The Effectiveness of Average Speed Cameras

a report commissioned by the RAC Foundation

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Background

• Road Safety Analysis
  – Not-for-profit company limited by guarantee registered in England
  – Independent specialists in collision and casualty analysis, evaluation, online analysis systems, intervention design, training and more

• Richard Owen
  – Former manager at Thames Valley Safer Roads Partnership
  – Specialist in spatial analysis, GIS, and project management

• Co-authors
  – Professor Richard Allsop - Emeritus Professor of Transport Studies at UCL
  – Dr George Ursachi – RSA Analyst
The Effectiveness of Average Speed Cameras

• History of speed cameras and previous analysis
• Objectives
• Collecting the data
• Problems
• Results
• Importance for those wanting to reduce collisions on roads
History of Speed Cameras in GB

• 2000 – 2007 Focus on casualty reduction
• Government sets installation criteria
  o 4 Collisions (KSI) per km in 3 years
  o 8 Collisions (PIC) per km in 3 years
  o Speed as a ‘causation factor’
  o 85th Percentile speeds > 10% + 2mph e.g. 35mph in 30mph limit
  o 20% of drivers exceeding the speed limit
Popularity
Evidence for Casualty Reduction

Department for Transport
A cost recovery system for speed and red-light cameras – two year pilot evaluation
Research paper
11 February 2003

The national safety camera programme
Three-year evaluation report
June 2004

The national safety camera programme
Four-year evaluation report
December 2005
Evidence for Casualty Reduction

- 42% reduction in KSI
- 22% reduction in PIC
- 50% reduction in fixed
- 35% reduction in mobile
Evidence for Casualty Reduction

- Regression to Mean
  - 36% at Fixed Sites
  - 43% at Mobile Sites
RAC Foundation Objectives

1. To create a national database/inventory of ASC sites of various kinds in Great Britain

2. To establish a suitably large and appropriate control group of sites to enable an understanding of the difference in collision reduction between potential ASC sites with and without such enforcement

3. To establish levels of occurrence of collisions before and after ASC installation (with consideration given to site-selection period, pre-installation and post-installation periods)
How we collected the data

• Support from manufacturers

• Support from authorities (Police, local authorities, camera partnerships)
  – Installation dates
  – Site selection periods
  – Prior enforcement
  – Other information

• Collision data independently sourced
Analytical problems

• We need to know if some sites are not suitable for analysis
• Input from authorities was crucial here
• It is possible that other changes could have occurred but weren’t recorded
Site Selection Periods

- ASC 1
- Comparison 1
- ASC 2
- Comparison 2
- ASC 3
- Comparison 3

- Site pre-site selection period
- Comparison pre-site selection period
- Site selection period
- Comparison selection period
- Site implementation period
- Comparison implementation period
- Site post-installation period
- Comparison post-installation period
- Month made operational

Roadsafetyanalysis
Map sample

Excluded

Road Safety Analysis
Comparison sites

GB Collisions 2005 - 2015

29%
PIC
Control sites

- Cameras considered but never installed
- 9 sections, 25km of roads
Standard “3 Before vs 3 Recent” Analysis

- Approach adopted by most authorities
- Doesn’t take into account trend
- Doesn’t allow for Regression to Mean
Generalised Linear Model

\[ \ln \mu_{ny} = \ln P_{ny} + c_n + ub_{ny} + vc_{ny} \]

- Monthly data for each site in each period
- Takes into account collisions on other similar roads
- Estimates the effect of the SSP
- Estimates the effect of installation
Results

- Site-selection period effect: 24.9% FSC, 16.7% PIC
- Overall installation effect: 36.4% FSC, 16% PIC
Results

• No difference in collision reduction rates at sites installed pre-April 2007 versus after

• No significant difference in effectiveness on low speed (20 – 40 mph) and high speed (50 – 70 mph) sites

• Candidate Sites – No significant change in collisions post-consideration
What this means

1. The presence of Average Speed Cameras reduces the frequency of injury collisions, even when other mitigating factors are taken into account

2. When analysing the long-term impact of road safety interventions, consider the influence of general trend

3. If you select sites for treatment based on high collision rates, not all of the subsequent reductions can be attributed to the intervention