



Curtin University



MONASH University
Accident Research Centre

Removing right turn filter movements from signalised intersections in metropolitan Perth: Preliminary findings

Tom Chen and Lynn Meuleners (Investigators)

Peter Palamara (Presenter)

Curtin-Monash Accident Research Centre

p.palamara@curtin.edu.au

Road Safety Research, Policing and Education Conference
28th-30th August 2013
Brisbane Australia



Project Aims

To investigate the effect of the introduction of a dedicated right turn green arrow signal on the incidence of crashes at existing 'filter movement' signalised intersections in Perth



Background

Nearly 40% of fatalities and serious injuries in WA in 2010 occurred at ‘intersections’

Eight in ten persons killed or seriously injured at intersection crashes were in metropolitan Perth

Crash types at intersections are frequently right angle and right turn thru – more often resulting in death and serious injury than rear-end crashes



Background

Traffic control signals at intersections have been noted to reduce the incidence of crashes by up to 30%

Filter movements may improve traffic flow but can be beset by poor driver judgement about gap selection

Signalisation that incorporates dedicated right turn on green arrow has been shown to be particularly effective in reducing crashes



Methods

Identified n=13 three-way signalised intersections upgraded from 'filter movements' to dedicated* right turn on green arrow, 2006-2011

Quasi-experimental 'pre and post' treatment design without comparison group

Data were all police reported crashes for the period January 1st 2001 to September 30th 2012

* n=2 partial control



Methods

Average exposure time across the 13 intersections:

- n=1,826 days pre-treatment
- n=854 days post-treatment

Data analysis using *General Estimating Equation (GEE) Poisson regression* – appropriate for the analysis of correlated longitudinal data

- All crashes
- Right angle, right turn thru crashes
- Rear end crashes
- Killed and hospitalisation crashes



Results



Curtin University

C-MARC



MONASH University
Accident Research Centre

Percentage crash reduction and effect by crash type

Crash type	N pre	N post	IRR	95% Confidence Interval		P-value
All reported	978	371	0.76	0.72	0.80	<0.0001
Right angle/right turn though	359	52	0.31	0.24	0.41	<0.0001
Rear-end	522	290	0.90	0.89	0.91	<0.0001
Fatal/Hosp.	44	9	0.42	0.22	0.80	<0.01



Discussion

Preliminary findings are consistent with those of previous studies citing crash reductions

Removing filter movement particularly reduces the opportunity for driver error around 'gap selection' for turning

Findings support the continued phasing out of filter movements from existing sites and use of right turn green arrow at all new sites



Discussion

Number of methodological limitations, e.g.;

- Change in crash reporting criteria in 2008 from \$1,000 property damage to \$3,000
- Limited number of days of exposure post-treatment
- Potential misclassification of date of treatment
- No adjustment for traffic volume; traffic migration
- Inability to include appropriate untreated sites for comparison
- Non-random assignment; regression to the mean
- Unknown site specific factors affecting drivers

