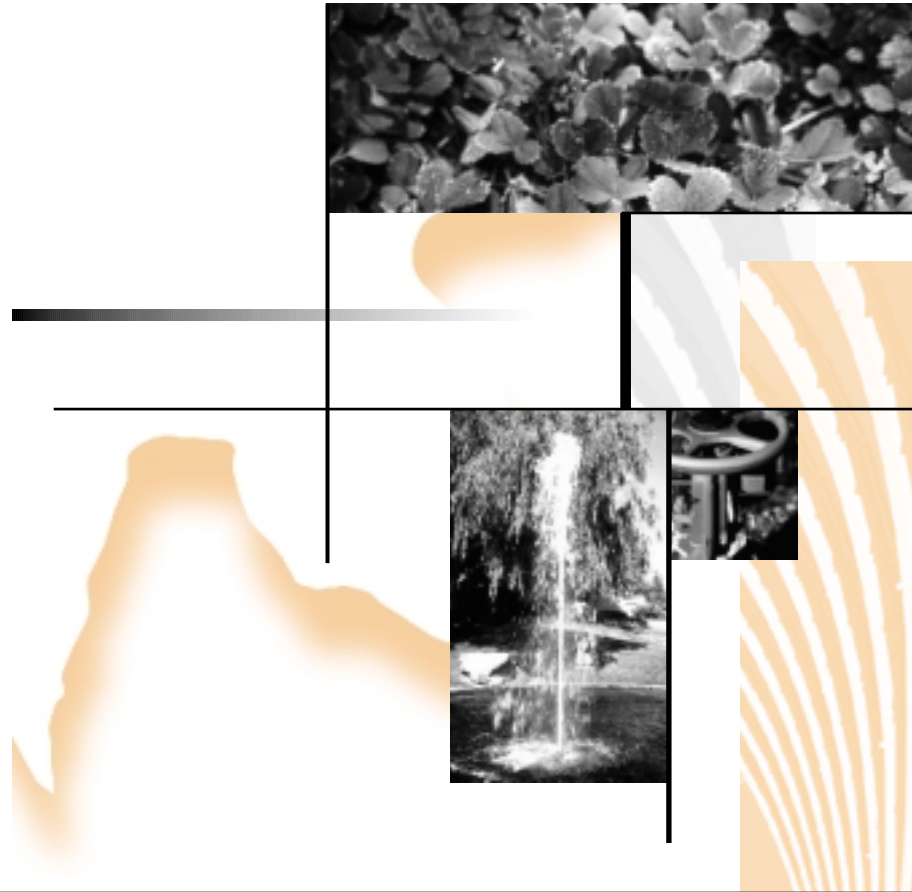
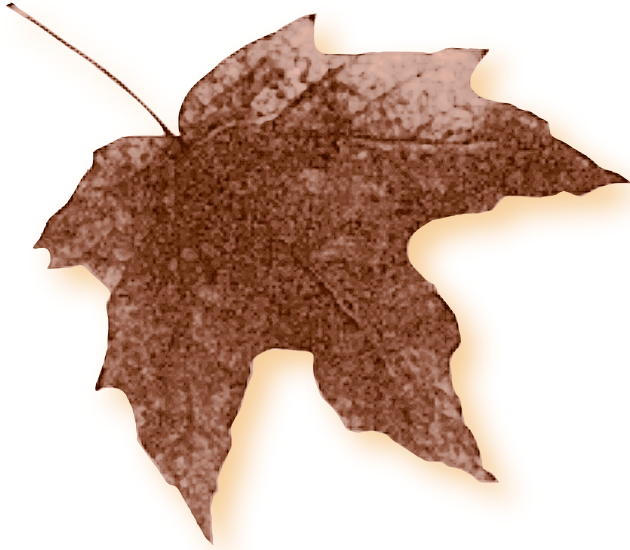




Public Works and
Government Services
Canada

Travaux publics et
Services gouvernementaux
Canada

Canada



Technology Development and Transfer Program

1999–2000
Annual Report

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This report is also available electronically. Additional copies can be obtained from the Real Property Services Documentation Centre at doc.centre@pwgsc.gc.ca. For more information about the Technology Development and Transfer Program, please contact Anne Auger at (613) 736-2130.

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Foreword

Public Works and Government Services Canada has shown once again the advances that can be made by putting innovative real property solutions to work. The *Technology Development and Transfer Program 1999–2000 Annual Report* offers many examples of how these solutions can extend the life of federal facilities, create workplaces that are accessible and productive for everyone, and save taxpayers money.

The projects highlighted in this report also underline the fact that technology is at its best when used to serve people. Technology helps to sharpen our focus on client service. By pairing technological expertise with an understanding of our clients' business, PWGSC can move to a new level, a level at which we anticipate clients' needs.

Technology also offers the opportunity for PWGSC employees to pursue learning throughout their careers. Our department is committed to helping employees gain the skills they need to provide top quality service and stay challenged and engaged in their work.

Lastly, the Technology Development and Transfer Program highlights how much we have to gain by working with other federal departments and partners in industry and education. When we pair our knowledge and ideas with those of our colleagues, everyone comes out ahead.

I am very pleased to report on the work achieved through the Technology Development and Transfer Program and I look forward to another productive year in 2001.



Michael G. Nurse
Assistant Deputy Minister
Real Property Services
Public Works and Government Services Canada





Program Highlights

Helping to “green” government operations, making buildings perform better and last longer, creating a better “fit” between people and offices—that’s how the Technology Development and Transfer (TD&T) Program helps PWGSC care for its buildings, and serve its clients and Canadians.

Through the TD&T Program, PWGSC seeks out new building technologies, processes and applications. It adapts them to suit its facilities and requirements, and tests them in sites across the country to see how they perform. Once these innovative technologies have proven themselves, PWGSC transfers them into its work, making them part of the range of services and solutions available to clients.

The TD&T Program funds projects in these areas:

- environmental initiatives
- support to effective investment, and operations and maintenance
- regulatory harmonization
- Innovative Officing solutions
- technology transfer

TD&T-funded projects help to preserve federal assets for the future, thereby guaranteeing safe, healthy workplaces and safeguarding investments. They help the Government of Canada reduce costs to taxpayers and meet its broader objectives regarding the environment and accessibility.

Through the TD&T Program, employees also get involved in leading-edge ideas and technologies, keeping the department in the forefront of building technology.

In 1999–2000, PWGSC completed a number of projects that resulted in immediate benefits; others are ongoing and their impacts will be seen later. On the environmental front, PWGSC is continuing to implement an Environmental Management System and building environmental considerations into its operations. By exploring alternative energy efficient technologies, the department is also helping the Government of Canada cut greenhouse gas emissions from its operations.

In the field of investment and support to operations and maintenance, PWGSC tested a wide range of technologies to enhance the performance of its buildings. It successfully tested cost-effective seismic technologies to make buildings resistant to damage from earthquakes. Infrared technologies are helping to detect condensation before it causes serious problems—an important tool for preserving Canada’s many stone heritage buildings. Installing personal lighting and ventilation controls in offices is also increasing people’s comfort and reducing energy costs.

Through its Innovative Officing approach, PWGSC is helping clients create exciting workspaces that meet government space allocation guidelines. In one recently completed renovation project at Montréal’s Complexe Guy-Favreau, occupants were involved in the design from the outset and have been very satisfied with their flexible, functional surroundings. The department is also developing new tools to assess a building’s capacity to accommodate Innovative Officing solutions.

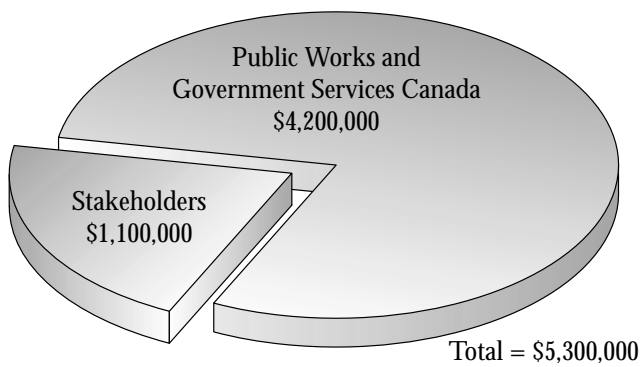
Funding

In 1999–2000, the TD&T Program funded approximately 100 projects for a total investment of \$4.2 million.

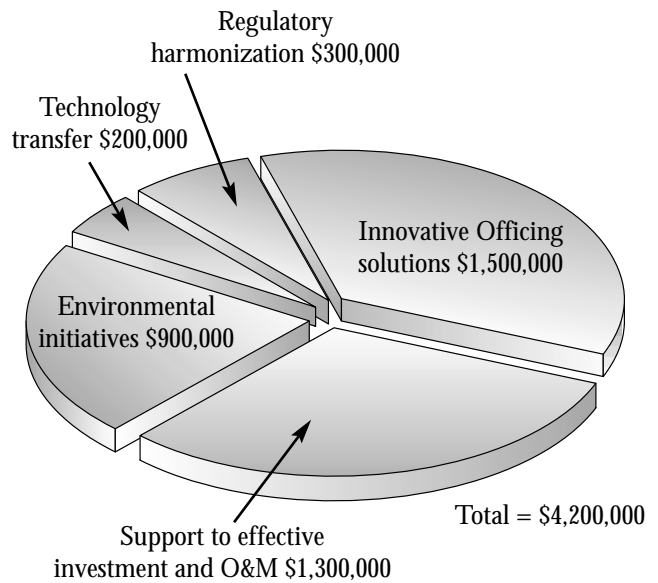
The Program also opens the door to partnerships, leading to shared investment and a cross-fertilization of ideas.

PWGSC has leveraged investments from other stakeholders with complementary interests such as Natural Resources Canada's Panel on Energy Research and Development.

Sources of Funding



PWGSC Investment



I. Environmental Initiatives

Making sustainable development part of our work

PWGSC is committed to making the principles of sustainable development part of its policies and operations. With support from the TD&T Program, the department is implementing an Environmental Management System, and putting cost-effective green technologies and processes to work.

Working toward Kyoto targets

In 1997, Canada was one of about 160 nations to negotiate an international climate change agreement—the Kyoto Protocol. Canada's target under the Protocol is to reduce our greenhouse gas emissions to 6 percent below 1990 levels by 2008–2012. That means Canada will need to cut its emissions from business-as-usual levels by at least 25 percent, taking into consideration forecasted economic growth.

To show leadership in this area, the Government of Canada has developed the Federal House-in-Order initiative to help it cut emissions from federal government operations. Through this initiative, the government will reduce energy use and displace energy derived from non-renewable sources.

All federal departments are involved in this effort, and the TD&T Program has helped to develop a strategy and implementation plan to guide PWGSC's activities. Current estimates show that PWGSC has reduced greenhouse gas emissions by approximately 20 percent since 1990. The strategy highlights other opportunities for reducing emissions through building recommissioning—calibrating major building systems to ensure maximum operational efficiency—and buying “green” power—power generated in a way that minimizes the negative impacts on the environment.

PWGSC has also looked into alternative energy technologies as a way of reducing greenhouse gas emissions. One of these is microcogeneration. Microturbines installed at a building site can generate electricity, with the waste heat being used for heating and cooling. The electricity can be used by the building or sold into the grid.

Greenhouse gas reductions with microturbine applications vary, but are 40 percent when coal is the fossil fuel displaced. The internal rate of return for microturbine applications is greater than 30 percent in Calgary, Toronto and Halifax. PWGSC has partnered with Natural Resources Canada, Enbridge Consumers Gas and Ontario Power Technologies to install the first Canadian building application of microturbine technology at a Health Canada laboratory in Toronto, Ontario.

PWGSC also investigated the application potential of fuel cell technology, in which hydrogen and oxygen are combined to produce electricity and water. Fuel cells are already being used to power city buses. When used in buildings, they could reduce CO₂ emissions by 50 percent compared with electricity generated by the average combustion-based process. Although the cost and maintenance requirements of this technology do not make it feasible for buildings yet, PWGSC is monitoring the development of applications for fuel cells. The department has collaborated with Natural Resources Canada, Union Gas and Caneta Research Inc. on a report entitled *Investigation of the potential of packaged cogeneration, microturbines and fuel cells for applications in Canadian buildings*.



A microturbine is producing electricity for a Health Canada lab in Toronto. Small on-site electricity generation makes use of waste heat and reduces carbon dioxide emissions.

Sustainable development strategy

PWGSC is preparing its second three-year sustainable development strategy, due to be tabled in Parliament on December 15, 2000. The department intends to green its activities by establishing targets related to its role as a custodian, leaseholder and service agent. These targets will help PWGSC reach its goals of implementing an Environmental Management System, greening its operations and daily activities, and helping clients green their operations.

Through TD&T funding, PWGSC analyzed its real property activities that affect the environment and reported on progress to identify actions for improvement. The results of this analysis were published in the 1998–1999 *Real Property Services Sustainable Development Strategy Performance Report*.

Creating an Environmental Management System

PWGSC is establishing an Environmental Management System (EMS) based on the ISO 14001 standard. At the end of 1999–2000, the corporate EMS was judged to be 88 percent in place. As part of this work, the department prepared an EMS operating procedures manual. PWGSC has also developed a means of integrating the results of environmental building reviews into an online system. This information can now be reflected in annual building management plans.

The department is making progress in its efforts to green its operations. It has developed approaches and an implementation plan for including environmental considerations in leases. It is also looking into opportunities to bring more environmental considerations into the way projects are delivered, especially in the areas of construction, renovation and demolition waste reduction, design for reuse, materials selection and lifecycle analysis. This plan will help project teams integrate sustainable development principles into their activities. One priority area is making environmental considerations part of design/build specifications and contracting.

Through TD&T support, PWGSC also conducted a financial analysis to identify funding requirements for implementing sustainable development strategy targets.

Greening the *National Master Specification*

PWGSC is continuing to update the *National Master Specification*—the most comprehensive master construction specification in Canada—to include more environmentally responsible choices for products, materials and work methods. Some 270 of the 650 sections have now been “greened.” The *National Master Specification* is an important resource tool for simplifying specification writing and is produced in cooperation with the private sector. Specification writers will also find references to the latest environmental laws applying to the Canadian construction industry, plus best practices in construction methods.

PWGSC is also working on new sections:

- Specifications for cleaning up sites contaminated by hydrocarbons will help government and the private sector comply with legislation. Other sections dealing with contamination by heavy metals are also in progress.
- Testing laboratories can be particularly hard to clean and disinfect. The NMS is adding sections for seamless epoxy coatings for ceilings, walls and floors. These coatings put a high quality, impervious finish on surfaces to prevent contamination.

Building technology site expanded

Advanced Buildings (www.advancedbuildings.org) is a Web site devoted to technologies and practices that improve the energy and resource efficiency of commercial and multi-unit residential buildings. PWGSC and other government and private-sector organizations support the site, which has been significantly expanded recently. Topics include building structure, heating and cooling, lighting, load management and ventilation. Users can find descriptions of new technology, its benefits and limitations, cost and case studies. Sources for further reading and the names of contact people are also available.



II. Support to Effective Investment and Operations and Maintenance

Maximizing the performance of federal facilities

The TD&T Program tests and transfers new technologies that help to maximize the performance of facilities and reduce costs. Through these activities, PWGSC also develops partnerships with other departments and agencies, universities and professional associations to make the most of investment dollars and share expertise.

Innovative approaches to seismic safety

Through the TD&T Program, PWGSC has successfully pilot tested innovative seismic technologies in its own inventory of buildings and put them to work for such clients as the British Columbia Building Corporation and the Geological Survey of Canada. These technologies include using friction dampers and strengthening columns and concrete walls with fibre-reinforced materials. By developing guidelines and a policy on seismic safety as well, PWGSC is integrating seismic issues into its business processes.

Loss of life and property damage during an earthquake are much more likely to be due to the failure of operational and functional components than to the collapse of a building. These components include lighting, mechanical and electrical systems, furniture and filing cabinets. Awareness of the seismic hazards associated with operational and functional components has increased significantly following the publication of the *1995 PWGSC Guideline on Seismic Evaluation and Upgrading of Non-Structural Building Components*. PWGSC is chairing a Canadian Standards Association (CSA) committee to develop this guideline into a national document (CSA-S832).

The PWGSC guideline and the draft CSA-S832 guideline have both been used on a number of seismic investigations of operational and functional components for PWGSC and other government departments such as Fisheries and Oceans, and the Canada Customs and Revenue Agency in British Columbia.

Current building codes offer a way to calculate the demand placed on a building during an earthquake and the building's ability to withstand these forces. The higher the demand, the more a building must be able to resist the forces within safe, acceptable limits. Code estimates tend to result in higher calculations of demand than is actually experienced and require a building to have an increased capacity to withstand the forces.

Working with the Department of National Defence and the University of Ottawa, PWGSC is developing methods and techniques to determine the demand more accurately and reduce the need for extensive and costly building retrofits. The department will also produce a guideline for applying these techniques.

New answers for corrosion problems

Canadian winters and coastal environments can severely corrode the steel used in reinforced concrete and increase the need for costly repairs to parking garages, retaining walls and sea walls. These conditions are of particular concern to PWGSC since it owns 300,000 square metres of parking garages, 67 percent of which are in the national capital area, where winter means road salt.

PWGSC has responded to a request from the Canada Centre for Mineral and Energy Technology (CANMET) to help develop a low-alloy steel of superior corrosion resistance to be used for concrete reinforcement. The goal is to develop a low-alloy steel that is cost effective and easily accepted by the design and construction community. In the initial phase of the three-year project, PWGSC reported on corrosion control methods, the effects of alloying elements on corrosion in concrete, and the chemical compositions of experimental low-alloy steels. The department is continuing to work with CANMET as it develops various trial alloys for field testing.

DBZ benefits proven

Results produced by the dynamic buffer zone system (DBZ) are very significant for Canada's many stone heritage buildings, particularly those that serve as museums and require high humidity levels to preserve collections. Following extensive testing and monitoring, PWGSC has found that the DBZ wall system, with properly designed and implemented air flow characteristics, is effective in preventing condensation and moisture damage in cold winter months. This system works by introducing warm, dry air into a wall cavity during the winter. Now that the benefits of DBZ technology have been confirmed in the East Memorial Building near Parliament Hill, it is ready for use in other Government of Canada buildings.

Reducing health hazards from mould and fungi

Moisture accumulation can damage a building and create air quality concerns once mould and mildew form. PWGSC is developing a departmental and industrial procedural standard for using infrared thermography to detect mould and fungi in wall assemblies. This technology helps identify areas where condensation could lead to problems and eliminates the need to cut holes into walls to do inspections. In 1999–2000, PWGSC used the technology to successfully inspect buildings such as Ottawa's Esplanade Laurier for suspected mould and mildew and to identify the areas of the envelope affected. It also conducted field tests to determine the best conditions and periods of the year for inspecting various wall systems for water damage and deterioration.

Working with the Atlantic Region, PWGSC installed wall and space sensors to monitor levels of humidification and wall condensation in Halifax's Bedford Row Building. Employees had requested internal humidification systems to combat a dry air problem. PWGSC installed sensors to determine the level of humidification possible before condensation occurs and mould develops. This information will be linked to building HVAC systems. The department is writing a guideline to help conservators and building specialists preserve Canada's heritage buildings.

Modern lighting solutions

PWGSC is developing innovative lighting systems that reduce energy consumption and create comfortable, productive working environments. Using findings gathered from test and demonstration sites over the past year, the department

is developing new standards and improved best practices for lighting systems that will benefit both public- and private-sector lighting designers and practitioners.

PWGSC and the National Research Council's Institute for Research in Construction (IRC) are developing performance evaluation parameters and design assessment tools to ensure that employees in Government of Canada workplaces have comfortable, glare-free lighting. Once approved, the standards and best practices will be ready to include in requests for proposals, and will give contractors measurable criteria to follow.

PWGSC is also updating its design standard and application guidelines for office lighting. This document will ensure that office accommodation in new and rebuilt buildings will meet the best practices of the day for lighting. It places more emphasis on task lighting and giving people greater control over their lighting systems. These measures can reduce energy costs related to lighting by about 30 percent and those related to HVAC systems by about 20 percent.

Personal environmental systems

In today's open-plan offices, air jets are proving more effective than conventional ventilation in ensuring air motion and comfortable temperatures. PWGSC has taken the air jet concept a step further by testing components and developing requirements customized for workplaces.

An extensive test is being done at 1 Front St., Toronto. Individual lighting controls and air jets have been placed in over 400 work stations, and room thermostats have been installed. In 1999–2000, PWGSC collected data and surveyed employees about the changes. Initial results show a greater level of satisfaction with ventilation and lighting. Ongoing monitoring and surveys are giving a complete picture of the effectiveness of these personal control systems.

Building condition reports

As part of its regular operations, PWGSC develops asset management plans for Crown-owned and lease-purchase assets every five years. An integral part of these plans is the building condition report. It describes the condition of the building's major components. The TD&T Program funded the development of a "checklist" to guide the collection of crucial information for the report. The information will create a long-term picture of building conditions and will be useful in planning the management of these assets. The checklist covers all major building components including the mechanical, architectural, electrical and life safety systems.

BELCAM project

Asset and building managers have few tools to help them make difficult decisions about when and how to repair their building stock. Through the Building Envelope Life Cycle Asset Management (BELCAM) project, PWGSC and the Institute for Research in Construction are developing a procedure to predict the service life of the building envelope and help managers make more informed decisions. Initial work has focused on roofing systems, and researchers have developed two easy-to-use tools. The first is the Roofing Risk Index Method, a simplified “spreadsheet” approach to calculating the risk of failure of low-slope roofing systems and conventionally placed membrane roofs. The second is the BELCAM Visualizer, a prototype application that lets users see the relative condition of assets using simple, clear graphics. With this software, users can import or create drawings of the buildings and add data concerning the condition of the roofs. The BELCAM Visualizer then offers the asset managers a “snapshot” of the various types of roofing systems in their portfolio, their level of performance, risk of failure and cost of repair.

Developing guidelines and standards

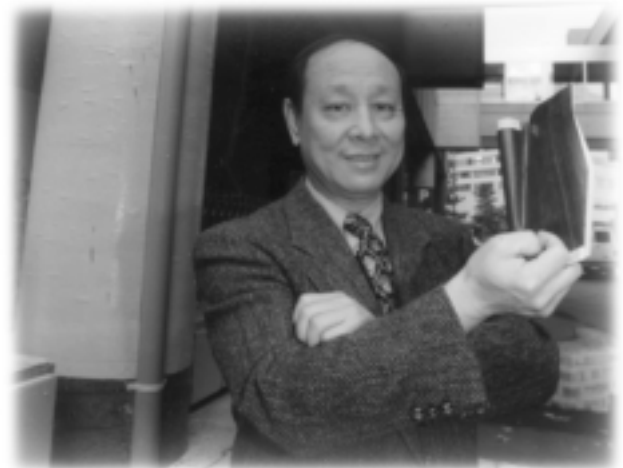
Government and the private sector benefit from the guidelines and standards for building technologies that PWGSC produces. In 1999–2000, it focused on the following areas:

- **Fibre-reinforced polymers**
PWGSC is chairing the committee to produce the first edition of CSA design standard S806 for the design of building components with fibre-reinforced polymers. In corrosive environments such as parking garages, the use of fibre-reinforced polymers should increase the design service life and reduce long-term costs. A demonstration slab is being tested in the Laurier-Tâché parking garage at Place du Portage in Hull.
- **Building envelope systems**
PWGSC, the Canada Mortgage and Housing Corporation and industry representatives are developing best practice guidelines for precast concrete walls and glass curtain walls. The guidelines will help manufacturers and installers better explain the systems’ capabilities, and will help architects and engineers develop more reliable and feasible construction details. These improvements will ensure a better integration of these wall systems with other components of the building envelope, and reduce air leakage and condensation problems.

- **Non-destructive testing**
PWGSC is drawing on its experience with infrared technology to co-author a chapter of the *American Society for Non-Destructive Testing Handbook, Volume 3: Thermal and Infrared Methods*. Information from the handbook will be used to develop industry standards in Canada.
- **Fly ash**
Fly ash is a byproduct of burning coal that is used to form a cement-like compound. This process prevents the fly ash from escaping into the air as pollution and produces a resource for industry that is cheaper than cement. PWGSC is developing guidelines on the use of fly ash as a replacement for cement to ensure that it meets requirements for strength, durability and long-term performance.

NMS targets design-build trend

The NMS is also developing new specifications to meet the boom in design-build contracts. Construction specifications usually give contractors a “formula” for reaching the final product. Design-build contracts focus more on what the final product should be and leave the formula to contractors. While design-build contracts make good use of contractors’ innovative ideas, it is often hard to verify their performance. The NMS is targeting this problem by developing 50 master performance-based specifications. The specifications will be applied to all aspects of a design-build project, from landscaping to roof construction.



Technology Director Moe Cheung holds a sample of a carbon fibre sheet that could improve the performance of concrete columns exposed to corrosive environments.

Photo: Mike Pinder

III. Regulatory Harmonization

Providing safe, productive workplaces

The TD&T Program looks for cost-effective ways to meet Government of Canada real property strategies, regulations and policies. It also supports the harmonization of local, provincial and federal requirements in such areas as fire safety, environmental protection and accessibility. The end result? Workplaces that are safe, productive and efficient.

Universal Design

Universal Design is the design of products and environments that can be used by all people, to the greatest extent possible, without the need for adaptation or specialized design. Elevators with an automated voice that announces the floors, levered door handles, easy-to-see signs on buildings—these are all examples of how universal design can lead to a more accessible world. This definition and a series of principles for implementing Universal Design were developed by the Center for Universal Design at North Carolina State University.

PWGSC made a commitment under the Government of Canada Disability Strategy to define how Universal Design can be applied in the context of federal real property. The department is heading up an interdepartmental working group to see how Universal Design principles mesh with the Treasury Board Real Property Accessibility Policy and the associated CSA Barrier-Free Design Standards.

The analysis showed that most of the current federal accessibility requirements and CSA standards are in step with Universal Design. The group identified some gaps and impacts and suggested alternative solutions. It also assessed whether these principles could be incorporated into building codes. The results of the report are shared with other federal custodians, central agencies, private sector stakeholders and code authorities, and will be tested in pilot projects.

Barrier-free design

The TD&T Program is continuing its work with a CSA technical committee to harmonize the *National Building Code* with the accessibility requirements in the CSA standard for barrier-free design.

FiRECAM

FiRECAM (Fire Risk Evaluation and Cost Assessment Model) is a tool to assess the level of life safety measures in a building and compare this level with code or other requirements. Developed by PWGSC and the Institute for Research in Construction, FiRECAM can be used to select the most cost-effective fire protection designs with either a comparatively equal or improved level of life safety.

In 1999–2000, FiRECAM was introduced in the regions through sessions in Edmonton, Vancouver, Toronto, Winnipeg, Montreal and Halifax. PWGSC trained employees and other stakeholders to use the software and provided technical support. The department will continue to conduct demonstration projects and will prepare a long-range strategy for the use of FiRECAM.

IV. Innovative Officing Solutions

Using space in creative new ways

Developments in technology and the increasing importance of knowledge workers have changed the way people work. Organizations are finding that the workplace must change in response and they are opting to use space in new and creative ways.

The TD&T Program supports “Innovative Officing,” PWGSC’s approach to delivering productive work environments that meet people’s needs and government standards for the allocation of space and funds. Innovative Officing takes into consideration employees’ well-being and professional development. It focuses on the type of work people do and the tools they need to do it, as well as the furniture, technology and activity settings that will help them.

Enriched Front End Planning

One of the first steps in bringing Innovative Officing designs to a workplace is to involve employees. PWGSC developed the Enriched Front End Planning (EFEP) process as a way to assess and respond to clients’ needs. EFEP is all about seeking employees’ input and integrating it into the design of their work environment. The EFEP process also keeps employees up to date on the project and gives people a feel for the design by displaying materials like floor plans and colour swatches.

Innovative Officing projects

PWGSC is leading by example and using EFEP in the relocation of its Office Accommodation and Real Estate Services (OARES) from Ottawa to Hull. The project will feature Innovative Officing solutions that incorporate the principles of employee participation and consultation, and the effective use of technology.

Another project is the redesign of offices for PWGSC employees on the 14th floor at 800 Burrard Street in

Vancouver. Employees attended a town hall meeting to find out about Innovative Officing solutions and visited displays to see how these solutions have worked at other sites. The goal of the redesign is to reshape the office space, striking a better balance between individual and team areas and responding to new ways of working. The design will serve as a showcase for new trends in office design on the west coast.

Clients in the Quebec Region can see new office designs in action through the latest renovation project funded in part by the TD&T Program. The project involved creating a comfortable and functional worksite for PWGSC’s Human Resources employees at Montréal’s Complexe Guy-Favreau. Team members involved employees from the outset, using one-on-one sessions to get their ideas and weekly informal meetings to keep them up to date. The result is a flexible and functional office with warm inviting colours and lots of natural light.

“The office is an absolute paradise. Everyone is really pleased,” said Danielle Lacasse, who represented Human Resources employees during the project. “The results show that the Innovative Officing team really understood our needs.”



An Innovative Officing project at Montréal’s Complexe Guy-Favreau got high marks from occupants.

Post-occupancy evaluation

The final stage in an Innovative Officing project is to gauge whether the new design has met its objectives. PWGSC is developing a post-occupancy template and an electronic template for its Client Satisfaction Survey. The completed Client Satisfaction Surveys will be kept in a data base, providing a case history of Innovative Officing projects. The survey will be tested on employees in the Innovative Officing demonstration site at Les Terrasses de la Chaudière in Hull and those in the new offices of the Assistant Deputy Minister, Real Property Services, in Place du Portage III.

Innovative Officing tools

TD&T funding has supported publications, videos and other materials to help clients and client accommodation service advisors better understand ways to modernize the workplace. Materials include:

- a fact sheet and virtual tour of the “Design Forward” demonstration site at Les Terrasses de la Chaudière;
- a pamphlet on office etiquette in an open plan area;
- *Situation cubicle*, a video on Innovative Officing;
- a video on the Enriched Front End Planning process; and
- option boards, showing choices for office layout.



Instruments collect data for COPE, a software development project for comparing open-plan office designs.

Photo: Institute for Research in Construction, National Research Council

PWGSC is also making greater use of the information highway:

- The Cyber Space Café is a new virtual meeting place for client accommodation service advisors. The Intranet site lets advisors share information and post questions for discussion.
- PWGSC is also developing an Internet site featuring Innovative Officing strategies, and accommodations policies and documents. In particular, clients will get information on space reduction requirements and see the range of design options available through Innovative Officing.

Improving acoustics in open-plan offices

As partitions get lower and team activities increase, sound can become a problem. Traditional design guidelines don't adequately address acoustical issues in an open office environment. PWGSC is working with the National Research Council on new design guidelines and a computer model to show how design options affect acoustics. The team has investigated how sound is transmitted in different types of open offices and how voice levels affect the work environment, and developed initial design guidelines.

COPE

The Cost-effective Open-Plan Environments (COPE) Program will help designers and facilities managers determine which design approach is best for a particular office. With the COPE software program, they can compare officing strategies on the basis of cost, employee satisfaction and a range of other variables.

PWGSC is participating in this four-year project, which is managed by the Institute for Research in Construction and includes partners from other Government of Canada departments and industry. In 1999–2000, initial experiments were done to test the effect of office design on acoustics, lighting, air quality and ventilation. Three field study sites were also selected in Ottawa and Toronto. During the field study, readings of variables will be taken and employee questionnaires distributed before and after office renovations. This project is the first of its kind to take such a wide range of physical measurements and survey a large population (500 occupants). Results of the test will show whether renovations affected employee satisfaction.

Determining a building's potential

When redesigning office space using Innovative Officing solutions, building professionals have to consider whether the building can handle the proposed changes. The Base Building Capability Assessment Instrument will give PWGSC a tool to analyze a building's potential performance: can the base building accommodate increased densities, or does it need improvements to meet the new performance requirements, such as additional elevators, more washrooms or an upgraded HVAC system? The Base Building Capability Assessment Instrument will improve PWGSC's decision-making ability and help to ensure that renovation plans are cost-effective.

Green Office Plan

PWGSC and Environment Canada are combining office accommodation and environmental stewardship through a special plan that is a model for greening office space. The two departments signed a Master Occupancy Agreement to share responsibilities for the provision and use of office space. One of the goals of the agreement is to make sure standards of accommodation are environmentally sound. The two departments also made a commitment to develop a Green Office Plan. The plan, developed through the TD&T Program, is a blueprint for becoming more resource efficient, preventing pollution and incorporating the 4Rs (Reduce, Reuse, Recycle and use Renewable materials) into office management. PWGSC has completed a draft of the plan and the accompanying handbook on environmentally responsible construction and renovation.

V. Technology Transfer

Putting innovative technologies to work

Discovering uses for innovative technology is only one side of the coin—letting people know about them is the other. The TD&T Program funds a number of activities to transfer technology and put information into people's hands.

Connections 2000

The TD&T Program sponsored Connections 2000, a one-day workshop where Real Property Services staff from across the country generated ideas for developing, testing and transferring advanced building technologies, processes and applications in the workplace.

Participants met in Ottawa in February 2000 to discuss a wide range of proposed projects concerning accommodation planning and design, support to operations and maintenance, the environment and regulatory harmonization. They also came up with many new project ideas for 2000–2001, such as the development of toolkits on “green moves” for clients, regional Innovative Officing projects, and communications materials to support technology transfer. PWGSC has reviewed these ideas and set priorities for action. The more than 80 participants also shared experiences and got an overall picture of TD&T activities through discussions and workshops.

Facts and images

PWGSC has produced a number of communications materials ranging from traditional publications to new media, including:

- a poster series highlighting PWGSC's activities such as FiRECAM and seismic research;
- fact sheets on infrared thermography, greening the National Master Specification and other topics;
- multimedia presentations; and
- a new Intranet site describing the projects and services produced through the TD&T Program.

RPS Documentation Centre

In 1999–2000, the RPS Documentation Centre moved into new quarters in Place du Portage, putting it close to the heart of real property activities. Users will now be able to consult documents in a comfortable setting, search for information using computer kiosks and consult on-site documentation specialists for reference services.

The TD&T Program also supported the development of the Centre's new Intranet site. The site features a powerful search engine that is easy to use and allows for extensive document searches. As soon as documents are entered in the database, screens are automatically updated to let searchers know of their availability.

The RPS Documentation Centre continued to be an important source of technical and policy documents for clients, PWGSC employees, industry, educational institutions and the public. Holdings of technical documents increased to 3,300 titles. In 1999–2000, the Centre responded to more than 900 requests for titles and distributed 27,000 copies of paper, audio-visual and electronic documents, triple the number distributed the previous year.