

Clean Air Research Fund

Status Report - 2006

Clean Air Research Fund Steering Committee

June 2007

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1 INTRODUCTION

Since the inception of the BC Clean Air Research Fund (CARF) at the end of 1995, the fund has been utilized for two programs, BC Scrap-It and Clean Air Research. From the outset half of the fund has been used to start the BC Scrap-It pilot program for retirement of old high-polluting motor vehicles. Since 1997 contributions have been made from the fund to a number of research projects on air quality in the Lower Fraser Valley and other areas of the province. The "*Clean Air Research Fund Status Report - 1997-1999*", July 2000, and subsequent annual reports provided summaries of the activities supported by the fund from the beginning to the end of the year 2005. This report summarizes the projects funded from CARF in the year 2006. It also provides brief descriptions and the status of the BC Scrap-It program and various research proposals considered for funding during this period.

All Clean Air Research Fund Status Reports are currently being made available at the following web site of the B. C. Ministry of Environment (MOE):
<http://www.env.gov.bc.ca/air/airquality/carf/index.html>

The 2006 year-end status of the completed and on-going research projects, and proposals approved-in-principle and under consideration for funding, as well as new proposals received are provided below. Also, included are the numbers of project discontinued and proposal withdrawn.

- (i) a total of 33 projects were completed since 1997,
- (ii) 8 projects were in-progress at the end of 2006, and
- (iii) 1 proposal remained as approved-in-principle.

The key aspects of these projects and proposals, as well as an update of the Scrap-It Program are provided below.

2. CLEAN AIR RESEARCH FUND HISTORY

In December 1995, the Canadian Petroleum Products Institute (CPPI) and BC MOE, signed an agreement on CPPI funding for two specific programs. While the BC Scrap-It Program is an old, high-polluting motor vehicle scrapping program, the Clean Air Research Program is for research projects on air quality issues in the Province with a particular focus on transportation and fuels. Under the agreement, CPPI is committed to contribute up to a maximum of \$500,000 per year for a total of \$2.5 million over the 5-year period (1996-2001), and the total annual amount is to be split between the two programs. The agreement was amended in December 1997 to include the Greater Vancouver Regional District (GVRD) as another party to the agreement. The CPPI funding members are Chevron Canada, Husky Oil, Imperial Oil, Petro-Canada and Shell Canada. Unless otherwise agreed by the Parties, \$250,000 per year will be dedicated to support clean air research on air quality issues during the 1997-2001 period. The Clean Air Research Fund is being managed by a Steering Committee consisting of one representative from each of CPPI, MOE's Water, Air and Climate Change Branch (WACC) and GVRD.

As the original CARF was due to expire at the end of 2001, the Parties agreed in March 2001, to continue the Agreement until "... *the full commitment of \$2.5 million has been expended or committed.*" Hence the Fund is still used for air quality research projects and the BC Scrap-It Program beyond the year 2001.

The CARF Steering Committee usually meets 3 or 4 times a year. Environment Canada and the Fraser Valley Regional District representatives attend the meetings as observers.

3. CLEAN AIR RESEARCH FUND PROGRAM ACHIEVEMENTS IN 2006

As in previous years, the CAR Fund was used to support both the BC Scrap-It Program and a number of research projects in 2005. The achievements of these financial contributions are described in the following sections.

3.1 BC SCRAP-IT PROGRAM

The BC Scrap-It Program was launched as a pilot project for retirement of old high-emitting vehicles in 1996 by WLAP in the Lower Mainland and Victoria. The program partners included the CPPI, BC Hydro, Vancouver and Victoria Regional Transit Commissions and BC Automotive Dealers Association (BCADA). WLAP, GVRD, and AirCare provided additional in-kind support to the program. The pilot program was operated from April 1996 to November 1998, and 955 vehicles of 1983 or older high-polluting vehicles were scrapped.

Based on the experience of the pilot program, in November 1998 the Scrap-It program was expanded to the owners of 1987 or older vehicles. Since 1999 the program has been funded by the CPPI, Translink, Insurance Corporation of B. C. and the BCADA. WLAP, GVRD, and AirCare (now Pacific Vehicle Testing Technologies) have continued their support for the program. Environment Canada is supporting the program with a contribution of \$60,000 for the fiscal year 2005-2006. Another car scarp page program not affiliated with Scrap-It Program is also operating in Kelowna, B. C. with funding from Environment Canada.

Presently, the Scrap-It Program Steering Committee is investigating the creation of a charitable society to manage the program; draft bylaws have been approved, and it is anticipated that the move to a society model will occur in the near future.

The CPPI contributions to the Scrap-It program are illustrated in Figure 1. A total of \$100,000 was paid towards the program in the year 2006, which brought the total CPPI contributions to the Scrap-It since 1996 to \$1,288,550.

The choice of incentives for the vehicle owners participating in the program has also been widened in subsequent years. The incentives presently offered to vehicle owners include: (i) varying amounts of cash toward the purchase of a new natural gas vehicle, a new vehicle, used 1994 or later model year vehicle, (ii) bicycle, (iii) money towards vanpooling or carpooling, and (iv) a choice of transit or West Coast Express pass.

Nearly 3,279 vehicles were scrapped between November 26, 1998 and December 31, 2005. In the year 2006 a total of 1,170 vehicles were approved for scrapping and 883 vehicles were scrapped. The vehicle owners opted for a total of 807 incentives: 375 transit passes, 11 West Coast Express passes, and cash for 359 new and used less-polluting vehicles, 61 bicycles, and 1 vanpool.

The major benefits accrued from the Scrap-It program have been a cost-effective reduction in vehicular emissions and an increased public awareness about alternatives to the use of old high-polluting vehicles. The estimated reductions in emissions of hydrocarbons (HC), nitrogen oxides (NO_x), carbon monoxide (CO) and carbon dioxide (CO₂) from recycling of vehicles for which incentives were granted during the pilot and expanded phases of the program are provided in Table 1. These estimates are based on the methodology developed in the August 1997 study, "Evaluation of the Scrap-It Pilot Program", one of the projects funded from CAR Fund.

Figure 1. Clean Air Research Fund Status

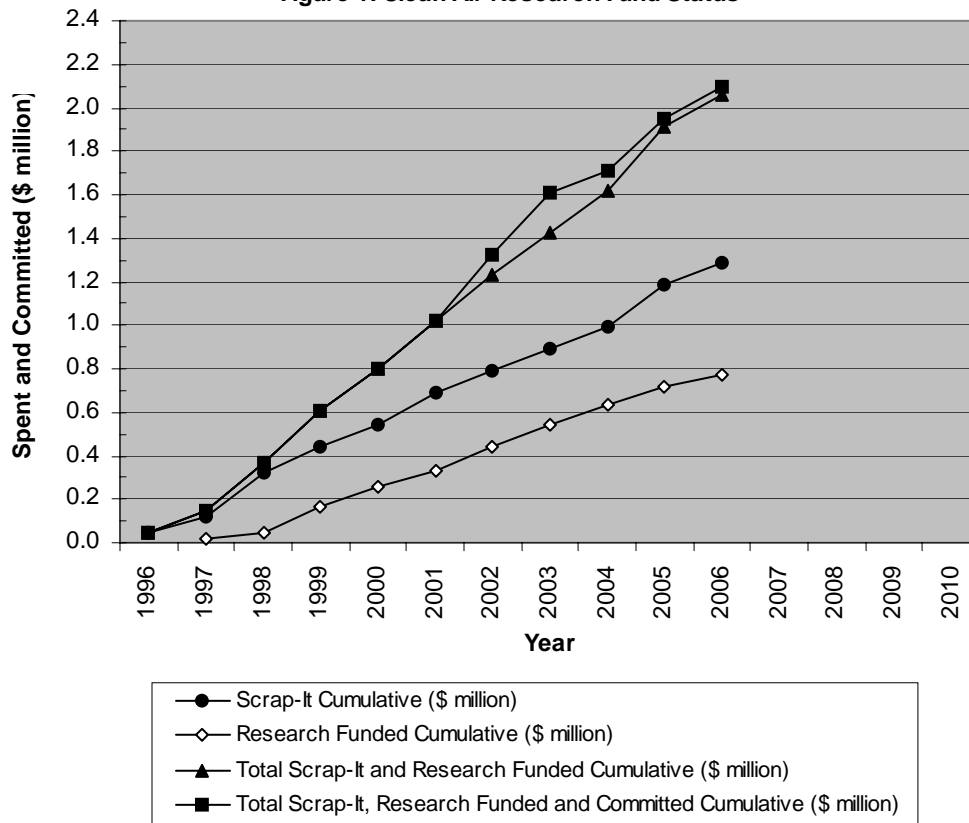


TABLE 1: ESTIMATED EMISSION REDUCTION BENEFITS OF THE SCRAP-IT PROGRAM

Program Phase	Reduction in Contaminant and Greenhouse Gas Emission, tonnes			
	HC	NO _x	CO	CO ₂
Pilot	164	43	1,173	7,691
November '96 - December '02	276	75	2,231	14,418
January '02 - December '04	135	36	972	7,190
January '05 - December '05	134	37	926	6,653
January '06 - December '06	154	42	1087	7,559

Note: Assuming 13,010 km/yr distance driven for 3 years, the remaining life of the scrapped vehicle.
 Source: CAR Fund Status Report – Year 2001, January 2003, January 2004, and Scrap-It Program Administration Office, February, 2005 and June 2007.

On the basis of the pilot program evaluation, the Scrap-It program has been found to be cost-effective, about \$2,177 per tonne of 'emission' reduced. The 'emission' in this context refers to the contaminants with smog-forming potential, and calculated as $(HC + NO_x + CO/7)$. The cost-effectiveness of greenhouse gas reduction was estimated to be \$130/t of CO₂, indicating that the program is not currently cost-effective when considered only in terms of these gases.

3.2 CLEAN AIR RESEARCH FUND CONTRIBUTIONS

The historical trend of the CAR Fund contributions made and committed to date towards all research projects that are complete and in-progress till the end of 2006 is shown graphically in Figure 1.

In the year 2006, about \$49,868 was paid from the CAR Fund towards the completed and on-going projects. This amounted to nearly \$807,307 contributions from the CAR Fund to various projects and the fees paid to the CAR Fund coordinator during 1997-2006. In 2004 an amount of \$12,500 was also contributed towards Bob Caton Memorial Scholarship Fund. The funding committed, but remains to be paid, towards the remaining on-going projects by the end of 2006 amounts to about \$34,206. The estimated total value of all projects co-funded from the CAR Fund is approximately \$13.30 million. The major projects towards which partial CAR funding have been made include:

- (i) Ethanol BC (Total - \$7.4 million and CAR funding - \$100,000),
- (ii) Pacific 2001 (Total - \$1.4 million and CAR funding for 2 projects - \$62,584), and
- (iii) Canadian Synthetic Diesel Fuel Testing (Total - \$1.25 million and CAR funding - \$75,000).

The total value of all other projects is estimated to be about \$3.38 million, and the contributions, already made and committed, from the CARF to these projects amount to \$0.84 million or 25%.

3.3 CLEAN AIR RESEARCH PROGRAM ACHIEVEMENT

Proposals submitted to the Steering Committee for CAR funding are required to meet the following eligibility criteria:

- (1) research projects should be on air quality issues relevant in B. C. and in particular on issues related to transportation and fuels;
- (2) in general, funds will not be available solely for capital equipment purchases, on-going programs or staff salaries and benefits;
- (3) generally the funding will be limited to a maximum of one-third of the total project cost, with an annual maximum of \$50,000 or 20% of the fund for any single project,
- (4) payments will be made either in installments according to approved project deliverables or in full upon project completion and acceptance of the final report.

Typically no projects will be funded in advance, and all three Steering Committee members must approve a project. Preference will be given to projects of immediate priority and to those co-funded by other partners.

From the inception of the CAR Fund in 1997 to the end of December 2006, altogether 74 research proposals were received. Of these 42 projects were approved for funding and other proposals were denied funding for not meeting the funding eligibility criteria. Several of the approved proposals were withdrawn, discontinued, and deferred. Of the 33 completed projects to date – (i) 8 were done by the end of 1999, (ii) 6 were finished in 2000, (iii) 1 was completed in 2001, (iv) 4 were completed in 2002, (v) 8 were completed by the end of December 2004, (vi) 6 were completed in 2005, and none were completed in 2006.

The categories of projects completed until the end of 2006 are listed in Table 2. The status of the projects completed, discontinued and in progress, as well as the new and revised proposals under consideration and withdrawn is discussed in Section 4.

TABLE 2: TYPES OF PROJECTS COMPLETED IN 2006
(Completed projects during 1997-2005 in parenthesis)

Project Proponent	Project Type				
	Basic Research	Applied Research (Study & Assessment)	Planning	Pilot Demonstration Program	Other
University					
- Academic	(5)	(1)		(1)	
- Student	(1)	(1)	(3)		
Business and Industry		(6)		(2)	
Government agencies		(16)	(6)		(1*)
Non-governmental Organizations					

* Training session on a new model (MOBILE 6) for estimation of on-road motor vehicle emission factors.

It should be noted that although no projects were completed in 2006, the total number of completed projects categorized in the Table was higher because some completed projects were jointly sponsored or undertaken by more than one proponent.

4 STATUS OF CAR FUNDED PROJECTS AND PROPOSALS AT THE END OF 2006

At the end of 2006 the status of projects and proposals stand as:

- No projects were completed in 2006;
- 2 new projects were approved (1 project, consisting of an already approved-in-principle project and an, as yet to be approved project, was resubmitted as a single entity.)
- 1 new project was approved-in-principle and 2 additional are under consideration.
- Funding was denied for one application and two applications were withdrawn.

4.1 PROJECTS COMPLETED IN 2006

No projects were completed in the year 2006.

4.2 PROJECTS IN-PROGRESS AT THE END OF 2006

The projects still in-progress at the end of 2006 are summarized in Table 4. Brief descriptions of these projects are provided below.

1. "Canadian Synthetic Diesel Fuel Testing Project – Phase 4"

Project Lead/Sponsor

CPPI is both the sponsor of this proposal and CAR Fund Steering Committee Contact.

Project Goal and Objectives

The Phase 4 of the project is a continuation of the Phases 1, 2 and 3 of the Canadian Synthetic Diesel Fuel Testing Project. The plans for this phase of the project include: (i) to perform data mining study to assess the fuel quality and emissions data collected during past years, and to collect additional data, if necessary, (ii) to measure nitrous oxide emissions from Caterpillar 3401E engine operating under various levels of exhaust gas recirculation, (iii) and to study the effects of hydrotreater/hydrocracker processing severity on engine emissions.

Project Funding

A total of \$400,000 - \$500,000 has been budgeted for Phase 4 work, and the CAR Fund contribution would be \$15,000. Besides the CARF contribution, the remainder was being provided in cash and in-kind by other project partners (National Research Council, Syncrude, CPPI, Shell, Suncor, Imperial Oil, Environment Canada, Natural Resources Canada and US Dept. of Energy).

Contractor

National Research Council of Canada, Ottawa.

Approval Date

Project was approved by the Steering Committee in the first Quarter of 2004.

Completion Date and Status

The project started in the 1st Quarter of 2004 and tests on fuels and engine emissions were done subsequently by the National Research Council (NRC), Shell Canada and Oak Ridge National Laboratory (ORNL). Several modifications to the testing systems, such as a light-duty diesel engine equipped with a prototype lean NO_x trap, a major computer upgrading to the Sierra PM sampling system, and a new high-speed data acquisition system for measuring cylinder pressure, were completed and a set of experiments with biodiesel derived from different sources is underway. However, the testing schedule has been delayed due to resolution of the Sierra PM sampling system malfunction. A revised testing program is being drawn up and additional resources are now in place.

TABLE 3 – CLEAN AIR RESEARCH FUND - PROJECTS COMPLETED IN 2006

Project				Comments
Title	Proponent/Sponsor	Duration	Total Cost and CAR Funding	
No projects completed				

TABLE 4 - CLEAN AIR RESEARCH FUND - PROJECTS IN - PROGRESS AT THE END OF 2006

Project/Proposal Title	Project Proponent/ CARF Sponsor	Project Schedule and Funding (\$)				Comments
		Project Schedule	Total Cost	CAR Funding	Other Partner Funding	
1 Canadian Synthetic Diesel Fuel Testing Project - Phase 4	Industry-Govt. Partners / CPPI	Start date - 2004, Multi-year program.	\$400,000 - \$500,000 per fiscal year	\$15,000	The remainder in cash and in-kind from various partners.	This project is a continuation of the multi-partner funded project on the testing of emissions from synthetic diesel fuel burning. Phase 4 of the study has been delayed due to malfunction of the PM sampling system, and steps are being taken to resolve the issue and plan for testing of new biodiesel fuels.
2 FIX-IT Program 2nd Pilot Project	Pacific Vehicle Testing Technology (PVTT) / CPPI	Start date - 2004. Presently on-hold (see comments).	\$46,000	\$16,000	PVTT- \$30,000 (in-kind)	The project started in May 2004. It is now on hold due to lack of response from vehicle owners.
3 Data Collection for Non-Certified Emission Repairs	Pacific Vehicle Testing Technology (PVTT) / CPPI	Start date - 2004. Scheduled completion - early 2006.	\$19,000	\$6,000	PVTT - \$6,800 (in-kind), Envirotec Canada - \$6,200 (in-kind)	The project started in November 2004. To date 1,290 responses from vehicle owners have been received, and are being analyzed. The project completion date is now scheduled for early 2006.

**TABLE 4 - CLEAN AIR RESEARCH FUND - PROJECTS IN - PROGRESS AT THE END OF 2006
(Continued)**

Project/Proposal Title	Project Proponent/ CARF Sponsor	Project Schedule and Funding (\$)				Comments
		Project Schedule	Total Cost	CAR Funding	Other Partner Funding	
4 Dispersion Modelling During Episode Events in Golden, B. C.	University of Northern B. C. / Ministry of Environment	Start date - 2005. Completion schedule (see comments)	\$44,000	\$11,000	MOE - \$22,000 and UNBC - \$11,000.	The literature review, statement of research questions, methodology and anticipated results are being completed. It is proposed to use CALPUFF dispersion model for assessing episodes of high PM levels in Golden during the winter and early spring.
5 Holland America Sea Water Scrubber	Ministry of Environment	Start May 2006 completion mid 2007	\$1.5 million	\$29,518	US EPA \$300k and West Coast Collaborative Grant \$100k	Holland America Line's cruise ship ms Zaandam installed and will demonstrate the feasibility of using sea water to "scrub" engine emissions on oceangoing vessels. In cooperation with several United States and Canadian government and regulatory agencies.
6 Development of a Source Receptor Tool for the Lower Fraser Valley, Victoria and Okanagan	GVRD	Start March 2006 completion mid 2007	\$55,000	\$20,350	GVRD, MoE, FVRD	This is an amalgamation of 2 projects originally submitted by RWDI and B.H. Levelton. In 2006 GVRD invited interested parties to re-submit a single proposal.
7 Gasoline Regulations Review	Ministry of Environment	(see comments)	(see comments)			The project is undertaken jointly with CPPI to review and amend BC Cleaner Gasoline Regulation. No CAR fund has been requested.
8 Stage 1 Vapour Recovery	Ministry of Environment	(see comments)	(see comments)			The project is undertaken jointly with CPPI and other agencies for review of existing Regulations and CGSB standard. No CAR fund has been requested.

2. *“FIX-IT Program 2nd Pilot Project.”*

Project Lead/Sponsor

Pacific Vehicle Testing Technologies (PVTT) is the sponsor/leader of the project, and CPPI is CAR Fund Steering Committee Contact.

Project Goal and Objectives

The goal of the project is to continue development and verification of the model developed during the 1st pilot program. The model will be refined to determine potential effectiveness and administrative process that can be implemented to provide repair cost assistance for vehicles which would otherwise use the cost waiver and conditional pass provisions of the AirCare program.

Project Funding

Total - \$46,000 in cash and in-kind. CAR Fund –\$16,000 approved in May 2004. PVTT is to contribute the remainder (about \$30,000) as in-kind contribution.

Contractor

PVTT (AirCare Program Administration).

Approval Date

A revised proposal incorporating certain requirements of the CARF Steering Committee was approved in May 2004.

Completion Date and Status

The project was started in May 2004 and anticipated to be complete in six months. Ten AirCare-certified repair shops have been selected and solicited for their participation in the project. These shops consist of the seven that had participated in the first pilot program plus three additional shops in N. Vancouver and Abbotsford to improve geographic coverage. The project objectives, guidelines and vehicle eligibility criteria have been discussed with each participating repair shop. The total number of participating repair shops has been limited to ten because it is anticipated that about 20 vehicles will be targeted in the study. Various means of active promotion of the project have been implemented to seek response and participation by vehicle owners. However, because of poor response, the promotion of the project is currently suspended until further notice, and CARF is in agreement with the decision.

3. *“Data Collection for Non-certified Emission Repairs.”*

Project Lead/Sponsor

Pacific Vehicle Testing Technologies (PVTT) is the sponsor/leader of the project and submitted the proposal in October 2004. CPPI is the CAR Fund Steering Committee Contact.

Project Goal and Objectives

More than half of vehicles failing the AirCare emission inspection are performed by non-certified repair shops. No data on the types of repair done and costs are available. The goal of the project is to collect repair information from a sample of these vehicles by offering a small incentive (\$2) to vehicle owners. The information will then be analyzed to determine the cost-effectiveness of non-certified emission-related repairs.

Project Funding

Total - \$19,000 in cash and in-kind. CAR Fund –\$6,000 approved in May 2004. PVTT and Envirotec Canada are to contribute \$6,800 and \$6,200 as in-kind contribution respectively.

Contractor

PVTT (AirCare Program Administration).

Approval Date

The proposal was approved by the CARF Steering Committee for funding of \$6,000 in the 4th Quarter 2004, although an incentive of \$2 was considered to be too small.

Completion Date and Status

The project was started in December 2004. The first run of 6,000 flyers was distributed to vehicle owners in early January 2005. As of the end of the 4th Quarter 2005, over 1,500 responses about the repair invoices were received. The responses are being reviewed for data analysis. It is anticipated that no additional data collection would be necessary. The project is now scheduled for completion in early 2006.

4. *“Dispersion Modelling During Episode Events in Golden, B. C.”*

Project Lead/Sponsor

Dr. Peter Jackson of the Faculty of Natural Resources and Environmental Studies, University of Northern B. C. is the project leader and Tyler Abel, a graduate student is the other member of the project team. The proposal was submitted in February 2005. The MOE is the project sponsor and CAR Fund Steering Committee Contact.

Project Goal and Objectives

The objectives of the project are to investigate the dispersion of air pollutants from the source to receptor in the Golden airshed, to characterize the boundary layer properties which influence the mixing and movement of air pollutants, and to assess the relative contributions of various sources to the observed and modelled ambient air pollutant levels. Recently collected meteorological and particulate measurements data under the Source Apportionment Study in Golden, as well as the emission inventory, will be used in this study. The research will be the basis of the thesis for an M. Sc. Degree in Environmental Studies at the University of Northern B. C..

Project Funding

The project budget is estimated to be \$44,000 of which \$11,000 is approved from the CAR Fund. The remaining fund will be available from MOE and UNBC.

Contractor

Not applicable.

Approval Date

After considering the proposal and the request for \$22,000, a funding of \$11,000 was approved by the Steering Committee in May 2005.

Completion Date and Status

The project started in May 2005 after all funding was approved. Since then the graduate student has undertaken to prepare a detailed thesis proposal consisting of a literature

review, statement of research questions, methodology and anticipated results for review by the thesis supervisory committee. It is proposed to use CALPUFF dispersion model for high PM episodes in Golden during the winter and early spring. The data from the existing three monitoring stations in Golden for meteorological and pollutant are to be used. In addition, a Doppler sodar monitoring system was set up in the area during the 4th Quarter 2005 to gather additional meteorological data. The project is scheduled for completion in 2 years.

5. *"Holland America Sea-Water Scrubber."*

Project Lead/Sponsor

CPPI and MoE

Project Goal and Objectives

The project is designed to demonstrate the feasibility of using sea water to "scrub," engine emissions on oceangoing vessels. The scrubber system uses seawater to remove virtually all sulphur oxide (SO_x) as well as significantly reduce particulate matter emissions. The sea water is then treated to remove harmful components while the calcium carbonate (CaCO₃) in seawater renders the sulphur oxides harmless by conversions to sulphates and neutral salts. Additional sponsors include the Port of Seattle, the Port of Vancouver, and Environment Canada.

Project Funding

The project budget is estimated to be \$1.5 million (US) of which \$25,000 (US) is approved from the CAR Fund.

Contractor

Not applicable.

Approval Date

After considering the proposal and the request for funding, \$25,000 (US) was approved by the Steering Committee in September 2006.

Completion Date and Status

Completion is anticipated for mid-2007 and the project is on-going.

6. *"Development of Source Receptor Tool for the Lower Fraser Valley, Victoria and Okanagan."*

Project Lead/Sponsor

GVRD

Project Goal and Objectives

The work is to develop a user-friendly desktop source-receptor tool (the "Tool") for use in ongoing air quality management planning in the Lower Fraser Valley, Victoria and the Okanagan. The Tool will provide estimates of future changes in regional air quality as a result of forecasted emission trends, and can be used to determine the effectiveness of various emission reduction strategies towards improving regional air quality. The selected consultant will produce a user-friendly desktop version of the Tool and a user manual, and provide training. A report will also be produced which summarizes the modifications made, methodology used to validate the Tool in each region, limitations of the Tool, and the results of one emission scenario.

Project Funding

Total project budget is estimated at \$55,000 with CARF contribution of approximately one third of the total.

Contractor

RWDI

Approval Date

This project was Approved-in-Principle in May 2006. (The CARF Steering Committee has been considering the proposals the CARF Steering Committee has been considering the proposals "Updating the Lower Fraser Valley Source-Receptor Air Quality Model" submitted by RWDI Air in December 2004 and Levelton Engineering Ltd.'s "An Improved Health Benefit Assessment Model for the GVRD" submitted in November 2005. The Committee had initially approved-in-principle the first one; however, after a further review of these proposals it was decided to replace these proposals with a new one and to invite the consultants to submit bids.)

In the 1st Quarter 2006, the GVRD issued a Request for Proposal (RFP) for "Development of a Source-Receptor Tool for the Lower Fraser Valley, Victoria and the Okanagan" and requested bids from these consultants. A Memorandum of Agreement has been signed by the funding partners, namely the GVRD, MOE, CPPI and FVRD Air in December 2004 and Levelton Engineering Ltd.'s "An Improved Health Benefit Assessment Model for the GVRD" submitted in November 2005. The Committee had initially approved-in-principle the first one; however, after a further review of these proposals it was decided to replace these proposals with a new one and to invite the consultants to submit bids.

Completion Date and Status

Originally planned for completion in 2006, the project completion is now anticipated in mid 2007.

7. "Gasoline Regulations Review"

In January 2005 BC MOE proposed an independent review of the new federal and existing BC gasoline Regulations for determining future options for retaining or repealing the Province with respect to the BC Regulations. On June 30, 2005 the CPPI provided the MOE with comments for consideration on the existing BC Cleaner Gasoline Regulation. This project is being carried out by the stakeholders, and no CAR funding has been requested at present.

8. "Stage 1 Vapour Recovery"

In view of the proposed amendments to the existing Canadian General Standards Board (CGSB) Standard for vapour control systems in gasoline distribution networks, the CPPI has submitted a proposal to MOE and GVRD for undertaking a review of the B. C. Regulations and GVRD Bylaw on the same subject. This project is being carried out by the stakeholders, and no CAR funding has been requested for the time being.

4.3 PROPOSALS APPROVED-IN-PRINCIPLE AND UNDER CONSIDERATION AT THE END OF 2006

The proposals approved-in-principle and new proposals under consideration are listed below and summarized in Table 5.

Proposals Approved-in-Principle

1. "2005 B. C. Marine Vessel Emission Inventory"

The GVRD submitted the proposal in October 2004 to undertake a 2-Phase work for a 2005 marine vessel emission inventory and forecasts for the Lower Fraser Valley at an estimated cost of about \$120,000. The project is planned to be conducted jointly with Env. Can., Transport Canada, MOE, Western Marine Community, Ports, and other industry sectors. A partial funding from CARF is requested. As the 2000 inventory for the marine vessel emission and emissions forecasts have recently been completed, CPPI has some concern about the new project. However, after receiving clarification about the objectives of the new project, i.e. to enhance the methodology and data collection, CPPI has advised it might be interested in partial funding for a nationally acceptable model/methodology development study for application in other areas of the country. Any CAR funding approval is subject to substantial funding from the marine industry, and the total funding from the latter and CARF should be about one-third of the total project cost.

Proposals Under Consideration

At the end of 2006 there were no additional projects under consideration.

4.4 PROPOSALS WITHDRAWN AND REFUSED IN 2006

Three proposals were withdrawn during 2006 and two projects were refused funding as follows:

Proposals Withdrawn

- (i) "*Updating the Lower Fraser Valley Source-Receptor Air Quality Model*" submitted by RWDI Air in December 2004 was Approved-in-Principle was withdrawn. (In 2006 RWDI re-submitted a proposal the for "*Development of a Source-Receptor Tool for the Lower Fraser Valley, Victoria and the Okanagan*")
- (ii) "*Air Toxics Emission Inventory Spatial Resolution to Census Tracts and Dissemination Areas*" submitted by B.H. Levelton was withdrawn.
- (iii) "*Development of an Emission Inventory of Cargo Handling Equipment, Trucks and rail Activities Associated with Ports in the Lower Fraser Valley of B. C.*" is currently underway and mostly funded (and led) by the Vancouver Port Authority. CARF funding was not required and this proposal was withdrawn by the GVRD in the 4th quarter of 2006.
- (iv) "*Scrap-It Program Review*", approved for CAR funding, was completed with funding from other sources.

Proposals Refused Funding

- (i) "An Improved Health Benefit Assessment Model for the GVRD" submitted in November 2005 by Levelton Engineering Ltd.

TABLE 5 – CLEAN AIR RESEARCH FUND - PROPOSALS APPROVED-IN-PRINCIPLE AND UNDER CONSIDERATION AT THE END OF 2006

Proposal Title	Proposal Proponent / Sponsor	Application Date	Total Cost and CAR Fund Requested	Other Potential Funding Partner	Comments
<i>CAR Funding Approved-in-Principle</i>					
1. 2005 B. C. Marine Vessels Emission Inventory	GVRD	October 2004	Approx. \$120,000. CAR fund requested part of the total.	GVRD, MOE, Env. Can., Transport Can., Western Marine Community, Ports, and other industry groups.	The proposal is for a 2-Phase work for developing an improved methodology and 2005 emission inventory and forecasts for marine vessels. An initial part of the project is being underway with separate funding. Partial CAR funding has been <i>approved-in-principle</i> subject for to substantial funding from the marine industry and the model / methodology developed should be applicable nationally.
<i>Proposal Under Consideration</i>					
At the end of 2006 there were no proposals under consideration.					

- (ii) Rempel Bros. Concrete Ltd. – “*Fuel Additive and Water Injection System*” proposal for a study to reduce emissions from its concrete trucks by using a combined fuel additive and water injection system. Funding for this project was refused.

5. FUTURE OUTLOOK OF CAR FUND

Under the Scrap-It program nearly 4,100 old vehicles have been scrapped during the period March 1996 to December 2006, and the CPPI contribution to the program to December 2006 has been about \$1,288,550. The present resources allow scrapping of about 500 vehicles per year. Although the number of scrapped vehicles is relatively low, compared to the total number of vehicles used in the region, the cumulative effect of retirement of high-polluting old vehicles over the years has resulted in cost-effective incremental emission reduction in the Lower Fraser Valley. The participation in the Scrap-It program appears to depend on the types of incentives available to the owners of old vehicles and the level of public awareness. Adequate funding for attractive incentives to vehicle owners’ participation is also a key to the success of the Scrap-It program. Presently, The Scrap-It Program Steering Committee is exploring the possibility of creating a charitable society to manage the program.

A similar car scrappage program not affiliated with Scrap-It Program for the Lower Fraser Valley is also operating in Kelowna, B. C. with funding from Environment Canada.

From August 1997 to the end of 2006 nearly \$807,306 from the CAR Fund has been contributed towards a number of research projects. By the end of 2006, a total of about \$34,206 from the CAR Fund remains committed towards projects that are still in-progress. The total value of all projects, jointly funded from the Clean Air Research Fund and various other partners, amounts to about \$13 million.

The projects funded to date consisted of basic and applied research, including pilot demonstration of technology, collection of information for planning purposes, and training program for agency personnel, industry and consultants. The study proponents ranged from academic and students to industry and government agencies. The type of projects included:

- analysis of air quality, emissions and meteorological data,
- air quality model development,
- enhancement of emission estimation methods,
- computer model development for greenhouse gas emission assessment,
- projects to improve AirCare testing and vehicle repair diagnosis,
- transportation demand management, and
- training of personnel from agencies, industry and consultants.

Research projects undertaken with full or partial CAR funding have resulted in significant scientific advances through improved understanding of key air quality issues, filling of important data gaps, and development of modeling tools to better forecast impacts of emission reduction measures on future air quality. Continued financial support from the CAR Fund for research on air quality issues will lead to improved understanding of the science, and development or enhancement of models and tools for data gathering and analysis. These are necessary prerequisites for formulation of appropriate air quality management strategies and policies.