CANADIAN POLICE RESEARCH CENTRE 1998-1999

ANNUAL REPORT

NRC-CNRC RCMP-GRC CACP-ACCP CPRC-CCRP

Canada

Canadian Police Research Centre

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Chairman's Message

In 1998-99, the project managers and staff of the Canadian Police Research Centre (CPRC) continued their efforts in the promotion of research and development for the Canadian police community.

This partnership of the Royal Canadian Mounted Police (RCMP), the National Research Council (NRC) and the Canadian Association of Chiefs of Police (CACP) provides a unique service to law enforcement personnel in Canada and, increasingly, beyond.

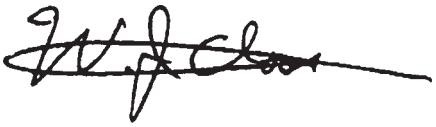
In last year's report, we noted that the CPRC had hosted two secondments. That arrangement continued in 1998-99. Jamie Kerr of RCMP Centralized Training and John Evans of the Edmonton Police Service have continued to contribute much time to the examination of the Internet's potential for the training of law enforcement personnel and for the timely sharing of useful, practical information amongst investigators and police agencies on a worldwide basis.

The projects and initiatives discussed herein pertain to many of the year's activities. In addition, CPRC continues to monitor certain topics such as "less than lethal" weapons and the use of pepper spray. The Technology Partner Program continues to provide an effective mechanism for the distribution of information to the police community.

The past year saw the emergence of CPRC as a participant at events such as the Technology Showcase co-sponsored by the Waterloo Regional Police Service and Response '99 sponsored by Blue Line Magazine. In addition, the Public Safety Test Bed initiative was prepared for presentation to the CACP.

The Centre acknowledges gratefully the significant contribution of Mr. Nick Cartwright, who has left the post of Manager, CPRC for another assignment. We also welcome his successor, Mr. Barry Gaudette, who joins us with many years of relevant experience in the Central Forensic Laboratory.

The material provided in this report is for your information. Please review it and do not hesitate to give us your feedback. The CPRC exists to provide a service to the Canadian law enforcement community and we welcome your comments.



Chief Bill Closs, Chairman
CACP Operational Research Committee

Introduction to the Canadian Police Research Centre

Mission: To provide leadership and focus for a national program of research, development, evaluation and commercialization in the law enforcement and public safety sectors in Canada.

Goal: To see that the best equipment and information is available to the Canadian police community and to offer Canadian expertise and enterprise an opportunity in this specialized field.

The CPRC is a partnership between the Canadian Association of Chiefs of Police (CACP), the Royal Canadian Mounted Police (RCMP) and the National Research Council (NRC) Canada and is staffed by personnel from the RCMP and NRC. Its structure and terms of reference allow it to deal effectively with police equipment and information research, development and evaluation.

The objectives of the CPRC can be summarized as follows:

- to develop the best tools (equipment and information sources) for the police community;
- to strive to keep necessary technology affordable;
- to forge partnerships with Canadian industry and the national and international research community.

The CPRC strives to ensure that the interests of the Canadian police community are best served with the available resources. The ultimate objective is to ensure that CPRC expenditures result in the timely transfer of technology to the police user for greater safety, increased efficiency and effectiveness.

The CPRC has a national focus, a single coordinated effort to support research and develop technologies for Canada's law enforcement community, and it promotes interaction between the police community, government, industry, universities and other research organizations.

The CPRC ensures that research results, expertise, information and facilities are shared among all partners. Equally important, the CPRC provides "technology partner" evaluation services to Canadian police agencies, participating government agencies, security firms, and Canadian industry. This benefits Canadian industries by giving them an opportunity to test security oriented products under operational conditions. Canadian products are thereby given credibility to compete successfully in domestic and international markets.

The collaborative effort of the CACP, RCMP and NRC continues to result in the sponsorship of numerous research projects and in the development of new products and information sources for the public safety market.

1998/1999 CPRC Executive Board

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Canadian Police Research Centre
(Seconded to Transport Canada April, 1999)

CATEGORY A

HEALTH AND SAFETY – PROTECTING THE POLICE IN HAZARDOUS SITUATIONS

Blast Suppressant Foam Containment System - Concluded

PROJECT MANAGER:
Glenn Carroll, CPRC (613) 998-6340
John Bureaux, Canadian Bomb Data Centre (613) 993-7880

REPORT: TM-06-95R "Blast Suppression Foam"

Development of foam delivery, foam formulations, and containment apparatus has been completed. Commercialization has also been completed providing this system to first responders. Due to the sensitivity of this work at this time, no further reports are being released.

Bomb Suit Testing - Concluded

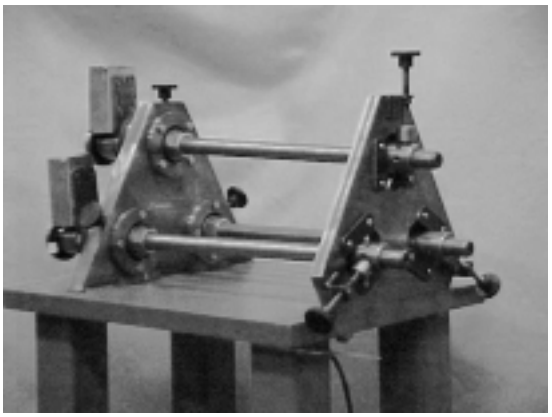
PROJECT MANAGER:
John Arnold, CPRC (613) 993-3737
Dr. Aris Makris, Med-Eng Systems Inc. (613) 739-9646

REPORT: No report

The Med-Eng EOD-7B bomb disposal suit, RCMP licensed technology, is an advanced personal safety system designed to protect Police and Military Explosives Technicians from all four threats presented by an explosive device: blast, impact, fragmentation, and heat. The work involved optimization for all four threats - improving communications, increasing wearer comfort, decreasing wearer stress and permitting longer mission times.

This project is concluded. For information contact Dr. Aris Makris, Med-Eng Systems Inc. (613) 739-9646.

Development of a Canadian Soft Body Armour Standard - Active



PROJECT MANAGER:
Julie Graham, CPRC (613) 990-9533

REPORT: No report

The Canadian General Standards Board (CGSB) is coordinating the drafting of a Canadian standard for daily personal use body armour. The 35 member committee represents all aspects of the manufacturing industry, the police community and the testing agencies. The US National Institute of Justice is participating as an observer on the committee. A series of round-robin testing was conducted by five testing laboratories to verify that the methodologies and protocols as written in the first draft produced comparable results when identical samples were tested. Based on the results, a final draft will be sent out for ballot by summer 1999.

Work was to be undertaken by the Canadian working group to test a draft protocol from the European Standards group (CEN). This work, designed to measure the ergonomic "fit and feel" of daily wear personal use body armour, had to be postponed because of other work pressures.

Work has been completed to design and build a test instrument to perform a reproducible multi-shot test that is designed to represent (but not simulate) shots from a submachine gun. This test instrument is designed to fire a series of three shots that strike the target in close proximity. The rate of fire is variable, each barrel is laser aimed and the speed of each round is recorded. Further work is proposed to create a database of results from the instrument and to create a draft method for consideration for the standard.

Drug Section Safety Cabinet - Active

PROJECT MANAGER:
Glenn Carroll, CPRC (613) 998-6341

REPORT: No report

Drug investigators may suffer inadvertent exposure to street drugs through operational requirements. A movable self-contained safety cabinet is under design to remove particulate materials and solvent vapours. In addition to providing a margin of safety for the investigator it is designed to prevent contamination of exhibits. A custom-fabricated unit is undergoing field-trials in an RCMP operational drug section. Evaluation is expected to be completed in 1999.

Nylon Duty Belt Evaluation - Active

PROJECT MANAGER: Julie Graham, CPRC (613) 990-9533
Al Pilon, RCMP Contract Policing (613) 993-8330
Andrew Wardroper, RCMP Materiel Management (613) 993-3256

REPORT: No report

Field trials have been completed. Four different types of nylon duty belt systems (Bianchi, Gould & Goodrich, and two from Michaels of Oregon) were evaluated, and compared to the leather duty belt system. A variety of criteria including comfort, durability, effectiveness and compatibility were addressed. Laboratory tests will be conducted to determine how the materials compare. It is hoped that these will be completed by the fall of 1999.

For further information, call Andrew Wardroper.

Remote Wireless Explosives Disruptor Initiator - Active

PROJECT MANAGER: Glenn Carroll, CPRC (613) 998-6341
Derick Ivany, Canadian Bomb Data Centre (613) 993-7880

REPORT: No report

The RCMP 'E' Division Explosive Disposal Unit has developed, in conjunction with the Canadian Bomb Data Centre (CBDC), a small light weight transmitter/receiver system that can initiate explosive charges and fire disruptors from a remote command post without the use of a ground line. Current technology requires use of such a ground line, presenting a physical safety hazard and tactical disadvantage. CBDC is currently evaluating this prototype with interest shown in commercialization.

Review of OC Spray - Concluded

PROJECT MANAGER: Julie Graham, CPRC (613) 990-9533

REPORT: TM-08-98 "OC Spray - A Review of Its Possible Risks including Carcinogenicity"
TM-01-98 "Comments on the Use of Capsaicin Spray"

This study has been concluded but there remains an ongoing need to monitor research in this area. CPRC will continue to seek out relevant material pertaining to this topic.

Smart-Gun Technology Evaluation - Concluded

PROJECT MANAGER: Nick Cartwright, CPRC (613) 998-6340

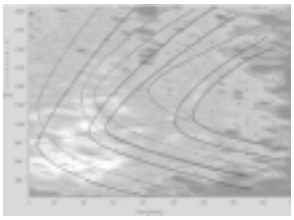
REPORT: No report

Efforts are continuing to "personalize" a weapon so that only the authorized user(s) can operate them. Fundamentally all the approaches involve technology that requires a code to be supplied before the weapon can be fired. There are significant barriers to overcome before this technology could be considered for operational deployment. Colt Manufacturing is involved with a project to further develop technology prototypes developed by Sandia National Labs for the US National Institute of Justice. CPRC will continue to monitor NIJ developments.

CATEGORY B

OPERATIONAL EFFECTIVENESS – FIGHTING CRIME, GATHERING INFORMATION, INTELLIGENCE AND EVIDENCE

Cockpit Voice Recorder Explosion Analysis Technique - Active



PROJECT MANAGER:
Barry Gaudette, CPRC (613) 998-6340
Nick Cartwright, Transport Canada (613) 990-0239
Howard Posluns Transportation Development Centre (514) 283-0034
Steve Hall, Structural Disaster Diagnostics Canada Ltd., (613) 837-1161

REPORT: No Report

This project, funded by the the Transportation Development Centre of Transport Canada is to further develop and computerize a Cockpit Voice Recorder Explosion Analysis technique. The technique has been shown to be capable of discriminating between in-flight break-ups caused by structural failures versus those caused by an explosion. It can also determine the location of the explosion within 1 meter. A rapid and reliable method of determining the nature and location of an on-board event will allow for a better and more focussed response from the crash investigation and law enforcement agencies. System development is now complete. Next year the technique and system will be evaluated using recordings from past incidents.

Crime Scene DNA Collection Kit - Active

PROJECT MANAGER: Glenn Carroll, CPRC (613) 998-6341
Dr. Brian Yamashita, Forensic Identification Research and Review Section, (613) 998-6190

REPORT: No report

Negotiations are underway to develop a crime scene DNA collection kit in collaboration with the RCMP Forensic Ident and Laboratory Services - Biology and a private sector supplier. A related kit should also be applicable to DNA data bank sample processing.

Drug Enforcement Technology Evaluation - Concluded

PROJECT MANAGER: Julie Graham, CPRC (613) 990-9533
Jean Auclair, RCMP Drug Enforcement Branch (613) 993-2124

REPORT: No Report

There is a continuing need for the monitoring and evaluation of new technologies which have potential application to the operational needs of drug enforcement units. Promising or relevant material will continue to be forwarded to Drug Enforcement Branch for their review, comment and possible action.

Evaluation of the Effectiveness of Helicopter Patrols – London, Ontario - Active

PROJECT MANAGER:
John Arnold, CPRC (613) 993-3737
Bruce Nelson, LPS (519) 661-5998

REPORT: No Report

The London Police Service approached the CPRC to assist in the above project. The project proposes to examine whether police helicopter patrols can reduce the incidence of certain types of crime as well as reduce the incidence of certain types of calls for service. The evaluation will express helicopter costs, reduction of crime and calls for service in dollars. It will be a cost benefit analysis focused on tangible and direct effects.

The results of the study will be circulated to the police community on completion.

Explosive Resistant Vehicle - Concluded

PROJECT MANAGER: Glenn Carroll, CPRC (613) 998-6341
Steve Boos, (613) 993-8003

REPORT: No report

Prototype vehicles have been constructed through a cooperative arrangement with a vehicle armouring manufacturer in order to assess the performance of explosive resistant materials against anticipated threats. As a result of successful performance, this technology has been licensed for commercialization.

Fingerprint Acquisition Device - Active

PROJECT MANAGER: John Arnold, CPRC (613) 993-3737
Patrick Moore, CPF Systems (613) 737-0023

REPORT: No Report

The objective is to develop an inexpensive device that can replace the pad and ink method used by police for capturing rolled fingerprints. The project started in August 1998, with the financial support of NRC-IRAP, brokered by CPRC. A special interest group from NRC, RCMP and Ottawa-Carleton Regional Police was formed to assist in the project.

A prototype is expected to be available in late 1999.

Fingerprint Research - Active

PROJECT MANAGER: Julie Graham, CPRC (613) 990-9533
Dr. Della Wilkinson, RCMP Forensic Identification Research & Review Section (613) 998-9718

REPORT: TM-02-99 “Crime Scene Guidelines for DNA Evidence Collection”
TM-02-99F « Protocole de recherche d’éléments de preuve génétiques sur les lieux du crime.»

Dr. Wilkinson continues to research the detection and visualization of fingerprints on human skin. Her work is a joint venture of the Royal Canadian Mounted Police and the National Research Council Canada and involves collaborative research with the Chief Medical Examiner’s Office in Richmond, Virginia, as well as the Ottawa-Carleton Regional Police, the Ontario Provincial Police and Coroner’s offices in Toronto and Montreal.

In conjunction with staff at the RCMP Central Forensic Laboratory, she has completed Crime Scene Guidelines for DNA Evidence Collection.

Dr. Wilkinson continues to provide instruction on Fluorescence Techniques Courses at the Canadian Police College and to moderate an internet discussion group. For additional information, call Dr. Della Wilkinson.

Forensic Entomology Across Canada - Active

PROJECT MANAGER:
Julie Graham, CPRC (613) 990-9533
Dr. Gail Anderson, Simon Fraser University (604) 291-3589

REPORT: Training video available. A 23 minute video, produced by the Audio-Visual Unit of "E" Division Training, deals with the collection of entomological evidence.

TR-10-98 "Freshwater Invertebrate Succession and Decompositional Studies on Carrion in British Columbia"
TR-09-97 "Aquatic Forensics - Determination of Time Since Submergence Using Aquatic Invertebrates"
TR-02-96 "Forensic Entomology - Determining Time of Death in Buried Homicide Victims Using Insect Succession"
TR-03-96 "Forensic Entomology - The Use of Insects in Death Investigations To Determine Elapsed Time Since Death In Interior and Northern British Columbia Regions"
TR-05-95 "Forensic Entomology - The Use of Insects in Death Investigations to Determine Elapsed time since Death"

Dr. Gail Anderson continues to gather data relative to insect succession on carcasses. The goal is a countrywide database which will cover all of the biogeoclimatic zones within Canada. A number of studies have been completed in British Columbia and projects are underway in Manitoba and Alberta. Planning continues for research in the Maritimes and in Saskatchewan.

For additional information, call Dr. Gail Anderson.

Geographic Profiling – Active

PROJECT MANAGER:
John Arnold, CPRC (613) 993-3737
Barry Dalziel, ECRI (604) 718-2060

REPORT: No report

As reported last year, Environmental Criminology Research Incorporated (ECRI) built "Rigel", a geographic profiling system developed from the work of Inspector Kim Rossmo of the Vancouver Police Department. Rigel project is supported by NRC IRAP funding.

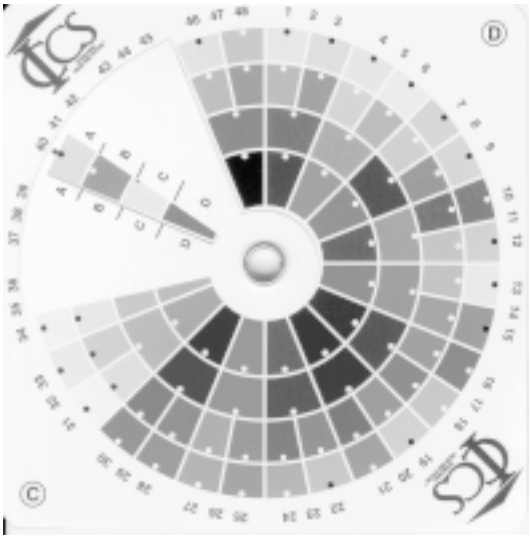
As new agencies were asking for Rigel, there was a need to provide a more rigorous system, using a generic programming language that would meet the needs of the police customer.

The objectives are to develop a system that will:
- run on a wide range of operating systems, including PC-based systems
- be developed in Java
- enable a more integrated environment providing a multi-client/server capability
- enable future additional capabilities using object oriented methodology
- provide a more effective environment to allow for data mining of other outside databases and systems
- provide a more "Windows-like" human interface
- use an ECRI developed Geographical Information System (GIS) based visualiser
- provide secure data flow on the Internet

"Rigel" has been purchased by the National Crime Faculty, Brams Hill, United Kingdom. Presentations were made to a number of large police agencies from the USA, Europe, and South Africa. ECRI attended a number of international police conferences and exhibitions, including the NCIS conference and PSDB'99 with the CPRC.

For information on "Rigel", contact Barry Dalziel at (604) 718-2060, or email at barryd@ecricanada.com

International Colour Code System - Concluded



PROJECT MANAGER:
Julie Graham, CPRC (613) 990-9533
Rod Davis, Calgary Police Service (403) 295-7953

REPORT: TM-03-99 "Evaluation of International Colour Code System"

The International Colour Code System was developed to assist law enforcement personnel and community support groups, such as Neighbourhood Watch, to accurately transmit colour sensitive information. Its pocket sized format is user-friendly. The System was evaluated by police agencies in Alberta with very positive results.

For additional information, contact Rod Davis.

Matching Feet to Footwear - Active

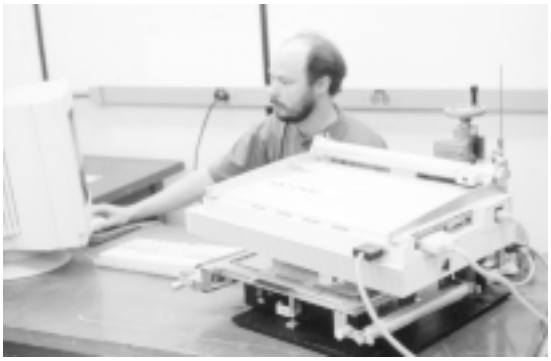
PROJECT MANAGER:
Julie Graham, CPRC (613) 990-9533
Bob Kennedy, RCMP Forensic Identification Research & Review Section (613) 990-9086

REPORT: No report

In order that the theory of identifying feet to footwear can be scientifically supported, data continues to be collected and statistically analysed. The project is targeted for completion in March 2001.

For additional information, call Bob Kennedy.

Micro-inspection - Active



PROJECT MANAGER:
John Arnold, CPRC (613) 993-3737

REPORT:
TM-20-95 "D-Sight Micro-inspection Technology"
TM-21-95 "Micro-inspection Technology"
TM-05-98 "Edge of Light Operational Assessment"

"Edge of Light™"(EOL) was invented at the Institute of Aerospace Research (IAR), NRC. EOL technology is useful in visually inspecting surfaces for small features (micro-metre) that might of be of forensic interest. Initial trials have indicated some success with counterfeit money, passport forgery, altered credit cards, document and hand-writing examination and oil painting authentication.

The EOL research team successfully looked at fingerprints on plastic bags (demonstrated at a Canadian hosted, international fingerprint conference in May 1999). In this coming year a laboratory system will be built with a high quality optics system and computer driven axis to assess and compile high resolution images.

This past year NRC sought Canadian licensees for EOL for aerospace NDI (Non Destructive Investigation) applications. This coming year, NRC will be seeking Canadian and international licensees for EOL's forensic applications.

Microwave Imaging System for Law Enforcement – Active

PROJECT MANAGER: John Arnold, CPRC (613) 993-3737
Kal Abdollal, Powertec (604) 590-7496

REPORT : No report

This project was proposed by the Coordinated Law Enforcement Unit (CLEU) of British Columbia.

The project objectives are:
1. To determine the effectiveness of passive microwave imaging for law enforcement applications and
2. To develop a field prototype imaging system once the feasibility of the technique has been established.

The technology is being used by BC Hydro to inspect the potential thermal breakdown of ceramic tranformer elements. The company has also carried out a feasibility study for BC Forestry where the technology was used to identify underground forest fires. The technology has the potential to be used in a variety of law enforcement applications, such as, looking through non-metallic walls and in certain types of snow (to locate buried avalanche victims).

A marketing/economic feasibility study, funded by CPRC through its NRC office, will be delivered in the fall of 1999.

PAN Disrupter - Active

PROJECT MANAGER: Julie Graham, CPRC (613) 990-9533
Steve Ethier, Canadian Bomb Data Centre (613) 993-7880

REPORT: No report

Two years ago, the evaluation of a new PAN disrupter, developed by Sandia National Laboratories, in the USA, was begun. Due to changing priorities the evaluation was not completed on schedule. It is now expected that the evaluation, which will seek to confirm the efficacy of its operation and the correctness of its deployment, will be completed in the coming fiscal year.

For additional information, please call Steve Ethier.

Public Safety Network/Internet Projects - Active

PROJECT MANAGER: Jamie Kerr, CPRC (613) 993-2073

REPORT: No report

Distance Learning for Law Enforcement via the Internet - CPRC supported a training course specifically developed for delivery to law enforcement personnel via the Internet. "Using the Internet as an Investigative Research Tool" course covers a variety of search skills investigators require to efficiently locate information on the Internet. This course has been delivered monthly, since December 1998, by the Specialized Computer Training Section of the Canadian Police College. It was designed and developed, and is updated by David Toddington of DM Toddington & Company (www.toddington.com). For further information contact:

Duncan Monkhouse
Specialized Computer Training Section
Canadian Police College
Telephone: (613) 990-2480
Email: cpc@cpc.gc.ca

Communication via the Internet for Computer Forensic Specialists - An Internet based discussion list is being provided to law enforcement members specializing in computer forensics. This discussion list permits specialists from law enforcement agencies around the world to share information on recent developments, training opportunities, forensic procedures and investigative techniques. Access to this discussion list is provided to law enforcement at no cost. The list is being coordinated by Detective Rob Munro of the Waterloo Regional Police Service. For further information contact:

Rob Munro
Waterloo Regional Police Service
Telephone: (519) 650-8500, Ext. 384

Access to CPRC Research Reports via the Internet - Technical Reports and Technical Memoranda published by CPRC are being converted for access via the Internet on the CPRC website. There will be provision to search the entire data base. For further information contact:

Jamie Kerr
Canadian Police Research Centre
Telephone: (613) 993-2073
Email: cprc@nrc.ca

Speech Recognition - Active

PROJECT MANAGER:
John Arnold, CPRC (613) 993-3737
Nigel Moore, Waterloo Regional PS
(519) 653-7700, Ext. 713
Oleg Feldgajer, International Neural Machine
(519) 746-3890 Ext. 24

REPORT: No report

This project was proposed by Waterloo Regional Police Service (WRPS) which presently has their police officers phone in their police reports to a recording system. Civilian operators transcribe the reports which are then proofed and keyed into their computer records system. The objective of this project is to directly input the telephoned report into the computer.

International Neural Machine (INM) of Waterloo, supported by NRC/IRAP, reported the following project progress this past year:

1. Data Preparation - transcribed and time-aligned recorded reports
2. Acoustic Training - trained phonetic models for telephone data
3. Linguistic Training - trained linguistic models for large size vocabularies
4. System Design and Analysis - based on performance analysis, “police keyword-based transcription engine” for effective WRPS Report Automation was developed.
5. System Development - testing and fine-tuning of transcription system is in progress.

It is anticipated that a pre-production police system will be available to the police market by the end of 1999.

WRPS hosted a technology showcase where the speech recognition technology was featured and its potential for the police community was demonstrated.

Use of Force Training Simulators Evaluation - Active

PROJECT MANAGER: Glenn Carroll, CPRC (613) 998-6341

REPORT: No report

A working group has been formed at the request of the Human Resources Committee of the Canadian Association of Chiefs of Police to address two main issues:

- to collect and collate data and features of commercially available systems;
- to study the pedagogical basis for simulator training.

The group consists of firearms trainers from major law enforcement training sites in Canada working in collaboration with the Defence and Civil Institute of Environmental Medicine.

Only limited progress was made last year due to budget constraints.

Visual Presenter - Concluded

PROJECT MANAGER: John Arnold, CPRC (613) 993-3737
Rick Devine, Guelph Police Service (519) 824-1212, Ext. 207
David Craig, ELMO Corp. (905) 453-7880

REPORT: TM-01-99 "Saving Court Time Using a Visual Presenter"

The Guelph Police Service (GPS) suggested the project after experiencing cost savings to the department and the courts. The technique of visual presentation is especially useful in major fraud cases where there is a substantial number of visual exhibits.

The three project objectives were to:
1. Increase awareness as to cost effectiveness.
2. Document, analyze and compare costs between current court procedures and this visual presentation technology.
3. Determine cost effectiveness in different jurisdictions.

Canadian jurisdictions, in Alberta, Ontario and Nova Scotia were approached to participate. Systems have been implemented in several jurisdictions.

CPRC wishes to thank ELMO Canada for their participation in this project.

For further information contact, Rick Devine, GPS at (519) 824-1212 x 207.

911HELP - Concluded

PROJECT MANAGER: Glenn Carroll, CPRC (613) 998-6341

REPORT: No report

Inexpensive software, 911HELP, is commercially available and was developed for logging calls and dispatching assistance in response to 911 emergency calls. The software is intended for small to medium-sized police agencies as a low cost solution to what might be otherwise cost prohibitive. This evaluation has been terminated due to the wealth of low-cost commercial off-the-shelf software currently available.

CATEGORY C

PROTECTING THE PUBLIC – TRAFFIC, CUSTODY, CRIME PREVENTION

Evaluation of Vehicle Stopping Device - ROADSPIKE™ - Concluded

PROJECT MANAGER: Nick Cartwright, CPRC (613) 998-6340
Dave Reichert, Justice Institute of British Columbia (604) 528-5758
Bob Steele PMG Manufacturing Group (304) 277-4050

REPORT: TM-12-98 "Testing of the Road Spike As a Tire Deflation Device"

RoadSpike is a retractable spiked barrier strip, containing hollow spikes, that police can deploy across a road ahead of a fleeing vehicle to safely deflate its tires. Because the spikes are retractable with remote activation and retraction, it allows for the normal flow of traffic ahead and behind the target vehicle. It was developed as a project from the National Institute of Justice by the Idaho National Engineering Laboratory and has been commercialized by PMG Manufacturing Group. A demonstration unit was made available for an evaluation conducted at the Justice Institute of British Columbia as part of an overall review of stopping devices and high speed pursuit strategies. A video demonstrating the functioning of RoadSpike is available from the company.

Less than Lethal Technology - Ring Airfoil Projectile - Concluded

PROJECT MANAGER: Nick Cartwright, CPRC (613) 998-6340
Ray Downs, NIJ (202) 307-0646

REPORT: A video was made of the demonstration (available upon request)

The Ring Airfoil Projectile was developed by the US military (as the Ring Airfoil Grenade) more than twenty years ago but was never actually deployed. It is characterized by a very flat flight trajectory due to its aerodynamic shape and very high spin velocity and also by its low muzzle velocity, which means it is less-than-lethal at the muzzle. The US National Institute of Justice has undertaken a project to update this technology and evaluate its application to civil law enforcement including its ability to be an accurate delivery system for OC spray or CS. CPRC will continue to monitor NIJ developments.

ResQ Disc Evaluation - Active

PROJECT MANAGER:
Julie Graham, CPRC (613) 990-9533
Bill Bedford, RCMP (613) 993-8428

REPORT: No report

The ResQ Disc is a frisbee-like device designed for rescue purposes. It is throwable and buoyant with a line attached. The device was developed in the United States and is increasingly widely used by police and fire departments.

CPRC purchased a number of the discs for evaluation by police and search and rescue personnel. The results of the evaluation will be made available in the coming year.

Security Upgrade of Windows - Active

PROJECT MANAGER: Glenn Carroll, CPRC (613) 998-6341
Larry Blanchette, RCMP Engineering Branch (613) 991-4989

REPORT: No report

Evaluation of current commercially available glazing materials including security films, against simulated sledge hammer attack has been proposed. Staff reductions have precluded progress on this evaluation, however consideration is being given to proceeding by way of outsourced testing or collaboration with a private sector partner.

TECHNICAL REPORTS and MEMORANDA

"Technical Memoranda" are less broad in scope than *"Technical Reports"*.

1999 TECHNICAL REPORTS

TR-01-99 "Low Back Pain Among RCMP Officers: An Investigation Into Vehicles, Duty Belts and Boots", S. Kumar, Y. Narayan; University of Alberta,1997

TR-02-99 "Back Pain in a Large Canadian Police Force", J. Brown, G. Wells, A. Trottier, J. Bonneau, B. Ferris, 1997

1999 TECHNICAL MEMORANDA

TM-01-99 "Saving Court Time Using A Visual Presenter", R. Devine, Guelph Police Service, 1999

TM-02-99E "Crime Scene Protocols for DNA Evidence", J. Bellefeuille, K. Bowen, D. Wilkinson, B. Yamashita; Royal Canadian Mounted Police; January 1999

TM-02-99F « Protocole de recherche d'éléments de preuve génétiques sur les lieux du crime. » J. Bellefeuille, K. Bowen, D. Wilkinson, B. Yamashita; Gendarmerie Royale du Canada; Janvier 1999

TM-03-99 "Evaluation of International Colour Code System", R. Davis, Calgary Police Service, 1999

TM-04-99 "Practical Applications of Digital Imaging in the Field of Forensic Firearms Identification", Scott Kashuba, Royal Canadian Mounted Police, Forensic Laboratory Edmonton, June 1998

TM-05-99 "12 Gauge Bean Bag Ammunition Penetration", D. Dahlstrom, K. Powley, D. Penk; Royal Canadian Mounted Police, March 1999

TM-06-99 "Laser Range Finders in Forensic Firearms Examination", A.J. Voth, Royal Canadian Mounted Police, Forensic Laboratory Edmonton, June 1998

PREVIOUS TECHNICAL REPORTS

1998

TR-01-98E "Vision Standards in the RCMP: Are They Reasonable and Fair?"

TR-01-98F «Normes visuelles de la GRC : Sont-elles raisonnables et équitables?»

TR-02-98E "To Wear or Not To Wear: A Survey on Current Contact Lens Use in the Royal Canadian Mounted Police"

TR-02-98F « Sondage sur le port des verres de contact à la Gendarmerie royale du Canada (GRC) »

TR-03-98 "Lead Shot Penetration in 10% Ordnance Gelatin"

TR-04-98 "Physical Ability, Fitness and Police Work"

TR-05-98E "Violent Incidents"

TR-05-98F « Incidents Violents »

TR-06-98 "Ontario Provincial Police Holster Committee Report"

TR-07-98 "Computer Assisted 2D and 3D Comparison of Bite Mark Evidence and Tooth Exemplars"

TR-08-98 "Incidence of Human Bite Marks in a Selected Adult Population"

TR-09-98 "Multicultural Communication Awareness for Police"

TR-10-98 "Freshwater Invertebrate Succession and Decompositional Studies on Carrion in British Columbia"

TR-11-98 "Penetration of Exterior House Walls by Modern Police Ammunition"

1997

TR-01-97 "Evaluation of Gun Lubricant Operation At Low Temperatures"
TR-02-97E "Risk to Police Officers From Biohazards Encountered in Police Work"
TR-02-97F « Les risques biologiques du métier de policier »
TR-03-97E "Physical Ability, Fitness and Police Work"
TR-03-97F « Aptitudes et condition physiques des policiers »
TR-04-97E "Occupational Medicine for Policing"
TR-04-97F « La médecine du travail dans le domaine policier »
TR-05-97E "Assessing Cardiac Risks in Police Officers"
TR-05-97F « Évaluation des risques de cardiopathie chez les policiers »
TR-06-97E "Occupational Health in Police Work: A Canadian Perspective"
TR-06-97F « La médecine du travail en milieu policier une perspective canadienne »
TR-07-97E "Respiratory Symptoms Among Forensic Identification Workers"
TR-07-97F « Les symptômes respiratoires chez les techniciens de l'identité judiciaire »
TR-08-97 "Evaluation of Water Soluble Evidence Collection Adhesive Tape"
TR-09-97 "Aquatic Forensics - Determination of Time Since Submergence Using Aquatic Invertebrates"
TR-10-97 "Results from the FBI Collaboration on the Detection of Fingerprints from Human Skin"
TR-11-97 "Investigaide B&E, A Break and Enter Expert System"
TR-12-97 "C.L.E.I.M.S. Canadian Law Enforcement Information Management System, A Major Case Management System"
TR-13-97 "Radar Health and Safety Study - Executive Summary of TR-14-97"
TR-14-97 "Radar Health and Safety Study - Complete Epidemiology Report

1996

TR-01-96 "Directed Studies: A Focused Approach to Collision Investigation"
TR-02-96 "Forensic Entomology - Determining Time of Death in Buried Homicide Victims Using Insect Succession"
TR-03-96 "Forensic Entomology - The Use of Insects in Death Investigations To Determine Elapsed Time Since Death In Interior and Northern British Columbia Regions"
TR-04-96 "Advanced Scientific Research For A New Europium Based Fluorescent Dye"
TR-05-96 "Advanced Scientific Research - Innovations in Cyanoacrylate Stain Technology"
TR-06-96R "Coarse Focus Soft Shaped Charge Disrupter - 1996 Update" - **Restricted**

1995

TR-01-95 "Comparative Performance of 9mm Parabellum, .38 Special and .40 Smith and Wesson Ammunition in Ballistic Gelatin"
TR-02-95 "Deenside Protective Equipment"
TR-03-95 "Comparative Analysis of Lead, Barium and Antimony Emission from Handgun Ammunition"
TR-04-95 "Oleoresin Capsicum in Buffalo"
TR-05-95 "Forensic Entomology - The Use of Insects in Death Investigations to Determine Elapsed time since Death"
TR-06-95 "Exposure and Health Status of Canadian Law Enforcement Personnel Associated with Identification Procedures"
TR-07-95 "A Comparison of Techniques for the Visualization of Fingerprints on Human Skin including the Application of Iodine and a-Napthoflavone"

1994

TR-01-94 "Evaluation of the Exposé System"
TR-02-94 « L' évaluation du système exposé »
TR-03-94 "Mobile Computer Workstation - Minimum Standards for Police "
TR-04-94 "Mobile Computer Workstation - Common Police Requirements"
TR-05-94 "Mobile Computer Workstation - Technology Developments and Industry Product Review"
TR-06-94 "Mobile Computer Workstation - Future Trends and Technology Developments"
TR-07-94 "Polygraph Validity Study - Final Report"
TR-08-94 "A Comparison of Thenoyl Europium Chelate with Ardrox and Rhodimine 6G for the Fluorescent Detection of Cyanoacrylate Prints"
TR-09-94 "Protective Equipment"
TR-10-94 "Extendible Baton Study"
TR-11-94 "Bomb Suit Helmet Evaluation"
TR-12-94 "Render Safe Procedures"
TR-13-94 "A Comparison of Three Forensic Light Sources: Polilight, Luma-lite and Spectrum 9000"

1993

TR-01-93 "Evaluation of Portable Contraband Detector Portable Microwave Dielectrometer M600P"
TR-02-93 "A Toxicological Review of Capsaicinoids (Oleoresin of Capsicum)"
TR-03-93 "Explosive Detection Security System (EDSS) Test and Evaluation"
TR-04-93 "Data Element Standards for Police Information Systems"
TR-05-93 "Fingerprints on Skin"
TR-06-93 "Automated Vehicle Location (AVL)"
TR-07-93 "Residential Break and Enter Expert System"
TR-08-93 "IMS Signal Processing"
TR-09-93R "9MM Ammunition for Fisheries and Oceans Operational Use", **Restricted**
TR-10-93R "Detection of Illicit Vegetation", **Restricted**
TR-11-93 "T.E.C. - A New Fluorescent Fingerprint Dye"
TR-12-93 "Ottawa Police Strategic Information Management System"

PREVIOUS TECHNICAL MEMORANDA

1998

TM-01-98 "Comments on the Use of Capsaicin Spray"
TM-02-98E "Common Chemical Techniques Used For Latent Fingerprint Detection"
TM-02-98F « Techniques chimiques courantes de détection des empreintes digitales latentes »
TM-03-98 "Improvements to Police Forage Cap Design"
TM-04-98R "Prototype Audio/Video Transmitter/Receiver", **Restricted**
TM-05-98 "Edge of Light Operational Assessment"
TM-06-98 "Ampel Probe Evidence Collection Device"
TM-07-98 "Emergency Equipment Mounting Bracket"
TM-08-98 "OC Spray - A Review of its Possible Risks Including Carcinogenicity"
TM-09-98 "Communicable Diseases Standards - Ontario Policing Standards Manual"

TM-10-98 "Testing of Garment Components of Crowd Control Equipment in Relation to Protection Against Heat and Flame"
TM-11-98 "Advanced Internet Investigations Course Evaluation Report"
TM-12-98 "Testing of the Road Spike as a Tire Deflation Device"

1997

TM-01-97 "Hot Meal™ Evaluation"
TM-02-97 "Electronic Drug Detection Equipment "
TM-03-97 "Nooklooker Evaluation"
TM-04-97 "Body Cam Evaluation"
TM-05-97 "Liquid Chalk Evaluation"
TM-06-97 "Barefoot Comparison and Identification Research"
TM-07-97E "Mobile Portable PC Prototype Project"
TM-07-97F « Prototype de micro-ordinateur Mobile »
TM-08-97 "Warthog Evaluation - Stop a High Speed Pursuit Before it Begins
TM-09-97 "Micro-Inspection Technology Update 1997"

1996

TM-01-96 "1995 Duty Belt and Uniform Pant Evaluation"
TM-02-96 "3D Eyewitness"
TM-03-96 "Collection of Evidence From Heavy Commercial Vehicle Incidents"
TM-04-96 "Rapport final du projet pilote sur l'utilisation du Capsicum"
TM-05-96R "Mobile Portable PC Prototype Project", **Restricted**
TM-06-96 "Spatial and Temporal Crime Analysis Techniques"
TM-07-96R "Evaluation of the XR-150 Portable X-Ray Generator", **Restricted**
TM-08-96 "Barefoot Comparison and Identification Research"
TM-09-96 "Regina Police Service Citizen Police Academy"
TM-10-96R "Canadian Bomb Data Centre Automated Database", **Restricted**
TM-11-96 "Lightman"
TM-12-96 "Field Evaluation Report of inCHARGE System"

1995

TM-01-95 "Velohorn"
TM-02-95 "Crowd Control Suit With Integrated Protection"
TM-03-95 "Bonowi® Protective Equipment"
TM-04-95R "Evaluation of Buster K910B Contraband Detector", **Restricted**
TM-05-95 "Officer Protection Kits"
TM-06-95R "Blast Suppression Foam", **Restricted**
TM-07-95 "Managing Technology in the Edmonton Police Service"
TM-08-95R "Development of a Robot Arm", **Restricted**
TM-09-95 "Impact Loading Tests for Upgrading the Security of Existing Windows"
TM-10-95 "MR-35 Punch Gun".
TM-11-95R "Dual Tone Multi Frequency Controller", **Restricted**
TM-12-95 "Barefoot Comparison and Identification Research"

TM-13-95 "Development of a New Europium Based Fluorescent Dye"; "Development of TEC for Detection of Cyanaocrylate Prints on Skin"; "Use of Tectopo for Cocaine Exhibits"; "Communication of Research Information to Police"; "Testing New Cyanoacrylate Glue"; "Testing of Minicrimescope"

TM-14-95R "Track Drive for Bomb Robot", **Restricted**

TM-15-95R "The Study of Interference Suppression for Surface Wave Radar", **Restricted**

TM-16-95R "Mobile Disruptor Transporter", **Restricted**

TM-17-95R "Miniature Emergency Response Vehicle (MERV)", **Restricted**

TM-18-95R "Evaluation of the EXPOSÉ System for Audio Interception", **Restricted**

TM-19-95 "Alternate Patrol Headgear"

TM-20-95 "D-Sight™ Micro-Inspection Technology"

TM-21-95 "Micro-Inspection Technology"

TM-22-95 "Evaluation of Auto-Kill Switch"

TM-23-95 "Use of Tectopo for Cocaine Exhibits; Communicating Research Results to Police; Miscellaneous"

TM-24-95 "Kevlar Under gloves"

1994

TM-00-94E "Technical Reports and Memorandums from 1990 to 1993"

TM-00-94F "Rapports technique et documents technique

TM-01-94 "Break and Enter Expert System 1994 Progress Report"

TM-02-94 "London Police Automated Charge Sheet System"

TM-03-94 "CONTACT - Computer Delivery of Community Services Information in the Sault Ste. Marie Police Service"

TM-04-94 "Police Research Databases"

TM-05-94 "Accident Investigation - Dragsled"

TM-06-94 "Fingerprint Research Progress 1993"

TM-07-94 "Winnipeg Police Evaluation of In-Car Video"

TM-08-94 "An Electronic Flare for the Police Traffic Officer"

TM-09-94 "Nooklooker - A device to look in hard to reach places"

TM-10-94 "Semi-automatic Pistol and Ammunition Study"

TM-11-94 "Evaluation of Pepper Spray for the Winnipeg Police Department"

TM-12-94 "Railway Evaluation of Emergency Alert"

TM-13-94 "Protective Clothing for Hazardous Spills"

TM-14-94 "Toxic-Free Ammunition - Ballistic Evaluation"

TM-15-94 "Articulating Robot Arm"

TM-16-94R "Remote Disruptor Transporter", **Restricted**

TM-17-94R "Miniature Emergency Response Vehicle (MERV)", **Restricted**

TM-18-94 "38 Special +P Police Ammunition"

TM-19-94E "Oleoresin Capsicum Spray"

TM-19-94F « Capsicum Oléorésineux »

TM-20-94 "Forensic Entomology Study"

1993

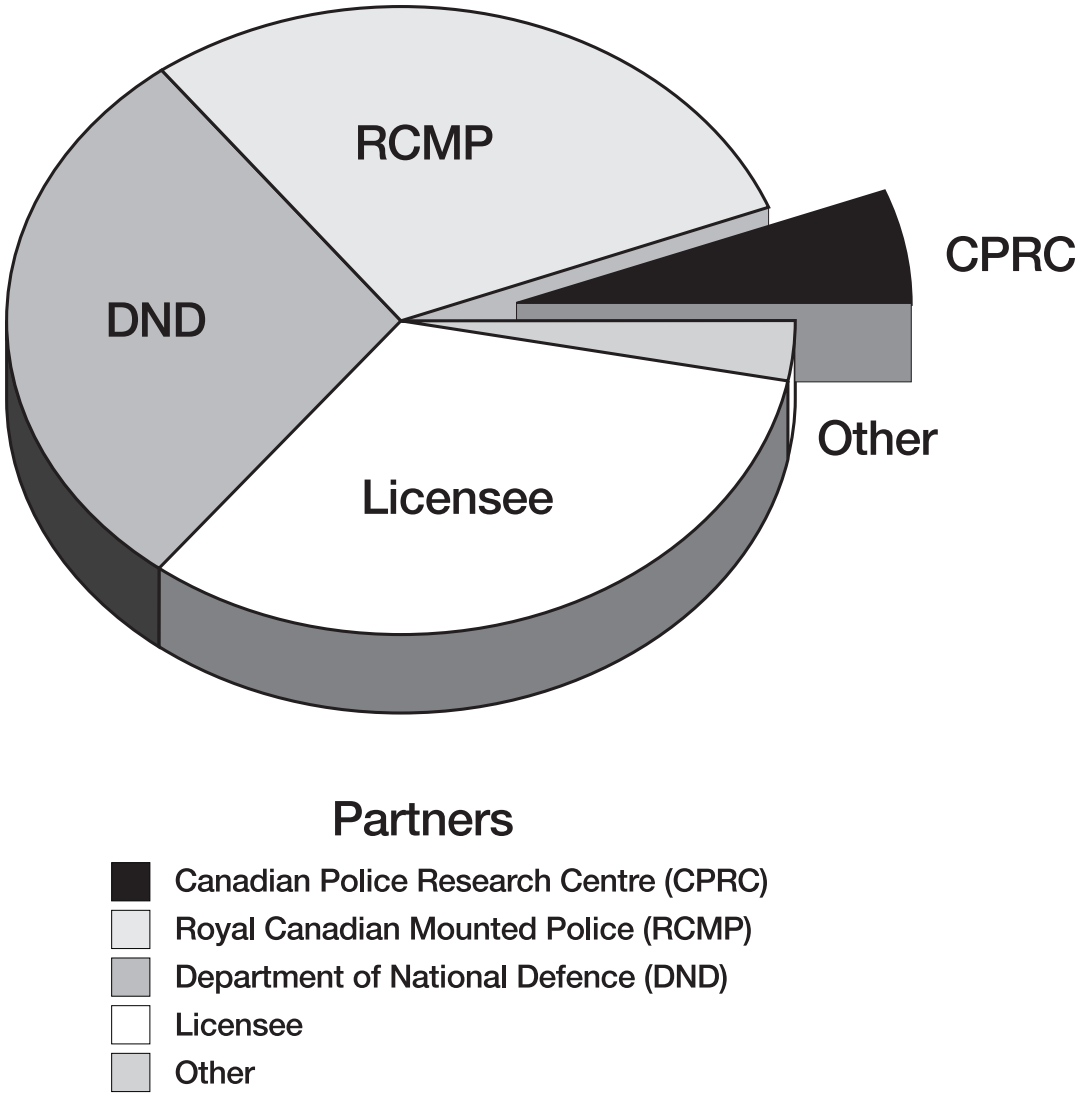
TM-01-93 "Proposed New Patrol Jacket"
TM-02-93 "Protective Coat for Riot Troop Members (S.T.A.R. Vest)"
TM-03-93 "Evaluation of Personal Cooling System - Explosive Ordnance Disposal Suits"
TM-04-93 "Explosive Detection Security System (EDSS) Test and Evaluation"
TM-05-93 "Tactical Troop Protective Equipment"
TM-06-93 "Blauer Two Piece Jacket and Pants"
TM-07-93 "Technology Platforms"
TM-08-93R "Panic Alarm System Evaluation", **Restricted**
TM-09-93 "Cyclop Video System"
TM-10-93 "Law Enforcement Television Network Evaluation"
TM-11-93 "Integrated Information Strategy for the Canadian Police Community"
TM-12-93 "Vancouver Police In-Car Video Evaluation"
TM-13-93 "Video Image Booking System"
TM-14-93 "Vacuum Fingerprint Chamber Evaluation"
TM-15-93 "Vacuum Metal Deposition Chamber"
TM-16-93 "Quick Don Gas Mask"
TM-17-93 "Police Shield Video Camera System"
TM-18-93 "Two-Piece Integrated Riot Suit"
TM-19-93 "Gore-Tex Lined Sweater Evaluation"
TM-20-93 "Electronic Measuring Device"
TM-21-93 "Chemical Exposure and Health Status of Identification Personnel"
TM-22-93 "Guideline for Evaluating the Potential Health Effects of Long-term Use of Radar Units on Police Traffic Officers"

1992

TM-01-92R "Summary Memorandum of Communications Protocol for Police Information Systems", **Restricted**
TM-02-92 "Evaluation of ST-1000 Safety Lights"
TM-03-92 "Alternative to Emergency Flares"
TM-04-92 "Evaluation of In-Car Video System"
TM-05-92 "Radiation Measurements on Police Traffic Radar Speed Detectors"

Financial Case Study

Blast Suppressant Foam Containment System



The Blast Suppressant Foam Containment System, described earlier in this report, has been successfully licensed thereby making it available to first responders. This represents an example of "leverage" wherein, through the synergy of several partners, the net result is a product which one partner alone might or could not develop independently. The combined contribution, either financially or in kind through investment of personnel, expertise, or infrastructure, provides benefit to all stakeholders and the law enforcement community.

CPRC's investment of approximately $20,000 (2%) resulted in a system whose development totalled in excess of $1,000,000.

Many of the other technologies described in this report are the result of similar collaborations.

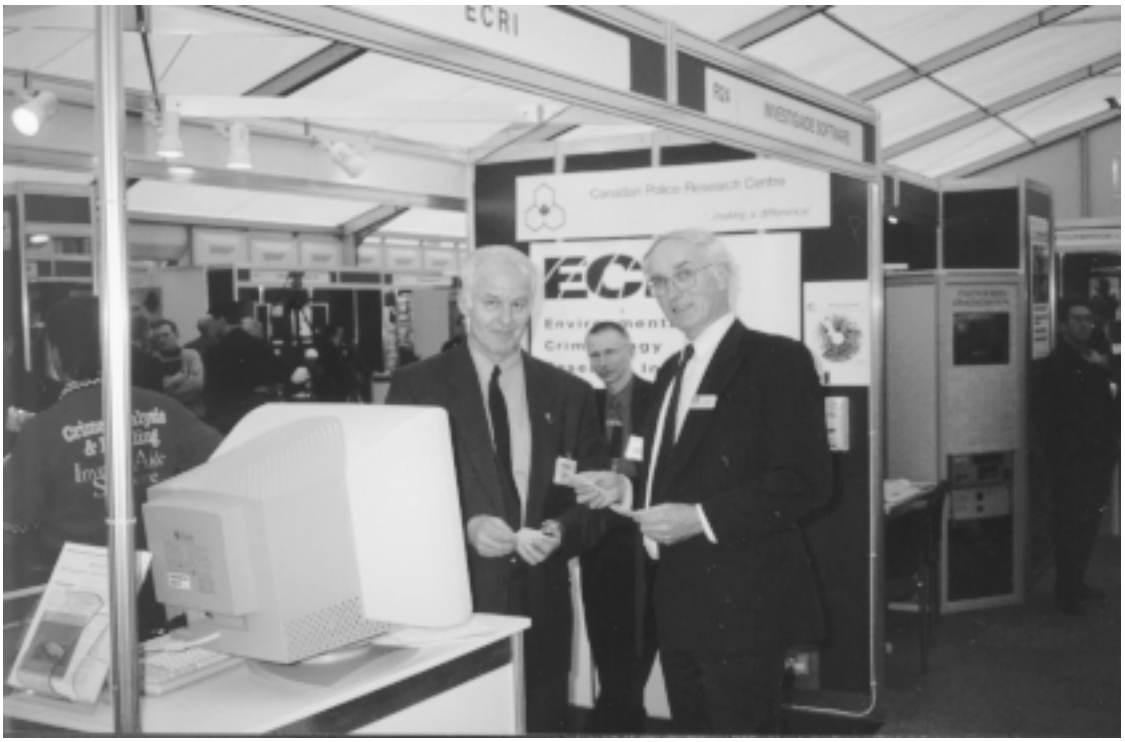
International Agreement - UK – Canada

In April 1998 the Solicitor General of Canada signed, on CPRC's behalf, a memorandum of understanding (MOU) for scientific and technical cooperation with the United Kingdom Home Office's Police Scientific and Development Branch (PSDB).

Under this MOU, CPRC brought two companies to the PSDB's annual equipment exhibition - PSDB'99. CPRC partially supported InvestigAide Software of Ottawa and Environmental Criminology Research Incorporated of Vancouver. The two day exhibition was hosted at the Senior Police Staff College in Brams Hill. This exhibition provided the companies and CPRC the opportunity to present Canadian technology to the UK police community.

Preceding PSDB'99, both companies presented at a NCIS (National Criminal Intelligence Service) conference in London.

As a result of this initiative both companies indicated potential sales were forthcoming and directly attributable to this endeavour.



TECHNOLOGY PARTNER PROGRAM

The Technology Partner Program is best described as a systematic human process for reviewing new police research ideas and products (actual and proposed), and for the evaluation of technology within Canadian police agencies. After years of dealing with the Canadian police community on many research and development issues, it was suggested that the Technology Partner approach be implemented to foster and strengthen police research and development.

The CPRC receives many requests from industry concerning new and proposed products or new technological ideas that might benefit the police community. As well there are many technological ideas and requests from the police community. To action these requests, the "product or idea" must be operationally evaluated by the police community, ie., does it serve a police need, make the job easier, more effective and more cost efficient. On receipt, the CPRC sends the proposal to a Technology Partner Associate (TPA) in a police agency, who in turn circulates the idea within their department to get an operational opinion. This opinion is returned to the CPRC which then decides on the course of action.

In the case of a new prototype product, which might be the product of research or an idea from industry, the CPRC will want an operational opinion on its effectiveness. Most often these new ideas are in the form of a single prototype. The CPRC canvasses the TPAs to solicit evaluators who are interested in testing a prototype. If the CPRC is able to get a number of departments to evaluate the product, they have a corresponding number of pre-production prototypes made and sent for evaluation under criteria that are set by the CPRC and industry. A report, addressing each of the criteria, is written by the department and submitted to the CPRC. This will enable industry to provide a better final product. The evaluation of a new product is an interactive process which, in the end, provides a new and better device to the police community.

The NRC/IRAP is of prime importance in the "technology partner" implementation. IRAP participation is encouraged in all regions of Canada by having the regional IRAP Industrial Technology Advisor (ITA) interact with the local police department. As noted earlier in this report, the IRAP ITAs are responding positively to the CPRC TPA network.

TECHNOLOGY PARTNER ASSOCIATES

POLICE SERVICE	TPA CONTACT	PHONE #	FAX #
Abbotsford	Insp. R. Gehl	(604) 859-5225	(604) 859-4812
Barrie	Ms. Barb Howse	(705) 725-7025	(705) 725-7705
Belleville	S/Sgt. Tony MacKinnon	(613) 966-0882	(613) 966-2701
Brandon	Deputy Chief Keith Buizer	(204) 729-2305	(204) 729-1999
Brockville	Chief Barry King	(613) 342-0127	(613) 342-0452
Calgary	Ms. Diana Bloom	(403) 268-8425	(403) 216-5322
Camrose	Sgt. D.A. Herle	(403) 672-4444	(403) 672-2929
Canadian Pacific Railway	Insp. Clark McLean	(403) 319-7001	(403) 319-7024
Delta	Sgt. Tom Davidson	(604) 946-4411	(604) 946-3729
Durham Regional	Supt. Tony Turner	(905) 721-4229	(905) 579-2273
Edmonton	Ms. Carol Wagar	(780) 421-2249	(780) 421-2281
Fredericton	Mrs. Michele Cronin	(506) 460-2300	(506) 460-2301
Guelph	Chief Lenna Bradburn	(519) 824-1212	(519) 822-0949
Halifax Regional	S/Sgt. Daniel Young	(902) 490-5138	(902) 490-5038
Halton Regional	Mr. Keith Moore	(905) 825-4830	(905) 825-5899
Hamilton-Wentworth Regional	S/Sgt. Paul McGuire	(905) 546-3870	(905) 546-4720
Hull	Capt. Claude Canuel	(819) 595-7603	(819) 595-7824
Kingston	D/Chief Robert Napier	(613) 549-4660	(613) 549-3111
Lévis	M. Sylvain Perron	(418) 838-4108	(418) 838-4119
London	Sgt. Bruce Nelson	(519) 661-5998	(519) 661-5999
Medicine Hat	Sgt. Gord Earl	(403) 529-8400	(403) 529-8444
Miramichi	Sgt. Robert Bruce	(506) 623-2125	(506) 623-2122
National Defence - DND	MWO David Martin	(613) 945-7279	(613) 995-4038
New Westminster	Chief Constable Peter Young	(604) 517-2410	(604) 517-2401
Niagara Regional	Supt. K. Davidson	(905) 688-4111x4445	(905) 685-7034
Ontario Provincial Police	C/Supt. Axel Frandsen	(705) 329-6178	(705) 329-6176
Ottawa-Carleton Regional	A/Insp. Tyrus Cameron	(613) 236-1222x5577	(613) 236-1947
Peel Regional	Insp. Fred Shaw	(905) 453-3311x4740	(905) 453-9360
RCMP “D” - Winnipeg	S/Sgt. Frank Ryttersgaard	(204) 984-0945	(204) 984-7919
RCMP “E” - Vancouver	Insp. Jim Begley	(604) 264-2223	(604) 264-3546
RCMP “H” - Halifax	Inspector Jeff Geddes	(902) 426-5783	(902) 426-7964
RCMP “J” - Fredericton	Sgt. Bernie Arbour	(506) 452-4188	(506) 452-2424
RCMP “K” - Edmonton	Mr. Wing Mah	(780) 412-5591	(780) 412-5636
Regina	Ms. Evelyn Rice	(306) 777-6393	(306) 777-6620
Royal Newfoundland Constabulary	Insp. Connie Snow	(709)729-8298	(709) 729-8161
S.P.C.U.M.	M. Alain Tonthat	(514) 280-6922	(514) 280-3527
Saint John	A/Deputy Chief Brian Fillmore	(506) 648-3200	(506) 648-3304
Sainte-Foy	M. Pierre Duchaine	(418) 650-7901x2110	(418) 650-7979
Sarnia	Sgt. Jim Cox	(519) 344-8861	(519) 344-6001
Saskatoon	Mr. Don Bodnar	(306) 975-8336	(306) 975-8319
Sault Ste Marie	Insp. Alan Wright	(705) 759-7350	(705) 759-7820
Solicitor General & Correctional	Mr. Greg Sones	(416) 314-0206	(416) 314-3092
Sudbury Regional	Ms. Liz Mazza	(705) 675-9171x2630	(705) 674-0348
Summerside	Chief George Arsenault	(902) 432-1200	(902) 436-4118
Sureté du Québec	M. Gilles Falardeau	(514) 598-4411	(514) 598-4729
Taber	Chief Terry Dreaddy	(403) 223-8991	(403) 223-5540
Thunderbay	Mr. Peter Worrell	(807) 625-1307	(807) 623-9242
Toronto	Ms. Kristina Kijewski	(416) 808-7771	(416) 808-7772
Vancouver	Insp. Dave Jones	(604) 717-2749	(604) 257-3716
Victoria	Sgt. Ole Jorgensen	(250) 995-7654	(250) 383-1581
Waterloo Regional	S/Sgt. Kevin Chaulk	(519) 653-7700x713	(519) 650-8551
Windsor	Mr. Barry Horrobin	(519) 255-6866	(519) 255-6191
Winnipeg	Insp. Gary Sandell	(204) 986-6916	(204) 986-7919
York Regional	Insp. Bruce Herridge	(905) 830-0303x7900	(905) 843-5810

TECHNOLOGY SHOWCASE

Voice Recognition

In December 1998, CPRC co-sponsored a technology showcase at the Waterloo Regional Police in Cambridge Ontario. The purpose of the showcase was to demonstrate to the police the potential use of computer voice recognition technology. The project, entitled "**Speech Recognition"** (mentioned elsewhere in this report), has the objective of inputting a telephoned report from the officer on the street directly into the computer. International Neural Machine (INM) of Waterloo, Ontario worked with Panda Voice of Belleville, Ontario which supplied their equipment providing the digitized voice for the research project.

Over twenty-five police agencies attended the one day event. The following demonstrations were given:

1. Police Policy Query: Front-line officers are able to verbally query the computer for specific policies and procedures while responding to a serious incident. For example, an officer en route to an airplane crash could ask the in-car computer notebook what his/her expected responsibilities would be on arrival at the scene. The computer would search and locate the appropriate place in the policy manual and reply verbally to the officer's query.
2. Vehicle License Query: While following a vehicle, the patrol officer is able to verbally query the license plate of the vehicle and receive the queries result from CPIC in Ottawa. Person checks were also demonstrated.
3. Police Related Vocabularies: The most common words used by police officers during dictation of reports could be recognized accurately without the need to pre-train the system on individual voices. For instance, a person's accent would be recognized and the spoken words understood by the computer.
4. Keyword Search: Panda Voice, which specializes in simultaneous recording of radio and telephone communications, demonstrated how these recordings could be stored and automatically transcribed using INM's technology. The verbal keyword search was demonstrated by INM.
5. Search by Concept: Keyword database searches generate extremely large numbers of unrelated hits: In contrast, INM's concept-based search engine retrieves information specified by the meaning of a query and returns precisely focused answers. This concept was explained.

The following quotes are from the February 1999 Blueline article which described the event:

"The benefits are that we are supporting a small, local company that has a lot of capability to develop voice recognition software that can be used in all sorts of police applications."

Staff Sergeant Nigel Moore, WRPS.

"It's always nice to see a project like the Waterloo initiative come together because it serves as an example of how CPRC can help bring businesses and police together in a manner that benefits all parties involved."

John Arnold, CPRC.

The CPRC would like to thank Chief Larry Gravill of Waterloo Regional Police, Dr. Oleg Feldgajer, President of INM, Mr. Gavin Hutchinson, President of Panda Voice and S/Sgt. Nigel Moore who organized the showcase.

CPRC will be sponsoring more technology showcases. If you have a technology you want to learn more about call CPRC and we'll see if we can put a technology showcase on in your area.

PUBLIC SAFETY TEST BED (PSTB) INITIATIVE

Following the lead of the NRC, the CPRC has begun work on the Public Safety Test Bed (PSTB), an initiative which will be of great interest to the Canadian police community.

PSTB's MISSION is to be a nationally recognized research consortium for developing and testing new public safety technologies, services and products that can be used in the fight against crime, enhance delivery of public safety services and educate public safety professionals.

Prime elements with which the police deal daily are *information* and *communication* to other law enforcement bodies. Police services seem always to be playing "catch-up, ie: replacing legacy computer information systems with technology that is often ten years old. Police want their systems to be reliable and tested in the marketplace. There is no room for mistakes and errors. Additionally, the police need to have the assurance that new information technologies will work and that they will offer the advantages they profess.

This PSTB initiative will allow the police the opportunity to experiment and test their ideas using the latest information technology in a non-operational environment.

The proposal suggests the following:

1. That a Public Safety Test Bed (PSTB) be developed and run by a research consortium which will develop and test new public safety technologies, services and products that can be used in the fight against crime, to enhance delivery of public safety services and to educate public safety professionals.
2. That PSTB be a means of sharing public safety information by providing justice professionals with video, audio, computer and internet technologies. Regardless of their geographic location, the PSTB consortium will provide Canadian police an appropriate test bed for public safety information technology development.
3. That research and development be the core business for PSTB. Public Safety technology is constantly becoming more user friendly and portable so that it can be connected into the busy world of the police investigator and ultimately provide Canadians with safe streets, safe communities, safe homes.

·• PSTB will conduct research and development on a variety of public safety hardware and software applications.However, initial development will focus on information and data solutions using the innovative techniques of integrated reasoning, data mining and rapid search and correlation techniques as applied to the safety and well being of Canadians.

- PSTB will conduct research and development in public safety and security training and internet long distance delivery. Initial development will focus on web specific information and data for police investigators, followed by the more traditional police training areas at the basic level.
- PSTB will be involved in all stages of invention and translation leading up to a successful commercialization of the technology. The development of products that address the market will potentially result in low-risk high return opportunities for PSTB's members.

The PSTB initial potential partners include – CPRC, the Canadian Network for the Advancement of Research, Industry and Education (CANARIE), national, provincial and municipal police services and the Canadian high technology and corporate communities.

The PSTB consortium will be guided by the following values and principles:

- Ensure confidentiality of sensitive public safety information (data security).
- Affirm a citizen's right of feeling safe anywhere in Canada.
- Provide an atmosphere of sharing where risk will be reduced for both the public safety professional and the industry provider (communication of information).
- Emphasize a holistic approach to public safety recognizing the cultural diversity and social fabric of the nation
- React quickly to opportunities, minimizing time between idea and delivered product.
- Promote entrepreneurial activity in the Canadian public safety community.
- Attract world-class researchers.

Proposed Activities

The *Public Safety Test Bed*

- will deliver an infra-structure to the front line public safety professional.
- will initially offer two Canadian-developed world-class applications to the front line user.
- will negotiate compensation from data users which will be shared with the data providers and support the PSTB's infra-structure and activities.
- will commence research on several fronts including research on stolen vehicles, bank robbery suppression, commercial fraud and illegal internet activity.

If you have interest or want to learn more about the PSTB initiative contact please contact - John Arnold at (613) 993-3737 or by e-mail at: John.Arnold@NRC.ca.

NATIONAL RESEARCH COUNCIL'S INDUSTRIAL RESEARCH ASSISTANCE PROGRAM

In policing, many good ideas are developed out of necessity on a one-of-a-kind basis to perform a specific task. These innovations are often useful to others. However, police are not in the business of producing products for others. This is where the National Research Council's Industrial Research Assistance Program (IRAP) provides an invaluable support element of the CPRC partnership.

The National Research Council's Industrial Research Assistance Program (NRC-IRAP) supports technology innovation in Canadian industry. NRC-IRAP provides Canadian industry with technical advice, linking companies with appropriate technologies, and assisting industrial research, development and adaptation. IRAP's 1998-99 contributionary budget was approximately $ 130 million.

IRAP uses CPRC technical/operational experts (often through the Technology Partnership route) to assist in evaluating potential IRAP projects in the police and security area. CPRC solicits operational feedback from police agencies as to whether the IRAP client's proposal addresses a true police need saving time and money.

Through the "Technology Partner Associate"(TPA) process, CPRC and IRAP together match their client needs (for the CPRC, the client is the police; for IRAP, Canadian industry). The TPA process encourages the more than 250 IRAP Industrial Technology Associates (ITAs) to deal directly with their local police community. CPRC recognized the difficulty in initiating IRAP projects across Canada (experience had indicated that it was much easier to develop IRAP projects within driving distance of Ottawa). Now, for example an IRAP-ITA in Alberta has taken up the challenge of working with the TPAs from Calgary and Edmonton police departments. This process of getting the local police community together with the local innovation community, the IRAP ITAs, is called "Technology Platforms" where local innovation is fostered and encouraged through this process.

The following CPRC projects were supported by NRC / IRAP this year:

- Bomb Suit Testing
- Geographic Profiling
- Speech Recognition
- Fingerprint Acquisition Device

INTERACTION WITH OTHERS

The CPRC's mandate of developing police equipment for the Canadian police community naturally interests many organizations. The following lists some of the many agencies and the interactions that took place during the year:

United Kingdom Home Office Police Scientific Development Branch (PSDB)

As noted elsewhere in this report, a Memorandum of Understanding (MOU) was signed between PSDB and CPRC to establish a program of coordination and collaboration for the research, development, evaluation and operational use of law enforcement technologies and to enhance the already existing co-operation between the two agencies.

United States Department of Justice – National Institute of Justice

CPRC is in the process of negotiating an MOU with NIJ also to establish a program of coordination and collaboration for the research, development, evaluation and operational use of law enforcement technologies and to enhance the already existing co-operation between the two agencies. CPRC is a member of NIJ's Law Enforcement and Corrections Technology Advisory Council which acts as their user advisory board. There is an existing cooperative research and development agreement (CRADA) for the RCMP Laboratory's Forensic Automotive Paint Database and efforts are well underway to create a similar agreement for the RCMP's Firearms Identification Database. On-going cooperation exists on a wide range of topics including less-than-lethal technologies, high speed pursuit interdiction, personal wear body armour, contraband detection.

Canadian Police Association (CPA)

The study on the possible harmful effects of hand-held radar guns was one of the first examples of a collaborative cost sharing venture involving the CPA and CPRC. Currently, the CPA and CPRC are funding and participating in the CGSB project to create a Canadian standard for Soft Body Armour. A new cooperative initiative involves the development of specifications for vehicles which would facilitate installation of police patrol vehicle equipment.

Commitée Européan de Normalization (CEN) Working Group on Personal Wear Body Armour

CPRC and other members of the Canadian Personal Wear Body Armour working group have participated as observers at the meetings of the European group and have undertaken some cooperative work plans to jointly resolve some of the issues facing both groups.

Canadian Society of Industrial Security (CSIS)

The CPRC participates as an associate member of this Canadian industrial security organization.

Criminal Intelligence Service of Alberta (CISA)

The CPRC regularly attends CISA technical seminars which address current police technology and equipment issues.

Criminal Intelligence Service of Ontario (CISO)

The CPRC regularly attends CISO technical seminars which address current police technology and equipment issues.

Ontario Police Forces Planning Association (OPFPA)

As an associate member, CPRC representatives attend these meetings, contributing experience and expertise in the applications of technology. This organization is an excellent forum for the discussion of new ideas of current police interest.

PROTECTION OF INTELLECTUAL PROPERTY ASSETS

"Intellectual Property" (IP) can be defined as systematic knowledge in any form that would allow one to produce a product for, or supply a service to, someone else. The creation of a new invention or the development of a new technology is an example of an IP asset. IP can also be information databases or ideas which, when put into practice, allow personnel to perform certain tasks. The best known form of intellectual property protection are those innovations that can be protected by patent. Other forms of Intellectual Property can be protected by other legal instruments provided by the Copyright Act , Industrial Design Act and the Trademarks Act.

Although police agencies do not have as their primary purpose the development of IP, many of their activities, especially in their technical units, result in the creation of IP assets. Some of these IP assets must be reserved for the exclusive use of the owning police agency or the general law enforcement community. However, when the IP assets are of potential commercial value and they can be released to private industry, commercialization should be pursued. Having protected the IP asset, there is the possibility of enhancing the technology through licensing or through cooperative research and development between the Crown and the private sector. The economic benefits to the police agency and Canadian industry can be significant as can those paid to the innovators.

The Science & Technology Branch of the RCMP, in addition to providing staff to the Canadian Police Research Centre, provides a management service for RCMP and CPRC Intellectual Property assets. The Intellectual Property Services of the National Research Council is the RCMP's primary source of expertise and assistance with such matters. Other police agencies can obtain general information regarding the management of their own IP assets from the CPRC. They will have to use other professional agencies (eg. law firms, patent firms) for specific legal assistance such as licensing and patenting.

A video-cassette entitled "Intellectual Property - Protecting Your Technology", is available from the CPRC upon request by fax at (613) 952-0156 or email: cprc@nrc.ca.

Submitting R & D Proposals

At the centre of this annual report you will find a proposal form which is to be completed as fully as possible. A copy of the form will suffice for our purposes. An Executive Officer must sign the form (Chief of Police, Commanding Officer or equivalent).

The focus of the CPRC is **research**, **development or evaluation of police equipment**. Liaison is maintained with the Solicitor General's Police Research Division with respect to social science input of technological innovation.

GUIDELINES FOR ACCEPTANCE AND ESTABLISHING PRIORITIES

"Can It Make A Difference"

Risk factor ..... Frequency of potential use or occurrence

Operational Impact ..... How widespread is the need in the community

Dollar implications ..... Resource saving potential/dollar cost

Progress/Innovation ..... Operational effectiveness and innovation

Attainability ..... Technical risks and costs - adapt or create

Partnerships ..... Potential for risk and cost sharing, degree of commercial viability

A project must fit one of the three categories to be included and the priority that will be assigned to it will be based on a review of the above factors. The results of the review based on the factors will be retained on the project file for reference.

Category A

Health and safety - protecting the Police in hazardous situations

Category B

Operational effectiveness - fighting crime, gathering information, intelligence and evidence

Category C

Protecting the public - traffic, custody, crime prevention,

As an illustration, a category B project that will save significant resources, be applicable throughout the community and is pretty sure of success may well be given the same or higher priority than a project that may protect a police officer in a hazardous situation that occurs very infrequently. Similarly protecting the public with a device that controls high speed chases simply and safely may well come first overall. The goal will be to effectively and as objectively as possible reflect the priorities of the overall police community and their clients.

Canadian Police Research Centre

Centre canadien de recherches policières

"RESEARCH AND DEVELOPMENT PROPOSAL"

« PROPOSITION EN MATIÉRE DE RECHERCHE ET DÉVELOPPEMENT »

- APPEND EXTRA PAGES IF INSUFFICIENT SPACE
- COMPLETE EMAIL SUBMISSIONS AVAILABLE AT WWW.CPRC.ORG

- ANNEXER DES PAGES SUPPLÉMENTAIRES SI L'ESPACE EST INSUFFISANT
- POUR OBTENIR UN FORMULAIRE ÉLECTRONIQUE COMPLET, CONSULTER WWW.CPRC.ORG

PLEASE TYPE AND FORWARD ORIGINAL TO

CANADIAN POLICE RESEARCH CENTRE
BOX 8885
OTTAWA, ONTARIO K1G 3M8

Fax (613) 952-0156

VEUILLEZ DACTYLOGRAPHIER ET TRANSMETTRE L'ORIGINAL À L'ADRESSE SUIVANTE :

CENTRE CANADIEN DE RECHERCHES POLICIÈRES
C.P. 8885
OTTAWA (ONTARIO) K1G 3M8

Télécopieur : (613) 952-0156

1. **PROJECT TITLE** / **TITRE DU PROJET**

CPRC FILE NO.
No DE DOSSIER DU CCPR

ORIGINATOR FILE NO.
N° DE DOSSIER DE L'AUTEUR

2. **ORIGINATOR/CONTACT** (NAME - ADDRESS - TEL. NO) / **AUTEUR/PERSONNE-RESSOURCE** (NOM - ADRESSE -N° DE TEL.)

3. **OBJECTIVE** / **OBJECTIF**

4. **BENEFITS -** / **AVANTAGES -**
HOW WOULD THE PRODUCT ASSIST POLICE OPERATIONS? / QUELLE SERAIT L'UTILITÉ DU PROJET PROPOSÉ POUR LES OPÉRATIONS POLICIÈRES ?

5. **HAS RELATED RESEARCH BEEN DONE BEFORE?** / **A-T-ON DÉJÀ EFFECTUÉ D'AUTRES RECHERCHES DE CE GENRE ?**
(IF YES, INCLUDE REFERENCES/CITATIONS) / (SI OUI, INDIQUER LES RÉFÉRENCES BIBLIOGRAPHIQUES)

6. **CONSEQUENCE OF NON-APPROVAL** - IF THIS RESEARCH IS NOT APPROVED WHAT WOULD THE CONSEQUENCES BE? WHAT ARE YOUR CONTINGENCY PLANS TO MEET THE OPERATIONAL NEEDS ADDRESSED BY THIS RESEARCH?

CONSÉQUENCES DU REFUS - SI CETTE RECHERCHE N'EST PAS APPROUVÉE, QUELLES SERONT LES CONSÉQUENCES ? QUELLES AUTRES OPTIONS RÉPONDRAIENT AUX BESOINS OPÉRATIONNELS VISÉS PAR CETTE RECHERCHE ?

7. **ASSISTANCE BY ORIGINATOR** - HOW CAN YOUR ORGANIZATION ASSIST WITH THIS PROPOSED RESEARCH? PLEASE PROVIDE DETAILS
   (A) FUNDING?
   (B) TECHNICAL RESOURCES?
   (C) OTHER WAYS?

AIDE DE L'AUTEUR - COMMENT VOTRE ORGANISATION PEUT-ELLE CONTRIBUER À CE PROJET DE RECHERCHE ? VEUILLEZ PRÉCISER
   A) FINANCEMENT ?
   B) RESSOURCES TECHNIQUES ?
   C) AUTRE ?

8. **RESEARCH PERFORMER** - WHO WOULD YOU RECOMMEND DO THE PROPOSED RESEARCH? PLEASE PROVIDE DETAILS.
   (A) YOUR AGENCY/DEPARTMENT?
   (B) OTHER DEPARTMENT/UNIVERSITY/RESEARCH AGENCY

PERSONNE CHARGÉE DE LA RECHERCHE - À QUI CONFIEREZ-VOUS CE PROJET DE RECHERCHE ? VEUILLEZ EXPLIQUER
A) VOTRE ORGANISME/MINISTÉRE?
B) AUTRE MINISTÈRE-UNIVERSITÉ-ÉTABLISSEMENT DE RECHERCHE

SIGNATURES

ORIGINATOR/AUTEUR	DATE
SUPERVISOR/SUPERVISEUR	DATE
EXECTUVE OFFICER OF ORIGINATOR'S ORGANIZATION/ CADRE SUPÉRIEUR DE L'ORGANISATION DE L'AUTEUR	DATE

Canada