CCTV

EVIDENCE BRIEF

Evidence suggests that CCTV with high coverage can be effective at reducing crime in car parks when used in combination with other interventions. CCTV can also provide other benefits such as supporting Police prosecutions and traffic management.

OVERVIEW

- Public Closed Circuit Television (CCTV) is one form of Situational Crime Prevention. CCTV is theorised to reduce crime by acting as a form of surveillance which increases the actual or perceived risks of offending to a level where they outweigh the benefits.
- International evidence shows that CCTV can be effective when tailored to a specific context but does not support its use as generic widespread solution for preventing crime.
- CCTV has been found to be effective at reducing crime in car parks when a large proportion of the car park is covered by cameras and it is used in combination with other interventions such as improved lighting.
- While the evidence does not support CCTV as a widespread solution for preventing crime, CCTV has other important benefits such as supporting Police investigations and prosecutions.
- CCTV is used by local authorities in New Zealand but there is limited information on the current level of investment.
- CCTV has not been formally evaluated for its impact on crime in New Zealand.
- International evidence is largely based on the UK experience. New Zealand evaluations of the impact of CCTV on crime and its other potential uses are needed.
- Further research is also needed to identify and disentangle the specific components of effective CCTV schemes.

EVIDENCE BRIEF SUMMARY

Evidence rating:	Promising for actively monitored CCTV in car parks with high coverage and when used in combination with other interventions. Inconclusive as a general crime prevention measure.
Unit cost:	Unknown
Effect size:	International evidence suggests that, on average, actively monitored CCTV can reduce crime in car parks by 54% when a large proportion of the area is covered and its use is combined with other interventions. No NZ evidence available.
Current justice sector spend:	Unknown
Unmet demand:	Low

New Zealand Police / Nga Pirihimana O Aotearoa

Ministry of Justice / Tāhū o te Ture

Department of Corrections / Ara Poutama Aotearoa

HOW DOES CCTV WORK?

CCTV operates through the mechanisms of Situational Crime Prevention (SCP). SCP is underpinned by theories such as routine activity and rational choice theory. These theories assert that whether crimes are committed depends on rational choices and situational factors such as the availability of targets and risk of detection.

Note that an Evidence Brief which looks at SCP more broadly is also available.

Routine activity theory

Routine activity theory rests on the premise that for a crime to occur there must be a motivated offender, a suitable target and the absence of a capable guardian[i]. In this regard, CCTV can be seen as playing the role of a capable guardian through its surveillance properties. It can either enhance or take the place of security personnel.

Rational choice theory

Rational choice theory asserts that individuals weigh costs and benefits and make a rational choice to offend or not. This choice can be shaped by efforts to change the situation through increasing the perceived or actual effort or risks, reducing the anticipated rewards, and removing excuses or provocation[ii]. According to this theory, CCTV works to deter an offender from committing a crime because it increases the perceived or actual risks of offending to a level where the risks outweigh the benefits.

DOES CCTV REDUCE CRIME?

International evidence

We found three international meta-analyses on CCTV. All three reviews of CCTV studies, the majority of which are based in the United Kingdom, found CCTV can be effective at reducing crime when tailored to a specific context but did not support the use of CCTV as a more generic widespread crime prevention measure.

The most recent meta-analysis, from 2008, synthesised the results of 41 studies of CCTV and found that CCTV has a modest but significant effect on crime with an overall reduction of 16 percent[iii]. The authors considered the effectiveness of CCTV in different contexts and found that CCTV is effective for some crime types when implemented in some locations, but not more generically. It was therefore concluded that the continued use of CCTV to prevent crime in public spaces is supported, but that future use should be targeted more narrowly targeted.

The results of two earlier meta-analyses, from 2007[iv] and 2002[v], also found CCTV can be effective at reducing crime in some contexts but not others. The authors therefore concluded that future CCTV schemes should be carefully implemented based on analysis of the crime problem in the area and its causes.

As mentioned earlier, the international evidence is largely based on the United Kingdom experience. Welsh and Farrington (2008) undertook cross country comparisons and found that CCTV was more effective in the United Kingdom than in other countries (including the United States, Canada, Norway and Sweden).[iii] Given these findings, further research examining the effectiveness of CCTV outside of the United Kingdom and in the New Zealand context would be beneficial.

The majority of studies were also based on the use of actively monitored cameras meaning that personnel (e.g. Police) watched the monitors linked to cameras in real-time[iii]. This differs from passive monitoring which involves watching the footage at a later time. The available meta-analyses did not look at the effects of active versus passive monitoring. Further research

comparing these would be beneficial to help inform implementation.

New Zealand evidence

We did not find any evaluations of CCTV for its impacts on crime in New Zealand. We did however find an Australian impact evaluation on the use of CCTV in the Gold Coast. It found that CCTV was effective at detecting violent offending but not in preventing any type of offending[vi]. The authors therefore questioned the effectiveness of CCTV as a crime prevention measure. However, concluded that it appears CCTV can play an important role in detecting violent crime and/or may result in increased reporting.

WHEN IS CCTV MOST EFFECTIVE?

The three available meta-analyses considered the effectiveness of CCTV across different locations. The locations studied include residential areas, town and city centres, public transport systems, car parks, public housing and a city hospital. All three meta-analyses found that CCTV was most effective when used in car parks, with an average reduction of 54 percent across the three studies. There was little or no effect of reducing crime in other locations.

Both of the meta-analyses by Welsh and Farrington considered whether the effectiveness of CCTV differs by crime type. Both meta-analyses found that CCTV is effective at reducing vehicle crime; however, noted that this was largely a function of it being successful in car parks. CCTV has not been found to be effective at reducing violent crime[iii,v].

Coverage

One important factor in effective CCTV schemes is the level of coverage the cameras have over the area. Farrington et al. (2007) found that those studies showing an undesirable effect on crime had an average coverage of 44% whereas those showing a desirable effect on crime had an average coverage of 71%[iv].

Of the studies in car parks that reported on CCTV coverage, all covered 95 – 100% of the area[iii,iv], suggesting that the high level of coverage was an important component contributing to the success of CCTV schemes in car parks.

Other interventions

Another factor which may be important in successful CCTV schemes is the presence of other interventions. While CCTV was the main intervention in the studies included in the international evidence, the use of CCTV was generally combined with other interventions such as improved lighting[iv], notices about CCTV, painting, fencing, payment schemes and security personnel[iii,v]. This was true in all of the studies in car parks suggesting implementing CCTV in combination with other interventions may increase the success.

While these factors may contribute to the success of CCTV, the authors of the most recent meta-analysis stated that ‘exactly what the optimal circumstances are for effective use of CCTV schemes is not entirely clear at present[iii]. Further research is therefore needed to identify and disentangle the specific components of effective CCTV schemes.

WHAT OTHER BENEFITS DOES CCTV HAVE?

Public CCTV policy[vii] in New Zealand indicates information collected by cameras is used for the deterrence or immediate detection of offences. It also states CCTV footage may be used in inquiries surrounding investigations and prosecutions, training of Police and authorised personnel, and research e.g. into the nature of street offences.

Detecting crime

As highlighted by the Gold Coast impact evaluation[vi], CCTV plays an important role in detecting crime and disorder. Monitored CCTV can enable a greater proportion of crime to come to the attention of Police and early detection helps facilitate the co-ordination of responses to incidents as they are occurring. Information obtained by local authorities indicates public CCTV is currently being used in this way in New Zealand.

Police investigations and prosecutions

CCTV footage can be used in investigations to help identify an offender and track their movements before and after an offence. It can also be used to identify and track the movements of victims or potential witnesses who may not have otherwise come forward to Police.[viii] CCTV footage can also be used as evidence to support Police prosecutions. The extent to which this impacts crime is unknown and indicates a New Zealand evaluation on the potential uses of CCTV is needed.

Location management

CCTV can be used for management of areas[viii]. For example, the New Zealand Police use CCTV to monitor traffic flow and to identify and remove hazards to motorists[ix].

The New Zealand Police also use CCTV to monitor large events, and if still operational, to assist with the deployment of resources following disasters such as major earthquakes.

Medical assistance

Operators of actively monitored CCTV can alert medical services to people in need of assistance in emergencies[viii].

Reducing fear of crime

The literature suggests CCTV may reduce fear of crime among those people who are aware that it is operating in the area.

However, a 2013 meta-analysis[x] which investigated the effects of CCTV on reducing fear of crime among people in the covered area found no evidence that CCTV reduced fear of crime. Although, it concluded that the evidence was limited and should be regarded as indicative.

CURRENT INVESTMENT IN NEW ZEALAND

CCTV is used by local authorities but there is no granular information available on the current investment into these interventions in New Zealand.

Expenditure on CCTV by local authorities is broadly captured under “community development.” Local authorities spent an average of $179 million each year on community development between 2010 and 2015[xi]. However, it is important to note that community development is not limited to spending on CCTV and cannot be disaggregated further.

Some local authorities provide more detailed information about their investment. For example, Hamilton City Council indicates an approximate per unit cost per CCTV of $8,000[xii]. This includes the cost of the camera, installation and infrastructure costs but excludes cost for monitoring. In 2014/15, the annual costs to Hamilton City Council for maintenance and monitoring of their central city CCTV units was $265,000[xiii]. While this provides an indication of cost, there is likely to be variation between different local authorities depending on factors such as the quality and functionality of the camera and the extent to which they are monitored.

BROADER CONSIDERATIONS

Cost-effectiveness

The available evidence does not allow for a consideration of the cost-effectiveness of CCTV. Welsh and Farrington (2002) had hoped to look at this as part of their meta-analysis but were

unable to as only one of the 22 studies included cost information[v].

The study that did present cost information found that the amount saved from fewer prosecutions and sentences as a result of reduced crime was more than three times greater than the cost of running the CCTV schemes[xiv] i.e. the financial benefits outweighed the costs. However, further research is needed to test this and to compare the cost-effectiveness of CCTV against other alternatives such as improved lighting.

Displacement and diffusion

One potential issue with situational crime prevention measures such as CCTV is the potential for displacement effects. Displacement can take a number of forms including:

- **temporal:** crime is committed in the same area but at a different time[xv]
- **spatial:** the same crime is moved from one location to another[xv]
- **target:** another target is chosen within the same area[xv]
- **tactical:** another method is used to commit the same crime[xv]
- **functional:** offender changes from one offence type to another[xv]
- **perpetrator:** crime is committed by another person[xvi]

The reverse of displacement is diffusion of benefits. This occurs when the presence of CCTV produces effects which extend beyond the area of the intervention, even in areas that were not actually targeted by the intervention. This can occur if offenders are cautious in the presence of CCTV and are unaware of how far the cameras capabilities extend[viii].

Farrington et al. (2007) found no evidence of displacement or diffusion of benefits[iv] while Welsh and Farrington (2008) found mixed results – some studies found a displacement effect, others found a diffusion effect and others found neither[iii]. Welsh and Farrington (2008) therefore concluded that any conclusions about displacement or diffusion are premature at this point[iii].

EVIDENCE RATING AND RECOMMENDATIONS

Each evidence brief provides an evidence rating between Harmful and Strong.

Harmful	Robust evidence that intervention increases crime
Poor	Robust evidence that intervention tends to have no effect
Inconclusive	Conflicting evidence that intervention can reduce crime
Fair	Some evidence that intervention can reduce crime
Promising	Robust international *or* local evidence that intervention tends to reduce crime
Strong	Robust international *and* local evidence that intervention tends to reduce crime

According to the standard criteria for all evidence briefs[1], the appropriate evidence rating for monitored CCTV in car parks with high coverage and when used in combination with other interventions such as improved lighting, notices about CCTV, painting, fencing, payment schemes and security personnel is Promising.

According to our standard interpretation, this means:

- robust international or local evidence that interventions tend to reduce crime
- investment may well generate a return if implemented well
- further evaluation desirable to confirm interventions are delivering a positive return and to support find-tuning of the intervention design

The appropriate evidence rating for CCTV as a general widespread crime prevention measure is Inconclusive.

According to our standard interpretation, this means:

- Conflicting evidence that intervention can reduce crime.
- highly uncertain whether intervention will generate return even if implemented well.

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[1] Available at www.justice.govt.nz/justice-sector/what-works-to-reduce-crime/

FIND OUT MORE

Go to the website

www.justice.govt.nz/justice-sector/what-works-to-reduce-crime/

Email

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Recommended reading

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Citations

[i] Armitage, 2002

[ii] Gurette, 2009

[iii] Welsh and Farrington, 2008

[iv] Farrington et al., 2007

[v] Welsh and Farrington, 2002

[vi] Wells et al., 2006

[vii] New Zealand Police, 2010

[viii] Ratcliffe, 2011

[ix] Personal Communication, received February 27 2017

[x] Lorenc et al., 2013

[xi] Statistics New Zealand, accessed December 22 2016

[xii] Personal Communication, received December 7 2016

[xiii] Hamilton City Council, (n.d.)

[xiv] Skinns, 1998a and 1998b

[xv] Repetto, 1976

[xvi] Barr and Pease, 1990

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SUMMARY OF EFFECT SIZES FROM META-ANALYSES

Meta-analysis	Treatment type/population	Outcome measure	Reported average effect size	Number of estimates meta-analysis based on	Percentage point reduction in offending (assuming 50% control over an area)	Number needed to treat (assuming 50% control over an area)
Welsh and Farrington 2002	CCTV (pooled result)	Crime	OR 1.04*	18	0.01	102
Welsh and Farrington 2002	CCTV (city centres and public housing)	Crime	OR 1.02 NS	9	0.00	202
Welsh and Farrington 2002	CCTV (Public transport)	Crime	OR 1.06 NS	4	0.01	69
Welsh and Farrington 2002	CCTV (car parks)	Crime	OR 1.70*	5	0.13	8
Welsh and Farrington 2002	CCTV	Vehicle crime	OR 1.38*	8	0.08	13
Welsh and Farrington 2002	CCTV	Violent crime	0.96 NS	5	-0.01	-98
Welsh and Farrington 2008a	CCTV (pooled result)	Crime	OR 1.19*	41	0.04	23
Welsh and Farrington 2008a	CCTV (city and town centres)	Crime	OR 1.08 NS	20	0.02	52
Welsh and Farrington 2008a	CCTV (public housing)	Crime	OR 1.07 NS	8	0.02	59
Welsh and Farrington 2008a	CCTV (public transport)	Crime	OR 1.30 NS	4	0.07	15
Welsh and Farrington 2008a	CCTV (car parks)	Crime	OR 2.03*	6	0.17	6
Welsh and Farrington 2008a	CCTV	Violent crime (robbery)	OR 1.03 NS	23	0.01	135
Welsh and Farrington 2008a	CCTV	Vehicle crime (thefts of and from vehicles)	OR 1.35*	22	0.07	13
Farrington et al. 2007	CCTV (including residential, town centres, hospital and car parks)	Crime	OR 1.10 NS	13	0.02	42
Farrington et al. 2007	CCTV (residential areas)	Crime	OR 0.95 NS	7	-0.01	-78
Farrington et al. 2007	CCTV (town centres)	Crime	OR 1.02 NS	4	0.00	202
Farrington et al. 2007	CCTV (train station car parks)	Crime	OR 3.34*	1	0.27	4

* Statistically significant at a 95% threshold

OR=Odds ratio

NS: Not significant

NR: Significance not reported