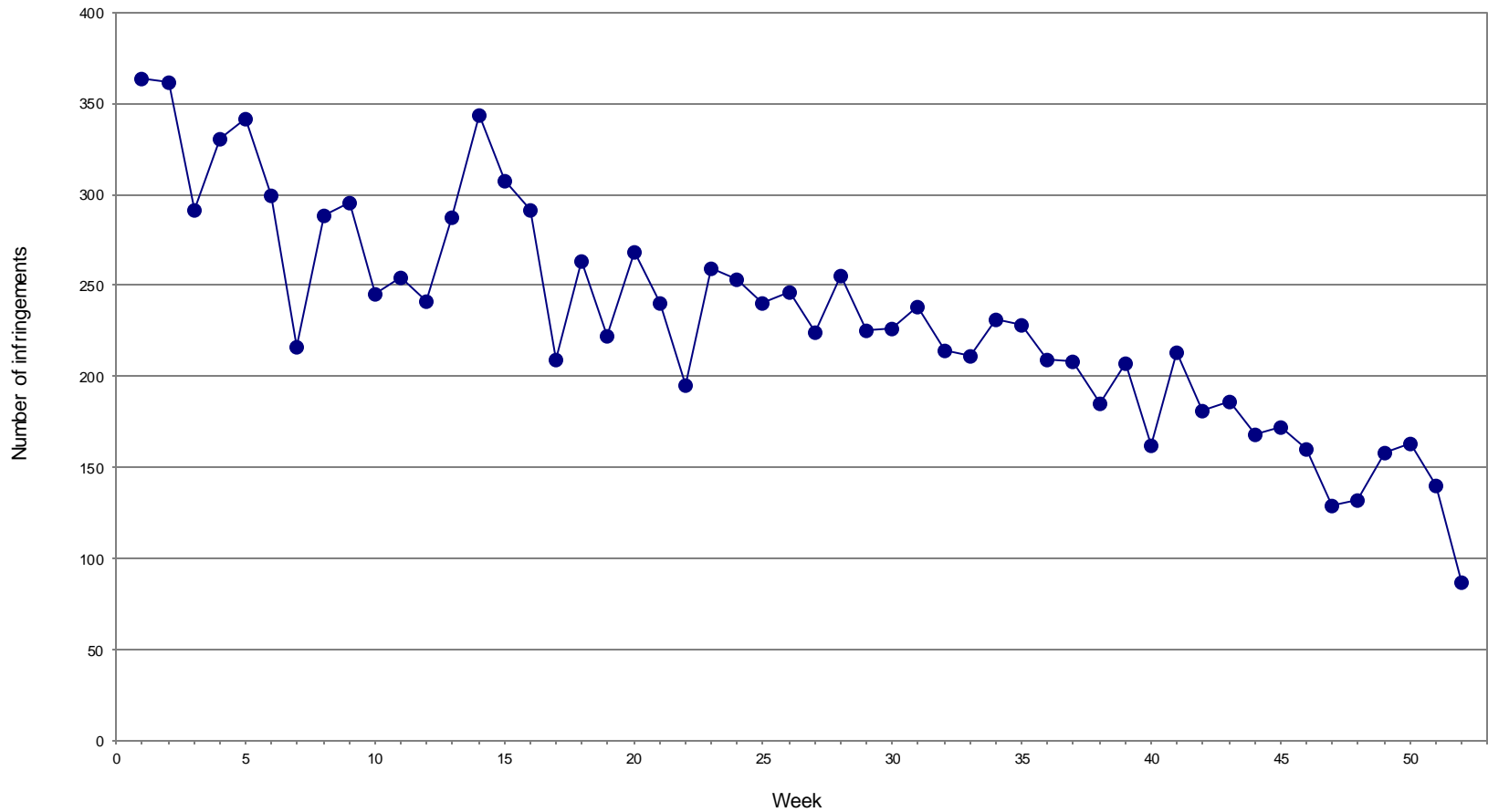
Results – Speeding 10+ km/h

100%



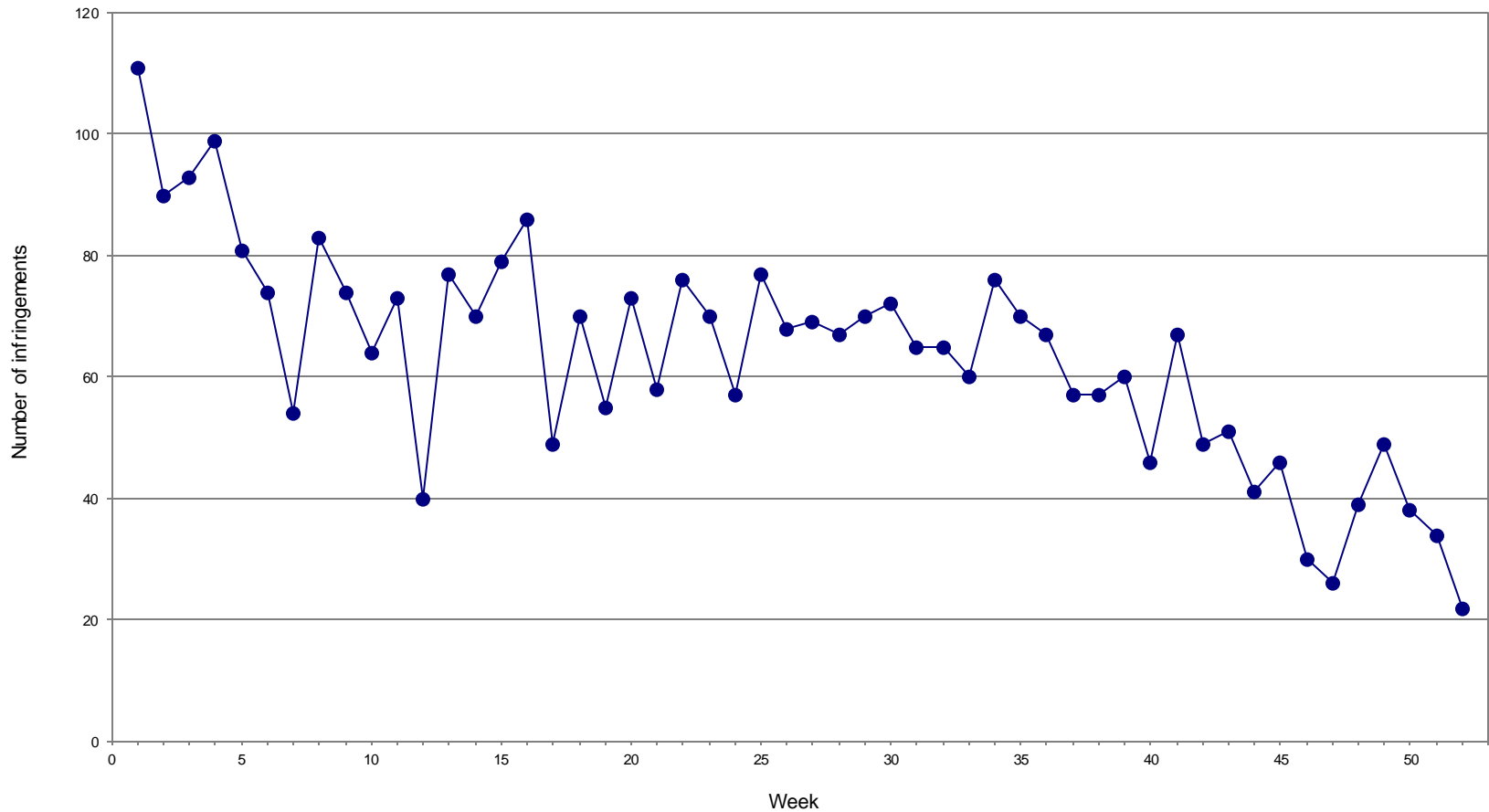
Results – Speeding 15+ km/h

20%



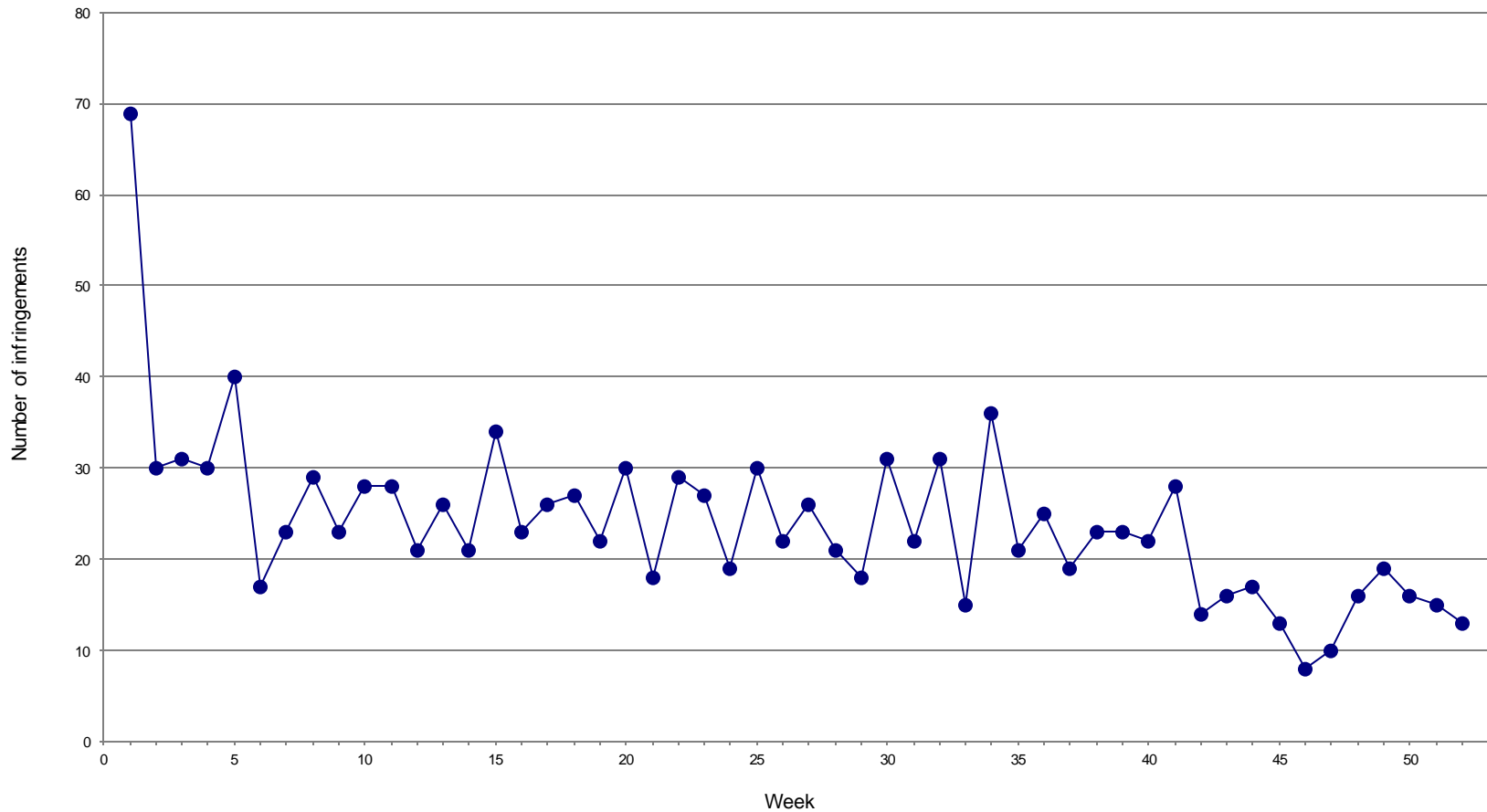
Results – Speeding 20+ km/h

5%



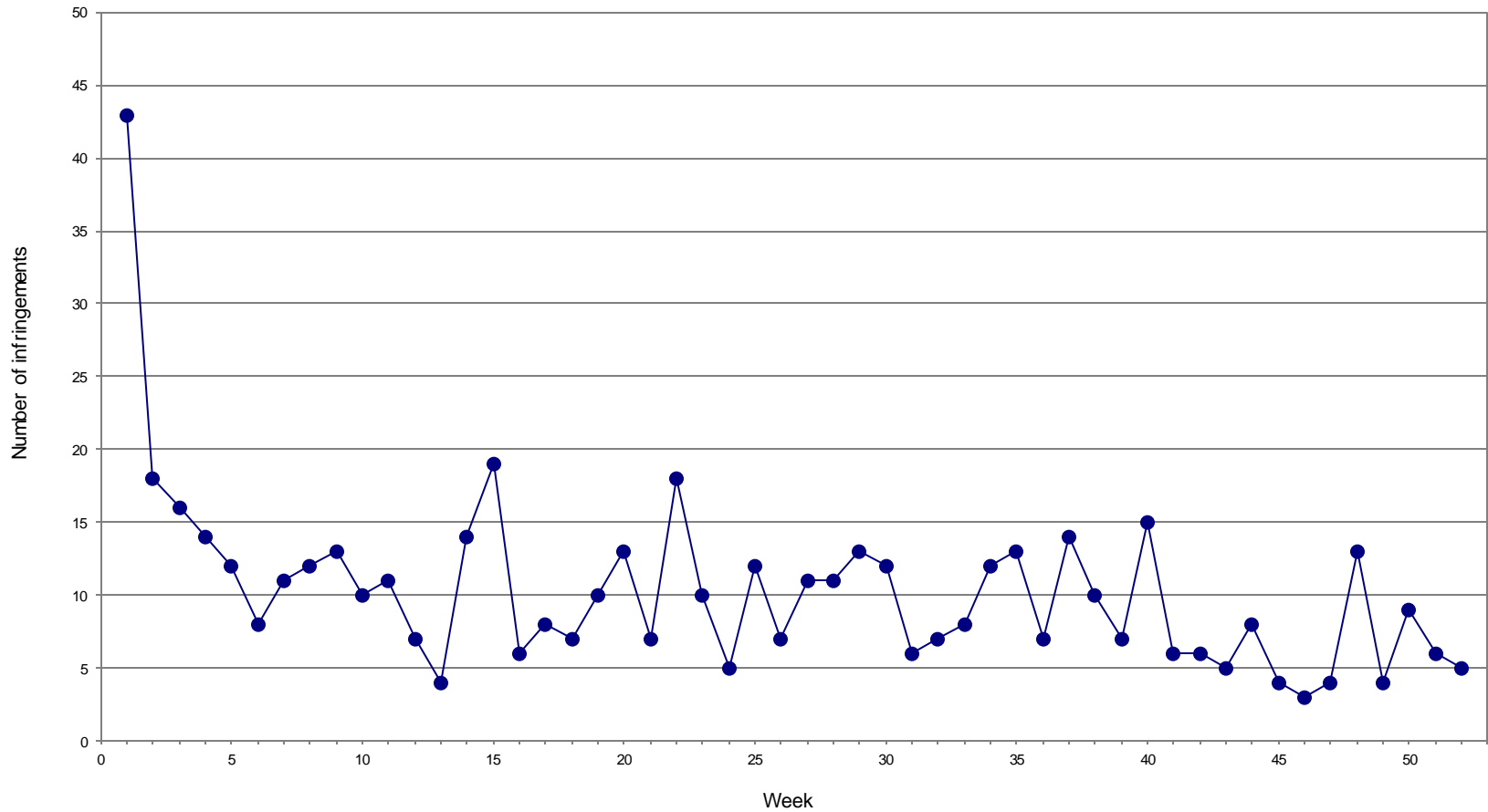
Results – Speeding 25+ km/h

2%

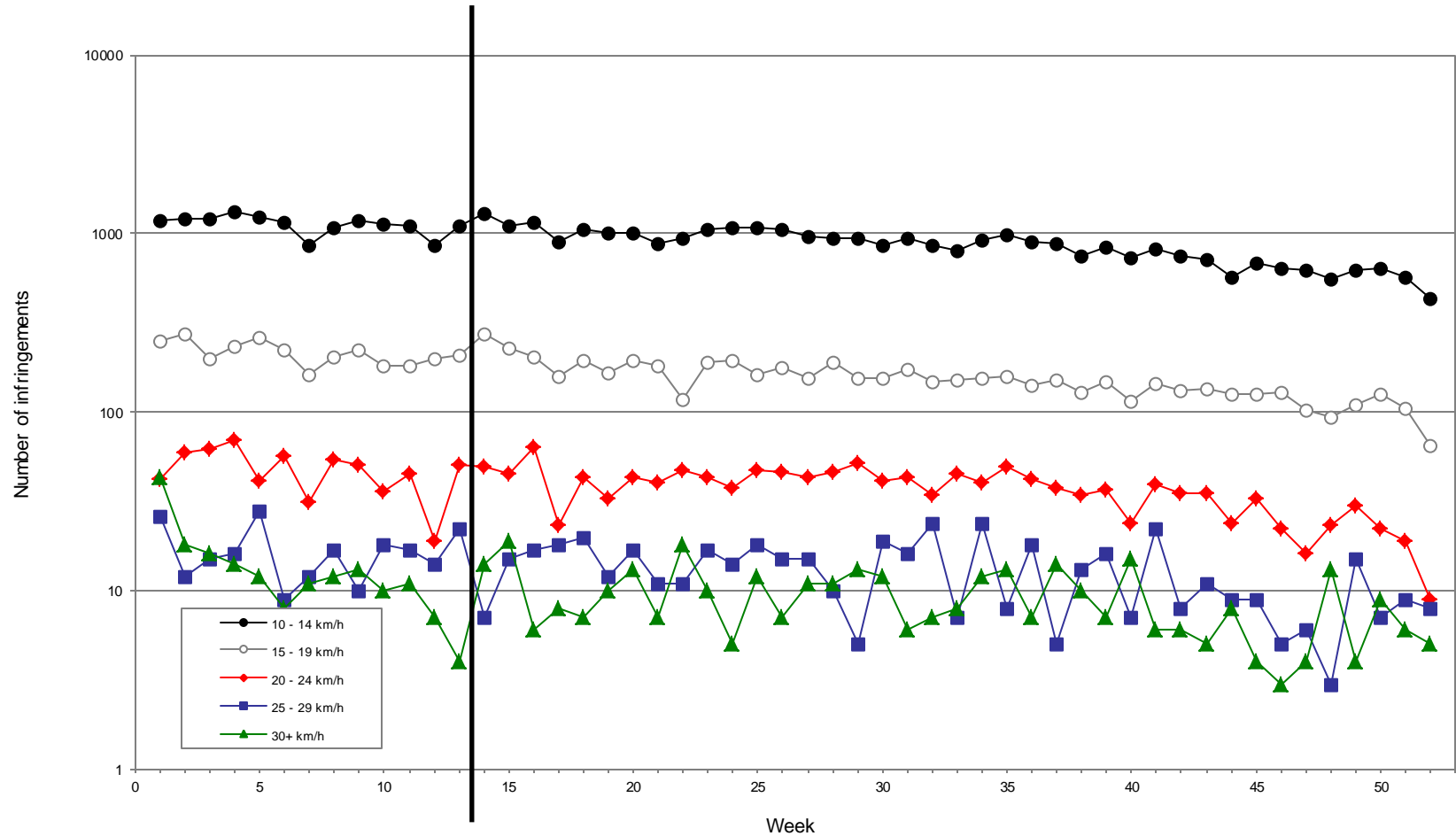


Results – Speeding 30+ km/h

1%



Results – Speeding stratified



Results – Summary

- Gradual decline in red signal infringements
- Faster decline in speeding infringements
 - Greater levels of speeding declined faster during the first few weeks

Discussion – Methodology

- No controls
- No before data
- No detailed knowledge of other changes at intersections

- Natural change in vehicle speeds on 60 km/h arterial roads between 2007 and 2008
 - 25 per cent drop in vehicles travelling 10+ km/h over the speed limit
 - 20 per cent drop in vehicles travelling 15+ km/h over the speed limit

- This natural change should be acknowledged but we don't think it is responsible for the total effect because:
 - The measured change is larger
 - The rapid decline in high level speeding is not consistent with such a change

Discussion – Behaviour change theory

- What is causing the change in driver behaviour?
 - (What causes drivers to violate in the first place?)
 - Seeing warning signs and camera unit
 - Receiving infringement notice with demerit points and fine
 - Information from radio, newspaper, internet, GPS navigator
- Why do higher levels of speeding decline faster?
 - Small group of drivers who habitually travel at high speed
 - Learn location of safety cameras and change behaviour quickly
 - Higher penalties for high speed infringements

Demerit points, fines, and disqualification

| Infringement | Demerit points | Fine | Automatic driving disqualification period |
|-------------------------|----------------|----------------|---|
| Speeding (< 15 km/h) | 1 | \$182 | - |
| Speeding (15 – 29 km/h) | 3 | \$290 | - |
| Speeding (30 – 44 km/h) | 4 | \$435 | - |
| Speeding (45 + km/h) | 6 | \$600 - \$1000 | 6 months |
| Red signal | 3 | \$390 | - |

| Total demerit points over a 3 year period | Automatic driving disqualification period |
|---|---|
| 12 – 15 | 3 months |
| 16 – 20 | 4 months |
| 20 + | 5 months |

Discussion – Infringement interaction

- Drivers who are travelling at the speed limit will have more time to recognise an amber or red signal and stop their vehicle
- Drivers who respect an amber or red signal will stop their vehicle instead of attempting to ‘beat the red’ by speeding up

Conclusions

- There are still unknowns
 - The reasons for red signal and speeding violations
 - The reasons for the decline in infringements
 - The level of interaction between infringement types
- The reduction in infringements after the installation of a safety camera at a signalised intersection is considered a worthwhile improvement in driver behaviour
 - Would be expected to lead to a reduction in crashes and crash severity

Acknowledgements

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Questions?



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