

# Safety investments paying off

Cost-benefit analysis invariably finds highly in favour of speed and red light enforcement, particularly so in Edmonton in the Alberta province of Canada, where authorities need no convincing of the merits of road safety engineering.

**J**ustification of enforcement efforts on economic grounds has been reinforced this year, by a study of the costs and benefits of red light enforcement. New York-based economic research firm John Dunham & Associates carried out this latest analysis for American Traffic Solutions (ATS), with the aim of quantifying the benefits of red light enforcement for individual US cities. The results are conclusive in showing large scale savings as a result of reduced accidents, injury and loss of life, regardless of enforcement revenue. But like in similar studies carried out in other parts of the world, the cost reductions have been calculated accumulatively from savings experienced by all affected by individual road accidents.

The benefits of reducing road fatalities for society at large are clearly enormous when all the disparate costs are added up, but the savings are generally far less for the operating or funding authority alone; unless, that is, revenue from enforcement is taken into account, and allowed to go directly back to that organisation to cover operating costs – or for further investment in road safety.

The business model promoted by ATS is predicated on a flat monthly fee per camera, funded from fines paid by violators. Highway authorities' only costs are in initial staff time needed to set up the enforcement programme, which then becomes self-financing. ATS' cost-benefit study has been carried out with the aim of showing communities how they can benefit from reduction of accidents, which, the company says, ought to be sufficient reason alone for red light enforcement.

## Unequivocal backing

North of the US border, in the Canadian province of Alberta, CAN\$32M has been collected by the City of Edmonton over the course of a single year as a result of a programme of speed and red light enforcement costing around \$6M to operate per year. Elsewhere this might cause political difficulty by attracting accusations of enforcing in the name of profit, but in Edmonton the city's executive has the unequivocal backing of its governing council.

"The public perception here is similar to elsewhere, with a small percentage of people not liking the speed and red light enforcement, but surveys have shown more than 80% are in favour of the initiative," says executive director of the City of Edmonton's Office of Traffic Safety, Gerry Shimko. "A big issue in Edmonton is the number of complaints of dangerous driving behaviour, so public support continues to grow. Another plus of the programme, for generating positive perceptions, is the fact that all of the revenue generated is ring fenced for going back into road safety projects."

Edmonton's Office of Traffic Safety set about expanding enforcement with award of a contract for upgrading camera technology for enforcing red light and speed violations at 50 intersections



An impression of enforcement being pursued for the right reasons is reinforced by the city's scientific approach to the problem of road safety, which has included the enlisting of road safety academics at Ryerson University in Toronto and the University of British Columbia in Vancouver. Revenue generated has been used to found and fund a chair in urban traffic safety within the faculty of civil and environmental engineering at the University of Alberta; and Edmonton will host its fifth annual International Urban Traffic Safety Conference in 2013, also funded by the city's enforcement programme.

### Political commitment

A political commitment is evident from efforts in Edmonton, driven in part by a 'Mayor's Task Force on Traffic Safety'. In 2007, the city established a new Office of Traffic Safety (OTS), which would be responsible for all road safety work, including evaluation, engineering, education and enforcement. Edmonton's police service had been operating a limited enforcement programme, but was seeking to distance itself from being seen to fund services from speeding fines. OTS was handed responsibility for enforcement in 2009 and immediately set about expanding the programme within the city limits. ATS was the successful vendor awarded a contract for upgrading camera technology for enforcing red light and speed violations at 50 intersections – equipment that was fully installed and operational by the close of 2009.

Since then numbers of traffic collisions have been "coming down nicely", Shimko says. There is still more than sufficient revenue being gathered for funding further road safety work, however. "The enforcement system has been designed to be self funding and relies on enough people exceeding limits or jumping red lights to fund ongoing safety work. Every year it seems we get another crop of speeders," he says.

## INTERSECTION SAFETY DEVICES

Edmonton's 'Intersection safety devices' consist of a TC-16 megapixel combined red light and speed camera supplied by ATS, together with an integrated loop detection and Idris vehicle identification system. These have been configured to detect and enforce red light and speeding violations, but not the two offences combined. Edmonton also has a number of mobile speed enforcement units.

For speed violations, when a speeding vehicle crosses the detection loop, a sophisticated software algorithm rapidly reviews and validates the data, which, if matching or exceeding set tolerances, triggers the ATS camera. Based on the measured speed of the vehicle, the system then calculates a fixed distance from the first shot to capture a second 'confirmation' image. This is then used to confirm that the system's speed calculation is accurate.

Two digital images are also taken for enforcing red light infractions: one is taken of the vehicle prior to the violation point showing the traffic signal illuminated; the second is taken to capture the offender within the intersection with the light on red.

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## ACCIDENT COSTS AND CAMERA SAVINGS

The John Dunham cost-benefit study has calculated cost savings from deployment of one red light safety camera at a single intersection for 25,000 cities and towns in all 50 US states and the District of Columbia. Costs equate to the \$57,000 annual fixed price of an ATS camera – a cost covered by fees collected from violators – while savings were derived from costs avoided through reduction in accidents, in

accordance with a detailed national model of the many different costs involved. For the 195 US towns and cities using red light cameras managed by ATS, the study reveals an average saving of \$190,415 for each intersection per year. Combined, these cameras save their communities an estimated \$37M every year.

City-specific savings can be viewed at <http://www.atsol.com/economicbenefit>

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### Reinvestment programme

Edmonton's OTS has opted to keep operation of its enforcement regime in-house rather than outsourced to a private sector supplier. According to Shimko this allows the city to exploit its ability to reduce cost and reinvest in further initiatives. The OTS is now a group of around 20 professionals analysing collision data and designing solutions where the numbers are high.

"We are now embarking on a programme of infrastructure improvements," says Shimko. "We have identified some necessary engineering changes to right turns and collector roads between residential streets and freeways."

So far Shimko's team has demonstrated a reduction in collisions worth \$203M to the City of Edmonton, over a period when the city's population has risen by 10% and the number of registered vehicles has increased by 21%. Shimko puts much of this success down to OTS' scientific approach: "Problems elsewhere are usually down to insufficient data. We collect a lot of it and use a full empirical bayesian methodology of statistical analysis for selecting sites to be treated. We also have leading edge academics helping so it's difficult for anybody to say we're doing any of this for the wrong reasons." ■

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