

CHAPTER

1

**DEVELOPMENT OF RISK ANALYSIS TOOLS
IN AUSTRALIAN POST-SECONDARY INSTITUTIONS**

Rick Draper

*Amtac Professional
Services Pty. Ltd.,
Australia*

Abstract: This paper describes a robbery risk assessment that was undertaken at 124 Tertiary and Further Education (TAFE) campuses in Australia by Amtac Professional Services Pty. Ltd. It identifies the approach and model used for the study, which involved principles of situational crime prevention, crime prevention through environmental design and security risk management. The paper also discusses the framework used to analyse the risk of harm to staff from robbery, which is based on the Australian and New Zealand Standard for Risk Management. The methods of data collection, composition of the project team, database development and final report are also presented.

Introduction

Following a competitive tender process, Amtac Professional Services Pty. Ltd., a Queensland-based security and crime prevention consultancy practice, was engaged to undertake robbery risk assessments at 124 Tertiary and Further Education (TAFE) campuses in Australia. Each campus had between two and ten cash handling points requiring assessment. More than 500 000 students attend TAFE campuses, which are spread over more than 1 000 000 km².

A number of important elements needed to be considered in the project planning phase, such as the remoteness of many of the sites; modes of travel, travel time and safety of review staff operating in remote areas; contingency plans for potentially problematic situations; and the most expedient way to facilitate consistent and reliable risk assessment reports from all staff. A key challenge for this large-scale project was to ensure that recommendations addressed the management of risks within a legally and morally defensible framework, which is also sensitive to philosophical, operational and financial constraints.

Definition and scope of the problem

"Robbery" was defined in consultation with the client as "the act of stealing from a person by intimidation, threat or force, often known as a 'hold-up'".

Research conducted by the Australian Institute of Criminology (AIC) revealed that the rate of robbery in Australia peaked at 136 per 100 000 persons in 2001. Of the incidents recorded, "59% were unarmed robberies, 35% were committed with a weapon other than a firearm, and only 6% were committed with a firearm". The rate of robbery has been declining since 2001 (AIC, 2002).

At the time of the review, relatively few incidents of robbery had been reported on TAFE campuses, although robbery on campus had been more widespread prior to a change in policy regarding receipt of cash for course fees and charges. However, on most campuses cash was still used for a range of transactions, including parking, student association fees, library fines, hairdressing services, child care, materials charges, vending and games machines, telephone coin box collections, photocopying charges, bookshop purchases and other operations such as massage, gymnasiums and restaurants. Some individual cash transactions were over AUD 200, but most involved much smaller amounts.

Although at the time of the review the campuses were clearly not identified by offenders as attractive targets, robbery can occur in locations that have not previously been targeted. The fact that the campuses are located in local government areas where over 1 700 robberies occur every year would suggest that a strategy is required to make these locations unattractive targets for robbery.

Approach

The principles of situational crime prevention, crime prevention through environmental design (CPTED) and security risk management were used to complete the robbery risk assessment.

Situational crime prevention is based on an understanding of the situational elements that may influence offender decision-making. An offender will consider the effort involved in committing a robbery and/or the risk of the robbery not being successful with the perceived level of reward (Clarke, 1997). This process can be meticulously planned or spontaneous. Situational crime prevention strategies seek to augment the effort involved in committing a successful robbery by increasing the perceived risk to the offender of something or someone intervening or of being caught and punished, and also to reduce the perceived reward available. Situational crime prevention theory also seeks to remove excuses for behaviours that may be precursors to robbery, such as loitering in cash-handling areas.

Crime prevention through environmental design strategies maintain that the design of the environment can be used to support desired behaviours and to discourage undesired behaviours (Crowe, 2000). When preparing to commit a robbery, the offender will pick up on "cues" from the environment and look for environmental factors that will serve to reduce the amount of effort and risk involved. When used appropriately, CPTED strategies such as natural surveillance, access control and territorial reinforcement (*i.e.* a sense of ownership) can be powerful deterrents, reducing the "attractiveness" of a cash-handling point as a target for robbery.

The concept of security risk management recognises two dimensions of risk: likelihood and consequences (Standards Australia, 1999). It focuses on reducing the likelihood that a robbery will occur and reducing the potential consequences should a robbery occur. Typically, both situational crime prevention and CPTED contribute to reducing likelihood. Others strategies contribute to staff safety, thus reducing potential consequences.

Model

Initially, a basic decision tree model was prepared to support the development of more detailed risk assessment tools. The model employed the principles of situational crime prevention, CPTED and security risk management to describe the likelihood that a given cash-handling point would be the target for a robbery, given a range of variables used in offender decision-making (Figure 1.1). Research undertaken by AIC on how robbery offenders select targets was also used to develop this model (Nugent *et al.*, 1989).

- Demographics, including number of students.
- Campus timetables and calendars.
- Scheduled hours of use of buildings and/or grounds.
- Details of any third parties who use the campus.
- Details of alarm monitoring, guard or patrol services, and any other contracted security function.
- Details of cleaning and/or maintenance contractors that access cash-handling areas.
- Details of all security-related incidents on the campus over the past three years and any serious incidents.
- Current security rosters.
- Details of any insurance policies that relate to cash.
- List of key issues and concerns about security.

Each site visit included:

- Formal interviews and/or discussions with staff, especially those directly involved in cash handling and security.
- Examination and clarification of policies, procedures, guidelines and management systems.
- Examination of the built environment to identify deficiencies in design, layout and operations, according to the principles of CPTED.
- Examination of security hardware and technology to identify physical security vulnerabilities that may increase the likelihood of robbery and/or increase harm arising from a robbery.
- Digital photography to document issues identified and to support later analysis.

The project team

Amtac developed a comprehensive project plan involving three key strategies:

- A project executive co-ordinated the collection of data, undertook the analysis, and prepared the recommendations and reports.
- A well-trained project team visited all the sites, and gathered and delivered the data to the project executive.
- Technology was used to ensure timely, consistent and high quality campus reports.

Given the short timeframe for the project, Amtac's existing staff was supplemented by casual employees holding undergraduate or postgraduate degrees in criminology or a related discipline. Professional experience of the project team varied considerably. One member, for example, was a recent graduate; a second employee had worked in the field of security risk management for a number of years; and a third staff member, who had been working in an administrative capacity in another post-secondary educational institution, provided valuable insight into some operational matters.

Each team member was provided with a kit that included a notebook computer and relevant software, palm pilot, digital camera, communications equipment, stationery and other supplies. They were given intensive training in the risk assessment tools, technology and underlying theory of the project.

As the members of the project team had different levels of computer skills, alternative methods of data gathering and consolidation were needed. Most of the project team chose to use palm pilots for data gathering. These data were then uploaded to computers after each site inspection. Other members of the project team chose to use paper-based forms to gather data on site, and to manually transfer the information into the database at the end of each day.

Risk analysis framework

The actual level of risk is a product of the likelihood and consequences of the risk. The Australian and New Zealand Standard for Risk Management framework was used to analyse the level of risk of harm to staff from robbery (Standards Australia, 1999). This framework recommends that a separate analysis of the likelihood and the consequences of the risk be undertaken after identifying sources of risk, taking into consideration existing controls that reduce the likelihood and/or consequences of risk. The framework also recommends the use of standard descriptors for likelihood, consequence and risk (Standards Australia, 1999), although it encourages users to adapt the framework according to their needs (Table 1.1).

Table 1.1. Likelihood descriptors

Level	Descriptor	Description
A	Almost certain	It is expected to occur in most circumstances
B	Likely	Will probably occur in most circumstances
C	Possible	Might occur at some time
D	Unlikely	Could occur at some time
E	Rare	May occur in exceptional circumstances

Source: Standards Australia, 1999.

Attractiveness assessment

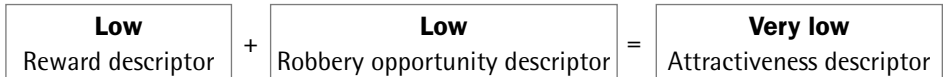
In order to assess the likelihood of a robbery, the "attractiveness" of a cash-handling point by a prospective offender must be calculated (Figure 1.2). A location with a very low level of perceived reward will generally have a very low level of attractiveness as a target for robbery. Similarly, a location with very little opportunity for a successful robbery will have a very low level of attractiveness for the offender. Figure 1.3 shows that a low level of perceived reward (*i.e.* level of cash) and a low level of opportunity to commit a robbery result in a very low level of attractiveness.

Figure 1.2. Attractiveness assessment

Attractiveness		Opportunity				
		Very low	Low	Moderate	High	Very high
Per-ceived reward	Very low	Very low	Very low	Very low	Very low	Very low
	Low	Very low	Very low	Low	Low	Low
	Moderate	Very low	Low	Moderate	Moderate	High
	High	Very low	Low	Moderate	High	Very high
	Very high	Very low	Low	High	Very high	Very high

Figure 1.3. Example of attractiveness assessment

Attractiveness		Opportunity				
		Very low	Low	Moderate	High	Very high
Cash level	Very low	Very low	Very low	Very low	Very low	Very low
	Low	Very low	Very low	Low	Low	Low
	Moderate	Very low	Low	Moderate	Moderate	High
	High	Very low	Low	Moderate	High	Very high
	Very high	Very low	Low	High	Very high	Very high



Contextual variables

A location may be assessed as having a high degree of attractiveness for robbery, but this does not necessarily mean that it is likely to be targeted. A range of contextual variables must first be considered. Amtac used a "site base crime weighting" derived from a weighted combination of three factors:

- Robbery rate in the wider community.
- Incidence of past robberies on the campus.
- Perceived level of other security incidents.

Given similar levels of attractiveness, it is reasonable to assume that a cash-handling point on a campus in a community that experiences frequent robbery will be a more

likely target than one located in an area where there have been no robberies in the past five years. For a robbery to take place, there also needs to be a suitably motivated offender (Cohen and Felson, 1979). Statistics show that a campus that has experienced one or more incidents of robbery is more likely to be a future target compared to a site that has not been victimised previously. Research also indicates a possible link between higher levels of other security-related incidents and robbery, where offenders effectively “graduate” to higher-order offences, given available opportunities (Clarke, 1997).

Likelihood assessment

Using the assessed attractiveness of a cash-handling point as a target for a robbery and the site base crime weighting, the likelihood that a robbery will take place at a given location can be estimated. Figure 1.4 shows the matrix used to derive the likelihood descriptor.

Figure 1.4. Likelihood assessment

Likelihood		Base crime weighting				
		Very low	Low	Moderate	High	Very high
Attract- iveness	Very low	Rare	Rare	Rare	Rare	Rare
	Low	Rare	Rare	Unlikely	Unlikely	Unlikely
	Moderate	Rare	Unlikely	Possible	Possible	Likely
	High	Rare	Unlikely	Possible	Likely	Almost certain
	Very high	Rare	Unlikely	Likely	Almost certain	Almost certain

Consequences assessment

The severity and nature of consequences differ for each risk event. The standard uses five descriptors to indicate the severity of consequences (Table 1.2), and provides descriptors for specific categories of consequences for a particular risk event (Tables 1.3 to 1.6). While direct financial costs are the easiest to identify (Table 1.3), other types of consequences such as damage to reputation (Table 1.4), legal (Table 1.5) and personal harm (physical and psychological) (Table 1.6) may also be significant.

Table 1.2. Standard consequences descriptors

Level	Descriptor	Description
1	Insignificant	No injuries, low financial loss
2	Minor	First-aid treatment, medium financial loss
3	Moderate	Medical treatment required, high financial loss
4	Major	Extensive injuries, loss of production capability, major financial loss
5	Catastrophic	Death, huge financial loss

Source: Standards Australia, 1999.

Table 1.3. Financial consequences descriptors

Level	Descriptor	Description
1	Insignificant	Managed within functional budget
2	Minor	Minor additional administration costs arising from risk event
3	Moderate	Administration costs plus some rectification expenses
4	Major	Significant impact on functional budget
5	Catastrophic	Extensive financial loss or diversion of resources, no possible funding recovery for function

Source: Standards Australia, 1999.

Table 1.4. Goodwill/reputation consequences descriptors

Level	Descriptor	Description
1	Insignificant	Virtually no impact
2	Minor	Credibility questioned
3	Moderate	Damage control implemented
4	Major	Confidence shaken but not totally lost
5	Catastrophic	Total loss of confidence, major recovery action required to restore credibility

Source: Standards Australia, 1999.

Table 1.5. Legal consequences descriptors

Level	Descriptor	Description
1	Insignificant	Threat of legal action but none taken
2	Minor	Plaint served: Action withdrawn or early settlement
3	Moderate	Court defence, settled for moderate award
4	Major	Major settlement or significant award by court
5	Catastrophic	Maximum court award for damages

Source: Standards Australia, 1999.

Table 1.6. Personal consequences descriptors

Level	Descriptor	Description
1	Insignificant	No injuries, inconvenience arising from event
2	Minor	First aid, initial counselling
3	Moderate	Medical treatment, counselling treatment required
4	Major	Extensive injuries, psychological trauma, hospitalisation
5	Catastrophic	Death or permanent disability

Source: Standards Australia, 1999.

Risk assessment

Figure 1.5 shows the matrix used by Amtac to derive the level of risk of harm to staff arising from a robbery. This matrix allows comparisons of levels of risk at different locations (Standards Australia, 1999). "Minor" was used to indicate the lowest potential consequence descriptor for staff who were potential robbery victims. Amtac also isolated those variables that were likely to reduce the potential harm to staff arising from a robbery, such as policies and procedures, training, separation of offender and victim, and availability of post-incident counselling and awareness programmes.

Other consequences such as financial costs arising from litigation or harm to reputation were also considered. However, in order to assess the risk of financial losses through litigation should a robbery occur, the likelihood and consequences of this risk event would also need to be assessed. For example, in the event of a robbery, the existence of appropriate strategies and post-incident management would determine if the campus was declared negligent in a civil litigation case. In addition, the likelihood of robbery may be assessed as "possible", but the likelihood of litigation may be assessed as "likely". The management of this risk can be approached from two directions: the reduction of the likelihood of robbery and/or reduction of the likelihood that the victim may seek compensation in the courts.

Figure 1.5. Risk analysis matrix

Risk		Potential consequences				
		Insignifi- cant	Minor	Moderate	Major	Cata- strophic
Likelihood	Rare	Low	Low	Moderate	High	High
	Unlikely	Low	Low	Moderate	High	Extreme
	Possible	Low	Moderate	High	Extreme	Extreme
	Likely	Moderate	High	High	Extreme	Extreme
	Almost certain	High	High	Extreme	Extreme	Extreme

Database development

Customised databases were used to store and analyse variables. The first stage in the database development process was identifying and programming risk analysis variables, which helped to qualify levels of opportunity, perceived reward, attractiveness, site base crime weighting, likelihood, consequences and risk.

Variable-dependant sentences and paragraphs were generated from these databases to produce reports. Each report needed to be easy to read and detailed, and contain specific recommendations for each cash-handling point reviewed. A model report framework was designed to create a list of report variables. The potential relationships between report variables, and between the risk analysis variables and the report variables were

explored and a series of matrices created. Some of these relationships were simple, such as the choice of phraseology to communicate likelihood; while others were extremely complex, such as the generation of recommendations. Calculations were then written in the databases to produce variable-dependant and variable-interdependent text. For example, the output in relation to the attractiveness of a particular cash-handling point as a target for robbery, dependent upon a specific set of risk analysis variables, appeared in the reports as either:

- "...makes this location *unattractive* as a target for robbery".
- "...makes this location *only moderately attractive* as a robbery target".
- "...makes this location *potentially very attractive* as a robbery target".

The process of verifying the calculations and monitoring the change in output, dependant upon changes in variables, was a time-consuming process, but one which delivered the required outcomes. The following is a calculation of likelihood, as shown in Figure 1.4, based on the variables of site base crime weighting and the attractiveness of the cash-handling point (CHP) as a potential target for robbery.

```
If((Weighting_Base_Crime="Very Low" or zCHP_Attractiveness="Very Low" or (Weighting_Base_Crime="Low" and zCHP_Attractiveness="Low")), "Rare", If((zCHP_Attractiveness="Low" and (Weighting_Base_Crime="Moderate" or Weighting_Base_Crime="High" or Weighting_Base_Crime="Very High")) or (Weighting_Base_Crime="Low" and (zCHP_Attractiveness="Moderate" or zCHP_Attractiveness="High" or zCHP_Attractiveness="Very High")), "Unlikely", If(Weighting_Base_Crime="Moderate" and (zCHP_Attractiveness="Moderate" or zCHP_Attractiveness="High") or (Weighting_Base_Crime="High" and zCHP_Attractiveness="Moderate"), "Possible", If((Weighting_Base_Crime="Moderate" and zCHP_Attractiveness="Very High") or (Weighting_Base_Crime="High" and zCHP_Attractiveness="High") or (Weighting_Base_Crime="Very High" and zCHP_Attractiveness="Moderate"), "Likely", If((Weighting_Base_Crime="High" and zCHP_Attractiveness="Very High") or (Weighting_Base_Crime="Very High" and zCHP_Attractiveness="High" or zCHP_Attractiveness="Very High")), "Almost Certain", "Error"))))
```

Reports

A report was produced for each campus, containing a photographic supplement and an annex including the assessment for each cash-handling point. Each campus report contained the following sections:

- Introduction.
- Method: Review instruments and sources of information.
- Campus background.
- Findings: Security-related incidents, existing security strategies and security issues.
- Threat assessment: Threat source objectives and limitations.

- Risk analysis: Process and risk assessments.
- Cash-handling point annexes.
- Photographic supplement.

The following excerpt from the "campus background" section of a campus report shows how variables were integrated into fixed and variable-dependent text to create sentences and paragraphs.

XYZ College is located at 205 Happy Street, Happyville and serves a student population of 2 000. Amtac was advised that approximately 150 staff work on the campus, with up to 12 involved in cash-handling duties.

According to a search of the records of the Department of Local Government, XYZ College is located in the Happyville local government area. Crime data for this area indicates that there were 114 recorded robberies during 2001. Based on the available data, the campus has been classified as situated within an area that has experienced a "moderate" rate of robbery compared to other campuses.

While the majority of campus reports were produced directly from the database, some required editing. For example, a small number of campuses included shared facilities, and it was important to refer to this within the body of the report. It was considered more efficient to make the required adjustments at the report stage, rather than to programme additional report variables.

Conclusion

This project has demonstrated the value of developing risk analysis tools. The approach used not only delivered reliable and consistent reports in relation to risks across a wide variety of campus settings; it also allowed the project to be completed within a restricted timeframe. The project highlighted the importance of ensuring that the staff gathering data are well trained and understand the significance of the information they are collecting. It was also important to have a strategy for dealing with discrepancies between sets of information provided by the client, presented during interviews and gathered by review staff. On several occasions, inconsistencies were identified and data needed to be validated before any analysis could be undertaken.

There is no legislative requirement in Australia to follow the Standards Australia and Standards New Zealand (AS/NZS) standard to assess and manage security-related risks, but as has been illustrated in this paper, the standard does provide a useful framework for delivering consistent outcomes. While the standard requires a commitment to gathering reliable data for analysis, the approach used for this project demonstrated the potential use of large-scale assessments of risks to establish a defensible position for managing those risks.

References

- Australian Institute of Criminology (AIC) (2002), *Australian Crime Facts and Figures 2002*, AIC, Canberra.
- Clarke, R.V. (ed.) (1997), *Situational Crime Prevention: Successful Case Studies* (2nd edition), Harrow and Heston, Albany, New York.
- Cohen, L.E. and M. Felson (1979), "Social Change and Crime Rate Trends: A Routine Activity Approach", *American Sociological Review*, Vol. 44, pp. 588-608.
- Crowe, T.D. (2000), *Crime Prevention Through Environmental Design* (2nd edition), Butterworth-Heinemann, Stoneham, Massachusetts.
- Nugent, S., et al. (1989), *Armed Robbery from an Offender's Perspective: Implications for Prevention*, Australian Institute of Criminology, Canberra.
- Standards Australia (1999), *AS/NZS 4360:1999. Risk Management*, Standards Australia, Sydney.

Bibliography

- Bureau of Crime Statistics and Research (BOCSAR) (2002), *New South Wales Recorded Crime Statistics by Area 1996-2001*, BOCSAR, Sydney, www.cjc.nsw.gov.au/bocsar1.nsf/pages/lga_alphalist.
- Chilvers, M. (1998), "Measuring Crime Dispersion" in Bureau of Crime Statistics and Research, *Crime and Justice Bulletin Contemporary Issues in Crime and Justice*, No. 39, BOCSAR, Sydney.
- Department of Employment, Training and Industrial Relations (DETIR) (1997), *Personal Security in the Retail Industry, Managing the Risk of Cash-Related Assault: A Workplace Health and Safety Guide*, DETIR, Brisbane.
- Doak, P. (1999), *Key Trends in Crime and Justice New South Wales 1999*, BOCSAR, Sydney.
- Hunter, R.D. and C.R. Jeffery (1992), "Preventing Convenience Store Robbery Through Environmental Design" in R.V. Clarke (ed.) *Situational Crime Prevention: Successful Case Studies* (2nd edition), Harrow and Heston, Albany, New York.
- Fennelly, L.J. (1996), *Handbook of Loss Prevention and Crime Prevention* (3rd edition), Butterworth-Heinemann, Stoneham.
- Fischer, R.J. and G. Green (1992), *Introduction to Security* (5th edition), Butterworth-Heinemann, Stoneham, Massachusetts.
- Murphy, R. (2001), "Crime Risk Management" in *Proceedings of the 7th Annual South Pacific Security and Access Control Conference*, International Security Management and Crime Prevention Institute, Brisbane.

Ogilvie, E. (2000), "Knives and Armed Robbery", *Trends and Issues in Crime and Criminal Justice*, Vol. 159.

WorkCover Authority of New South Wales (1994), *Armed Hold-ups and Cash Handling: A Guide to Protecting People and Profits from Armed Hold-ups*, WorkCover NSW, Sydney.

WorkCover Authority of New South Wales (2001), *Workplace Violence in the Finance Sector: Guidelines, Checklists and Forms for Small to Medium Workplaces*, WorkCover NSW, Sydney.

WorkCover Authority of New South Wales (2002), *Code of Practice Cash in Transit Industry*, WorkCover NSW, Sydney.