THE AUTOMOBILE OF THE 21ST CENTURY

2001-2002 ANNUAL REPORT
Driving innovation through research excellence
AUTO21, a federal Network of Centres of Excellence, is working to help position Canada as a leader in innovative automotive research and development. An initial four-year grant of more than $23 million, plus industrial and institutional contributions of more than $11 million, helps fund 28 research projects in areas including materials and manufacturing; design processes; health, safety and injury prevention; societal issues; powertrains, fuels and emissions; and intelligent systems and sensors.
# TABLE OF CONTENTS

- Message from Board Chair .................................................. 2
- Message from the Program Leader and Managing Director ............................................. 3
- Year in Review .................................................................. 4
- First-Year Highlights ........................................................... 5
- AUTO21 Research Structure ................................................... 6
- Theme A - Health, Safety and Injury Prevention .......................................................... 7
- Theme B - Societal Issues and the Future Automobile .................................................. 8
- Theme C - Materials and Manufacturing ................................................................. 9
- Theme D - Powertrains, Fuels and Emissions ............................................................ 10
- Theme E - Design Processes ........................................................................ 11
- Theme F - Intelligent Systems and Sensors ............................................................. 12
- AUTO21 Board of Directors ............................................................. 13
- AUTO21 Research Management Committee Members ........................................ 14
- AUTO21 Administrative Staff ........................................................................ 14
- Researchers and Affiliations ........................................................................ 15
- Industry Researchers ........................................................................ 16
- Industry Partners ........................................................................ 18
- Public Sector Partners ........................................................................ 19
- Financials ............................................................................... 21
MESSAGE FROM BOARD CHAIR

The Network of Centres of Excellence program focuses on collaborative research between universities, governments and industry resulting in new, leading-edge technologies and their deployment in the Canadian automotive industry.

— Dr. Inge L.H. Hansson

The year 2001/2002 has been a remarkably fast initiation period for the AUTO21 Network of Centres of Excellence. Only twelve months ago, the AUTO21 program consisted of three thick proposal books created by enthusiastic committees and dedicated individuals from university, government and industry, who were determined to help position Canada as a leader in automotive research and development. Today, that initial hard work has developed into the flourishing AUTO21 Network of more than 200 researchers, 28 universities, 100 industry, institution and government partners, a Board of Directors consisting of 16 members, and an administrative centre with a core staff of five employees.

The research projects, with their multi-stakeholder partnership arrangements, are the heart of AUTO21 and we are fortunate to have Canada's top researchers and research managers as part of AUTO21. Each of the 28 research projects displays a high level of innovation and research excellence that will positively contribute to Canada's reputation as one of the world leaders in automotive research and development.

The Network of Centres of Excellence program focuses on collaborative research between universities, governments and industry resulting in new, leading-edge technologies and their deployment in the Canadian automotive industry. The AUTO21 Network of Centres of Excellence thrives on this mandate. With the help of close to 75 industry partners, tomorrow's needs are being anticipated and addressed today. As AUTO21 takes its place as a source for both Canadian innovation and highly qualified personnel, the industry support will continue to grow.

The Board of Directors has had a challenging, but exciting year. Creating a new Network requires a great deal of time, effort and commitment. The Board members have continuously demonstrated their dedication and genuine interest in guiding AUTO21 through its initial year of operation. The coming year will be even more exciting as we create growth strategies for AUTO21, and determine content to address the major research and development needs of the broader Canadian automotive sector.

On behalf of all involved parties, I would like to thank AUTO21’s Board of Directors for their hard work and the Administrative Centre staff for their dedication in making AUTO21 a role model for collaborative, multi-disciplinary research administration.

Dr. Inge L.H. Hansson
Chair of the Board of Directors
March 31, 2002
MESSAGE FROM THE PROGRAM LEADER AND MANAGING DIRECTOR

The past several months have been very exciting for the AUTO21 Network of Centres of Excellence. Since funding was announced in March 2001 for AUTO21, it has been a time of new beginnings, new alliances and rapid growth.

For those involved in the initial AUTO21 proposal to the NCE Directorate, it has been fulfilling to see AUTO21 grow. In November 2001, a supportive and dynamic Board of Directors formed to steer the activities of AUTO21. Located across Canada, the Board members are leaders in their fields, and we are fortunate to have their wisdom and experience to help guide our success.

We are also fortunate to enjoy a good working relationship with our host institution, the University of Windsor. Their support and generosity have been greatly appreciated in both providing a home for the AUTO21 Administrative Centre, and in assisting AUTO21 with administrative support in its early days. We are pleased that staffing for roles within the administrative centre is nearly complete, with five key members on the AUTO21 team, and plans to fill the remaining two vacancies shortly.

While many milestones have been met during the past year, two of the most important were the funding of the 28 projects that form AUTO21 and the support of the students working on those projects. In August and September 2001, AUTO21 administrative staff managed a formidable effort to complete network agreements with the 28 universities and more than 200 project researchers. This effort culminated in the first disbursement of funds for AUTO21 projects in October. Each of these 28 projects has the potential to influence the Canadian automotive industry and society. The projects are well underway, and a number have already started to report initial results at conferences and in research publications.

As a Canadian Network of Centres of Excellence, AUTO21 is committed to increasing the number of highly qualified personnel for the Canadian automotive industry. In its first six months of operation, AUTO21 projects provided approximately 100 graduate students and post-doctoral fellows an opportunity to gain valuable experience in this highly competitive industry. We are developing both the innovative solutions to help develop the automobile in the 21st century, and the highly qualified personnel who will contribute to the Canadian automotive industry in the years to come.

The upcoming year promises to be just as exciting as our first few months of operation. Key to AUTO21’s success is the collaborative partnership between university researchers and industry. Initial industry support was beyond expectations, and as awareness of AUTO21 increases amongst industry leaders, these partnerships continue to grow. This solid show of support from Canadian industry validates the role of AUTO21. We are not just a virtual research institute - we are on our way to becoming one of Canada’s leading sources for new automotive technology research.

Our second year of operation also sees our second targeted call for proposals. New projects arising from this call for proposals will expand the scope of research, and potentially bring new researchers and industry and university partners into the Network.

We are also looking forward to the first AUTO21 Annual General Meeting and Scientific Conference to be held in Toronto from September 26 - 28, 2002. This event will provide an opportunity for the researchers to gather from across Canada to share findings and explore new collaborations.

Now fully operational, AUTO21 is on the road to automotive research and development success. With the continued support of our researchers, industry, institution and government partners, we will drive forward Canada’s reputation as an innovative leader in automotive-related research.
YEAR IN REVIEW

**March 2001**

Industry Minister Brian Tobin and Deputy Prime Minister Herb Gray announced the initial funding for the new AUTO21 Network of Centers of Excellence at the University of Windsor. The Government of Canada is providing approximately $23 million in funding over four years. The University of Windsor was announced as the Network’s host institution.

**August 2001**

The AUTO21 Administrative Centre moved into the newly renovated Centre for Automotive Research and Education, part of the University of Windsor’s Faculty of Engineering. Staffing for administrative roles began.

**March 2002**

The AUTO21 Network of Centers of Excellence has enjoyed great support from Industry Canada and the Department of Foreign Affairs and International Trade (DFAIT) through the Consulate-General in Detroit. With assistance from DFAIT, AUTO21 participated in the Canadian Pavilion at the Society of Automotive Engineers (SAE) Conference in Detroit, Michigan.

**February 2002**

AUTO21 administrative staff hosted a visit from the Japanese Consul General. Mr. Frise met with Mr. Takashi Koezuka, Consul-General of Japan, for a discussion about the Canadian and Japanese auto industries and how research partnerships between the two countries could be strengthened.

DFAIT also assisted with AUTO21’s participation in Canada Day at the U.S. Army’s Tank Automotive and Armaments Command facility (TACOM) in Michigan. Mr. Bill Woodward, AUTO21 Managing Director, Ms. Stephanie Campeau, Communications Manager, and Mr. Peter Frise, Program Leader, staffed the AUTO21 information booth. Dr Frise also presented an overview of AUTO21 to TACOM personnel.

In partnership with Industry Canada and the Canadian Council of Professional Engineers, AUTO21 hosted “Engineers of Tomorrow”, a roundtable discussion for senior automotive executives to provide feedback on how to best prepare young engineers for futures in the auto industry. Information from this roundtable will be used by AUTO21 administration to plan its highly qualified personnel (HQP) strategies.
FIRST-YEAR HIGHLIGHTS

Fast Facts
Industry Partners 75
University Partners 28
Hospitals/institution Partners 2
Government Partners 28
AUTO21 administrative staff 5
Research projects 28
Students working on AUTO21 projects 152
Researchers 243

Amount (in millions of $)
NCE funding 4.8
Initial industry support (cash) 1.2
Initial industry support (in-kind) 1.6
NCE Research disbursements in 2001/2002 4.5

PROJECT ACCOMPLISHMENTS

Conferences, Presentations and Papers

Theme F
ITS 2002
March 25-26, 2002 - Mississauga, Ontario
Dr. Denis Gingras, Theme F Coordinator presented "IMSI, AUTO21 and Intelligent Systems and Sensors Applied to the Automotive Industry and Road Transportation: an Overview of These New Canadian Initiatives."

Project A02: Vehicle Safety for Vulnerable Populations
International Conference on Technology and Aging
September 12-14, 2001 - Toronto, Ontario
Dr. Jan Polgar provided a display on her research "Safety Transportation for Seniors."

Project A03: Industrial Health and Safety in the Auto Industry


Project B01: Public Policy and the Automobile in Canada
Biennial Meeting of the Association for Canadian Studies in the United States
November 2001 - San Antonio, Texas, United States
Dr. Maureen Molot: "NAFTA: Is There a Road Map?"


Project C03: Polymer Composites

UMCH Conference
January 22, 2002 - Prague, Czechoslovakia
Dr. Bohuslav Kokta: "PE Reinforced Composites."

Paptac International Conference
January 29-31, 2002 - Montreal, Quebec
Dr. David Rouison, Dr. M. Sain, and Schmidhauser: "Surface Sizing of Wood Pulp with SMA."

SAE 2002 World Congress & Exhibition
March 2002 - Detroit, Michigan, United States
Dr. Phil Bates: "Vibration Welding Scale Up - A Comparison of Laboratory and Industrial Components."

Polymer Institute Bratislava Conference
March 13, 2002 - Slovak Republic
Dr. Bohuslav Kokta: "PE and PP Reinforced Composites."

UMCH Conference
March 20, 2002 - Prague, Czechoslovakia
Dr. Bohuslav Kokta: "PE and PP Reinforced Composites."

Project C06: Advanced Manufacturing, Assembly and Inspection
SPIE-Photonics Boston 2001
October 28- November 2, 2001 - Boston, Massachusetts, United States
AUTO21 RESEARCH STRUCTURE

The AUTO21 Network recognizes that the automobile plays a larger role in today’s society than just transporting people and materials from point A to point B. It affects the labour force, urban planning, government policy, the health and safety of factory workers and vehicle occupants, and the environment.

Six key theme areas were created to ensure AUTO21 projects encompass all areas of the vehicle’s impact. Each theme is led by a Theme Coordinator who facilitates the work of the project leaders within that theme.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Description</th>
<th>Coordinator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme A</td>
<td>Health, Safety and Injury Prevention</td>
<td>Dr. Anne Snowdon, University of Windsor</td>
</tr>
<tr>
<td>Theme B</td>
<td>Societal Issues and the Future Automobile</td>
<td>Dr. Charlotte Yates, McMaster University</td>
</tr>
<tr>
<td>Theme C</td>
<td>Materials and Manufacturing</td>
<td>Dr. Jennifer Jackman, Natural Resources Canada</td>
</tr>
<tr>
<td>Theme D</td>
<td>Powertrains, Fuels and Emissions</td>
<td>Ms. Lisa Graham, Environment Canada</td>
</tr>
<tr>
<td>Theme E</td>
<td>Design Processes</td>
<td>Dr. Roy Pick, University of Waterloo</td>
</tr>
<tr>
<td>Theme F</td>
<td>Intelligent Systems and Sensors</td>
<td>Dr. Denis Gingras, Université de Sherbrooke</td>
</tr>
</tbody>
</table>

Future AUTO21 projects will continue to explore issues within these areas.
Theme Coordinator: Dr. Anne Snowdon, University of Windsor

Health, safety and injury prevention are priorities for everyone, from vehicle designers to drivers. Today’s cars are safer than ever, however automotive injuries remain a leading cause of hospitalization and death for people up to the age of 44 years in most developed countries.

Theme A focuses on four priority areas of research that affect the people who design and build the vehicle, and those who drive and ride in them. In addition to exploring how to keep vehicle occupants safe, Theme A also reviews how to improve on-the-job health and safety precautions that may help autoworkers avoid chronic injuries.

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Project Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01 Crash Investigations - Outcomes for Vehicle Design</td>
<td>Dr. Mary Chipman, University of Toronto</td>
</tr>
<tr>
<td>A02 Vehicle Safety for Vulnerable Populations</td>
<td>Dr. Anne Snowdon, University of Windsor</td>
</tr>
<tr>
<td></td>
<td>Dr. Jan Polgar, University of Western Ontario</td>
</tr>
<tr>
<td>A03 Industrial Health and Safety in the Auto Industry</td>
<td>Dr. Jack Callaghan, University of Guelph</td>
</tr>
<tr>
<td>A04 Safety Restraint of Children During Collisions</td>
<td>Dr. Andrew Howard, Hospital for Sick Children, Toronto</td>
</tr>
</tbody>
</table>

Increasing the effectiveness of safety systems for young and elderly passengers is a key objective for Project A02: Vehicle Safety for Vulnerable Populations, led by Dr. Anne Snowdon at the University of Windsor and Dr. Jan Polgar at the University of Western Ontario.

Better understanding the body’s response to repetitive movements such as lifting is key to reducing the chronic injuries often suffered by autoworkers. Project A03: Industrial Health and Safety in the Auto Industry, led by Dr. Jack Callaghan at the University of Guelph, focuses on injury prevention in the automotive workplace.
Through the years, the automobile has had a profound effect on society. More than 150,000 Canadians are employed directly in the automotive industry, with thousands more employed in related industries. Enormous wealth is generated for Canada as a result of this industry. Yet, the conditions under which this industry operates are changing as a result of regional economic integration with the United States and Mexico and changing government policy.

The automotive industry and use of the automobile also entail significant social and societal impacts. As a major force in Canadian society, the automobile affects national employment, government policy, standards and regulations, labour relations and international trade relations. Increasing volumes of vehicular traffic on roads in densely populated regions not only impact the environment, but can also lead to increased vehicle operator stress resulting in anti-social behaviours in the operation of motor vehicles.

Theme B focuses on the effects the automobile has on modern day society by exploring four sub-themes:

- Public policy;
- Work and labour;
- Anti-Social behaviour (including drunk driving, road rage, etc.); and
- Business and economic analysis of the automotive industry.

More than just a form of transportation, the vehicle affects all aspects of society. Theme B investigates the positive and negative societal impacts generated by today’s automobile and its successor.
THEME C

MATERIALS AND MANUFACTURING

Theme Coordinator: Dr. Jennifer Jackman, Director
CANMET - Materials Technology Laboratory, Natural Resources Canada

The structure of a vehicle consists of many different materials, including steel, aluminum and plastic polymer composites. As vehicle design changes to meet the requirements of tomorrow, there is a growing need for new, high-performance materials and manufacturing technologies. Today’s research in materials and manufacturing is focused on:

- reducing vehicle weight for increased fuel efficiency;
- meeting customers’ sensitivity to sticker price;
- using efficient manufacturing processes in terms of materials, energy and the impact on the environment; and
- producing materials which exceed current vehicle performance requirements for energy absorption (crash worthiness), stiffness (handling and safety), strength and corrosion (structural integrity and durability) and NVH (noise, vibration and harshness).

Theme C is the largest area of study in the AUTO21 program. The 11 research projects complement industry research by focusing on developing and improving new techniques for using materials such as magnesium, polymers, and also on improving procedures such as welding and joining and machining in today’s highly-competitive industry.

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Project Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>C01 Magnesium Casting Processes</td>
<td>Dr. Jeff Wood, University of Western Ontario</td>
</tr>
<tr>
<td>C02 Foam Processes for Automotive Parts</td>
<td>Dr. Andrew Hrymak, McMaster University</td>
</tr>
<tr>
<td>C03 Polymer Composites</td>
<td>Dr. François Trochu, Ecole Polytechnique</td>
</tr>
<tr>
<td>C04 Sheet and Tube Forming</td>
<td>Dr. Michael Worswick, University of Waterloo</td>
</tr>
<tr>
<td>C05 New Generation Steels</td>
<td>Dr. Steven Yue, McGill University</td>
</tr>
<tr>
<td>C06 Advanced Manufacturing, Assembly and Inspection</td>
<td>Dr. Allan Spence, McMaster University</td>
</tr>
<tr>
<td>C07 Advanced Casting of Light Materials</td>
<td>Dr. Jerry Sokolowski, University of Windsor</td>
</tr>
<tr>
<td>C08 Machinability</td>
<td>Dr. Mohammed Elbestawi, McMaster University</td>
</tr>
<tr>
<td>C09 Welding and Joining</td>
<td>Dr. Norman Zhou, University of Waterloo</td>
</tr>
<tr>
<td>C10 Tools, Dies and Moulds</td>
<td>Dr. Doug Boyd, Queen’s University</td>
</tr>
<tr>
<td>C11 Thermal Coatings</td>
<td>Dr. Javed Mostaghimi, University of Toronto</td>
</tr>
</tbody>
</table>

Steel is a predominant material used in a vehicle’s structure. Project C05: New Generation Steels, led by Dr. Steven Yue at McGill University, investigates how to improve today’s steels to meet the needs of the automobile in the 21st century.

From the creation of an auto part to the assembly of a vehicle, welding is prevalent technology. Project C09: Welding and Joining, led by Dr. Norman Zhou at the University of Waterloo, focuses on improving spot welding techniques on aluminum sheets.
Driving innovation through research excellence

**THEME D**

**Powertrains, Fuels and Emissions**

Theme Coordinator: Ms. Lisa Graham, Environment Canada

Vehicle emissions are a major contributor to air pollution - in urban areas, vehicles produce up to three-quarters of the pollutants that form smog. Scientific studies conclude that more than 5,000 Canadians die early deaths each year due to poor air quality, and thousands more suffer from respiratory illnesses such as bronchitis and asthma.

Air pollution isn’t just a Canadian or North American issue. Industrialized countries around the world are working to reduce emissions of pollutants that contribute to global warming - specifically carbon dioxide. Since vehicle emissions resulting from burning fossil fuels contribute to this issue, researchers are exploring ways to mitigate carbon dioxide emissions.

Modifying today’s internal combustion engine and developing viable alternate fuels for mass-consumption are strategies to achieving these reductions.

The four projects within Theme D focus on near-, mid-, and long-term solutions to reducing the environmental and health impacts of vehicle emissions. Two projects explore how to modify current engine designs to use less carbon-intensive fuels and to reduce emissions. Another project reviews the use of liquid petroleum fuels as a transitional energy source for fuel cells. The fourth project investigates the key issues of safety and infrastructure required to use hydrogen as a vehicle energy source.

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Project Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>D01 Combustion Systems for Alternative Fuels</td>
<td>Dr. Andrzej Sobiesiak, University of Windsor</td>
</tr>
<tr>
<td>D02 Lean Burn Combustion for Reducing Emissions</td>
<td>Dr. Robert Evans, University of British Columbia</td>
</tr>
<tr>
<td>D03 Reformer Technology for Fuel Cells</td>
<td>Dr. Brant Peppley, Royal Military College</td>
</tr>
<tr>
<td>D04 Hydrogen Safety and Infrastructure</td>
<td>Dr. Tapan Bose, Université du Québec à Trois-Rivières</td>
</tr>
</tbody>
</table>

Industrialized countries around the world are working to reduce emissions of pollutants that contribute to global warming, specifically carbon dioxide. Theme D projects explore ways to reduce the environmental and health impacts of vehicle emissions.

While fuel cells show great promise for future automotive use, it is vital that a safe infrastructure be in place to support it. Project D04: Hydrogen Safety and Infrastructure, led by Dr. Tapan Bose at Université du Québec à Trois-Rivières, focuses on the safe storage of hydrogen, and how to best establish the required infrastructure.
THEME E

Design Processes

Theme Coordinator: Dr. Roy Pick, University of Waterloo

One of the biggest trends in the auto industry is the shift in responsibility for design and manufacturing processes from the automakers to the auto-parts suppliers. It is becoming increasingly important that supplier companies have the knowledge and procedures in place to meet these new tasks.

Theme E focuses on design processes - how to develop comprehensive design methodologies and tools for rapid vehicle component design, and how to develop and supply highly qualified design engineers to this field.

Projects in Theme E aim to document current practices within the auto-parts industry and using a variety of techniques, share these results with other researchers and the industry itself. It will also improve existing design methodologies and techniques and introduce new ones.

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Project Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>E01 Design Processes</td>
<td>Dr. Roy Pick, University of Waterloo</td>
</tr>
<tr>
<td>E02 Integration of Design and Process Planning</td>
<td>Dr. Hoda ElMaraghy, University of Windsor</td>
</tr>
</tbody>
</table>

Auto-parts companies are taking more responsibility for initial part design and research and development. Theme E investigates how to best prepare the highly qualified design personnel required by all segments of the Canadian auto industry.
Driving innovation through research excellence

THEME F

INTelligent Systems and Sensors

Theme Coordinator: Dr. Denis Gingras, Université de Sherbrooke

Every year, cars are becoming "smarter." Today, many cars are equipped with global positioning systems and other navigational aids. In the future, vehicles will be capable of offering more extensive navigation assistance, monitoring their own systems and alerting the driver when action is required. They will also contain other sensor systems that will alert drivers to hazardous conditions.

Theme F focuses on the intelligent systems and sensors that will become even more prevalent in the upcoming years. The three projects in Theme F focus on three streams of study:

I) Control and Monitoring of Vehicle Behaviour: Using systems such as advanced electronics, integrated chassis control systems, and active airbag control systems, vehicles will be able to monitor their onboard systems to adjust for certain situations.

II) Vehicle Guidance, Navigation & Telematics: Collecting and transmitting information enroute, including guidance, traffic conditions and transit schedules. Such systems can decrease traffic incidents, reroute traffic flow and allow for automatic toll collections.

III) Driving Assistance and Automation: Developing driver assistance systems will help reduce accidents, injuries, death and property damage. These systems help drivers make decisions and operate vehicles more effectively.

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Project Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>F01 Collaborative Driving System</td>
<td>Dr. Jean de Lafontaine, Université de Sherbrooke</td>
</tr>
<tr>
<td></td>
<td>Dr. François Michaud, Université de Sherbrooke</td>
</tr>
<tr>
<td>F02 Construction of Integrated Navigation</td>
<td>Dr. Elizabeth Cannon, University of Calgary</td>
</tr>
<tr>
<td>Information Infrastructure</td>
<td>Dr. Shengrui Wang, University of Windsor</td>
</tr>
<tr>
<td>F03 Interior Noise Environment of Future Automobiles</td>
<td>Dr. Patrice Masson, Université de Sherbrooke</td>
</tr>
<tr>
<td></td>
<td>Dr. Alain Berry, Université de Sherbrooke</td>
</tr>
</tbody>
</table>

With the high volume of vehicles on the road, the use of intelligent systems and sensors will increase. Project F01: Collaborative Driving Systems examines how assisted driving and automation could contribute to fewer accidents, decreased traffic congestion and reduced driver stress. Led by Dr. Jean de Lafontaine and Dr. François Michaud at the Université de Sherbrooke, the research includes the use of robot car convoys to simulate real-life situations.
AUTO21 BOARD OF DIRECTORS

Chair of the Board
Dr. Inge L.H. Hansson
President
Hansson Technology Management

Directors
Dr. Elizabeth Cannon
Professor of Geomatics Engineering
University of Calgary

Ms. Anne Cool
Executive Vice-President
Algonquin Automotive Group

Dr. Peter George
President and Vice-Chancellor
McMaster University

M. Jean-Paul Gourdeau
Président du Conseil École Polytechnique de Montréal

Mr. Brian Grosman
Barrister and Solicitor
Grosman, Grosman and Gale - Toronto

Mr. Robert Hindle
President & CEO
Giffels Associates Limited

Mr. Norman Lockington
Vice-President, Technology
Dofasco

Mr. Gerard Lukassen
Senior Vice-President, Commercial Banking
Canadian Imperial Bank of Commerce

Mr. James Miller
Senior Vice-President, Corporate Affairs
Honda Canada

Mr. John McDougall
Managing Director and CEO
Alberta Research Council

Dr. Ross Paul
President and Vice-Chancellor
University of Windsor

Dr. Bryne Purchase
Deputy Minister of Energy
Government of Ontario

Mr. Ronald Watkins
Director General, Aerospace and Automotive Branch
Industry Canada

Ex-officio Directors
Dr. Alain Canuel
NCE Directorate Designate Networks of Centres of Excellence

Dr. Peter Frise
Program Leader
AUTO21

Mr. Bill Woodward
Managing Director
AUTO21
AUTO21 RESEARCH MANAGEMENT COMMITTEE MEMBERS

CHAIR OF THE COMMITTEE

Dr. Peter R. Frise
Program Leader
AUTO21

MEMBERS

Dr. George Adams
President and CEO
University of Toronto Innovations Foundation

Ms. Sandra Allin
Industry Analyst, Aerospace and Automotive Branch
Industry Canada

Dr. Alain Canuel
NCE Directorate Designate
Networks of Centres of Excellence

Ms. Lisa A. Graham
Theme Coordinator
AUTO21

Mr. William Harney
Director of Product Development
Magna International

Ms. Nancy E. Hill
Patent & Trademark Agent
Hill & Shumacher

Mr. Gerald Fedchun
President and CEO
Automotive Parts and Manufacturing Association

Dr. Jennifer A. Jackman
Theme Coordinator
AUTO21

Mr. Brian A. Jonah
Director, Motor Vehicles Standard and Res. Road Safety and Motor Vehicle Registration
Transport Canada

Mr. James W. Lanigan
Senior Manager, Product Development Engineering
DaimlerChrysler Canada

Mr. Greig Mordue
Manager, Corporate Affairs
Toyota Motor Manufacturing Canada Inc.

Mr. Bill Murnighan
National Representative
Canadian Autoworkers Union

Dr. Patric Ouellette
Chief Scientist
Westport Innovations

Mr. R. Wyman Pattee
Manager, Vehicle Emissions & Fuels
Ford Motor Company of Canada

Dr. Roy J. Pick
Theme Coordinator and Project Leader
AUTO21

Dr. Anne W. Snowdon
Theme Coordinator and Project Leader
AUTO21

Dr. Floyd R. Tuler
Executive Director
Centre for Automotive Materials and Manufacturing

Ms. Marlene Viau
President
Project 6116: National Program to Reduce Auto Theft

Dr. Charlotte Yates
Theme Coordinator and Project Leader
AUTO 21

AUTO21 ADMINISTRATIVE STAFF

Dr. Peter R. Frise
Program Leader

Mr. Bill Woodward
Managing Director

Ms. Sandra Bortolotti
Office Manager

Ms. Stephanie Campeau
Communications Manager

Ms. Lisa Ouellette
Administrative Assistant
# RESEARCHERS AND AFFILIATIONS

**Carleton University**
- Dr. Maureen Molot

**Centre for Addiction and Mental Health**
- Dr. Robert E. Mann
- Dr. Reginald G. Smart

**Concordia University**
- Dr. Rajamohan Ganesan
- Dr. Suong Hoa

**Dalhousie University**
- Dr. Michael A. Gharghouri

**École des Hautes Études Commerciales**
- Dr. Christian Levesque

**École Polytechnique de Montréal**
- Dr. Marek Balazinski
- Dr. Pierre Carreau
- Dr. Guy Cloutier
- Dr. Steven Dufour
- Dr. Michel Gou
- Dr. Marie-Claude Heuzey
- Dr. René Mayer
- Dr. François Trochu

**McGill University**
- Dr. Benoit Boulet
- Dr. Musa R. Kamal
- Dr. Larry Lessard
- Dr. Hannah Michalska
- Dr. James Nemes
- Dr. Steven Yue

**McMaster University**
- Dr. David Capson
- Dr. Mohamed A. ElBestawi
- Dr. David Embury
- Dr. Andrew Hrymak
- Dr. Philip Koshy
- Dr. Wayne Lewchuk
- Dr. Tony Porter
- Dr. Parminder Raina
- Dr. Allan D. Spence
- Dr. Michael Thompson
- Dr. Stephen Veldhuis
- Dr. John Vlachopoulos
- Dr. David Wilkinson
- Dr. Charlotte Yates
- Dr. Samir Ziada

**Nipissing University**
- Dr. Lynette L. Stamler

**Queen’s University**
- Dr. Doug Boyd
- Dr. Steven Harrison
- Dr. John Holmes
- Dr. Marianna Kontopoulou
- Dr. Vladimir Krstic
- Dr. Pradeep Kumar
- Dr. Patrick H. Oosthuizen
- Dr. Keith Pilkey
- Dr. Shigeo Saimoto
- Dr. Peter Wild

**Royal Military College of Canada**
- Dr. Phil Bates
- Dr. David DuQuesnay
- Dr. Brant Peppley

**Ryerson University**
- Dr. Kamran Behdinan
- Dr. Rachid Boukhili
- Dr. Said Easa
- Dr. Ian Hale
- Dr. Bhagwant Persaud
- Dr. Filippo A. Salustri
- Dr. Khaled M. Sennah

**Simon Fraser University**
- Dr. Ash Parameswaran

**University of Alberta**
- Dr. Dave M. Checkel
- Dr. Doug Dale
- Dr. Brian A. Fleck

**University of British Columbia**
- Dr. Gouri S. Bhuyan
- Dr. Kendal Bushe
- Dr. Steven L. Cockcroft
- Dr. Robert Evans
- Dr. Göran Fernlund
- Dr. Philip Hill
- Dr. Matthias Militzer
- Dr. William C. Miller
- Dr. Anoush Pourari
- Dr. Steven Rogak
- Dr. Douglas P. Romilly
- Dr. Tom Troczynski
- Dr. Reza Vaziri
- Dr. Ian Yellowley

**University of Calgary**
- Dr. Elizabeth Cannon
- Dr. Peihua Gu
- Dr. Gérard Lachapelle
- Dr. Henry Leung
- Dr. Anthony Perl

**Université du Québec à Trois-Rivières**
- Dr. Kkodjo Agbossou
- Dr. Pierre Bénard
- Dr. Tapan K. Bose
- Dr. Richard Chahine
- Dr. Jacques Goyette
- Dr. Bohuslav V. Kokta
- Dr. Luc Laperrière

**University of Guelph**
- Dr. Jack P. Callaghan
- Dr. Belinda Leach

**Université Laval**
- Dr. Brahim Chaib-draa
- Dr. Gregor Murray
- Dr. Yunlong Sheng

**Université de Montréal**
- Dr. Claire Laberge-Nadeau

**University of New Brunswick**
- Dr. Wayne J. Albert
- Dr. Guida Bendrich
- Dr. David Bonham
- Dr. Hossam Kishawy

**University of Ottawa**
- Dr. Nancy Edwards

**University of Regina**
- Dr. Raphael Idem

**Université de Sherbrooke**
- Dr. Alain Berry
- Dr. Maher Boulos
- Dr. Yvan Champoux
- Dr. François Charron
- Dr. Jean de Lafontaine
- Dr. Alain Desrochers
- Dr. Denis Gingras
- Dr. François Gitzhofer
- Dr. Patrice Masson
- Dr. Kenneth Neale
- Dr. François Michaud
RESEARCHERS AND AFFILIATIONS

Université de Sherbrooke
Dr. Philippe Micheau
Dr. Jean Nicolas
Dr. Bruno Paillard
Dr. Raymond Panneeton
Dr. Pierre Proulx
Dr. Djemel Ziou

University of Toronto
Dr. John J. Balatinecz
Dr. Beno Benhabib
Dr. Sanjeev Chandra
Dr. Mary L. Chipman
Dr. William Cleghorn
Dr. Thomas Coyle
Dr. Gabriele D’Eleuterio
Dr. Andrew Howard
Dr. Nancy Jackson
Dr. James K. Mills
Dr. Javad Mostaghimi
Dr. Tom North
Dr. Chul Park
Dr. Mohini Sain
Dr. Ronald Venter
Dr. James S. Wallace
Dr. Zhirui (Jerry) Wang

University of Victoria
Dr. Colin Bradley

University of Waterloo
Dr. Stephen Corbin
Dr. Jan Huisssoon
Dr. Fathy Ismail
Dr. Hugh Kerr
Dr. Roy J. Pick
Dr. Costas Tzoganakis
Dr. Michael Worswick
Dr. Norman Zhou

University of Western Ontario
Dr. Lyndon J. Brown
Dr. Ralph Buchal
Dr. Steve Feng
Dr. Jin Jiang
Dr. Jan Polgar
Dr. Robert M. Solomon
Dr. Evelyn R. Vingilis
Dr. Jeff Wood

University of Windsor
Dr. William Altenhof
Dr. David M. Andrews
Dr. Xiang Chen
Dr. Hoda A. ElMaraghy
Dr. Waguih H. ElMaraghy
Dr. Anne Forrest
Dr. Peter Frise
Dr. Alan Hall
Dr. Peter Kwan
Dr. Lucia Matuk
Dr. Sharon M. McMahon
Dr. Bruce Minaker
Dr. Linda J. Patrick
Dr. James Potvin
Dr. Graham Reader
Dr. Alan Sears
Dr. Anne W. Snowdon
Dr. Andrezej Sobiesiak
Dr. Jerry H. Sokolowski
Dr. David Ting
Dr. Shengrui Wang

Wilfrid Laurier University
Dr. Pam J. Bryden

INDUSTRY RESEARCHERS

Mr. C. Armenakis
Natural Resources Canada

Dr. Bobbye Baylis
Siemens Canada Limited

Dr. Steven Beale
National Research Council Canada

Mr. Douglas Beirness
Traffic Injury Research Foundation Canada

Mr. Alan Bernardi
Bell Canada

Dr. Patrick Blanchard
Ford Motor Company United States

Mr. Douglas Boomer
Alcan International Limited United Kingdom

Dr. Elhachmi Es-Sadiqi
CANMET-MTL Natural Resources Canada

Mr. Frank Feng
Alcan International Limited Canada

Mr. M. Gambino
Istituto Motori Italy

Dr. Alan German
Transport Canada

Mr. Patrick Girard
National Research Council Canada

Mr. Douglas Boomer
Alcan International Limited United Kingdom

Dr. Elhachmi Es-Sadiqi
CANMET-MTL Natural Resources Canada

Mr. Frank Feng
Alcan International Limited Canada

Mr. M. Gambino
Istituto Motori Italy

Dr. Alan German
Transport Canada

Mr. Patrick Girard
National Research Council Canada

Ms. Christine Duchesne
Recyc RPM Inc. Canada

Mr. Claude Dussault
Société de l’assurance automobile du Québec
INDUSTRY RESEARCHERS

Ms. Lisa Graham
Environment Canada

Dr. Jennifer Jackman
Natural Resources Canada

Dr. Carl Johnson
Ford Motor Company
United States

Mr. Roger Kaufold
Alcoa Technical Center
United States

Dr. Ken Kendall
Aston Martin Lagonda Limited
United Kingdom

Mr. Geoffrey Kime
Hempline Inc.
Canada

Dr. George Lampropoulos
A.U.G. Signals Ltd.
Canada

Mr. Denis Laroche
National Research Council Canada

Ms. Valerie Lee
Infant Toddler Safety Association
Canada

Dr. Hua Liang
Dupont Canada Inc.

M. Éric Maire
Institut National des Sciences Appliquées de Lyon
France

Dr. Pierre Martin
CANMET-MTL, Natural Resources Canada

Mr. Jason McCarthy
Weyerhaeuser Company Limited
Canada

Mr. Éric Michaud
Centreline (Windsor) Limited
Canada

Mr. Christian Moreau
National Research Council Canada

Mr. Daniel Morneau
LPM Technologies Inc.
Canada

Mr. Ron Murphy
Weyerhaeuser Company Limited
Canada

Prof. Lynn Mytelka
UNU/INTECH
Netherlands

Dr. Patric Ouellette
Westport Innovations Inc.
Canada

Dr. Edward Rode
QuestAir Industries Inc.
Canada

Mr. Jim Sabine
Eagle Precision Technologies
Canada

Mr. Nigel Scotchmer
Huys Industries Limited
Canada

Mr. Michael Sweeney
Stelco Inc.
Canada

Mr. Randy Shermet
ATOFINA Canada Inc.

Mr. Ronald Soldaat
Dofasco Inc.
Canada

Prof. Richard Stone
Oxford University
United Kingdom

Dr. Dedo Suwanda
Nexwood Industries Ltd.
CRF Technologies Group Ltd.
Canada

Mr. Leo Tasca
Ministry of Transportation of Ontario

Mr. Mike Thorpe
Stelco Inc.
Canada

Mr. Peter Tsantrizos
PyroGenesis Inc.
Canada

Dr. James Vanderveen
Siemens Canada Limited

Mr. G. Wang
Meridian Technologies Inc.
Canada

Mr. Christopher Wilson
Daimler Chrysler Research & Technology North America
United States
## INDUSTRY PARTNERS

<table>
<thead>
<tr>
<th>Company Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABBA Systems</td>
</tr>
<tr>
<td>Aceram Technologies Inc.</td>
</tr>
<tr>
<td>Aerospace Industries Association of Canada</td>
</tr>
<tr>
<td>Alcan International Limited</td>
</tr>
<tr>
<td>Aluminum Company of America</td>
</tr>
<tr>
<td>Alcoa Technology Center</td>
</tr>
<tr>
<td>Atofina Canada Inc.</td>
</tr>
<tr>
<td>A.U.G. Signals Ltd.</td>
</tr>
<tr>
<td>Automotive Parts Manufacturers Association (APMA)</td>
</tr>
<tr>
<td>BAE Systems Canada Inc.</td>
</tr>
<tr>
<td>Bell Canada</td>
</tr>
<tr>
<td>Bombardier Recreational Products</td>
</tr>
<tr>
<td>BSB Mfg. Limited</td>
</tr>
<tr>
<td>BTS Consulting Engineers</td>
</tr>
<tr>
<td>Camoplast Thermoplastics Group</td>
</tr>
<tr>
<td>CAW/TCA Canada</td>
</tr>
<tr>
<td>CAZ Technologies Co.</td>
</tr>
<tr>
<td>Centerline (Windsor) Limited</td>
</tr>
<tr>
<td>Century Products Co. Ltd.</td>
</tr>
<tr>
<td>C-MAC</td>
</tr>
<tr>
<td>Cobra Machine Tool Co. Ltd.</td>
</tr>
<tr>
<td>Commonwealth Oil Corporation</td>
</tr>
<tr>
<td>Cooper Standard Automotive</td>
</tr>
<tr>
<td>Cosco Inc.</td>
</tr>
<tr>
<td>CRF Technologies Group Ltd.</td>
</tr>
<tr>
<td>DaimlerChrysler Canada Inc.</td>
</tr>
<tr>
<td>DaimlerChrysler AG</td>
</tr>
<tr>
<td>DaimlerChrysler Research &amp; Technology North America Inc.</td>
</tr>
<tr>
<td>De Beers Industrial Diamonds (UK) Ltd.</td>
</tr>
<tr>
<td>Dofasco Inc.</td>
</tr>
<tr>
<td>DuPont Canada Inc.</td>
</tr>
<tr>
<td>Dynamic Digital Design Inc.</td>
</tr>
<tr>
<td>Dynetek Industries Ltd.</td>
</tr>
<tr>
<td>Eagle Precision Technologies Inc.</td>
</tr>
<tr>
<td>Ford Motor Company</td>
</tr>
<tr>
<td>Ford Research</td>
</tr>
<tr>
<td>General Motors of Canada Limited</td>
</tr>
<tr>
<td>Hempline Inc.</td>
</tr>
<tr>
<td>Hymarc 3D Vision Systems</td>
</tr>
<tr>
<td>Infineon Technologies AG</td>
</tr>
<tr>
<td>Ingenia Polymers, Inc.</td>
</tr>
<tr>
<td>ISPAT Sidbec Inc.</td>
</tr>
<tr>
<td>LPM Technologies Inc.</td>
</tr>
<tr>
<td>Louisiana Pacific Corp. Ltd.</td>
</tr>
<tr>
<td>Magna International Inc.</td>
</tr>
<tr>
<td>Massiv Die-Form Automated Systems</td>
</tr>
<tr>
<td>Meridian Magnesium</td>
</tr>
<tr>
<td>Omini-Tech CMM Services (Canada) Inc.</td>
</tr>
<tr>
<td>Origin International Inc.</td>
</tr>
<tr>
<td>PyroGenesis Inc.</td>
</tr>
<tr>
<td>QuestAir Technologies Inc.</td>
</tr>
<tr>
<td>Recyc RPM</td>
</tr>
<tr>
<td>Rio Tinto Iron &amp; Titanium Inc.</td>
</tr>
<tr>
<td>Sensor Technology Limited</td>
</tr>
<tr>
<td>Siemens Canada Limited</td>
</tr>
<tr>
<td>Soft dB Inc.</td>
</tr>
<tr>
<td>Solidworks Inc.</td>
</tr>
<tr>
<td>Stelco Inc. (Hilton Works)</td>
</tr>
<tr>
<td>Stuart Energy Systems Inc.</td>
</tr>
<tr>
<td>Sulzer Metco (Westbury) Inc.</td>
</tr>
<tr>
<td>Tencar Automation Ltdée</td>
</tr>
<tr>
<td>TISEC Inc.</td>
</tr>
<tr>
<td>Canadian Autoparts Toyota Inc.</td>
</tr>
<tr>
<td>Toyota Canada Inc.</td>
</tr>
<tr>
<td>Toyota Motor Manufacturing Canada Inc.</td>
</tr>
<tr>
<td>Tremcour Neutrotest Inc.</td>
</tr>
<tr>
<td>Triumph Tool Ltd.</td>
</tr>
<tr>
<td>Van-Rob Stampings Inc.</td>
</tr>
<tr>
<td>VON Windsor-Essex County Branch</td>
</tr>
<tr>
<td>Westport Innovations Inc.</td>
</tr>
<tr>
<td>Westroc Industries Inc.</td>
</tr>
<tr>
<td>Weyerhaeuser</td>
</tr>
<tr>
<td>Wittke Waste Equipment</td>
</tr>
<tr>
<td>Xerox Canada Ltd.</td>
</tr>
<tr>
<td>Xilinx Inc.</td>
</tr>
</tbody>
</table>
PUBLIC SECTOR PARTNERS

British Columbia Hydro & Power Authority (BC Hydro)
Calgary Regional Health Authority (CRHA)
Chatham-Kent Health & Social Services
Essex, Kent and Lambton District Health Council
Infant & Toddler Safety Association
Insurance Corporation of British Columbia
Insurance Institute for Highway Safety
Materials and Manufacturing Ontario (MMO)
National Research Council Canada (NRC)
NRC Industrial Materials Institute (IMI)
NRC Integrated Manufacturing Technologies Institute (IMTI)
NRC Institute for National Measurement Standards (INMS)
Natural Resources Canada (NRCan) Minerals & Metals Sector
Natural Resources Canada (NRCan) Geomatics Canada
Ontario Ministry of Economic Development & Trade
Ontario Ministry of Energy, Science & Technology
Ontario Ministry of Transportation
Ontario Neurotrauma Foundation
Safe Kids Canada
Saskatchewan Government Insurance (SGI)
Société de l'Assurance Automobile du Québec
Traffic Injury Research Foundation of Canada
Transport Canada Safety & Security
U.S. Department of Transportation - National Highway Traffic Safety Administration
Windsor-Essex County Health Unit
Windsor-Essex County Injury Prevention Coalition
FINANCIALS

PricewaterhouseCoopers LLP
Chartered Accountants
245 Ouellette Avenue
Suite 300
Windsor, Ontario
Canada N9A 7J4
Telephone +1 (519) 585 8900
Facsimile +1 (519) 258 5457

May 24, 2002

Auditors' Report

To the Directors of the
AUTO21 Network of Centres of Excellence

We have audited the balance sheet of the AUTO21 Network of Centres of Excellence ("AUTO21") as at March 31, 2002 and the statements of operations and changes in net assets and cash flows for the year then ended. These financial statements are the responsibility of AUTO21's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of AUTO21 as at March 31, 2002 and the results of its operations and its cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.

PricewaterhouseCoopers LLP
Chartered Accountants

PricewaterhouseCoopers refers to the Canadian firm of PricewaterhouseCoopers LLP and other members of the worldwide PricewaterhouseCoopers organization.
FINANCIALS

AUTO21 Network of Centres of Excellence

**Balance Sheet**
As at March 31, 2002

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>(unaudited)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Current Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash (note 3)</td>
<td>3,246,559</td>
<td>3,951,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>19,352</td>
<td>—</td>
</tr>
<tr>
<td><strong>Total Current Assets</strong></td>
<td>3,265,911</td>
<td>3,951,000</td>
</tr>
<tr>
<td><strong>Property, plant and equipment (note 4)</strong></td>
<td>279,619</td>
<td>—</td>
</tr>
<tr>
<td><strong>Total Assets</strong></td>
<td>3,545,530</td>
<td>3,951,000</td>
</tr>
<tr>
<td><strong>Liabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Current liabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts payable and accrued liabilities</td>
<td>36,367</td>
<td>—</td>
</tr>
<tr>
<td>Deferred revenue (note 5)</td>
<td>3,062,091</td>
<td>3,951,000</td>
</tr>
<tr>
<td><strong>Total Current Liabilities</strong></td>
<td>3,098,458</td>
<td>3,951,000</td>
</tr>
<tr>
<td><strong>Net assets</strong></td>
<td>447,072</td>
<td>—</td>
</tr>
<tr>
<td><strong>Total Liabilities</strong></td>
<td>3,545,530</td>
<td>3,951,000</td>
</tr>
</tbody>
</table>

Approved by the Directors

Dr. Inge L.H. Hansson  
Director

Mr. Gerard Lukassen  
Director
FINANCIALS

AUTO21 Network of Centres of Excellence

Statement of Operations and Changes in Net Assets
For the year ended March 31, 2002

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td><strong>Revenues</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Assistance - NSERC</td>
<td>3,615,682</td>
<td>—</td>
</tr>
<tr>
<td>Government Assistance - SSHRC</td>
<td>1,205,227</td>
<td>—</td>
</tr>
<tr>
<td>University of Windsor Contributions (note 6)</td>
<td>432,300</td>
<td>—</td>
</tr>
<tr>
<td>Interest earned and other revenue</td>
<td>88,592</td>
<td>—</td>
</tr>
<tr>
<td><strong>Total Revenues</strong></td>
<td>5,341,801</td>
<td>—</td>
</tr>
<tr>
<td><strong>Expenses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projects</td>
<td>4,469,206</td>
<td>—</td>
</tr>
<tr>
<td>Operating</td>
<td>376,229</td>
<td>—</td>
</tr>
<tr>
<td>Networking</td>
<td>49,294</td>
<td>—</td>
</tr>
<tr>
<td><strong>Total Expenses</strong></td>
<td>4,894,729</td>
<td>—</td>
</tr>
<tr>
<td><strong>Net income</strong></td>
<td>447,072</td>
<td>—</td>
</tr>
<tr>
<td><strong>Net assets - Beginning of year</strong></td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Net assets - End of year</strong></td>
<td>447,072</td>
<td>—</td>
</tr>
</tbody>
</table>
## FINANCIALS

AUTO21 Network of Centres of Excellence

**Statement of Cash Flows**

For the year ended March 31, 2002

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2001 $</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td>(unaudited)</td>
</tr>
<tr>
<td><strong>Cash flows from operating activities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net income</td>
<td>447,072</td>
<td>—</td>
</tr>
<tr>
<td>Adjustments for amortization</td>
<td>52,559</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td><strong>499,631</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Net change in non-cash working capital</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decrease (increase) in prepaid expenses</td>
<td>(19,352)</td>
<td>—</td>
</tr>
<tr>
<td>Increase (decrease) in accounts payable and accrued liabilities</td>
<td>36,367</td>
<td>—</td>
</tr>
<tr>
<td>Deferred revenue</td>
<td>(888,909)</td>
<td>3,951,000</td>
</tr>
<tr>
<td></td>
<td><strong>(372,263)</strong></td>
<td>3,951,000</td>
</tr>
<tr>
<td><strong>Cash flows from investing activities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquisition of computer equipment</td>
<td>(27,178)</td>
<td>—</td>
</tr>
<tr>
<td>Acquisition of furniture and fixtures</td>
<td>(41,500)</td>
<td>—</td>
</tr>
<tr>
<td>Acquisition of leasehold improvements</td>
<td>(263,500)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td><strong>(332,178)</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Net (decrease) increase in cash</strong></td>
<td><strong>(704,441)</strong></td>
<td>3,951,000</td>
</tr>
<tr>
<td><strong>Cash - Beginning of year</strong></td>
<td>3,951,000</td>
<td>—</td>
</tr>
<tr>
<td><strong>Cash - End of year</strong></td>
<td>3,246,559</td>
<td>3,951,000</td>
</tr>
</tbody>
</table>
FINANCIALS

AUTO21 Network of Centres of Excellence

Notes to Financial Statements
For the year ended March 31, 2002

1. Nature of Operations

AUTO21, one of the Federal Networks of Centres of Excellence, commenced operations in fiscal 2001/2002 through an agreement with the Natural Sciences and Engineering Research Council ("NSERC") and the Social Sciences and Humanities Research Council ("SSHRC"). AUTO21 is in the first year of its initial seven-year research cycle. AUTO21 will undergo its first midterm review in the third year of its initial research cycle.

2. Significant Accounting Policies

Property, plant and equipment
Property, plant and equipment assets are recorded at cost and amortized over their useful lives as follows:

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Amortization Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer equipment</td>
<td>3 years straight-line</td>
</tr>
<tr>
<td>Furniture and fixtures</td>
<td>7 years straight-line</td>
</tr>
<tr>
<td>Leasehold improvements</td>
<td>7 years straight-line</td>
</tr>
</tbody>
</table>

Government Assistance
AUTO21 follows the deferral method of accounting for government contributions. These restricted contributions are recognized as revenue in the period in which the related expenses are incurred.

Financial Instruments
The organization’s financial instruments consist of cash, accounts receivable, accounts payable and deferred revenue. It is management’s opinion that the entity is not exposed to significant interest, currency or credit risks arising from these financial instruments.

Use of Estimates
The preparation of financial statements in conformity with Canadian generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

3. Cash

Cash represents amounts held in trust by the University of Windsor in accordance with the host agreement.

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Restricted cash</td>
<td>3,079,296</td>
<td>3,951,000</td>
</tr>
<tr>
<td>Unrestricted cash</td>
<td>167,263</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>3,246,559</td>
<td>3,951,000</td>
</tr>
</tbody>
</table>

Restricted cash represents government assistance received, which is subject to NSERC and SSHRC expenditure eligibility requirements.
**FINANCIALS**

**AUTO21 Network of Centres of Excellence**

**Notes to Financial Statements**
For the year ended March 31, 2002

### 4. Property, plant and equipment

<table>
<thead>
<tr>
<th></th>
<th>Cost $</th>
<th>Accumulated amortization $</th>
<th>Net $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer equipment</td>
<td>27,178</td>
<td>9,059</td>
<td>18,119</td>
</tr>
<tr>
<td>Furniture and fixtures</td>
<td>41,500</td>
<td>6,000</td>
<td>35,500</td>
</tr>
<tr>
<td>Leasehold improvements</td>
<td>263,500</td>
<td>37,500</td>
<td>226,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>332,178</td>
<td>52,559</td>
<td>279,619</td>
</tr>
</tbody>
</table>

### 5. Deferred Revenue

<table>
<thead>
<tr>
<th></th>
<th>2002 $</th>
<th>2001 $ (unaudited)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance - Beginning of year</td>
<td>3,951,000</td>
<td>—</td>
</tr>
<tr>
<td>Contributions received from NSERC</td>
<td>2,949,000</td>
<td>2,963,250</td>
</tr>
<tr>
<td>Contributions received from SSHRC</td>
<td>983,000</td>
<td>987,750</td>
</tr>
<tr>
<td><strong>Total Government Funds</strong></td>
<td>3,932,000</td>
<td>3,951,000</td>
</tr>
<tr>
<td>Less: Amount recognized as government assistance in year</td>
<td>4,820,909</td>
<td>—</td>
</tr>
<tr>
<td><strong>Balance - End of year</strong></td>
<td>3,062,091</td>
<td>3,951,000</td>
</tr>
</tbody>
</table>

### 6. Contributions from the Host Institution

In accordance with AUTO21’s Host Agreement with the University, the University has agreed to provide AUTO21 with annual funding and in kind contributions.

During the year, AUTO21 received funding and in kind contributions from the University. The value of the in kind contribution pertaining to the Program Leader’s salary has not been recognized in these financial statements.

### 7. Contingency

AUTO21 is contingently liable under the terms of the Host Agreement with the University of Windsor ("the University") to reimburse the University for reconverting all space facilities presently occupied by AUTO21 in the event of relocation.