CANADIAN POLICE RESEARCH CENTRE

CENTRE CANADIEN DE RECHERCHES POLICIÈRES

ANNUAL REPORT

2003–2004

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Canada

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This Annual Report is a publication of the Canadian Police Research Centre.
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Cat. No. PS61-2/2004E-PDF
ISBN0-662-37923-3
ISSN1181-6244
PAID411

PROJECTS

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

Special Initiatives

Links and Leverages

Chairman's Message

The past year has been a year of change for the CPRC. In November 2003, the Executive Board of the Canadian Association of Chiefs of Police (CACP) endorsed the transition of the Canadian Police Research Centre (CPRC) into a self-sustaining organization, located at the National Research Council of Canada. Following this decision, the CPRC established a new advisory board; confirmed the vision, mission and values of the organization; and obtained the necessary resources to run the organization and strengthen the foundation for "your CPRC".

The CPRC has been instrumental in helping Canada build a distinguished record of increasing public safety through science and technology, across Canada and abroad. From geographic profiling, to cutting edge forensic analysis tools, to protecting children from predators, the CPRC and its partners have added a new dimension to preventing and addressing criminal acts—the CPRC is truly "making a difference".

Such achievements are born from on-going cooperation, dedication, and innovation. As the CPRC enters its 25th year, it remains committed to this formula for success, while endeavouring to widen its scope and influence.

Since 1979, the CPRC has supported research and development relevant to the demands of law enforcement. Under the new governance structure, identifying common needs, developing solutions, and evaluating technologies in an operational environment will remain our primary goals. The work of the CPRC will remain focussed on three priority themes: increasing first responder safety, improving forensic techniques, and establishing technology standards.

The demands of law enforcement have, however, changed dramatically in this post-September 11th, 2001 world. It is no longer sufficient to simply perform research and development in isolation. Innovation requires integrating research and development with a wide variety of partners, including industry, so that new ideas can be commercialized—and operationalized—in a state-of-the-art, cost-effective way.

The CPRC can be proud of its strong relationships—both nationally and internationally—that enable collaboration across jurisdictions, within organizations, and in co-operation with industry. The CPRC draws strength from the strong partnership between the Royal Canadian Mounted Police, the Canadian Association of Chiefs of Police, and the National Research Council. The CPRC also depends on on-going collaboration with over 270 organizations, which includes police and other professionals, researchers, and industry. Such co-operation allows the CPRC to disseminate technologies and policing practices on a trusted basis with all key players.

Over the past few months, I have met with many chiefs to discuss the CPRC. I am impressed by the strong support they demonstrate, for both the work CPRC performs now, and the need for a strong CPRC in the future. The advisory board, partners, and staff of the CPRC will be working in 2004–2005 to strengthen the organization so that it can continue meeting the needs of policing in the future.

I am confident that the long track record of CPRC achievements, spanning a quarter of a century, will inspire you with the same enthusiasm I feel as I look to the CPRC's future.

Please accept my invitation to come and discover "your Canadian Police Research Centre."

Jim Cessford

Chief Constable, Delta Police Department, Delta, British Columbia
Chair, Canadian Police Research Centre Advisory Board

CPRC'S VISION

A safer Canada through science and technology

MISSION

To provide leadership and focus for science and technology in policing and public safety across Canada through research, development, standards, evaluation, and commercialization

VALUES

Inclusive
Encouraging collaboration in an open atmosphere

Innovative
Exploring new opportunities with creativity and open-mindedness

Integrity
Doing the right things at all times in an ethical manner

Responsive
Reacting to the client and to changing business practices efficiently and effectively

Accountable
Being responsive to the organizations that collaborate with us while exercising due diligence with respect to financial matters and in our financial practices

The Strategic Pillars of the CPRC

The CPRC was originally structured around three strategic objectives:

- developing the best tools for the police community;
- ensuring that solutions are both affordable and practical; and
- building enduring partnerships.

As the CPRC enters its next quarter century, these three original strategic objectives have evolved to reflect current needs and operational demands. Today's CPRC is guided by three strategic pillars that will provide the context and framework for CPRC activities for years to come.

E-learning & E-working

- To develop the Canadian Police Knowledge Network (CPKN) as a collaborative network, identifying needs and co-ordinating the design and delivery of e-learning and e-working solutions for the Canadian police community.

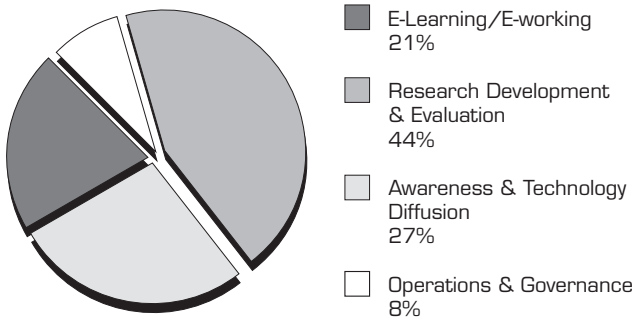
Research, Technology Development, and Evaluation

- To identify user needs for improved technologies
- To facilitate collaborative projects addressing areas of need
- To identify and develop technologies enhancing investigative techniques
- To provide tools, techniques, and objective technology analysis
- To identify and develop technologies to enhance public and officer safety
- To facilitate the development of effective standards and provide objective technology evaluations to aid decision-making
- To operationally evaluate new technology products that assist the work of the first responder and public safety community

Awareness and Technology Diffusion

- To be the national focal point for R&D and technical information for the Canadian police community
- To coordinate regional, national, and international collaborations with research and technology providers
- To increase the competitiveness of the Canadian security technology industry by linking industrial capabilities to first responder requirements, regionally, nationally, and internationally
- To market CPRC services by increasing awareness of and use of these services by our present and future clients

The chart below illustrates the percentage of resources the CPRC will direct towards each of the four pillars, and to administration and governance, in 2004–2005.



The Business of the Canadian Police Research Centre
"The Science of Safety and Security"

The Canadian Police Research Centre (CPRC) is a partnership among the Canadian Association of Chiefs of Police, the Royal Canadian Mounted Police, and the National Research Council Canada. It is staffed by personnel from the RCMP and the National Research Council (NRC), and is governed by an independent advisory board made up of representatives from police and other related organizations from across Canada. The CPRC will celebrate its 25th anniversary in 2004.

The CPRC serves as a single, national focal point for technology research and development efforts in support of Canada's law enforcement community. By promoting innovation and cooperation between the police community, governments, industry, universities, and other research organizations, the CPRC strives to ensure that the best possible resources are made available to police and related organizations in a cost-efficient and timely manner.

Canadians today have an unprecedented awareness of public safety concerns, and equally unprecedented expectations for seeing those concerns addressed. In December 2003, the Canadian government clearly signalled its heightened priority for all aspects of security issues at home and on the world stage. While the CPRC cannot address all of these areas or expectations, it has made—and will continue to make, significant contributions to public safety at home and abroad.

Through its research agenda, the CPRC provides the law enforcement community with reliable, objective information on a variety of topics, that contributes to sound, evidence-based decision-making. It also provides a unique service by developing and evaluating technologies and technical standards to respond to the following areas.

- Law enforcement and public security organizations benefit from having an organization that can identify common technology needs, develop standards, and evaluate technology in an operational environment. The CPRC is well positioned to respond to these needs on a national basis and has commercialized over 50 technologies that are in daily use in Canada and internationally.

- The responsibility for law enforcement and public security crosses all levels of government. The ability to work seamlessly with all stakeholders in this area is critical in solving operational problems and commercializing key solutions. An important core competence of the CPRC is strong partner relationships. The CPRC plays a key role in facilitating cooperation across jurisdictions and between organizations including law enforcement, industry, other private sector interests, and non-governmental organizations.

- When it comes to police research, the capacity to respond to immediate operational needs (within 0–24 months) is essential. The CPRC is a flexible organization that can contract, develop, and integrate technology rapidly. It does this by bringing Canada's major research organizations, police services, and innovative industries together to produce the solutions required for today's policing.

- First response begins at the community level. The CPRC maintains the Technology Partner Associates, a network of police professionals that helps to provide Canadian industries with opportunities to test new products and technologies in an operational environment. The CPRC also works with the NRC's Industrial Research Assistance Program and other research institutes to link first responders, industry, and researchers. In 2004–05, the CPRC will establish a Technology Development Advisory Committee (TDAC) to assist in identifying needs and setting project priorities.

- Training is costly and difficult to provide on an "as needed basis". This results in a need for e-learning and e-working tools to develop and maintain effective first-line response. The CPRC, working with police educators, has initiated a national Canadian Police Knowledge Network to coordinate developing high-quality courses for members of police services around the world.

Barry Douglas Gaudette: 1947–2003

Barry Gaudette, an internationally renowned forensic scientist, a loving husband and father, an active member in his community, and a modest, wonderful human being, passed away on October 1, 2003 after a brief but valiant battle with multiple myeloma. He is survived by his beloved wife, Leslie, and two children, Darrell and Lisa. Barry was a loving brother to his siblings, Allan, Neil, Dawn, Shelley, and Douglas, and a dear uncle to his many nieces and nephews.

Barry's career began with the RCMP Crime Detection Laboratory in Edmonton, Alberta in 1969. When I (GRC) first arrived at the lab, I met this studious, bespectacled guy poring over literally thousands of hair samples on the examination table (which in those days, by the way, doubled as our lunch and coffee room table!). As an understudy, I thought to myself, "What is this guy up to?" Barry had embarked on a massive research project that would ultimately involve close to 100,000 side-by-side microscopical human hair comparisons. This sample size was unheard of. He did it. He raised the bar in forensic hair comparisons. He raised the bar to the point where nobody has ever exceeded it. In fact, this past February, when I had the opportunity to attend the American Academy of Forensic Sciences (AAFS) annual conference in Chicago, they were still talking about Barry's landmark studies—30 years later: far greater than a lifetime in the scientific world.

Glenn Carroll

Barry Gaudette with Queen Elizabeth II, Golden Jubilee Commemorative Medal, June 2002.

In 1980, he was transferred to the Central Forensic Laboratory in Ottawa as Chief Scientist, Hair & Fibre.

Everywhere I went with him, he received high praise. Early in both our careers, Barry and I (GRC) travelled to Toronto to visit the Ontario Centre of Forensic Sciences, each for the first time. I distinctly recall meeting with the personnel and being humbled by the high regard they held for Barry and his work. Later, when he and I travelled to the International Association of Forensic Sciences (IAFS) conference in the UK, and subsequently visited the HOFSS research facilities in Aldermaston, it was much the same—and it didn't stop there. Last year when he announced his retirement, our colleagues on the US–Canada Counterterrorism R&D working group, among others, saw fit to honour Barry with their appreciation as well.

He received numerous accolades at home and abroad for his pioneering forensic work and was highly regarded as a world leader in the area of forensic hair and fibre examination. He was actively involved in implementing forensic DNA analysis in the RCMP forensic laboratories and contributed to the 1997 DNA Databank legislation. For his work in all areas, he earned the Government of Canada Public Service Award of Excellence and the Queen Elizabeth II Golden Jubilee Commemorative Medal.

In 2000, Barry assumed the duties of Officer In Charge of the Science & Technology Branch, as well as Manager of the Canadian Police Research Centre. In 2002, he retired after 33 years with the RCMP.

Barry was an ideal colleague and mentor. He was non-confrontational, supportive, and fair. We know that the strong support from his family had so much to do with that. He was a pure joy to work with and is sorely missed.

This text is used with permission from the Journal of the Canadian Society of Forensic Science, vol. 36, no. 3, pages 189-190.

Anthony Tessarolo, Assistant Manager, Centre of Forensic Sciences Northern Regional Laboratory, Sault Ste. Marie, ON
Glenn R. Carroll, Acting Officer in Charge, Science & Technology Branch, RCMP; and, Acting Manager, Canadian Police Research Centre, Ottawa, ON

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Harry Turner, NRC

Members of the CPRC advisory board and staff at the inaugural meeting of the advisory board, Ottawa, Ontario, January 2004.

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PROJECTS

CATEGORY A — Health and Safety: Protecting the Police in Hazardous Situations

Blast Suppressant Foam Containment System — Concluded

CPRC

Blast Suppressant Foam Containment System.

Project Managers:
Sheldon Dickie, CPRC
(613) 949-4174
John Bureaux, Canadian Bomb Data Centre
(613) 993-7880

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

This award-winning technology—comprised of foam delivery, foam formulations, and containment apparatus—has been successfully commercialized. The *Blast Guard* system is available to first responders through Vanguard Response Systems Inc. (formerly NBC Team Limited).

Contact:
Telephone: North America 866-434-4514, International 905-643-8801
Email: info@vanguardresponse.com

Blunt Trauma Protective Equipment: Performance Standards — Active

Project Managers:
Randy Gaw, Correctional Services Canada
(613) 995-3981
Julie Graham, CPRC
(613) 949-4173
Dave Shanahan, Canadian Standards Association
(416) 747-2586

Correctional Service Canada, RCMP, various user agencies, and representatives of industry are working to create performance standards for protective equipment for police and correctional officials.

Enhanced Torso Protection Systems — Concluded

Project Managers:
Julie Graham, CPRC
(613) 949-4173
Dr. Michael Worswick, University of Waterloo
(519) 885-1211, ext. 5830

University of Waterloo researchers, in association with researchers from Defence R&D Canada (Val Cartier), and with representatives from several Ontario industries concerned with the production of personal protection systems, were involved in this project, which was also supported by Materials and Manufacturing Ontario (MMO) and the CPRC.

The project successfully developed an advanced body armour that provides protection against an AP 0.50 calibre round at 500 m/s with back-plane deflection less than the National Institute of Justice standard of 44 mm in clay. The armour also falls within the weight parameters laid out by the Department of National Defence partners at the beginning of the project, and the materials used should result in a cost competitive product.

A final report is expected in the summer of 2004.

Hazardous Material Portable Burn System — Concluded

CPRC

Hazardous Material Portable Burn System.

Project Managers:
Sheldon Dickie, CPRC
(613) 949-4174
Derick Ivany, RCMP Technical Operations Directorate, Explosive Disposal & Training Section (EDTS)
(613) 993-9869

Disposing of some seized materials can be difficult or dangerous. The RCMP's Explosive Disposal & Training Section has developed a solution in the form of a cost-effective, mobile incinerator. It is capable of destroying ammunition, drugs, tobacco, limited pyrotechnics, and other exhibit materials in a way that is safe, controlled, and environmentally-friendly.

The project team (Cpl. Ivany and a Hamilton-Wentworth Regional Police Service member) researched the background technology, consulted with industry, and developed partnerships with a number of other police agencies.

Other agencies provided in-kind contributions in the form of prototype testing (such as RCMP 'B', 'H', and 'J' Division Explosives Disposal Units, Sûreté du Québec, and Peel Regional Police Service). Field trials, and environmental assessments were also done. The product has been successfully commercialized and is available through Tulmar Systems Inc. (613) 632-1282.

Remote Wireless Explosives Disruptor Initiator — Concluded

Project Managers:
Sheldon Dickie, CPRC
(613) 949-4174
Scott Sheppard, Canadian Police College
(613) 993-4566

The RCMP 'E' Division Explosive Disposal Unit, in conjunction with the Canadian Bomb Data Centre (CBDC), has developed a small light-weight transmitter/receiver system that can initiate explosive charges and fire disruptors from a remote command post without using a ground line. Current technology requires using such a ground line, which is a physical safety hazard, as well as a tactical disadvantage.

Further refinements are in progress with a private sector collaborator. These include making the system smaller and more rugged. Commercialization is expected in 2004.

CATEGORY B — Operational Effectiveness: Fighting Crime, Gathering Information, Intelligence and Evidence

Alberta Police Secure Network (APSNet) — Active

Project Managers:
John Evans, CPRC
(613) 949-4175
Rick Saunders, Edmonton Police Service, Information Technology Section
(780) 421-2391

The Alberta Public Safety Network is a project to integrate the record management systems and other key databases of Alberta police services. The system was considered too expensive and complex to undertake until alternate technologies were introduced by the CPRC. The project was re-examined and deemed to be affordable and quickly achievable.

In 2003, funding was arranged and the project was tendered. In early 2004, the contract was awarded and due to be on-line by the summer of 2004. The technology will create an interface to the existing databases and allow them to be treated like one large virtual database. Police will then be able to query all municipal police databases through a single interface, which will give them more complete information.

ATV Gated Laser Imaging — Active

Project Managers:
Denni Bonnier, Obzerv
(418) 657-7006
Sheldon Dickie, CPRC
(613) 949-4174

The CPRC continues working with Obzerv, a Quebec-based Institut National d'Optique (INO) spin-off company that has developed a product with a potential law enforcement application. A portable gated laser imaging system is in the prototype stage.

Bullet Containment System for Canada Customs and Revenue Agency (CCRA) — Concluded

Project Manager:
Sheldon Dickie, CPRC
(613) 949-4174

CCRA approached the CPRC for assistance to evaluate a bullet containment system to render firearms safe, which could be used by CCRA officers at border locations. An Ottawa company with ballistic test facilities has been contracted to conduct this evaluation.

Canadian Field Trials: Treatment of Porous Exhibits — Concluded

Project Managers:
Julie Graham, CPRC (613) 949-4173
Dr. Della Wilkinson, RCMP Forensic Identification Research Section (613) 993-3059

This study compared the treatment of porous exhibits with the forensic chemical 1,8-Diazafluoren-9-One (DFO), with Ninhydrin, and with the sequential use of DFO followed by Ninhydrin. Many other countries process porous exhibits in a sequential manner; this process has not been adopted in Canada. This field study provided an opportunity to introduce this sequential and standardized approach to the field. The results allowed identification personnel to evaluate sequential processing against their current practices.

A report will be published later in 2004.

Decomposition In The Great Lakes Environment — Concluded

G. Anderson, Simon Fraser University

Underwater video camera.

Project Managers:
Dr. Gail Anderson, Simon Fraser University
(604) 291-3589
Julie Graham, CPRC
(613) 949-4173

Report:
TR-08-2001 "Underwater Digital Photography Equipment for Evidence Recording"

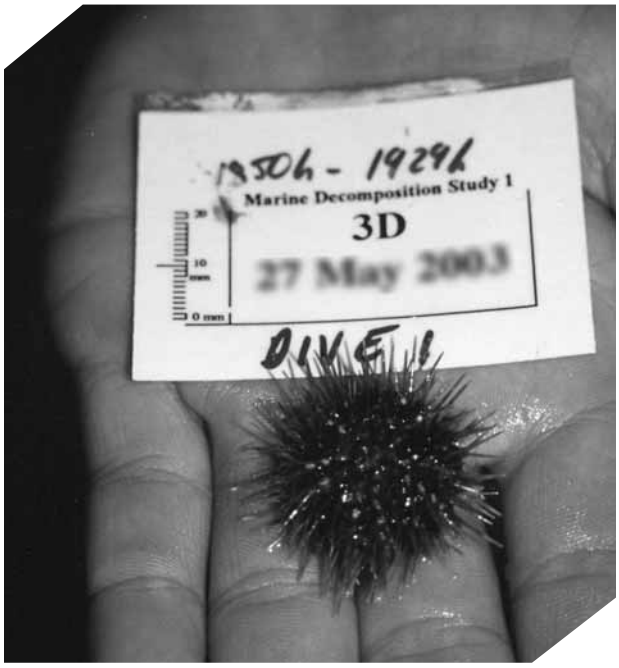
Working in co-operation with Dr. Gail Anderson of Simon Fraser University, the Niagara Regional Police Service Underwater Search and Recovery Unit (USRU) studied aquatic death/crime scenes. The study involved the use of pig carcasses and was conducted in Lake Ontario.

Decomposition In The Marine Environment — Concluded

Project Managers:
Dr. Gail Anderson, Simon Fraser University
(604) 291-3589
Julie Graham, CPRC
(613) 949-4173

Report:
TR-09-2002 "Determination of Time of Death for Humans Discovered in Saltwater Using Aquatic Organism Succession and Decomposition Rates"

Dr. Gail Anderson of Simon Fraser University, in co-operation with the Vancouver Public Aquarium, the Canadian Coast Guard, the Canadian Amphibious Search Team, and the RCMP, studied arthropod succession on pig carcasses placed at varying depths in the ocean. The purpose of the study was to develop a system to determine time of death for bodies that have been disposed of in saltwater.



S. Simms

Green urchin (Stronglyocentrotus droebachiensis).

Distribution of Sequence Heteroplasmy in Human Mitochondrial DNA from Skeletal Remains — Active

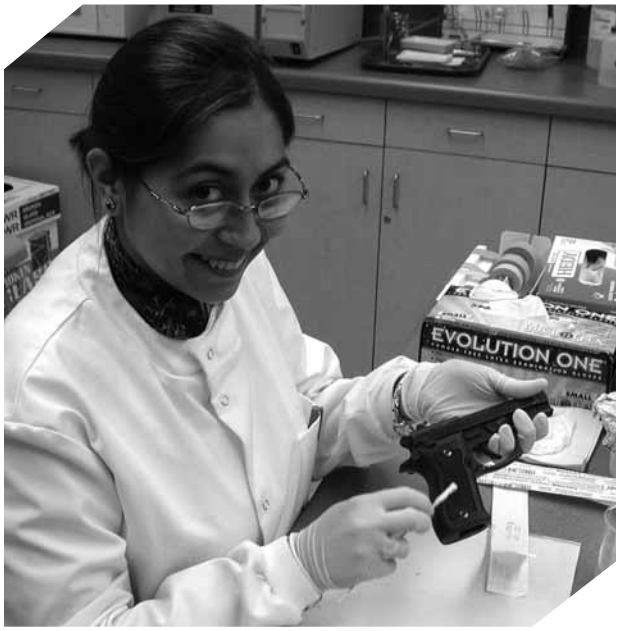
Project Managers:
Julie Graham, CPRC
(613) 949-4173
Dr. Dean Hildebrand,
British Columbia Institute of Technology
(604) 451-7027

Dr. Hildebrand and his colleagues are investigating the consistency of heteroplasmy in the hard tissues of an individual. If it is not consistent, they will investigate how it varies between different regions of the skeleton. Initial studies were done with animal skeletons and work has yet to be completed on human hard tissue.

Dr. Dean Hildebrand, British Columbia Institute of Technology.

Collecting tissue samples at the start of the mitochondrial DNA project.

DNA Sampling From the Trigger and Handgrip of Discharged Firearms — Active



Dr. Dean Hildebrand, British Columbia Institute of Technology

Collecting a DNA sample from the handgrip of a discharged firearm.

Project Managers:
Julie Graham, CPRC
(613) 949-4173
Dr. Dean Hildebrand,
British Columbia Institute of Technology
(604) 451-7027

Report:
TR-01-2004 "DNA Sampling from the Trigger and Handgrip of Discharged Firearms"

Since many criminal acts employ the use of firearms, methods for obtaining DNA-based identifications from firearms need to be developed. In the past, DNA has been successfully obtained from skin cells deposited on handled objects that have simply been touched by an individual. Minute quantities of DNA can now be analyzed using PCR-based DNA technology. This project resulted in an approach to maximize the recovery of DNA from handled firearms in order to generate a profile of the handler.

Additional work will be undertaken in the summer of 2004.

Drugs in Homicide Victims — Concluded

Project Managers:
Dr. Gail Anderson, Simon Fraser University
(604) 291-3589
Julie Graham, CPRC
(613) 949-4173

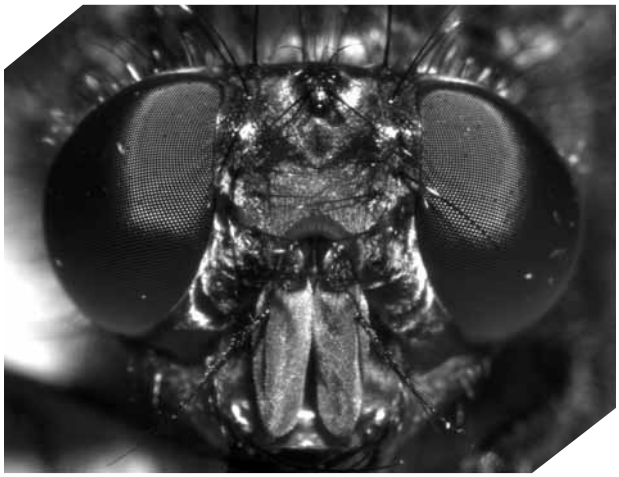
Reports:

TR-02-2004 "Effects of Amitriptyline and Nortriptyline on Time of Death Estimations in the Later Postmortem Interval Using Insect Development"

TR-03-2004 "Method validation for Amitriptyline and Nortriptyline in Artificial Foodstuff"

Dr. Anderson and her colleagues investigated the effects of various drugs on the development of Canadian insects. This information was required in order for forensic entomologists to determine time-since-death in homicide investigations where the deceased used drugs. It is known that drugs will alter insect development but the impact of drugs on Canadian species is currently unknown. This research contributed to gaining an understanding of this impact on Canadian species.

Effects of Various Environmental Regimes on Blow Fly Maggot Development — Active



Dr. Doug Strongman, Saint Mary's University

Adult blowfly (calliphora vicina).

Project Managers:
Dr. Gail Anderson, Simon Fraser University
(604) 291-3589
Julie Graham, CPRC
(613) 949-4173

This project will determine the effects of various environmental regimes such as fluctuating temperatures, very high and very low temperatures, varying humidity, food deprivation, etc. on the development of blow fly larva. The study of these effects will assist in time-since-death determinations.

Fingerprint Research — Active

Project Managers:
Julie Graham, CPRC
(613) 949-4173
Dr. Della Wilkinson,
RCMP Forensic Identification Research Section
(613) 993-3059

Report:

TR-05-2002 "Evidence Recovery From Chemically Hazardous Scenes" Restricted

In co-operation with Defence Research and Development Canada (Suffield), Dr. Wilkinson continues her research into the recovery of fingerprints from chemically contaminated crime scenes. This work has received funding from the US Department of Defense.

The project has three phases:

- a study of the effects of chemical agents on physical evidence such as fingerprints and DNA
- a study of the effects of decontamination on physical evidence
- a study of the effects of biological agents on physical evidence and development of procedures to separate the DNA of the biological agents from that of the physical evidence

Forensic Entomology Across Canada — Active

Dr. Doug Strongman, Saint Mary's University

Researchers and police officers working in the field in Kentville, Nova Scotia.

Project Managers:
Dr. Gail Anderson, Simon Fraser University
(604) 291-3589
Julie Graham, CPRC
(613) 949-4173
Dr. Doug Strongman, Saint Mary's University
(902) 420-5754

Reports:
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-09-2002	"Determination of Time of Death for Humans Discovered in Saltwater Using Aquatic Organism Succession and Decomposition Rates"
TR-04-2002	"Insect Succession on Carrion in the Edmonton, Alberta Region of Canada"
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. Anderson continues to direct studies involving insect succession on pig carcasses in Saskatchewan and Manitoba. An additional project is currently underway in the Maritime region.

The information gathered from these studies will assist in determination of time-of-death in homicide cases. The goal is a countrywide database covering all of the biogeoclimatic zones within Canada.

Reports are expected later in 2004.

Dr. Doug Strongman, Saint Mary's University

Insect succession on pig carcass, after seven days.

K9 Pro Wear — Concluded

K9 Pro Wear

PSD Police Service Dog "Brew" models winter-weight K9 Pro Wear designed for cold weather.

Project Manager:
Sheldon Dickie, CPRC
(613) 949-4174

At the 2002 International Association of Chiefs of Police conference, the CPRC met a Canadian company with a unique product line of garments for police service dogs. The CPRC introduced the company to RCMP dog handlers in Ottawa, who offered to do field trials for the prototype garments. They were enthusiastically received, as they should assist dog handlers in better locating their dogs in outdoor and tactical situations, as well as indicating to the public that these are police dogs on duty.

Kingston GPS Tracking Evaluation — Concluded

Project Managers:
John Arnold, CPRC
(613) 993-3737
Scott Geoffrey, Kingston Police
(613) 549-4660, ext 2263
Mickey Marshall, ATS, Asset Tracking Services Inc.
(403) 213-5577

Global Positioning System (GPS) technology has evolved to the point where it is reliable and has a number of applications. The purpose of this evaluation was to see how this technology could contribute to police work.

The CPRC brokered an evaluation proposal between the company ATS, Asset Tracking Services Inc. of Calgary, and the Kingston Police. The project addresses the following:

- police use of GPS technology for battered women's assistance
- police use of GPS technology for cruiser tracking (automatic vehicle location)
- police use of GPS technology as a personal alarm in the "man down" situation

The project also sought to gain sufficient experience to develop guidelines to optimize the performance of the GPS device for each specific scenario.

On-Line Reporting — Active

Project Manager:
John Evans, CPRC
(613) 949-4175

The Calgary Police Service is partnering with the CPRC to develop a guide for police services considering taking on-line reports from citizens via the Internet. The Calgary Police Service has been examining the past results and experiences of other police agencies. The goal of the project is to offer a planning guide to other agencies contemplating offering this type of service to the public.

Pressure Sensitive Paint (PSP) — Active

Project Managers:
Sheldon Dickie, CPRC
(613) 949-4174
Jean-Yves Vermette, RCMP Explosives Disposal & Technology Section
(613) 993-7880

This project examines enabling technology that is used to simplify the instrumentation necessary to measure blast effects and to verify blast-modelling methods. Accurate modelling information is necessary to mitigate blast attacks directed against buildings, motorcades, etc. Additionally, information gathered in this co-operative effort with the Department of National Defence can be used to provide the same service to soldiers and police officers deployed outside of Canada in peacekeeping roles.

In order for this modelling approach to be dependable, it must be verifiable. Verification is accomplished by conducting a sufficient number of live tests to conclude that the modeler is accurate enough for field use. Current technology demands that data is captured by placing large numbers of pressure transducers in the blast zone, connecting them to oscilloscopes (eight channels per oscilloscope), then capturing outputs from the oscilloscopes for computer for analysis.

This project attempts to develop a polymer (with bonded dye) with properties that will allow the pressures emitted from a blast to react with it in a way that indicates the precise pressure change across a surface coated with the polymer. The change, and therefore the data, is captured in one of two ways. Either the polymer property changes are retained long enough to capture via a video tape recorder, or the longevity of the property changes is short and must be captured via high-speed photography. The question will only be answered after a usable quantity of polymer is synthesized and tested.

Removable Equipment Package (Chameleon RS3P) (Restricted) — Active

RCMP

Chameleon RS3P

Project Manager:
Sheldon Dickie, CPRC
(613) 949-4174

A modular system is being developed to allow portability and rapid deployment of equipment.

Segway Human Transporter — Active

CPRC

SEGWAY Human Transporter.

Project Managers:
Sheldon Dickie, CPRC
(613) 949-4174
Gord Scott, RCMP Technical Operations,
Explosive Disposal & Technology Branch
(613) 993-7880

The CPRC was asked to share the costs in procuring a Segway mobile transporter for bomb technician evaluation, particularly in biological and chemical contaminated crime scenes. The unit is currently being evaluated by the RCMP's Technical Operations in Ottawa.

SOKKS Micro-Particle System for Police Service Dog Training — Concluded

Project Managers:
Sheldon Dickie, CPRC
(613) 949-4174
George Voelk, RCMP 'O' Division,
Police Dog Service Handler/ERT
(416) 614-7924

This project entails attending the Austrian Federal Training Center for Police Service Dogs and learning first hand their training methods, which use the SOKKS system. SOKKS training uses tubes with pure Octogen to condition the dog. This is the only odour a dog needs to be proficient in detecting every military, commercial, and home-built explosive available in the world. The dogs are conditioned to respond to the slightest presence of any explosive matter. Drive and accuracy are increased, while false positives are reduced. The training aids are completely inert and non-toxic, and can be stored anywhere.

After the 2-week course is completed, the participant will train a dog in explosive detection using the SOKKS method. After completing this training, the dog will attend an annual explosive validation given by the head instructor of the RCMP Dog Services Training Centre.

Tactical Window Punch — Concluded

Project Managers:
Sheldon Dickie, CPRC
(613) 949-4174
Derick Ivany, RCMP Technical Operations Directorate, Explosive Disposal & Training Section (EDTS)
(613) 993-9869

This project provided the Knights Armament Rail System—used to break vehicle safety glass—to police who use Heckler and Koch MP-5. The system provides responding officers with a reliable tool to break vehicle safety glass without removing their hands from their weapons. This is especially important if the officer cannot see the occupants of a vehicle.

Use of Force Training Simulators Evaluation — Active

Project Manager:
Sheldon Dickie, CPRC
(613) 949-4174

Having located a potential champion in academia, the CPRC is continuing to facilitate an information gathering exercise aimed at:

- collecting and collating data and features of commercially available systems
- studying the pedagogical basis for simulator training

Water Projection System: RCMP Technical Operations Directorate — Concluded

RCMP

Prototype Water Projection System.

Project Managers:
Sheldon Dickie, CPRC
(613) 949-4174
Roger Cameron, RCMP Technical Operations
(613) 993-7685

This project aims to provide policing services with an alternative form of less-lethal response when addressing violent demonstrations at major events. Traditional less-lethal responses have included tear gas, pepper spray, impact munitions, and direct physical contact between rioters and police personnel.

Protests are changing, however. Protests at major events have grown considerably in recent years. Dedicated groups of criminal extremists have become better prepared, via training. Violence can commence quickly at the outset and escalate rapidly to unprecedented levels, and it can be sustained for hours and days.

Police personnel are also now facing a wide array of potentially lethal measures being directed at them. Protesters may now be equipped with ex-military protective gear and weaponry to augment their usual inventory of thrown objects.

Police services have recognized a pressing requirement to develop a more flexible and effective response to these new threats. This project evaluated how water projection systems could be used to respond to these threats.

Winter Tires Testing For Police Vehicles — Active

John Lesko

Testing winter tires for police vehicles in Regina, Saskatchewan.

Project Managers:
Sheldon Dickie, CPRC
(613) 949-4174
Bruce Richter, National Institute of Justice: National Law Enforcement and Corrections Technology Center, Northwest (NLECTC, Northwest)
(866) 569-2969

Under the initiative of the National Law Enforcement and Corrections Technology Center, Northwest (NLECTC, Northwest), in Anchorage Alaska, the CPRC partnered to test winter tires for police patrol vehicles. Other partners were the United States Army Corps of Engineers, Cold Regions Research and Engineering Laboratory (CREL), Ford Motor Company, and the Tekne Group Inc. This testing took place with the collaboration of the Royal Canadian Mounted Police at the Training Depot facilities in Regina, Saskatchewan in February 2004. Results should be published in late 2004.

CATEGORY C — Protecting the Public: Traffic, Custody, Crime Prevention

Cell Design — Concluded

Project Managers:
Nancy Chevrier, RCMP
(613) 993-1993
Julie Graham, CPRC
(613) 949-4173

Reports:

TR-03-2000	"Proposals for Modification and Design Changes to Jail/Holding Cells: Psychological Impact on Aggressive and Self Destructive Behaviour"
TR-06-2002	"The Perceived Characteristics of Holding Cell Environments"

The initial phase of this project was a study of the psychological impact of aggressive and self-destructive behaviour by detainees in holding cells. Recommendations from that study were incorporated in cell retrofits in selected detachments. Questionnaires were presented and a post-retrofit survey was conducted.

Results have been analysed and a final report will be prepared in due course.

Computer Safety and Ethics — Active

Project Manager:
John Evans, CPRC
(613) 949-4175

The CPRC is working with several government and corporate partners to develop a means for teachers and school resource officers to develop, locate, and distribute curriculum and tools for teaching children computer safety and ethics. The goal is to have a resource centre and knowledge base for developing, sharing, and improving training aids and programs related to these topics, as well as creating ways to facilitate partnership and participation.

Cybercops/Cybercrime Game — Concluded

Project Managers:
Sheldon Dickie, CPRC
(613) 949-4174
Drew Ann Wake, LiveWires Design Ltd.
(604) 687-5046

LiveWires Design Ltd. of Vancouver developed an Internet safety curriculum for police officers to dialogue with teenagers. The curriculum is composed of two computer games targeted at children of different ages. MISSING is for children in grade six and seven and CyberCops (in English)/CyberCrime (en français) is for high school students. An on-line training programme will accompany each game, so that police officers can train themselves to use the game effectively with students. (See the entry for "MISSING: School Resource Officer Training Module")

Mirror Image — Active

Project Manager:
John Evans, CPRC
(613) 949-4175

"Mirror Image" is a web-based interactive game for children 13 to 15 years old, which warns about the dangers teens may face when using instant messaging. The CPRC is working with the game designer to promote awareness and use of the game. The game has recently completed its final testing and is due for official launch in the fall of 2004.

For more information, contact:
LiveWires Design Ltd.
(604) 687-5046
www.livewwwires.com

MISSING: school resource officers' training module — Active

LiveWires Design Inc.

Box cover from the game MISSING.

Project Manager:
John Evans, CPRC
(613) 949-4175

"MISSING", a computer game played in school classrooms or group settings, has become a very successful tool in educating young teens how to recognize and avoid sexual predators on the Internet. With assistance from the CPRC, the game's popularity has continued to spread throughout Australia, Canada, the U.K, the U.S., and other countries. With over 100,000 copies now in use, it is the second highest selling educational game of all time. Even more important, several times young teens had been in the final stages of arranging to meet with Internet acquaintances, but turned to authorities for help after they played the game and realized that their acquaintances were, in fact, sexual predators laying a trap for them.

The CPRC has funded a training module for school resource officers to assist them with introducing MISSING to schools in their regions.

For more information, contact:
LiveWires Design Ltd.
(604) 687-5046
www.livewwwires.com

Pedestrian Crash Test Dummy — Active

Project Managers:
Eric Brewer, RCMP
(250) 828-3139
Julie Graham, CPRC
(613) 949-4173

Training courses in the area of Pedestrian Collision Reconstruction require dummies to prove formulae and collision dynamics. Crash testing allows technical investigators to observe first-hand what evidence may be found and where. Dummies provide the ability to examine the interaction between vehicles and bodies and this allows the student to better understand and deal with speed estimates and pedestrian trajectories. Personnel in the Mechanical Engineering Department of the University of British Columbia have designed, and are in the process of testing and completing, a prototype dummy for use in training courses. Testing in a course situation will take place in the summer of 2004.

Eric Brewer, RCMP

Pedestrian crash test dummy.

Smart Side — Active

Project Managers:
John Arnold, CPRC
(613) 993-3737
Jack Cronkhite, RCMP (retired)
John Evans, CPRC
(613) 949-4175

The objective of this proposal—received from the RCMP North-West Region—is to stop impaired driving. This would be done by developing micro-technologies to detect ethanol molecules in the air of the passenger compartment of motor vehicles and, if detected, cause the vehicle to perform certain actions to avoid collisions, or alert other road users and the police. Once the technical solutions are developed, a motor vehicle safety standard could be created through Transport Canada and US National Transportation Safety Board. Such a standard would require that the technology be included in any new vehicle sold in North America.

Given the capabilities of nanotechnology, this is a realistic and achievable objective, and its technical feasibility is considered high. Enforcement and education, combined with engineering and the political will to create the vehicle safety standard, can end impaired driving. The proposed passive detection system, perhaps using nanotechnology, could reduce today's sophisticated and expensive instruments to the microchip level.

This past year, a multi-year plan was developed to establish resource requirements for the project. The success of acquiring these resources will depend on the progress of the project. Mr. Cronkhite retired this year but is still involved in the project.

Sydney Safe Seeker — Active

Project Manager:
John Evans, CPRC
(613) 949-4175

The CPRC is working with the developers of "Sydney Safe Seeker", an animated computer game that enhances children's confidence and self-esteem. It does this by teaching them safe behavior when they encounter a potentially threatening situation such as dealing with strangers, using 911 to get help, and deciding where to go to be safe. The game involves the children in role-playing, in a non-violent simulation. The target audience is kindergarten to grade three.

Contact: www.childsafetygateway.org

SPECIAL INITIATIVES

Special Initiatives

(CRTI) Chemical, Biological, Radiological, and Nuclear Research and Technology Initiative — Active

Project Manager:
John Arnold, CPRC
(613) 993-3737

In response to the events of September 11, 2001, the Canadian government set up a research and development program called **CRTI** (**C**hemical, Biological, **R**adiological, and Nuclear Research and **T**echnology **I**nitiative). This five year R&D program is administered by Defense Research Development Canada (DRDC). The priority categories for the CRTI program are:

1. Lab Cluster Management and Operations
2. Collective Command, Control, Communications, Co-ordination and Information (C4I) Capabilities for CBRN Planning and Response
3. Equipping and Training First Responders
4. Prevention, Surveillance, and Alert Capabilities
5. Immediate Reaction and Near-Term Consequence Management Capabilities
6. Longer-term Consequence Management Issues
7. Criminal Investigation Capabilities
8. Science and Technology Dimensions of Risk Assessment
9. Public Confidence and Psycho-Social Factors

This past year, John Arnold, the CPRC's Chief Scientist, was invited to serve on the CRTI proposal and project selection team, bringing his considerable expertise in dealing with the first responder community. This experience was valuable and provided an opportunity to forge a closer business relationship between the CPRC and DRDC.

During the past year, the selection committee reviewed over 100 project proposals. Fifteen of those have been approved and are now underway.

The CPRC looks forward to continuing to forge these contacts into business collaborations for our mutual benefit.

National Building Security Code — Active

Project Managers:
John Arnold, CPRC
(613) 993-3737
Gerry Pernica, NRC
(613) 993-9750

This project was brought to the NRC by the RCMP and the department of Public Works and Government Services Canada (PWGSC). In the summer of 2002, the Director of NRC's Institute of Research and Construction Fire Research program approached the CPRC to ask for assistance to develop this project. A contract was put in place and managed by the CPRC to conduct Phase 1, the purpose of which was to poll the Canadian building security and motivation to support developing a National Building Security Code. Over 200 surveys were sent out. The response indicated that there was interest.

This past fiscal year, the CPRC continued to work with the project team on phase 2 of project, which meant developing a full proposal and time line for a National Building Security Code. The five year project proposal has been developed and costed, and is awaiting federal government approval.

John Arnold, CPRC

PoliceLearn meeting, Ottawa, May 2003.

Canadian Police Knowledge Network (formerly PoliceLearn.com) — Active

Project Managers:
John Arnold, CPRC
(613) 993-3737
John Evans, CPRC
(613) 949-4175

In 1997, John Arnold and John Evans of the CPRC, in response to the PS3 Initiative (Public Safety in the 3rd Millennium), developed the concept of a national not-for-profit consortium of police educators. The mandate of the PS3 Initiative was "to provide cost-effective information technology to policing in Canada". The PS3 initiative evolved into PoliceLearn.com, which has, in turn, evolved into the Canadian Police Knowledge Network. It was suggested that the creation of a national consortium of all police educators be explored and developed to provide various types of e-learning (including Internet-based) to all police officers in Canada. The history of this initiative follows.

- May 2001: The initial concept was presented by the CPRC to the CAPE (Canadian Association of Police Educators) conference in Vancouver, British Columbia.
- November 2001: The consortium approach was fully endorsed by the CPRC Executive Board.
- May 2002: The CPRC presented the consortium concept to the members of CAPE at their National Conference in Halifax, Nova Scotia.
- August 2002: The CPRC presented the concept, now known as PoliceLearn.com (PLC), to the members of the CACP (Canadian Association of Chiefs of Police) at their annual conference in Quebec City, Quebec.
- September 2002: The CPRC, in co-operation with CAPE, sent an invitation to the entire Canadian police community to participate in the creation of the not-for-profit PLC consortium.
- February 2003: Twenty-seven stakeholders representing the Canadian provincial police colleges, major Canadian police services, and the NRC/CPRC met at the National Research Council in Ottawa to create PLC's strategic plan. This meeting generated PLC's Vision, Mission, and Corporate Values/Principles. A six member working group was established to direct the development of a PLC business plan and incorporation document for the next meeting, held in Ottawa, Ontario in May 2003.

- March 2004: The CPRC hosted a founders' meeting, which included participation of the Justice Knowledge Network. The CPRC was asked to lead, manage, and develop the Canadian Police Knowledge Network (CPKN) at the NRC. The following principles for the CPKN were agreed to at this meeting:
  - Establish a small advisory board to guide the CPKN.
  - Foster a collaborative attitude among Canadian police leaders in e-learning and e-working.
  - Focus on production of high quality e-learning solutions.
  - Leverage federal government investments in e-learning building on those successes.
  - Endorse a model of economic sustainability.
- April 2004: The CPRC set up the advisory board to CPKN.
- May 2004: The CPKN was announced to the broader Canadian police educational community at the annual CAPE conference. A national needs assessment survey was launched at CAPE.

CPRC

"Aged" photos can be added to Project BlueBear's facial recognition database.

Project BlueBear — Concluded

Project Managers:
John Arnold, CPRC
(613) 993-3737
Sal Kahn, VisionSphere Technologies Inc.
(613) 599-7766

Over the past two years, the CPRC has been working with the Ottawa company VisionSphere Technologies (VST) on a facial recognition technology pilot project, to see if it is a worthwhile investigative tool in the police environment. This project, called "BlueBear", has now successfully concluded.

VST was selected for this pilot project because it has developed an advanced, fully integrated facial recognition technology (FRT) system. Their inexpensive camera is software controlled, dramatically improving the accuracy, reliability, and scalability of the technology in operational conditions.

The facial recognition technology converts existing "mugshot" pictures to a facial recognition bio-metric. This digital "template" or "number" is then stored in a computerized facial recognition database. The computer's rapid search capabilities produces a match—with varying degrees of accuracy—from this facial recognition database.

The production of the facial recognition bio-metric allows police investigators to carry out FRT searches using a captured suspect mugshot, as well as police artist composite sketches. The pilot project also evaluated images extracted from video surveillance tapes, news video, passports, photographs, and negatives to determine the FRT's degree of accuracy.

The Chatham–Kent, Windsor, and York police services volunteered to become members of the pilot project.

Lessons learned in this project include:

- The best uses for facial identification technology within a police forensic identification environment were to confirm the identity of a suspect prior to booking, to identify facial images extracted from video surveillance systems, and to create a facial image suspect database.
- The distributed secure searches of mugshot and text databases can be done via the Internet, making this approach cost tolerant and efficient.
- The BlueBear system would be even more effective if it was linked to more police mugshot systems.

- It would be more convenient, and significantly easier, to keep databases up to date by having the VS-Ident server connected to individual arrest and booking systems. This has been resolved at the Chatham–Kent Police Service.
- Providing digital fingerprint services with facial identification technology would make the solution more complete.
- As an extension of Pilot Project BlueBear, VisionSphere will be conducting a trial of an AFIS quality, high-resolution, 10-print finger scanner at Chatham–Kent Police Service. This will happen in the second quarter of 2004.

SCCan: Security Communities Canada — Active

John Arnold, CPRC

Security Communities meeting on Marine Security, St. John's, Newfoundland, October, 2003.

Project Manager:
John Arnold, CPRC
(613) 993-3737

The events of September 11, 2001 indicated that, more than ever before, the business of security and public safety is critical to the well being of Canadians. New ways of doing business to quickly respond to these pressures must be in place to guarantee the safety and security of our communities. In order to address fast emerging safety and security issues from both government and business perspectives, it is necessary to quickly, effectively, and efficiently communicate and network to address situations such as the terrorist attacks of 2001.

To have an impact on terrorism, we need to know what innovative technologies are available in Canada. First we need to examine what technologies can be applied immediately to the terrorism problem. Then we need to identify potential technologies that could be used. It is possible that Canadian capabilities are not well known. This is where security communities become important, by sharing the information that they have.

A security community is a regional collection of security technology. Its main purpose is to provide a forum for networking and collaboration—a voice and focus for the public safety and security community, from the user perspective and the provider (industry) perspective. The community provides a level of comfort to meet, discuss, share, and educate the users and providers in the field of security and public safety technology issues.

The proactive approach of the Security Communities Canada (SCCan) was developed by the CPRC and the National Research Council (NRC), in partnership with NRC's Canadian Technology Network (CTN). SCCan supports and maintains the necessary dialogue to get security issues dealt with today, rather than tomorrow. NRC's Industrial Research Assistance Program (IRAP) has a crucial role to play in the technology identification process. There is no other organization in Canada that has the connectivity and knowledge of what is going on in the Canadian technology community of the small- to medium-sized enterprises (SMEs). In a typical year, IRAP deals with about 12,000 SMEs, and only some of these have technology that is appropriate to user needs. The SCCan initiative addresses this void.

The objectives of SCCan are to:

- provide an identity for the Canadian technology companies in matters concerning public safety and security issues
- share and discuss technology issues of importance to the safety and security of Canadians
- provide a venue that allows for dialogue and awareness of local capabilities between the developers and the users of these technologies
- create an environment for discussion of problems and solutions

- provide a voice for local input into government security concerns
- provide a platform for inter-regional exchanges of capabilities
- connect, via the Internet, regional security clusters for the benefit of all Canadians

The initial SCCan Forum was held November 20, 2002. The CPRC, with the assistance of two students, worked with IRAP and CTN to organize the event, which was attended by more than 250 people. The SCCan website (www.securitycommunities.org) was created with the assistance of NRC's Canadian Institute of Scientific and Technical Information (CISTI). SCCan has enabled the CPRC to interact with Industry Canada, Department of Foreign Affairs and International Trade, Defense Research and Development Canada, the Atlantic Opportunities Agency, the Canadian Commercial Corporation, Communications and Information Technology Ontario, Photonics Research Ontario, PRECARN, and a number of local companies.

SCCan activity in 2003–2004 included two networking events:

- Marine Security, held in St. John's Newfoundland in October 2003
- Internet Security, held in Vancouver November 2003, in cooperation with the Society of Policing in Cyberspace or POLCYB

There are two events planned this coming year: one in Edmonton on education and public safety, and the other in Vancouver on security and major events.

For further information on the SCCan initiative visit: www.securitycommunities.org

LINKS AND LEVERAGES

Technical Reports And Memoranda

This section lists all the Technical Reports and Technical Memoranda that the CPRC has published since 1998. These documents can be downloaded from our web site at www.cprc.org. As well, the web site contains a complete listing of earlier Technical Reports and Memoranda, which are also available for downloading.

It should be noted that in 2000, the CPRC ceased using the designation "Technical Memorandum". All documents containing scientific and technical information about the CPRC projects are now termed "Technical Reports".

2004 Technical Reports

TR-01-2004	"BlueBear: Inter-Agency Facial Recognition Integration"
TR-02-2004	"Effects of Amitriptyline and Nortriptyline on Time of Death Estimations in the Later Postmortem Interval Using Insect Development"
TR-03-2004	"Method Validation for Amitriptyline and Nortriptyline in Artificial Foodstuff"
TR-04-2004	"DNA Sampling from the Trigger and Handgrip of Discharged Firearms"
TR-05-2004	"Winter Tire Evaluation"

Previous Technical Reports

2003

TR-01-2003	"Development of a Robot Accessory for Fuming Fingerprint Evidence"
TR-02-2003	"Collapsible Baton Study"
TR-03-2003	"Comprehensive Assessment of the Potential to Extract Forensic DNA Evidence from Various Regions of Human Teeth"

2002

TR-01-2002	"PS3 Workshop"
TR-02-2002	"Coverup: Protective Covers for Evidence"
TR-03-2002	"Resistance of Exterior Walls to High Velocity Projectiles"
TR-04-2002	"Insect Succession on Carrion in the Edmonton, Alberta Region of Canada"
TR-05-2002	"Evidence Recovery from Chemically Hazardous Scenes" (Restricted)
TR-06-2002	"The Perceived Characteristics of Holding Cell Environments"
TR-07-2002E	"Vehicular Terminals and Visual Fatigue: Patrol Officers with the Sherbrooke Regional Police (SRP)"
TR-07-2002F	« Terminaux véhiculaires et fatigue visuelle : le cas des patrouilleurs du service de police de la région sherbrookoise (SPRS) »
TR-08-2002	"The Conducted Energy Weapon Evaluation Report"
TR-09-2002	"Determination of Time of Death for Humans Discovered in Saltwater Using Aquatic Organism Succession and Decomposition Rates"

2001

TR-01-2001	"The Eye in the Sky: Evaluation of Police Helicopter Patrols (The London Police Service Helicopter Research Project)"
TR-02-2001	"Evaluation of the Test Delivery of the Investigator's Guide to Internet Relay Chat"
TR-03-2001	"Illicit Crop Information Management Using Satellite Imagery"
TR-04-2001	"Drug Section Safety Cabinet"
TR-05-2001	"Crowd Management and Conflict Resolution Pilot Workshop Evaluation"
TR-06-2001	"Arson Crime Linkage Analysis System (ACLAS)"
TR-07-2001	"Canadian Police College Library Catalogue on the Internet"
TR-08-2001	"Underwater Digital Photography Equipment for Evidence Recording"
TR-09-2001	"Hangings: A Practical Study of Ligatures and Suspension Point Morphology"
TR-10-2001	"The Statistical Analysis of Footprint Data Report 2000-2001"
TR-11-2001	"Side Scan and ROV Based Sonar for Locating Submerged Cadavers"
TR-12-2001	"Conducting Internet Operations & Investigations Manual (CIOIM2000)"
TR-13-2001	"CIOIM Supplement 1: Child Pornography Investigations (CIOIM Supp1)"
TR-14-2001	"CIOIM Supplement 2: Using AOL & ICQ (CIOIM Supp2)"
TR-15-2001	"CIOIM Supplement 3: Deception Hosts (CIOIM Supp3)"
TR-16-2001	"CIOIM Supplement 4: Digital Officer Safety (CIOIM DOS)"

2000

TR-01-2000	"TASER Technology Research Paper"
TR-02-2000	"Update on Footprint Research"
TR-03-2000	"Proposals for Modification and Design Changes to Jail/Holding Cells: Psychological Impact on Aggressive and Self Destructive Behaviour"

1999

TR-01-99	"Low Back Pain Among RCMP Officers: An Investigation Into Vehicles, Duty Belts and Boots"
TR-02-99	"Back Pain in a Large Canadian Police Force"

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 B 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"

Previous Technical Memoranda

2000

TM-01-2000	"Evaluation of the Millennium Backsaver Suspender"
TM-02-2000	"Needs Assessment for Microwave Imaging"
TM-03-2000	"Nylon Duty Belt Field Trials"
TM-04-2000	"Evaluation of the ResQ Disc"
TM-05-2000	"Introduction to Security: Computer, Internet, Network Security (Secman2000)"

1999

TM-01-99	"Saving Court Time Using A Visual Presenter"
TM-02-99E	"Crime Scene Protocols for DNA Evidence"
TM-02-99F	« Protocole de recherche d'éléments de preuve génétiques sur les lieux du crime. »
TM-03-99	"Evaluation of International Colour Code System"
TM-04-99	"Practical Applications of Digital Imaging in the Field of Forensic Firearms Identification"
TM-05-99	"12 Gauge Bean Bag Ammunition Penetration"
TM-06-99	"Laser Range Finders in Forensic Firearms Examination"

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"

Financial Case Study
Winter Tires Testing For Police Vehicles

Leveraging limited financial resources is an important part of the CPRC's product development strategy. As an example from this past year, the CPRC partnered with several groups to test winter tires for police patrol vehicles. The partners for this project were:

Canadian Police Research Centre (CPRC)

Industry

- Ford Motor Company
- Pirelli Tires
- Bridgstone Tires

National Institute of Justice (NIJ)

- National Law Enforcement and Corrections Technology Center Northwest (NLECTC, Northwest)
- United States Department of Justice
- Tekne Group Inc.

Royal Canadian Mounted Police (RCMP)

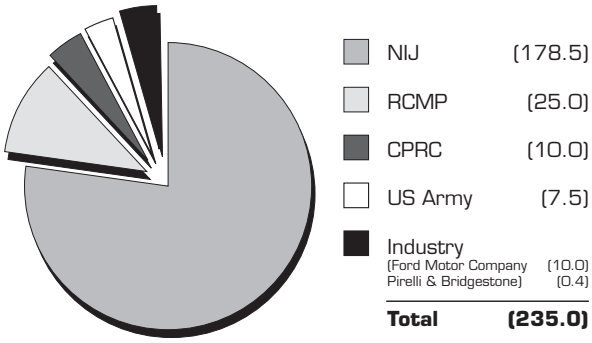
- Training Academy "Depot"

United States Army

- Corps of Engineers, Cold Regions Research and Engineering Laboratory (CREL)

A project this large is often out of the range for a single organization. By bringing together several organizations, and providing seed funding, the CPRC is able to give life to innovative research that might not otherwise be possible. For more details on this project, please the full project description under Category B.

Financial Contribution
Actual + In Kind
(X $1000)



Industrial Research Assistance Program (IRAP) — Helping the Police by Supporting Industry

The police community does not frequently network with the Canadian innovation community. One major objective of the CPRC is to provide the opportunity for these two diverse communities to interact.

The Industrial Research Assistance Program (IRAP) of the National Research Council (NRC) is a major Canadian player in the innovation community. IRAP provides Canadian industry with technical advice, linking companies with appropriate technologies and assisting industrial research, development, and adaptation. IRAP's 270 Industrial Technology Advisors (ITAs) deliver this highly successful innovation program to Canada's small- to medium-sized enterprises, thereby sharing the risk in new product development. IRAP's 2002–03 contributory budget was approximately $130 million.

IRAP works with the CPRC's technical and operational experts to assist in evaluating potential IRAP projects in the police and security area. The CPRC solicits operational feedback from police agencies as to whether the IRAP client's proposal addresses a true police need, and whether it can save time and/or money.

Through the "Technology Partner Associate" (TPA) process, the CPRC and IRAP together match their client needs (for the CPRC, the client is the police; for IRAP, the client is Canadian industry). This process encourages the local Industrial Technology Advisor to deal directly with their local police community. In this way, local police needs and local industry products can be dealt with on a decentralized basis.

This coming year, IRAP will be providing financial support to the CPRC for operations and projects. IRAP and the CPRC will be working together internationally, with a focus on China and the United States, to help Canadian firms succeed in these markets.

The CPRC encourages the Canadian police community to contact us whenever they become aware of a potential police product that may qualify for IRAP support. If you need assistance in identifying your local NRC–IRAP Industrial Technology Advisor, contact the CPRC or call the National Research Council in your local phone book.

Technology Partner Program

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 that come from the police community itself. New products or ideas must be evaluated by the police community with respect to operations (for example, does it serve a police need, such as making the job easier, more effective, or more cost efficient). When the CPRC receives a proposal, it sends it to a Technology Partner Associate (TPA) in a police agency, who in turn circulates the idea within his or her department to get an operational opinion. These comments are 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 enables industry to provide a better final product. The evaluation of a new product is an interactive process that, in the end, provides a new and better device to the police community.

The Technology Partner Program also provides a mechanism for dissemination of some police technical information received by the CPRC (for example, reports, brochures, videos, and newsletters).

Technology Partner Associates

Police Service/Agency	TPA Contact	Telephone
Abbotsford	Insp. R. Gehl	(604) 864-4704
Barrie	Ms. Barb Howse	(705) 725-7025
Belleville	S/Sgt. Tony MacKinnon	(613) 966-0882
Brandon	Chief F. Richard Bruce	(204) 729-2305
Brantford	Deputy Chief Derek McElveny	(519) 756-7050
Brockville	Chief Barry King	(613) 342-0127 x4222
Calgary	Ms. Diana Bloom	(403) 206-8425
Camrose	Insp. Darrel Kambeitz	(780) 672-5940
Canada Customs & Revenue Agency	Pierre Pilon	(613) 954-4112
Canadian Pacific Railway	Insp. Bruce Berringer	(403) 319-7007
Defence R&D Canada—Valcartier	Mr. Phil Twardawa	(418) 844-4000 x4393
Delta	Mrs. Pat Hart	(604) 940-4002
Department of National Defence	Major Denis Egglefield	(613) 945-7279
Durham Regional	Supt. Greg Mills	(905) 579-1520 x4302
Edmonton	Ms. Carol Wagar	(780) 421-2249
Estevan	Peter S. MacKinnon	(306) 634-1505
Fredericton	Mrs. Michele Cronin	(506) 460-2412
Gatineau	Dany Montmigny	(819) 243-2345 x6090
Halifax Regional	S/Sgt. John Peach	(902) 490-5093
Halton Regional	Mr. Keith Moore	(905) 825-4830
Hamilton	Sgt. Alison Hood	(905) 546-3870
Kingston	Deputy Chief Robert Napier	(613) 549-4660
Lévis	Deny Blouin	(418) 835-8256
London	Sgt. Scott Blandford	(519) 661-2583
Medicine Hat	Insp. Gord Earl	(403) 529-8413
Ministry of Public Safety & Security Ontario	Noreen Alleyne	(416) 314-3015
Miramichi	Sgt. Robert Bruce	(506) 623-2124
Montréal	Alain Tonthat	(514) 280-6922
New Westminster	Chief Constable Lorne Zapotichny	(604) 525-5411
Niagara Regional	Det Constable Craig Moore	(905) 688-4111 x4222
Ontario Provincial Police	C/Supt. John Carson	(705) 329-7624
Ottawa	Sgt. Gerry Doucette	(613) 236-1222 x5556
Peel Regional	Insp. Michael Grodzinski	(905) 453-3311 x4740
RCMP “D” - Winnipeg	S/Sgt. Kevin Miller	(204) 983-8138
RCMP “G” - Yellowknife	Insp. Paul Richards	(867) 669-5194
RCMP “HQ” - Ottawa	Sgt. Carl McDiarmid	(613) 993-1193
RCMP “J” - Fredericton	Sgt. Bernie Arbour	(506) 452-4188
RCMP “K” - Edmonton	Mr. Wing Mah	(780) 412-5591
RCMP “M” -Whitehorse	Sgt. Randy Fraser	(867) 633-8629
RCMP “O” - Toronto	Cst. Dan Aubin	(416) 614-6206
Regina	Mr. Ron Davis	(306) 777-6615
Royal Newfoundland Constabulary	Chief Richard Deering	(709) 729-8151
Saint John	Brian Malone	(506) 648-3208
Sarnia	Sgt. Frank Rodin	(519) 344-8861 x6078
Saskatoon	Deputy Chief Dan Wiks	(306) 975-8250
Sault Ste Marie	Insp. Art Pluss	(705) 949-6300
Solicitor General	J.P. Labonte	(613) 842-1849
Sudbury (Greater)	Ms. Liz Mazza	(705) 675-9171 x2630
Summerside	Chief Ian N. Drummond	(902) 432-1201
Sureté du Québec	D/DG Normand Proulx	(514) 598-4411
Taber	Chief Terry Dreaddy	(403) 223-8991
Thunder Bay	Mr. Peter Worrell	(807) 625-1307
Toronto	Ms. Kristina Kijewski	(416) 808-7769
Vancouver	Insp. Kevin McQuiggin	(604) 717-2618
Victoria	Sgt. Ole Jorgensen	(250) 995-7297
Waterloo Regional	Supt. Matt Torigian	(519) 650-8544
Windsor	Mr. Barry Horrobin	(519) 255-6866
Winnipeg	Insp. Gary Sandell	(204) 986-7870
York Regional	Deputy Chief Bruce Herridge	(905) 830-0303 x7900

Interaction with Others

The CPRC's mandate of developing equipment for the Canadian police community naturally involves interaction with others. Some of the many agencies and the interactions that took place during the year included the following:

- Criminal Intelligence Service of Canada (CISC), Criminal Intelligence Service of Alberta (CISA), Criminal Intelligence Service of Ontario (CISO), and the Ontario Technical Investigators Association (OTIA)
- The CPRC regularly attends CISC, CISA, and CISO technical seminars that address current police technology and equipment issues.

Federal Partners in Technology Transfer (FPTT)

The Federal Partners in Technology Transfer initiative brings together the various federal science-based departments and agencies involved in technology transfer. In addition to providing a forum for discussions on best practices, this organization provides excellent networking and learning opportunities. The CPRC is now able to participate fully in this organization because we share a membership with the RCMP Intellectual Property Office.

Ontario Association of Law Enforcement Planners (OALEP)

As an associate member, CPRC representatives attend meetings of, and/or provide input to, the Ontario Association of Law Enforcement Planners, 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.

United States Department of Justice, National Institute of Justice

The CPRC has a Memorandum of Understanding (MOU) with the National Institute of Justice (NIJ) of the United States Department of Justice, to establish a program of co-ordination and collaboration for the research, development, evaluation, and operational use of law enforcement technologies, and to enhance the existing co-operation between the two agencies. In addition to a pre-existing co-operative research and development agreement (CRADA) for the RCMP Laboratory's Forensic Automotive Paint Database, in 2003–2004, this MOU led to joint projects with respect to the Firearms Reference Table (a firearms identification software database) and a multi-hit test standard for soft body armour.

US/Canada Bilateral Counter-Terrorism Research and Development

The CPRC also has an MOU with the US–Canada Bilateral Agreement on Counter-Terrorism Research and Development. The CPRC's participation provides a means of exchanging information and initiating joint projects with American colleagues. The manager of the CPRC is the Canadian chair of two of this group's committees (Forensic and Investigative Techniques Committee and the Technology Transition Advisory Panel).

University of Alberta (U of A)

The CPRC has been working with the University of Alberta (U of A) and their Industrial Liaison Office to establish a closer working relationship between leading-edge university R&D and the police community. This initiative holds much promise and has been met with enthusiasm by all participants. Of particular note is the world-class status of the U of A's Computer Science department in data-mining and machine-learning. Also, the National Institute of Nanotechnology, currently being constructed at the U of A. Nanotechnology in partnership with the National Research Council is likely to create some of the most revolutionary products since the microchip, and will have a tremendous and wide-ranging impact over the next two decades. We plan to have the police community involved and taking advantage of it right from the start.

The Society for the Policing of Cyberspace (POLCYB)

POLCYB was incorporated as a not-for-profit society in June 1999 to enhance international partnerships among public and private professionals working to prevent and combat crimes in cyberspace. Based in British Columbia, its international network includes practitioners from all organizational levels in the public and private sectors. Their partners include professionals who work in the areas of law enforcement, criminal justice, corporate security, and academic institutions.

The CPRC has been working with POLCYB to help them achieve their goals, which are:

- to enhance and develop global partnerships to prevent and combat cyberspace crimes
- to establish a permanent network for international criminal justice and corporate sectors to share knowledge, information, and resources to prevent and combat cyberspace crimes
- to facilitate educational forums to enhance understanding of the work international criminal justice and corporate agencies undertake in preventing and combating cyberspace crimes
- to provide public education on information security

Submitting R&D Proposals

At the centre of this annual report you will find a research and development (R&D) proposal form. It should be completed as fully as possible. An Executive Officer must sign the form (Chief of Police, Commanding Officer, or equivalent).

You may keep the original and submit a copy to us.

The focus of the CPRC is research, development, or evaluation of police equipment.

Guidelines for Acceptance and Establishing Priorities

How does it make a difference?

The priority assigned to each project proposal will be based on a review of the following factors:

- 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 also fit one of the following three categories.

- 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

For example, a category B project that will save significant resources, be applicable throughout the community, and has a high chance of success may be given the same or higher priority than a project that may protect a police officer in a hazardous situation that occurs infrequently. Similarly, protecting the public with a device that controls high speed chases simply and safely may score first overall in the reviews. Our goal in prioritizing project proposals is to effectively and objectively reflect the priorities of the overall police community and its clients.

The results of the review will be retained on the project file for reference.

Protection of Intellectual Property Assets: **CPRC'S Role in Technology Transfer**

Some of our most innovative solutions come from our own employees. Police personnel faced with not having the proper tools for their jobs will often design and build a prototype themselves. Do you have a piece of equipment or software developed by yourself or unit? Does your daily work involve research and development? The creation of a new invention or the development of a new technology is an example of an "intellectual property (IP) asset".

Intellectual property can fall into several broad categories. Some are defined by statute and are referred to as "hard" rights. These include assets that can be protected by patent, trademark, copyright, industrial design, integrated circuit topography, and plant breeders' rights. Others, referred to as "soft" rights, include trade secrets, know-how, and show-how. These really are assets and not only do they have value commercially, they can help you and your colleagues do your jobs more safely and effectively.

Collaboration with the private-sector is often the next step in order to design and build a prototype for field trial. Following such a successful trial, the collaborator may wish to license the technology and take it to market.

The Science & Technology Branch of the RCMP, in addition to providing staff to the CPRC , works closely with other sectors to manage RCMP and CPRC IP assets. Other police agencies can obtain general information regarding the management of their own IP assets from the CPRC. The CPRC can assist you in the technology transfer process and can provide general information regarding the management of IP assets.

A video-cassette entitled "Intellectual Property - Protecting Your Technology", is available from the CPRC upon request by fax at (613) 949-3056 or email at: cprc@cprc.org.

CANADIAN POLICE RESEARCH CENTRE

CENTRE CANADIEN DE RECHERCHES POLICIÈRES

"RESEARCH AND DEVELOPMENT PROPOSAL"

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

PLEASE TYPE AND FORWARD ORIGINAL TO
CANADIAN POLICE RESEARCH CENTRE
BOX 8885
OTTAWA, ONTARIO K1G 3M8
Fax (613) 952-0156

« PROPOSITION EN MATIÉRE DE RECHERCHE ET DÉVELOPPEMENT »

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

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

CPRC FILE NO.
N° DE DOSSIER DU CCPR

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

1. PROJECT TITLE

TITRE DU PROJET

2. ORIGINATOR/CONTACT (NAME - ADDRESS - TEL. NO)

AUTEUR/PERSONNE-RESSOURCE (NOM - ADRESSE -N° DE TEL.)

3. OBJECTIVE

OBJECTIF

4. BENEFITS - HOW WOULD THE PRODUCT ASSIST POLICE OPERATIONS?

AVANTAGES - QUELLE SERAIT L'UTILITÉ DU PROJET PROPOSÉ POUR LES OPÉRATIONS POLICIÈRES ?

5. HAS RELATED RESEARCH BEEN DONE BEFORE?
(IF YES, INCLUDE REFERENCES/CITATIONS)

A-T-ON DÉJÀ EFFECTUÉ D'AUTRES RECHERCHES DE CE GENRE ?
(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