

APPENDIX A

Stakeholder List

Appendix A – Stakeholder List

Name (Agency or Firm)	Prov	Address	Contact Name	Fax	Phone	Email
Adtech Manufacturing Ltd.	NB	PO Box 3772, Stn. B, Fredericton NB E3A 5L8	Bill Chamberlain, Operations Manager	506-452-0891	506-452-0126	adtech@nbnet.nb.ca
Advanced Business Services Ltd.	NB	800 Hanwell Road, Suite C, Fredericton NB E3B 2R7	Stephen Murray	506-452-9820	506-452-0551	absadmin@abs.ca
Advanced Monitoring Technologies	NB	127 Rocky Road, Keswick Ridge, NB E6L 1V1	Ernie Adsett	506-363-3069	506-363-3068	ernie@amt.nb.ca
Advatek Systems Inc.	NB	PO Box 966, 1560 Main Street, Moncton NB E1C 8N8	Terry LeBlanc	506-858-9271	506-857-0909	advatek@nbnet.nb.ca
Anywhere Group Inc.	NB	15 Market Square Suite 1602, Saint John NB E2L 1E8	John Gaudet, Dir. of Sales	506-643-6605	506-643-6600	john.gaudet@anywaregroup.com
Approach Navigation System	NB	409 Dieppe Blvd., Dieppe NB E1A 6P9	Brian Ahern	506-854-0030	506-854-2967	bahern@approach.nb.ca
Armour Transport Ltd	NB	689 Edinburgh Dr, Moncton E1E 2L4	Angus Armour	506-859-9339	506-857-0205	aarmour@armour.ca
Atlantic Canada Opportunities Agency (ACOA – APECA) – Head Office	NB	Blue Cross Centre, 644 Main St, PO Box 6051, Moncton E1C 9J8	David Slade, Director – General, Policy	506-851-7403	506-851-6141	dslade@acoa-apeca.gc.ca
Atlantic Canada Opportunities Agency (ACOA – APECA) – New Brunswick Office	NB	570 Queen St, PO Box 7303, Fredericton E3B 5A6	Victor Paul-Elias, Policy Analyst	506-452-3285	506-452-3037	VElias@acoa-apeca.gc.ca
Atlantic Provinces Chamber of Commerce	NB	236 St George St, Suite 110, Moncton E1C 1W1	Sean Cooper, Executive Director	506-857-6131	506-857-3980	apcced@auracom.com
Atlantic Provinces Trucking Association	NB	407 Dieppe Blvd, Dieppe E1A 6P8	Ralph Boyd, President	506-853-7424	506-866-1679	rboyd@apta.ca
Belledune Port Authority	NB	261 Shannon Drive, Belledune, NB, E8G 2W1	Captain Wynford Goodman Director of Operations	506-522-0803	506-522-1201	goodman@portofbelledune.ca
Brookville Carriers Inc – Sales & Marketing	NB	Spruce Lake Industrial Park, 66 Alloy Dr, PO Box 3039 Stn B, Saint John E2M 5Z9	John Travis, Vice President	506-634-5614	506-633-7555	sales@brookville.ca
Business New Brunswick - Knowledge Industry & Technology	NB	Centennial Bldg, PO Box 6000, King St, Fredericton E3B 5H1	Len Weeks, Manager	506-453-4845	506-453-2727	len.weeks@gnb.ca

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Calais-St Stephen Area International Border Crossing Public Advisory Committee - New Brunswick Department of Transportation	NB	PO Box 6000, 670 King St, Fredericton E3B 5H1	Brian McEwing, Director Planning & Land Management	506-444-5207	506-453-2754	brian.mcewing@gnb.ca
Canada Customs			Austin MacPhee		506-636-5595	Austin.Macphee@ccra-adrc.gc.ca
Canadian Automobile Association - CAA Maritimes	NB	737 Rothesay Ave, PO Box 310, Saint John E2L 3Y2	Steve McCall, President	506-653-9500	506-634-1400	smccall@caa.maritimes.ca
Canadian Manufacturers & Exporters, NB Division	NB	Suite 420, 1133 St. George Blvd. Moncton, NB, E1E 4E1	Blain Lewis, Vice President	506-857-3059	506-857-3056	nb@cme-mec.ca
CARIS Universal Systems	NB	264 Rookwood Ave., Fredericton NB E3B 2M2	Heather MacLean	506-459-3849	506-458-8533	info@caris.ca
City of Fredericton - Development Services	NB	397 Queen St, PO Box 130, Fredericton E3B 4Y7	Frank Flanagan, Director	506-460-2126	506-460-2028	frank.flanagan@city.fredericton.nb.ca
City of Fredericton	NB		Roger Shannon		506-460-2020	shannonr@city.fredericton.nb.ca
City of Moncton	NB		Stephane Thibodeau		(506) 383-6718	stephane.thibodeau@moncton.org
City of Moncton- Codiak Transit Commission	NB		John Allain	506-859-2680	506-857-2008	john.allain@moncton.org
City of Moncton - CN Rail	NB		Will Myers	506-853-2234	506-853-2214	will.myers@cn.ca
City of St. John	NB		Eric Giffin, Municipal Senior Project officer		506-658-2896	eric.giffin@cityofsaintjohn.com
Coastal Transport	NB	PO Box 7235, Saint John NB E2L 4S6	Murray Ryder	506-642-0526	506-642-0523	mryder@nbnet.nb.ca
Comdev Wireless	NB	328 Urquhart Ave., Moncton NB E1H 2R6	Guy Beaulieu, Sales Manager	506-863-1524	506-857-1417	guy.beaulieu@wireless.comdev.ca
Dalhousie Port Authority	NB					
Day & Ross Inc	NB	398 Main St, Hartland E7P 1C6	Mike Likely, V.P of Information Systems	506-375-4945	506-375-4401	mblikely@dayandrossinc.ca
Dramis Network Cabling Ltd.	NB	PO Box 1162, 500 St. George Street Moncton NB E1C 8P9	Murray Simard	506-383-4916	506-383-4040	msimard@dramis.com
e-Hub.net	NB	331 Elmwood Drive, Suite 4-237, Moncton NB E1A 1X6	Marc Maurice	506-861-0997	506-388-4199	info@e-hub.net

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Environment and Local Government New Brunswick - Policy, Educational Services and Communications	NB	Marysville Place, PO Box 6000, 20 McGloin St, Fredericton E3B 5H1	Michael Merritt, Executive Director	506-453-3676	506-453-8762	mike.merritt@gnb.ca
Greater Moncton Airport Authority Inc	NB	1575 Champlain St, Unit 12, Dieppe E1A 7P5	Rob Robichaud, President & CEO	506-856-5461	506-856-5440	robir@nbnet.nb.ca
Ibridge Inc.	NB	480 Main Street, Woodstock NB E7M 2C1	Paul Dore, President	506-328-4602	506-328-4282	pdore@ibridge.net
Institute of Transportation Engineers - Atlantic Provinces Section	NB	c/o Geoplan Consultants Inc, 919 Prospect St, Fredericton E3B 2T7	Karen Robichaud, President	506-450-4838	506-451-0055	geoplan@geoplan.nb.ca
Intelisys Aviation Systems Inc.	NB	815 Bombardier Street, Shediac NB E4P 1H9	Ralph Eisenschmid, President	506-533-1470	506-532-8515	info@ameliasoftware.com
Investment and Exports New Brunswick - Planning and Research	NB	Centennial Bldg, PO Box 6000, King St, Fredericton E3B 5H1	Doug Holt, Director	506-444-5299	506-444-5373	doug.holt@gnb.ca
J.D. Irving	NB	300 Union Street, P.O. Box 5777, Saint John, NB E2L 4M3	Robert Youden, VP Irving Transportation Services	506-632-5150	506-633-5540	youden.bob@jdirving.com
LearnStream Inc.	NB	420 York St., 3rd Floor Chestnut Complex, Fredericton NB E3B 3P7	Phillip Lambert	506-447-4911	506-447-4900	info@learnstream.com
Nav Canada - Eastern Region - Atlantic	NB	222 Old Coach Road, Riverview E1B 4G2	Tony Mason, Regional Safety Manager	506-867-7081	506-867-7055	masondt@navcanada.ca
NB Southern Railway	NB	11 Gifford Rd, PO Box 5666, Saint John E2L 5B6	Dale Thibodeau, General Manager	506-632-5818	506-632-4712	thibodeau.dale@sunburytransport.com
New Brunswick Community College - Dieppe	NB	505 College Street, Dieppe, NB, E1A 6X2	Raymond Dufour, Instructor Business Technology Transportation	506-856-2125	506-856-2201	raymond.dufour@gnb.ca
New Brunswick Department of Public Safety	NB	P.O. Box 6000, Fredericton, N.B.	Bill Adams		506-453-5376	Bill.Adams@gnb.ca

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New Brunswick Department of Public Safety	NB	P.O. Box 6000, Fredericton, N.B.	Eric Howatt, CVO Reg.		506-457-7822	Eric.Howatt@gnb.ca
New Brunswick Department of Public Safety	NB		Ron Richard			Ron.Richard@gnb.ca
New Brunswick Department of Public Safety	NB		John Goggin		506-453-2407	John.Goggin@gnb.ca
New Brunswick Department of Transportation - Policy	NB	670 King St, PO Box 6000, Fredericton E3B 5H1	Dave MacFarlane, Maintenance & Traffic		506-453-2600	Dave.Macfarlane@gnb.ca
New Brunswick Department of Transportation - Policy	NB	670 King St, PO Box 6000, Fredericton E3B 5H1	Don Mason, Maintenance & Traffic		506-453-2600	Don.Mason@gnb.ca
New Brunswick Department of Transportation - Policy	NB	670 King St, PO Box 6000, Fredericton E3B 5H1	Tyrone Parsons, Radio Communications		506-453-3393	Tyrone.parsons@gnb.ca
New Brunswick East Coast Railway	NB	34 Rail Road, Campbellton E3N 3G7	Francis Mimeault, General Manager	506-753-0462	506-753-0454	fmimeaul@cfqc.com
Royal Canadian Mounted Police	NB	NCO1C Traffic Services, PO Box 3900, E3B 4Z8	Staff Sergeant Robert Theriault	506-452-3312	506-452-3421	bob.theriault@rcmp-grc.gc.ca
Saint John Harbour Bridge Authority	NB	29 King St. W, PO Box 3728, Stn B, Saint John E2M 5C1	Jack Keir, General Manager	506-635-1322	506-635-1320	sjhb@nbnet.nb.ca
Saint John Parking Commission	NB	PO Box 1971, Saint John E3L 4L1	Richard Smith, Administrator	506-649-7938	506-658-2897	richard.smith@city.saint-john.nb.ca
Saint John Port Authority	NB	133 Prince William St, 5th Floor, Saint John E2L 2B5	Al Soppitt, President & CEO / Pat LeBlanc, Corporate Secretary	506-636-4443	506-636-4869	ags@sjport.com
Saint John Transit Commission	NB	PO Box 3860, Stn B, Saint John E2M 5C2	Frank McCarey, General Manager	506-658-4704	506-658-4710	sjtrans2@nbnet.nb.ca
SMT (Eastern) Limited - Head Office	NB	100 Midland Dr, Dieppe E1A 6X4	Don Carmichael, General Manager	506-859-5111	506-859-5100	carmichael.don@smtbus.com

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Sunbury Transport Limited	NB	PO Box 905 Stn A, Fredericton E3B 5B4	Dale Thibodeau	506-458-2542	506-453-1133	thibodeau.dale@sunburytransport.com
The DPL Group	NB	1216 Sand Cove Road, Saint John NB E2M 5V8	Rick Baker, GM, Research & Development & Production	506-635-1057	506-635-1055	marketing@dpl.ca
Tourism Association of New Brunswick	NB	PO Box 23001 Fredericton, NB, E3B 7B3	Real Robichaud	506-459-3634	506-458-5646	real@tianb.com
Transport Canada - Atlantic Region Coordination	NB	95 Foundry St, PO Box 42, Moncton E1C 8K6	Roger Saunders, Transportation Analyst	506-851-7576	506-851-7573	saunder@tc.gc.ca
Trip Data and Safety Management Inc.	NB	PO Box 29098, RPO North End, 383 Baig Blvd. Moncton NB E1G 4R3	Andy Brownell	506-853-7612	506-853-7522	tdsm@tdsm.com
University of New Brunswick - UNB Transportation Group	NB	Head Hall, Room D126, PO Box 4400, Fredericton E3B 5A3	Eric Hildebrand	506-447-3440	506-452-6229	edh@unb.ca
Ajilon Canada - DGS Information Technology	NF	47 New Gower Street St. John's Newfoundland A1C 1J4	P. Young	709-754-4240	709-722-1871	pyoung@dgsinfo.com
Aliant Inc. - NewTel Communications & Public Affairs	NF	PO Box 2110, St. John's A1C 5H6	Harry Connors, Vice President	709-739-3955	709-739-2837	harry.connors@aliant.ca
Beothuk Data Systems Ltd.	NF	17 Pippy Place, PO Box 8951, St. John's, Newfoundland A1B 3R9	R. Benson	709-753-3333	709-753-9061	rbenson@beothuk.com
Briggs Aero Ltd.	NF	Gander International Airport PO Box 574, Gander Newfoundland A1V 2E1	K. Smith	709-256-8271	709-256-8147	ksmith@briggsaero.com
Canadian Manufacturers & Exporters, Newfoundland Division	NF	1st Floor, Parson's Bldg, 90 O'Leary Avenue, St. John's, NF A1B 2C7	Tina Pomroy	709-772-3213	709-772-3337	tina.pomroy@cme-mec.ca
Canpolar East	NF	702 Water Street, St. John's NF A1E 1C1		709-722-1138	709-722-6067	info@canpolar.com

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City of Corner Brook - Engineering Services Department	NF	PO Box 1080, Corner Brook A2H 6E3	James Warford, Coordinator	709-637-1502	709-637-1626	jwarford@citycornerbrook.nf.ca
City of St. John's - Engineering & Planning	NF	City Hall, 10 New Glower St, PO Box 908, St. John's A1C 5M2	Robin King, Transportation Engineer	709-576-8625	709-576-8658	rking@city.st-johns.nf.ca
ColabNet Collaborative Network Technologies	NF	55 Bond Street, Suite 202, St. John's Newfoundland A1C 5V3		709-754-7482	709-754-7406	info@colabnet.com
Consilient Technologies Corp.	NF	Suite 105, 66 Kenmound Rd., PO Box 2172, Stn C St. John's NF A1C 6E6			709-576-1706	info@consilient.net
Consolidated Technologies Ltd.	NF	37 Stavanger Drive, St. John's Newfoundland, A1A 5E8	Gary Dinn, President	709-576-0746	709-576-0748	mail@contechnav.com
Earth Information Technologies (NF) Limited	NF	20 Mercers Drive, St. John's NF A1A 2X1	Mr. Robert Leeman	709-576-2546	709-738-1638	geomatics@eitnf.com
Emergency Measures Organization - Department of Municipal & Provincial Affairs	NF	P.O. Box 8700, St. John's, NF A1B 4J6	Elizabeth Peckham, Director	709-729-3857	709-729-3703	niemo@mail.gov.nf.ca
Futureworks Inc.	NF	24 OceanView Hill, PO Box 1012, Torbay, NF A1K 1K9	K. McBride	709-772-2462	709-437-1877	kmcbride@fastfwd.com
Gander International Airport Authority Inc	NF	1000 James Blvd, Gander A1V 1W8	Gary Vey, President & CEO	709-256-8092	709-256-2750	QX.Airport@nf.sympatico.ca
Guigne Technologies Ltd.	NF	Box 13, Site 21, RR#1, 685 St. Thomas Line, Paradise NF A1L 1C1	Dr. Jacques Guigne	709-895-3999	709-895-3819	GIL@guigne.com
Hunt's Transport Ltd	NF	PO Box 81, Paradise A1L 1C4	Greer Hunt	709-747-5516	709-747-4868	hunts@firstcity.net
Instrumar Limited	NF	PO Box 13246 St. A, 39 Pippy Place, 3rd Floor, St. John's NF A1B 4A5	Michael Chan	709-726-8613	709-726-8460	michael.chan@instrumar.com

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Memorial University - Faculty of Engineering & Applied Science - Ocean Engineering Research Centre	NF	St. John's A1C 5S7	Claude Daley, Director	709-737-2116	709-737-8805	cdaley@engr.mun.ca
Newfoundland & Labrador Department of Environment - Policy & Planning	NF	Confederation Building, PO Box 8700, Prince Philip Dr, St. John's A1B 4J6	John Drover, Director	709-729-6969	709-729-1090	jdrover@gov.nf.ca
Newfoundland & Labrador Department of Industry, Trade & Rural Development - Information Services	NF	Confederation Building, PO Box 8700, Prince Philip Dr, St. John's A1B 4J6	Tim Summers, Manager	709-729-4858	709-729-4819	tsummers@mail.gov.nf.ca
Newfoundland & Labrador Department of Tourism, Culture & Recreation - Tourism	NF	Confederation Building, PO Box 8700, Prince Philip Dr, St. John's A1B 4J6	Brenda Walsh, MC & IT Specialist	709-729-0057	709-729-2777	bbwalsh@mail.gov.nf.ca
Newfoundland & Labrador Department of Works, Services & Transportation - Goose Bay Region	NF	PO Box 3014 Stn B, Happy Valley-Goose Bay A0P 1E0	Dean Osmond, Regional Director	709-896-513	709-896-7840	osmondjd@mail.gov.nf.ca
Newfoundland & Labrador Department of Works, Services & Transportation - Policy & Planning	NF	Confederation Building, PO Box 8700, Prince Philip Dr, St. John's A1B 4J6	Wanda Lundrigan, Director of Policy and Planning	709-729-0283	709-729-5344	lundriganw@mail.gov.nf.ca
Newfoundland & Labrador Department of Works, Services & Transportation - Policy & Planning	NF		Tom Beckett, Deputy Registrar Motor Vehicles	709-729-6955	709-729-2520	beckettt@mail.gov.nf.ca
Newfoundland & Labrador Department of Works, Services & Transportation - Policy & Planning	NF		Keith White- Executive Director Roads	709-729-0283	709-729-5399	whitek@gov.nf.ca

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Newfoundland & Labrador Department of Works, Services & Transportation - Policy & Planning	NF		Cluney Mercer - Director of Construction	709-729-0283	709-729-6321	mercercg@gov.nf.ca
Newfoundland & Labrador Department of Works, Services & Transportation - Policy & Planning	NF	Confederation Building, 6th Floor, West Block, P.O. Box 8700, St. John's, Newfoundland A1B 4J6	Neil Campbell - Director of Maintenance	709-729-6934	709-729-3636	campbelln@mail.gov.nf.ca
NF Carriers Association	NF		Gerry Dowden			
NF & Lab. Independent Truckers	NF		Jon Summers			
Northstar Technical Inc.	NF	687 Water Street, PO Box 37052, St. John's NF A1E 1C2		709-738-6443	709-738-6440	info@northstar-technical.com
Pathix ASP Inc.	NF	34 Harvey Road, St. John's NF, A1C 5P3	Mr. Paul Dube, VP Corp. Development	709-724-8545	709-724-8500/ 1- 866-724-8500	inquiries@pathix.com
Provincial Airlines	NF	Torbay Airport, PO Box 9460, St. John's A1A 2Y4	Roy Symonds, Service Manager	709-726-0105	709-726-3712	
Puddister Trading Ltd	NF	23 Springdale St, St. John's A1C 5H5	Gerry Puddister, Owner	709-722-8008	709-722-4000	puddister.ncl@nf.sympatico.ca
St. John's International Airport	NF	80 Terminal Access Rd, PO Box 301, St. John's A1A 3R1	Jim Roche, General Manager	709-758-8521	709-758-8500	jroche@stjohns-airport.nf.ca
St. John's Port Authority	NF	1 Water St, PO Box 6178, St. John's A1C 5X8	Sean Hanrahan, President & CEO	709-738-4748	709-738-4782	shanrahan@sjsa.com
St. John's Regional Fire Department	NF	PO Box 908, C72, St. John's A1C 5M2	Jack Hickey, Deputy Chief	709-576-8635	709-576-8644	ghickey@city.st-johns.nf.ca
St. John's Transportation Commission - Metrobus	NF	245 Freshwater Rd, St. John's A1B 1B3	Janet Bradshaw, General Manager	709-722-0018	709-570-2063	janetb@metrobus.com
Stratos Mobile Networks	NF	34 Glencoe Drive, St. John's NF A1N 4S8		709-748-4305	709-748-4233	info@stratos.ca
Acadian Line Limited	NS	6040 Amon Street, Halifax, Nova Scotia, B3K 1T8	Brian Hacket			

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Air Canada Regional	NS	310 Goudey Drive, Halifax International Airport Enfield, Nova Scotia, B2T 1E4	Joseph Randell, President & CEO			
Air Nova - Marketing	NS	Halifax International Airport, 310 Goudey Dr, Enfield B2T 1E4	Rick Flynn, Vice President	902-873-2098	902-873-4911	RicFlynn@airnova.ca
Atlantic Container Line AB	NS	1969 Upper Water St, Suite 1608, Halifax, Nova Scotia, B3J 3R7	Fritz King		902-420-9259	
Atlantic Television System (ATV) Atlantic Satellite Network (ASN)	NS	2885 Robie St, PO Box 1653, Halifax B3J 2Z4	Ron MacNeil, IT Manager	902-453-4000	902-454-3302	rmacneil@ctv.ca
Autoport Limited	NS	PO Box 9, Eastern Passage, Halifax County, Nova Scotia, BOJ 1L0	Des Gomes			
Cabco Communications Group	NS	4 MacDonald Ave., Dartmouth, NS B3B 1C5	Don Reid, Data Proj. Mgr.	902-468-2557	902-468-2252/ 902-383-4574/ 1-800-675-4025	dreid@cabco.ca
Canada Customs and Revenue Agency	NS	5th Floor CIBC Building, 1809 Barrington Street, Halifax, NS, B3J 3K8	Dan Coffin, Director, Customs Atlantic Region	902-426-5042	902-426-2914	dan.coffin@ccra-adrc.ca
Canada Customs and Revenue Agency	NS	1809 Barrington St., CIBC Building 5th Floor, Halifax B3J 3K8	Anna LeBlanc	902-426-5527	902-426-1824	Anna.LeBlanc@ccra-adrc.gc.ca
Canada Customs and Revenue Agency - Marine Operations and Commercial Client Customs Services	NS	PO Box 3080, Halifax B3J 3G6	Sue Horne, Client Services Officer	902-426-8825	902-426-7340	sue.horne@ccra-adrc.gc.ca
Cape Breton & Central Nova Scotia Railway	NS	121 King St, Stellerton B0K 1S0	Peter Touesnard, Business Development Manager	902-752-6665	902-752-3357	ptouesnard@railamerica.com
CN Rail	NS	3833 Barrington Street, P.O. Box 8296 Station A, Halifax, NS, B3K 5M1	Shawn McMahon, Manager CN Intermodal	902-428-5218	902-428-5270	
Core Networks	NS	55 Chain Lake Drive, Suite 19, Halifax, NS B3S 1B3		902-481-5799	902-468-6397/ 1-866-855-2673	info@corenetworks.com

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Council of Atlantic Premiers	NS	Royal Bank Building, 5161 George St, PO Box 2044, Halifax B3J 2Z1	Glenn Davis	902-424-8976	902-424-7600	gdavis@cmp.ca
Diaphonics	NS	3045 Robie Street, Suite 6, Halifax, NS B3K 4P6	Jeremy Bernard	902-484-3542	902-452-1187	Jeremyb@diaphonics.com
Eastern Canada Towing	NS	PO Box 337, Halifax, Nova Scotia, B3J 2N7	Paul Ritcey, President	902-423-5123	902-423-7381	ritcey@ectug.com
Emergency Measures Organization - Nova Scotia Headquarters	NS	PO Box 2581, Halifax B3J 1N5	Mike Myette, Deputy Director / 911 Manager	902-424-5376	902-424-6206	myettemj@gov.ns.ca
Environment Canada - Corporate Planning	NS	Queen Square, 45 Alderney Dr, Dartmouth B2Y 2N6	Zal Davar, Policy and Planning Advisor	902-426-2690	902-426-2284	zal.davar@ec.gc.ca
Fairview Cove Container Terminal Cerescorp Inc.	NS	PO Box 8958, Station A, Halifax, Nova Scotia, B3J 2X7	Calvin Whidden			
Fisheries and Oceans Canada - Canadian Coast Guard - Maritimes Region	NS	176 Portland St, PO Box 1035, Dartmouth B2Y 4T3	Gary Walsh, Regional CG Planning Officer	902-426-4312	902-426-4370	walshga@mar.dfo-mpo.gc.ca
Freight 2000	NS	PO Box 789, Elmsdale B0N 1M0	George Hill	902-758-1543	902-758-2910	freight2@1star.ca
Halifax International Airport Authority	NS	1 Bell Boul, 3rd Floor, PO Box 40, Enfield B2T 1K2	Rick Garcon	902-873-4750	902-873-4422	milleyr@hiala.ca and brownl@hiala.ca (send to both)
Halifax Port Authority	NS	1215 Marginal Rd, PO Box 336, Halifax B3J 2P6	Jim Nicoll	902-426-7335	902-426-3643	dbelle@portofhalifax.ca
Halifax Regional Municipality - Halifax Regional Police Service	NS	1975 Gottingen St, Halifax B3J 2H1	David McKinnon, Chief	902-490-5038	902-490-6500	mckinnd@region.halifax.ns.ca
Halifax Regional Municipality - Metro Transit	NS	200 Ilsey Ave, Dartmouth B3B 1V1	Brian Taylor, Director	902-490-6688	902-490-6608	taylorb@region.halifax.ns.ca
Halifax Regional Municipality - Traffic and Transportation	NS	PO Box 1749, Halifax B3J 3A5	David Mc Cusker, Manager	902-490-6904	902-490-6696	mccuskd@region.halifax.ns.ca
Halifax Shipping Association	NS	c/o Cerr Norton Marine, Suite 610, 5670 Spring Garden Road, Halifax, NS, B3J 2H7	Russell Herder, Chairman	902-420-1450	902-422-8178	
Halifax-Dartmouth Bridge Commission	NS	Administration Building, Wyse Rd, PO Box 40, Dartmouth B2Y 3Y2	Steve Snider, General Manager	902-469-6281	902-463-2800	bridges@hdbc.ns.ca

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Halterm Limited	NS	PO Box 1057, Main Post Office, Halifax, Nova Scotia, B3J 2X1	Patrick Morin, President		902-421-1778	
Hapag-Lloyd (Canada) Inc.	NS	PO Box 9140, Halifax, Nova Scotia, B3K 5M7	Peter Selig, General Manager	902-453-4881	902-453-4747	usa.selig@hlc.com
Highway 104 Western Alignment Corporation	NS	1969 Upper Water St, Suite 1305, Halifax B3J 3R7	Don Piercy, General Manager	902-422-6401	902-422-6718	dpiercy@highway104.ns.ca
IMP Group International	NS	2651 Dutch Village Road, Halifax, NS B3L 4T1		902-453-6931	902-453-2400	webmaster@impgroup.com
Maersk Canada Inc.	NS	PO Box 27064 Green St. Halifax, N.S. B3J 1N0	Allan Ray		902-422-7331 ex. 227	
Marine Atlantic Inc - Marine Services	NS	355 Purves St, North Sydney B2A 3V2	John Lochhead, Director	902-794-5283	902-794-5744	jlochhead@marine-atlantic.ca
Medusa Medical Technologies Inc	NS	Suite 701, 1888 Brunswick St, Halifax, NS B3J 3J8	Christopher D McNamara	902-484-5583	902-429-5916	cmcnamara@medusamedical.com
Metocean	NS	21 Thornhill Drive, Dartmouth NS B3B 1R9		902-468-4442	902-468-2505	webmfr@meteocean.com
N.S. Road Builders Association	NS	109 Chain Lake Drive, Halifax, Nova Scotia, B3S 1B3	Ron Legere			
N.S. Truckers Association	NS	PO Box 1527, Truro, Nova Scotia B2N 5Z2	Dave Roberts	902-897-0487	902-895-7447	dave@tans.ca
Nova Scotia CAD/CAM Centre	NS	Technical University of Nova Scotia PO Box 1000, Halifax, NS B3J 2X4	Leigh Day	902-422-8380	902-494-6040	leigh@tuns.ca
Nova Scotia Department of Economic Development - Port Development	NS	World Trade Centre, 1800 Argyle St, PO Box 519, Halifax B3J 2R7	Wade Elliott, Consultant	902-424-5739	902-424-7051	elliottw@gov.ns.ca
Nova Scotia Department of Health - Emergency Health Services - Communications Dispatch Services	NS	Bedford Tower, Suite 401, 1496 Bedford Highway, Halifax B4A 1E5	Grant Lingley, Director	902-424-1781	902-424-2679	lingleyg@gov.ns.ca
Nova Scotia Department of Tourism & Culture - Policy	NS	World Trade Centre, 1800 Argyle St, Halifax B3J 2R5	David Ross, Director	902-424-4872	902-424-0424	dross@gov.ns.ca

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Name (Agency or Firm)	Prov	Address	Contact Name	Fax	Phone	Email
Nova Scotia Department of Transportation & Public Works - Asset Management	NS	Purdy's Wharf Tower II, 1969 Upper Water St, PO Box 186, Halifax B3J 2N2	Janice Harland, Road Network Management	902-424-0571	902-424-4206	harlanja@gov.ns.ca
Nova Scotia Transportation Strategy Working Group	NS	984 Bellevue Avenue	John Gratwick	902-422-6215	902-423-1606	
OKAM Logic Inc	NS	1161 Hollis Street, Suite 360 Halifax, NS B3H 2P6		902-466-6889	902-492-8496	
Public Works and Government Services Canada - Atlantic Region Real Estate Division	NS	1713 Bedford Row, PO Box 2247, Halifax B3J 3C9	David Alexander, Land Surveyor	902-496-5276	902-496-5252	david.alexander@pwgsc.gc.ca
Satlantic	NS	Richmond Terminal Pier 9, 3481 North Marginal Road Halifax, NS B3K 5X8		902-492-4781	902-492-4780	info@satlantic.com
Secunda Marine	NS	PO Box 605, Halifax, Nova Scotia, B3J 2X1	Mr. Fred Smithers			
Seimac Limited	NS	271 Brownlow Ave., Dartmouth NS B3B 1W6	Mac MacCleod	902-468-3009	902-468-3007	mmacleod@seimac.com
Semaphore Solutions Inc	NS	3 Forest Drive, Halifax, NS B3N 1M8	Randy Rolls		902-830-5630	rrolls@semaphoresupport.com
Service Nova Scotia & Municipal Relations - Compliance	NS	Purdy's Wharf Tower II, 1969 Upper Water St, PO Box 186, Halifax B3J 2N2	Paul Arsenault, Director	902-424-0523	902-424-7801	arsenapj@gov.ns.ca
SPM Marine International Inc.	NS	PO Box 31 CRO Halifax, Nova Scotia, B3J 2L4	Roger Swallow	902-425-7054	902-425-7945	roger@spmgroup.com
Strait of Canso Superport Corporation	NS	PO Box 238 Mulgrave, Nova Scotia BOE 2G0	John Langley	902-747-2453	902-747-2078	straitsuperport2@ns.sympatico.ca
Sydney Airport Authority	NS	PO Box 670, Sydney, Nova Scotia B1P 6H7	Vince MacLean, Chairman			
Transport 2000	NS	40 Lorne Avenue, Dartmouth, Nova Scotia, B2Y 3E7	John Pearce, President		902-468-2306	
Transport 2000 Atlantic	NS	37 1/2 Fairbanks Street, Dartmouth, NS, B3A 1B9	Marcus Garnet, Vice President	902-490-4346	902-490-4481	garnetm@region.halifax.ns.ca

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Name (Agency or Firm)	Prov	Address	Contact Name	Fax	Phone	Email
Transportation Safety Board	NS	150 Thorn Ave., Dartmouth NS B3B 1Z2	Don Ross	902-426-5143	902-426-1680	Ross@tsb.gc.ca
VIA Rail (Halifax Office)	NS	1161 Hollis Street, Halifax, NS, B3H 2P6	Dave DeWolfe	902-494-7925	902-494-7900	
Voluntary Planning - Transportation Sector	NS	Suite 600, Joseph Howe Building, 1690 Hollis Street, Halifax, NS, B3J 3J9	Rita Fraser, Sector Coordinator	902-424-0580	902-424-5682	fraserra@gov.ns.ca
Windsor & Hantsport Railway Company	NS	PO Box 578, Windsor B0N 2T0	James Taylor, General Manager	902-798-0816	902-798-0798	jimwhrc@ns.sympatico.ca
Yarmouth Airport Commission	NS	PO Box 266, Yarmouth, Nova Scotia, B5A 4B2	Fraiser Howel	902-742-6881	902-742-6484	
Zim Container Service	NS	PO Box 227, Halifax Nova Scotia B3J 2N7	Jim Stoneman			
Air Transport Association of Canada	ON	255 Albert St, Suite 1100, Ottawa K1P 6A9	Cliff Mackay, President	613-230-8648	613-233-7727 ext. 313	cmackay@atac.ca
Atlantic Canada Opportunities Agency (ACOA - APECA) - Ottawa Office	ON	PO Box 1667, Station B, Ottawa K1P 5R5	Michael Zinck, Policy Officer	613-954-0429	613-952-9106	mzinck@acoa-apeca.gc.ca
Bank of Nova Scotia - Electronic Banking - Merchant Products and Smart Card Program	ON	44 King St W, Toronto M5H 1H1	Bryce Hutt, Senior Manager	416-866-7085	416-866-4902	
Canada 3000 Airlines	ON	27 Fashen Drive, Toronto Ontario, M9W 1K6	Angus Kinnear, President			
Canadian Automobile Association - Communications	ON	1145 Hunt Club Road, Suite 200, Ottawa K1V 0Y3	Elly Meister, Vice President	613-247-0118	613-247-0117	emeister@national.caa.ca
Canadian Courier Association	ON	555 Dixon Road, Etobicoke M9W 1H8	Phil Cahley, Executive Director	416-242-2570	416-242-9874	pcahley@canadiancourier.org
Canadian Trucking Alliance (CTA) - Public Affairs & Research	ON	130 Slater St, Suite 1025, Ottawa K1P 6E2	Richard Cavanagh, Director	613-563-2701	613-236-9426	cavanagh@istar.ca

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Name (Agency or Firm)	Prov	Address	Contact Name	Fax	Phone	Email
Canadian Urban Transit Association - Research and Technical Services	ON	55 York St, Suite 901, Toronto M5J 1R7	Brendon Hemily, Manager	416-365-1295	416-365-9800	transit@cutaactu.on.ca
Cancom Tracking Solutions - Marketing Communications	ON	50 Burnhamthorpe Rd West, Mississauga N5P 2P5	Krista Hutchins-Deering, Manager	905-272-3399	905-272-6621	kdeering@cancom.ca
Communications Research Centre (CRC) - Terrestrial Wireless Systems	ON	3701 Carling Ave, PO Box 11490, Ottawa K2H 8S2	Gerry Chan, Vice President	613-990-4715	613-998-4139	gerry.chan@crc.ca
Fortran Traffic Systems Limited	ON	470 Midwest Road, Toronto M1P 4Y5	Peter Lengyel, CEO	416-288-1939	416-288-1320 ext. 207	plengyel@fortrantraffic.com
ITS Canada - c/o Delcan Corporation	ON	133 Wynford Drive, North York M3C 1K1	Joseph Lam, Chairman	416-441-0226	416-391-7521	toronto@delcan.com
Motor Coach Canada	ON	4141 Yonge St, Suite 306, Toronto M2P 2A8	Brian Crow, President	416-229-6281	416-229-9305	
Private Motor Truck Council of Canada (PMTCC)	ON	1155 North Service Road West, Suite 11, Oakville L6M 3E3	Bruce Richards, President	905-927-8212	905-827-0587	trucks@pmtc.ca
RCMP - Chief Information Office	ON	1200 Vanier Parkway C400, Ottawa K1A 0R2	Gavin Berube, Information Architect	613-993-7824	613-993-7061	gavin.berube@rcmp-jrc.gc.ca
Transport Canada - Intelligent Transportation Systems	ON	Tower C, Place de Ville, 330 Sparks Street, Ottawa K1A 0N5	Helena Borges, Senior Policy Coordinator	613-998-2686	613-998-9834	borgesh@tc.gc.ca
Transport Canada - Transportation of Dangerous Goods	ON	Place de Ville, 330 Sparks St, 9th floor, Ottawa K1A 0N5	Gerry McPhee, Senior Technical Officer	613-990-5925	613-990-1138	mcphee@tc.gc.ca
University of Toronto - Department of Civil Engineering - ITS Centre	ON	35 George St, Toronto M5S 1A4	Baher Abdulhai, Professor	416-978-5054	416-946-7662	baher@ecf.utoronto.ca
3M Canada Company - Intelligent Transportation Systems	ON	PO Box 5757, London N64 4T1	Bill Woolford, Project Manager	519-452-6245	519-452-6269	bhwoolford@mmm.com

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Name (Agency or Firm)	Prov	Address	Contact Name	Fax	Phone	Email
National Research Council of Canada - Industrial and Government Relations - Institute for Microstructural Science	ON	1200 Montreal Road, Bldg M50, Ottawa K1A 0R6	Winston Tam, Advisor	613-957-8734	613-990-7656	winston.tam@nrc.ca
Navigation Technologies Canada	ON	550 Alden Road, Suite 201, Markham L3R 6A8	Michael Bailey, General Manager	905-305-7482	905-305-6652	m Bailey@navtech.com
Transportation Association of Canada - Research and Information Services	ON	2323 St. Laurent Blvd, Ottawa K1G 4J8	John Pearson, Technical Program Director	613-736-1395	613-736-1350	jpearson@tac-atc.ca
Atlantic Canada Airports Association	PE	273 Richmond Street, Charlottetown, PE, C1A 1J7	Gerry Gallant, Executive Director	902-628-1673	902-566-1701	ggallant@airports.ca
AcA Digital Knowledge	PE	Box 55 Wellington Station PEI C0B 2E0	Angie Cormier	902-854-2741	902-854-3487	acprmier@teleco.org
Baseline Business Geographics	PE	PO Box 123, 209 Queen St., suite 205, Charlottetown PEI C1A 7K2	Frank MacEachern, President	902-628-0300	877-351-2244/ 902-892-0300	frankm@baselinegeo.com
Bulk Carriers (PEI) Ltd.	PE	P.O. Box 153, New Haven, PE, C0A 1H0	Jack Kelly	902-675-3100	(902) 675-2600	bulkcarriers@attcanada.ca
Caltech Information Technologies	PE	PO Box 695, Charlottetown PEI C1A 7L3	Nazmi Lawen	902-566-3768	902-368-2320	
Charlottetown Airport Authority Inc	PE	250 Maple Hills Ave, Suite 132, Charlottetown C1C 1N2	Michael Campbell, General Manager	902-566-7929	902-566-7997	info@charlottetownairport.pe.ca
CIFTA Technologies	PE	Box 104 Wellington, PEI C0B 2E0	Shawn Gallant	902-854-3011	902-854-7278	shawn@cifta.com
City Cab Taxi	PE	168 Prince St, Charlottetown	Joseph Corrigan, Proprietor	902-892-6568	902-892-6567	
City of Charlottetown - Corporate Affairs	PE	199 Queen St, PO Box 98, Charlottetown C1A 7K2	Donna Waddel, Director	902-566-4701	902-566-5548	dwaddel@city.charlottetown.pe.ca
City of Summerside	PE	1 West Drive, PO Box 1510, Summerside C1N 4k4	Cynthia Wedge	902-432-3191	902-432-1256	cwedge@city.summerside.pe.ca
City of Summerside Technical Services	PE	45 Summer St. P.O. Box 1510 C1N 4K4	Cindy Wedge		902-566-1224	cwedge@city.summerside.pe.ca
Coles Associates Ltd	PE	197 Malpeque Road, PO Box 695, Charlottetown C1A 7L3	Richard Coles, President	902-566-3768	902-368-2300	rcoles@caltech.ca

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Name (Agency or Firm)	Prov	Address	Contact Name	Fax	Phone	Email
DeltaWare Systems Inc.	PE	535 North River Road, Charlottetown PE C1E 1J6	Ed Lawlor	902-628-4660	902-368-8122	elawlor@deltaware.com
Emergency Measures Organization - PEI	PE	P.O. Box 2000, Charlottetown, PE, C1A 7N8	Jack Saunders, Director	902-368-5582	902-368-5526	
Freedom Tech Inc.	PE	PO Box 1896 Charlottetown PEI C1A 7N9	William McMaster		902-629-5908	wbm@formbydesign.com
GE Capital IT Solutions Inc.	PE		Jeff Vey	902-481-8119	902-471-3248	jvey@gects.ge.com
GeoNet Technologies Inc.	PE	Box 3989, Central Bedeque, PEI C0B 1G0	Mike Pearson	902-887-2349	902-887-3170	mike.pearson@geonet-tech.com
Holland College	PE	140 Weymouth St, Charlottetown C1A 5Z1	Alton Glenn, Professor	902-566-9509	902-566-9546	aglenn@hollandc.pe.ca
Information Technologies Association of Prince Edward Island	PE	PO Box 241, Charlottetown, PEI, C1A 7K4	Mike Ives, President	902-894-4867	902-894-4827	itap@itap.pe.ca
iWave.com	PE	PO Box 143, Charlottetown PEI C1A 7K2	Richard Jamieson	902-894-2630	902-894-2600	richard.jamieson@iwave.com
Northumberland Ferries Ltd	PE	94 Water St, PO Box 634, Charlottetown C1A 7L3	Mitchell McLean, Owner-Operator	902-566-1550	902-566-3838	
PEI Truckers Association	PE	3 Queen Street PO Box 3253 Charlottetown, PEI C1A 8W5	Sterling Crane, President	902-894-4943	902-894-4943	
Prince Edward Air	PE	250 Brackley Point Road, PO Box 2349, Charlottetown, PEI C1A 8C1	Bob Bateman, President	902-368-3573	902-566-4488	
Prince Edward Island Department of Agriculture and Forestry - Market and Industry Development Division	PE	Building 19, PO Box 2000, Charlottetown C1A 7N8	Tony Glencross, Technology Development Officer	902-569-7745	902-368-5641	taglencross@gov.pe.ca
Prince Edward Island Department of Development and Technology - Special Projects	PE	Shaw Building, 105 Rochford St, PO Box 2000, Charlottetown C1A 7N8	Kim Jay, Director	902-368-4224	902-368-6258	mkjay@gov.pe.ca
Prince Edward Island Department of Tourism - Policy, Planning & Research	PE	Shaw Building, 105 Rochford St, PO Box 2000, Charlottetown C1A 7N8	Chris Jones, Director	902-368-5922	902-368-6342	ckjones@gov.pe.ca

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Name (Agency or Firm)	Prov	Address	Contact Name	Fax	Phone	Email
Prince Edward Island Department of Transportation and Public Works - Planning, Development & Building Construction	PE	Jones Building, 11 Kent St, PO Box 2000, Charlottetown C1A 7N8	Paul Godfrey	902-368-5395	902-368-5155	jpgodrey@gov.pe.ca
Prince Edward Island Department of Transportation and Public Works - Planning, Development & Building Construction	PE	Jones Building, 11 Kent St, PO Box 2000, Charlottetown C1A 7N8	Cathy Worth, Project Engineer	902-368-5395	902-894-0276	ceworth@gov.pe.ca
Queen Elizabeth Hospital - Administration Office	PE	PO Box 6600, Charlottetown C1A 8T5	Marilyn Olson, Administrative Assistant	902-894-2416	902-894-2355	
Strait Crossing Bridge Limited	PE	104 Abegweit Boul, PO Box 2032, Borden-Carleton C0B 1X0	John Francis, General Manager	902-437-7321	902-437-7304	johnf@scbl.net
Technomedia Inc.	PE	17 Pownal Street, Charlottetown PEI C1A 3V7	Allan MacLeod	902-566-5447	902-368-3043	info@technomediapei.com
Trius Tours Ltd.	PE	PO Box 2288, Charlottetown, PEI C1A 8C1	George Brookins	902-566-3497	902-566-5664 or 902-566-9962	
University of Prince Edward Island, Engineering Department	PE	550 University Avenue, Charlottetown, PEI C1A 4P3	Professor Don Gillis, Engineering Department		902-566-0342	gillis@upei.ca
Veterans Affairs Canada - Knowledge Economy Partnership	PE	161 Grafton St, PO Box 7700, Charlottetown C1A 8M9	Marlene Zalewski, Senior Planning Advisor	902-368-0437	902-566-8888	mazalews@vs.vac-acc.gc.ca
Wireless Island	PE	105 Watts Ave., West Royalty Industrial Park, Charlottetown PEI C1E 2B7	Christopher Ogg	902-892-2671	902-628-2009	wisland@isn.net
Zambra Systems Inc.	PE	179 Queen Street, Charlottetown PEI C1A 4B4	Barb Allen	902-894-3534	902-894-3679/ 1- 866-633-4725	barb@zambra.com
Canadian National Railway Co. - Market Planning	QC	935 rue de la Gauchetiere Ouest, Montreal H3B 2M9	Sandra Turgay, Director	514-399-7707	514-399-5958	turgay@cn.ca

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Name (Agency or Firm)	Prov	Address	Contact Name	Fax	Phone	Email
Inro Consultants Inc	QC	5160 Decarie Blvd, Suite 610, Montreal H3X 2H9	Michael Florian, President	514-369-2026	514-369-2023	mike@inro.ca
Railway Association of Canada	QC	800 boul Rene-Levesque ouest, Suite 1105, Montreal H3B 1X9	Robert Ballantyne, President	514-879-1522	514-879-8556	robertb@railcan.ca
Transportation Development Centre - Technology Applications Division	QC	800 boul Rene-Levesque ouest, 6th floor, Montreal H3B 1X9	Brian Marshall, Chief	514-283-7158	514-283-0009	marshab@tc.gc.ca
Calais-St Stephen Area International Border Crossing Public Advisory Committee - Maine Department of Transportation	US	16 State House Station, Augusta, ME 04333-0016	Kevin Rousseau, Transportation Planning Specialist	207-287-3292	207-287-2841	kevin.rousseau@state.me.us
Eastern Border Transportation Coalition	US	P.O. Box 243, Youngtown, New York, 14174	Irvine Rubin	716-745-1088	716-745-1087	
I 95 Corridor Coalition	US	77 Belmont Dr, Saratoga Springs, NY 12866	John Baniak, Executive Director	518-584-4827	518-584-4826	jbaniak@ny.cap.rr.com
I 95 Corridor Coalition - Massachusetts Highway Department	US	10 Park Plaza, Room 7111, Boston, MA 02116	Noreen Hazelton, Contract Manager	617-973-8487	617-973-8487	I95nhaze@aol.com
Intelligent Transportation Systems America	US	400 Virginia Ave SW, Suite 800, Washington, DC 20024-2730	Joseph Giglio, Vice Chair	202-484-3483	202-484-4847	webmaster@itsaorg
Prince of Fundy Cruises Limited	US	P.O. Box 4216, Portland, ME, 04101		207-773-7403	1-800-341-7540	
State of Maine	US					
US Department of Transportation - Federal Highway Administration - ITS Joint Program Office	US	Room 3401, HOIT-1, 400 7th St, SW, Washington, DC 20590	Christine Johnson, Director	202-366-3302	202-366-0408	christine.johnson@fhwa.dot.gov
US Department of Transportation - Federal Highway Administration - ITS Joint Program Office	US	Room 3401, HOIT-1, 400 7th St, SW, Washington, DC 20590	Jeff Piniati, ITS Joint Program Officer	202-366-3302	202-366-9536	jeff.piniati@fhwa.dot.gov

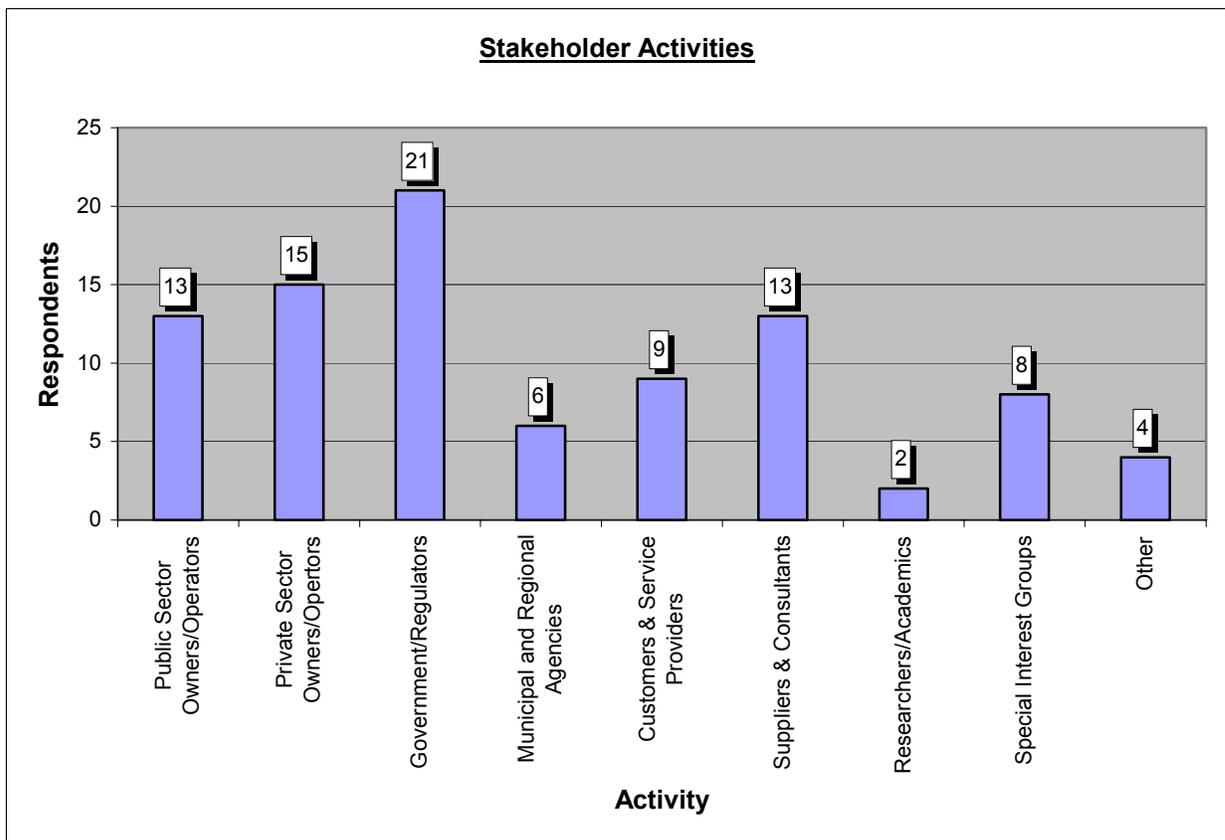
APPENDIX B

Web Survey Results

1. QUESTIONS FOR ALL STAKEHOLDERS

1.1 WHAT ACTIVITIES APPLY TO YOUR COMPANY/AGENCY (MORE THAN ONE MAY BE APPLICABLE)?

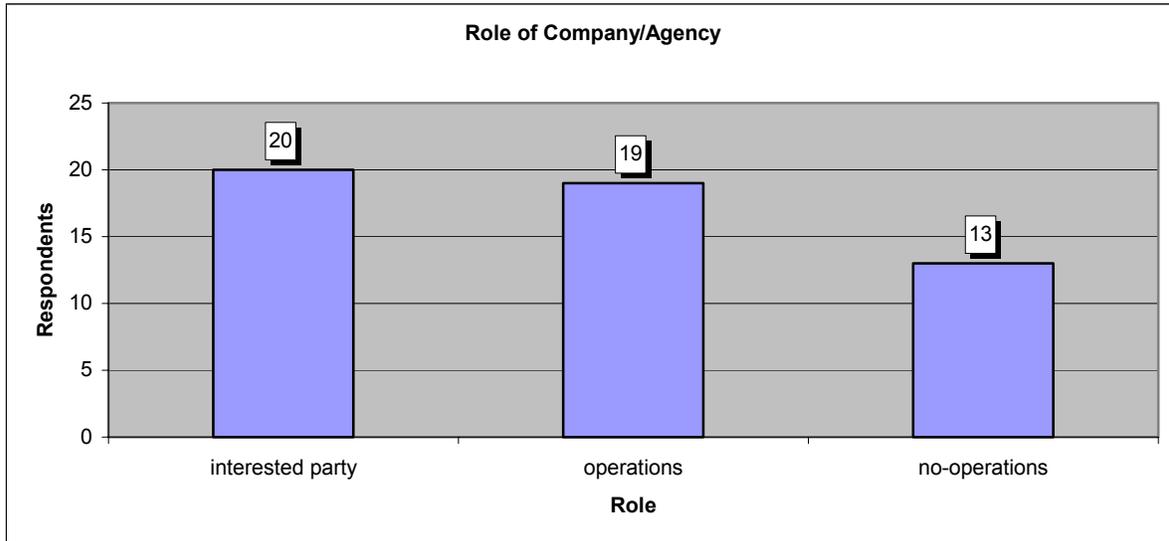
All stakeholders were asked to identify their areas of activity according to the categories shown in the chart below. A total of sixty responses were received, from a distribution list of 200. Note that any given stakeholder could identify multiple areas of activity, which yielded a total of 91 category responses, distributed as shown in the chart below.



1.2 WHAT COMMENT BEST DESCRIBES YOUR COMPANY/AGENCY/INVOLVEMENT IN ITS?

Each respondent was asked to indicate whether their involvement with Intelligent Transportation Systems would be characterized as an interested party, potential for direct involvement in an operations capacity, or potential for direct involvement without operations activity. As the chart indicates below, the responses were relatively evenly distributed; 8 of the 60 respondents did not offer a reply.

Appendix B – Web Survey Results



1.3 PLEASE DESCRIBE YOUR COMPANY'S/AGENCY'S PRIMARY MANDATE USING THE BOXES BELOW.

Each respondent was asked to characterize their primary mandate within the transportation industry. The following lists the responses received, illustrating the broad range of stakeholder roles. Typically the public sector respondents indicated their mission statements, with infrastructure owner/operators reflecting a customer service focus, and the mandate to manage transportation infrastructure. Private sector suppliers responses indicate product development and marketing mandates.

The following provides a complete listing of responses:

- Business Development in The Knowledge and Innovation Sector.
- Toll bridge facility that currently uses electronic toll system. (Amtech).
- Canadian Manufacturers and Exporters Newfoundland and Labrador Division (CME) are dedicated to promoting and preserving the interests of provincial manufacturers and exporters.
- Providing transportation consultation based on a vast experience working in a provincial transportation department for people, agencies or other organizations.
- Engineering Consulting Services.
- LearnStream is a custom courseware design firm creating effective learning experiences through inspired teaching techniques and the innovative use of technology.
- Diaphonics develops intuitive, user-friendly voice-interactive applications. diaphonics®; PowerTalk Platform helps companies automate and improve the way they interact with their customers, suppliers and employees over the telephone. PowerTalk delivers automated speech

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recognition and biometric security to the enterprise market, resulting in demonstrable cost savings and improved customer service.

- The objective behind the formation of the Saint John Parking Commission is to provide parking for the City of Saint John and the patrons using the parking services in Saint John.
- EMO (NS) administers and manages a Province wide enhanced 911 emergency reporting service.
- The Bridge Commission was created in 1950 by a statute of the province of Nova Scotia. With the approval of the Governor in Council, the Commission has the power to construct, maintain and operate bridges and the necessary approaches across the Halifax Harbour and the North West Arm, or either of them. The Commission currently provides safe and efficient crossing to the following modes of transportation.
- Collection and data processing of traffic count, classification and weigh-in motion data for all of Nova Scotia.
- To construct, maintain, and manage provincial highways, buildings and infrastructure; to provide accommodation and property services in support of sustainable economic growth and social well-being.
- To provide public transit to the City of St. John's, NF.
- Provide and Maintain a Safe Provincial Transportation System.
- Geomatics and GIS consulting.
- Ensure all levels of government are prepared to respond to emergencies as defined in the Emergency Measures Act and to coordinate provincial government emergency operations.
- To provide and maintain a safe and efficient transportation system in all matters within provincial jurisdiction and to monitor and advise on all matters of federal jurisdiction.
- To provide a safe and efficient transportation system for the province of New Brunswick.
- Transportation engineering consultancy.
- Manage municipal transportation network.
- Development of technology related ideas with the potential to benefit PEI Agriculture.
- For hire transport.
- Education in Transportation and Logistics.
- Develop, sell and implement computerized solutions for the airline and aviation sector.
- Socio-economic development on PEI.

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- To provide a safe, efficient, and sustainable transportation system.
- High speed low cost open access community networking.
- Encouraging the economic development of the province.
- Provides mapping and GIS support for all modes (land, sea, air).
- Enhance public safety on provincial highways and reduce highway damage caused by overweight vehicles.
- Support for collaborative initiatives between the Atlantic provincial governments that will provide benefit to the region as a whole. To undertake projects which might not be possible or advisable by individual governments.
- To help promote the unique Acadian culture through tourism products.
- Industry Association Representing Manufacturers and Exporters.
- To ensure public safety on NB highways. Enforcing acts and regulations pertaining to Commercial Vehicles.
- To be the airport hub of Atlantic Canada. Offering air service to: all parts of Atlantic Canada; transborder connections to major US hubs; International services to major European hubs Offering cargo and passenger service whereas; cargo can be transferred efficiently and in-bond to/from ground transportation agencies; passengers can transfer to ground service transportation services effectively and efficiently A link between the air and sea industry primarily in the passenger cruise business.
- Ship management.
- To provide parking for the City of Saint John and the patrons using the parking services. The service addresses both short and long term parking needs.
- To provide public transit for the City of Saint John.
- Public & Private Sector Transportation Services.
- The mandate of the Halifax Port Authority includes the regulation of port operations, the administration of Halifax Harbour, the development and management of harbour properties, the provision of port services, and the promotion of international trade through the Port of Halifax.
- INSTRUMAR provides real time information systems to the polymer fibre and aerospace industries using proprietary sensor technologies.
- To operate an aerodrome for civil aviation purposes.
- Providing Municipal Services to the St. John's area.

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- Controlling the movement of In Bond goods into and out of Canada.
- Provide marine infrastructure for company in Northeastern New Brunswick.
- Represent trucking industry in Nova Scotia to government officials, suppliers and contractors.
- Provision of environmental services including meteorological forecast services to government and private industry.
- Maersk Canada is agent for Maersk Sealand container line.
- We are a privately owned company providing line run bus service covering most areas in the Province. Our mandate is to increase passenger traffic on our buses, continue to improve our customer service levels and remain profitable.

1.4 WHAT ARE THE KEY EXTERNAL AGENCIES YOU DEAL WITH IN CARRYING OUT YOUR MANDATE?

Each respondent was asked to indicate the various external agencies that they interact with in fulfilling their mandate within the transportation industry. An array of federal, provincial and municipal funding agencies and economic development organizations were noted. Also, there were some references to international markets such as the U.S. Defence and Aerospace industry. The following provides a complete listing of responses:

- Federal, provincial and municipal governments.
- Private industry, provincial, federal and municipal government, and other industry associations.
- New Brunswick Businesses and industries.
- Consulting firms, federal departments and provincial departments, transportation associations.
- Provincial, and Municipal Governments, other consulting firms.
- Our clients are found the world over. We deal with the companies and agencies such as the United Nations, the Department of National Defence, as well as private sector companies in Canada and the U.S.
- Technology and sales partners, corporate clients, investors.
- Emergency responders, members of the public, Municipal Governments.
- We have dealt with and still deal with the City of Saint John Community Planning Department, Municipal Operations, Finance Department, Police Department, Saint John Transit, Provincial Supply and Services Department and other individuals or companies where we lease properties. Also we continually work with cities like Fredericton and Moncton.
- NS Dept of Finance NS Dept of Transportation & Public Works Halifax Regional Municipality.

Appendix B – Web Survey Results

- IRD Inc an ITS solutions Group and Diamond Traffic Services who make counters and classifiers.
- Federal and Municipal governments.
- City of St. John's.
- Government of Canada (i.e., Transport Canada, Environment Canada, Emergency Preparedness Canada) Provincial Departments (Justice, Municipalities, Environment) Municipalities.
- Provincial government, transportation agencies.
- Federal, provincial, territorial, municipal and state governments Institutions and private industries Volunteer organizations.
- Federal government, municipal governments.
- RCMP EMO Municipalities Federal Government.
- Public and private sector transportation (road, rail, marine, utility) agencies Public sector mapping agencies.
- N.S. Transportation & Public Works Halifax-Dartmouth Bridge Commission Transportation Association of Canada.
- ACOA PEI BDI AAFC.
- Various governmental departments. The Canadian Institute of Traffic and Transportation. We are also associated with other associations such as: The Logistic Institute, Canadian Association of Supply Chain & Logistics Management.
- Federal government organizations; not for profit organizations with a socio-economic development mandate and private business.
- Industry, Federal Government, other jurisdictions, special interest groups, i.e. environmental groups, port authorities, airports, road builders, general public, environment Canada, I am new to this position but there are a great many agencies involved in our mandate.
- Federal & provincial regulators, funding bodies.
- Federal funding agencies such as Industry Canada, HRD, ACOA Regional and municipal economic development organizations.
- Provincial Transportation Departments.
- NB Department of Transportation APTA Police and RCMP.
- The four Atlantic provincial governments via Intergovernmental Affairs and direct discussions with line departments.

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- Private sector and government transportation and tourism agencies.
- Various government bodies.
- Transport Canada; TIANS; ACTA; Petroleum Directorate; Nova Scotia Business Inc.; Government of Nova Scotia; Halifax Chamber of Commerce; Greater Halifax Partnerships; Greater Washington Partnerships; Canadian Consulates; Governors office of Louisiana; International centre Lafayette; etc.
- Dept of Transport/Transport Canada RCMP.
- CN Rail Halterm Public Trucking Companies Oceanex Halifax Port Corp Revenue Canada Atlantic Pilotage Corp EC Tugs Halifax Employers Association.
- Owners Charterers Government.
- The majority of our dealings are carried out with other city departments or commissions, however, we carry out business with the Province of N.B. (Service N.B., Supply and Services and Motor Vehicle Branch).
- Ocean Carriers Vessel operators and agents Multimodal marine terminals CN Rail Halifax Employers Association Halifax Regional Police and Fire Departments Canadian Coast Guard Various industry groups.
- Honeywell Aerospace.
- Department of National Defence.
- We deal with a lot of external agencies in conducting the business of the City.
- Public Utility Review Boards Nova Scotia, New Brunswick, Prince Edward Island.
- Foreign Affairs, Citizenship & Immigration, Transport Canada, Statistics Canada, Environment Canada, Department of Justice.
- Our tenant, freight service operator and companies in the region.
- Government of Nova Scotia, all agencies Roadbuilders of Nova Scotia.
- Environment Canada Nova Scotia Department of Transportation and Public Works.
- Halterm, CN Rail, Coast Guard, Atlantic Pilotage, Revenue Canada, Agriculture Canada.
- We have working relationships with the Nova Scotia Utility and Review Board, Department of Transportation, Motor Vehicle, Tax Commission as well we are members of the Canadian Bus Association and American Bus Association.

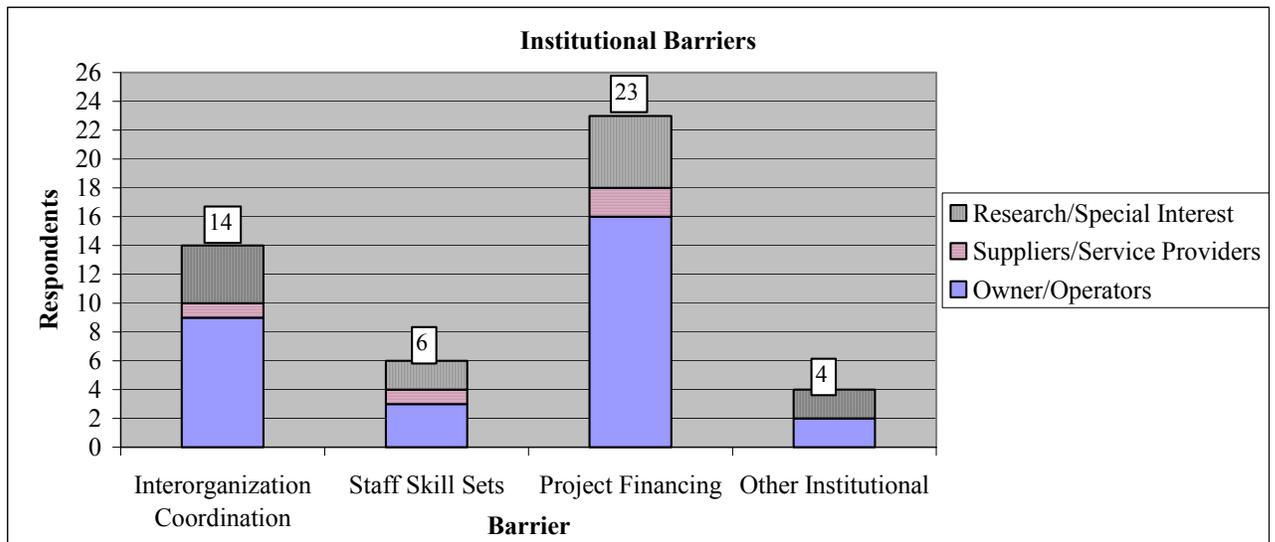
1.5 IDENTIFY ANY OF THE FOLLOWING BARRIERS THAT PREVENT YOUR FROM OPTIMIZING THE TRANSPORTATION RELATED SYSTEMS YOU OWN/OPERATE OR THE SERVICES YOU PROVIDE:

All stakeholders were asked to identify the institutional, legal, and technical barriers they encounter in the delivery of their transportation systems services. As the following charts indicate, the key barriers include:

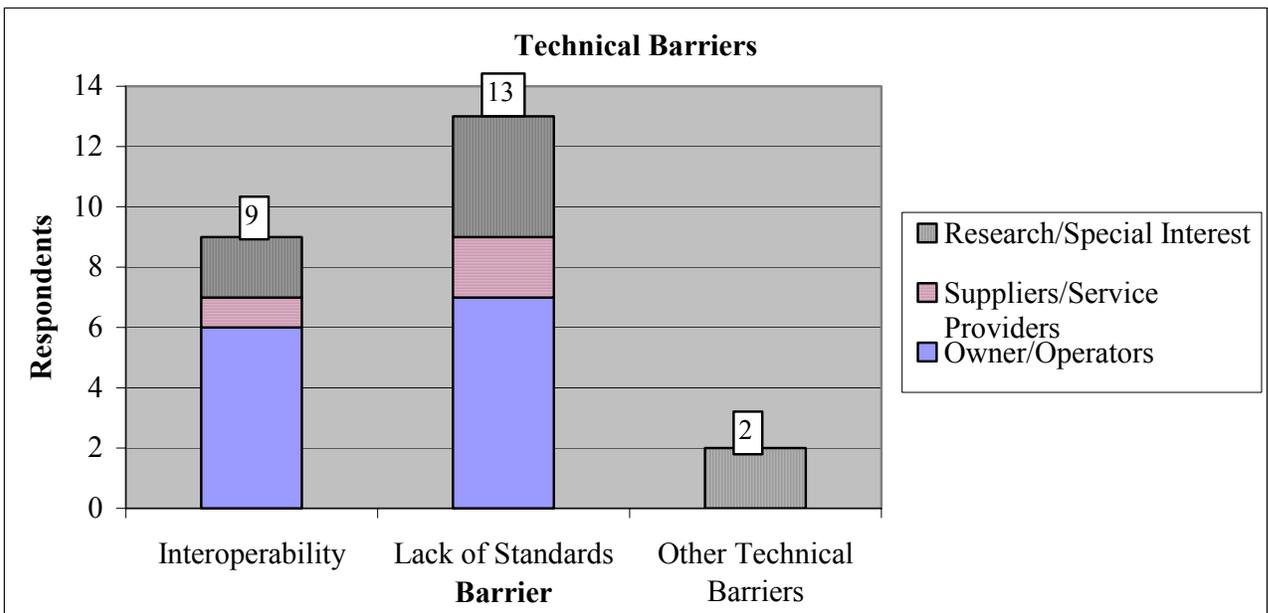
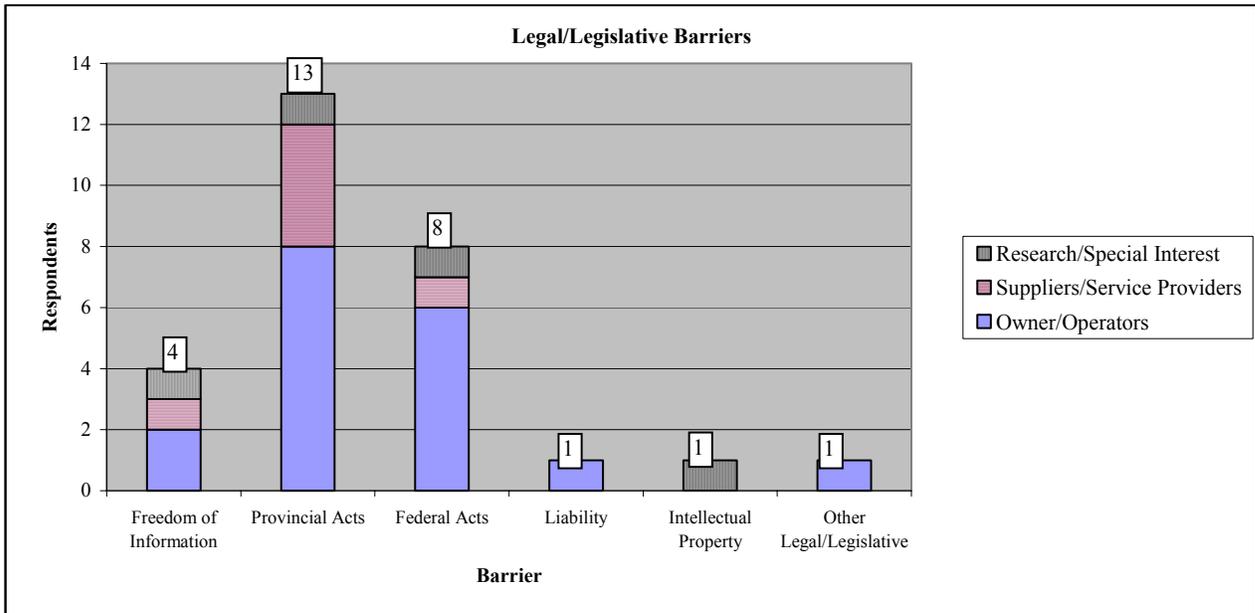
- The inability to raise project financing.
- The inability to achieve interagency coordination and technical interoperability and the associated lack of standards to support this interoperability.
- Issues pertaining to some provincial and federal acts of legislation, such as a lack of harmonization of rules and regulations in the trucking sector.

Some respondents indicated that interagency coordination between U.S. and Canadian authorities would be very helpful in areas such as road-weather information, and commercial vehicle operations.

The following graphs indicate the identification of institutional, legal, and technical barriers, with the responses distinguished according to stakeholder classification.



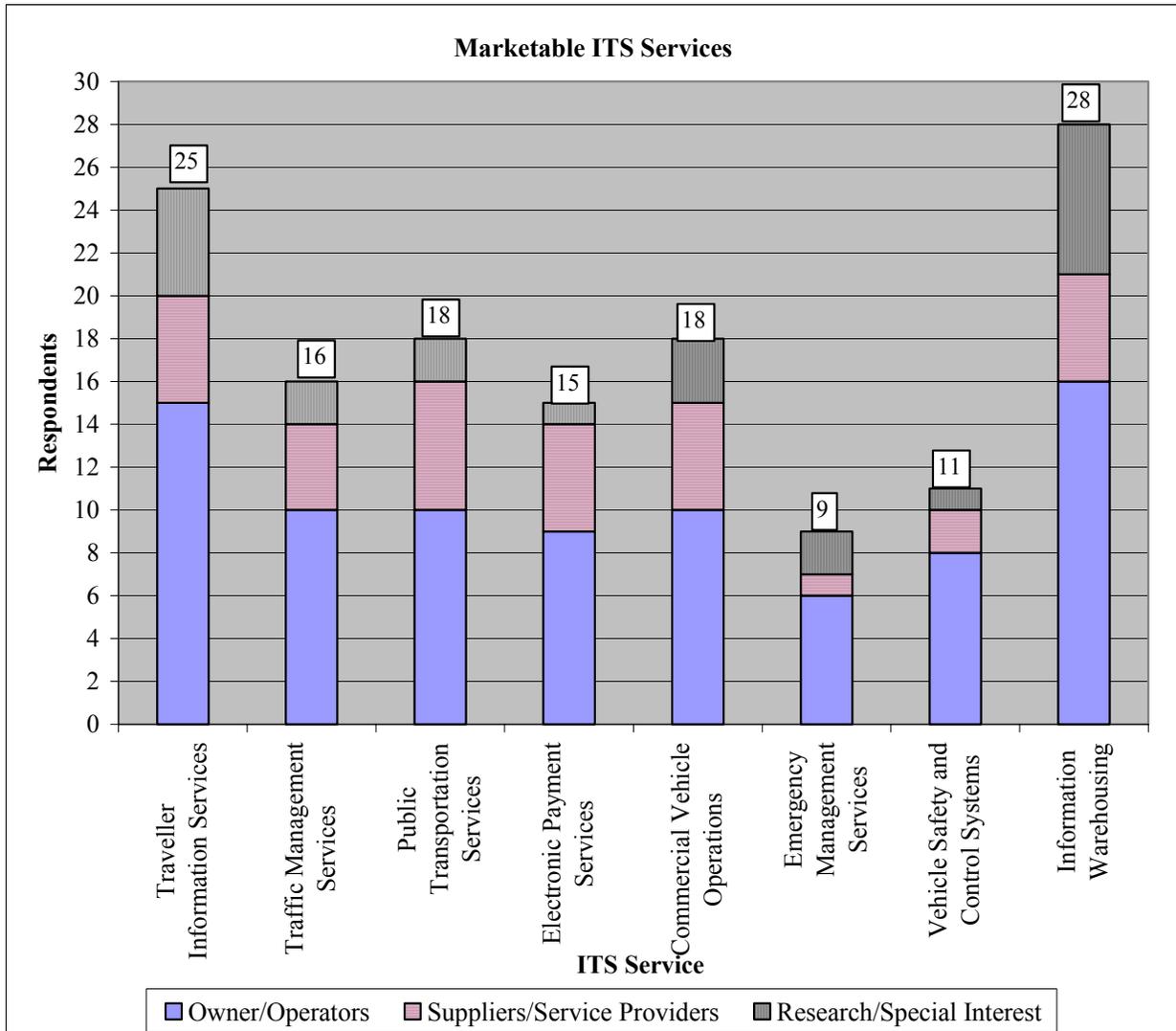
Appendix B – Web Survey Results



1.6 WHICH ITS SERVICES DO YOU PERCEIVE TO BE THE MOST MARKETABLE OR HELP TO EXPAND YOUR BUSINESS INTERESTS?

Each stakeholder was asked to identify the user service bundle containing the ITS services which they perceive to be the most relevant to their areas of interest. The responses that are shown in the following chart are categorized according to the type of stakeholder. As the chart indicates, there was a heavier weighting in traveller information and the related information warehousing services, reflecting the need to fuse data from a variety of sources and make it available to travellers.

Appendix B – Web Survey Results



OWNER/OPERATOR QUESTIONS

1.7 SELECT ANY ITS SERVICES THAT YOUR AGENCY IS CURRENTLY INVOLVED WITH OR HAS AN INTEREST IN.

The owner/operator stakeholders were asked to indicate the user service bundles where they currently provide services, as well as the bundles where they would have a future interest in providing services.

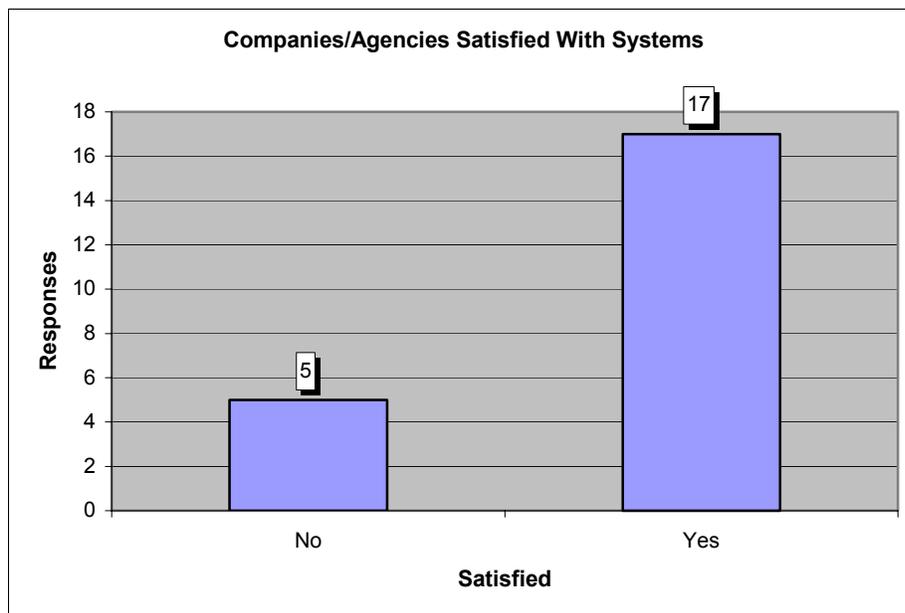
	Currently Using	Future Interest	No Interest
Traveller Information Services	11	7	5
Traffic Management Services	8	10	3

Appendix B – Web Survey Results

	Currently Using	Future Interest	No Interest
Public Transportation Services	5	5	9
Electronic Payment Services	9	9	3
Commercial Vehicle Operations	5	10	8
Emergency Management Services	6	10	4
Vehicle Safety and Control Systems	5	11	6
Information Warehousing Services	4	15	5

1.8 ARE YOU SATISFIED WITH THE PERFORMANCE OF YOUR ITS APPLICATION(S)?

The owner/operator stakeholders were asked to indicate the level of satisfaction with their ITS applications to date. Some respondents indicated that they are presently at an interim level of development as part of a staged implementation, and anticipate achieving further benefits through ongoing deployment.



1.9 IS YOUR ORGANIZATION IN NEED OF, OR SEEKING, ANY PARTNERSHIP OPPORTUNITIES TO IMPROVE YOUR BUSINESS?

Owner/operators were asked to indicate their experience in seeking partnerships for the deployment of ITS, summarized as follows:



1.10 RATE THE BENEFITS OF ITS SERVICES THAT YOUR AGENCY IS CURRENTLY EXPERIENCING.

Owner/operators were asked to indicate the relative importance of the benefits of the ITS applications that they are experiencing, summarized in the following chart:

	Very Important	Important	Somewhat Important	Least Important
Customer Satisfaction	18	2	2	0
Increased Revenues	10	4	3	5
Improved Operating Efficiencies	15	7	1	0
Reduction of Pollution	9	5	5	3
Improved Safety	16	4	2	0

SUPPLIER/SERVICE PROVIDER QUESTIONS

1.11 SELECT ANY ITS SERVICES THAT YOUR COMPANY/AGENCY IS CURRENTLY INVOLVED WITH.

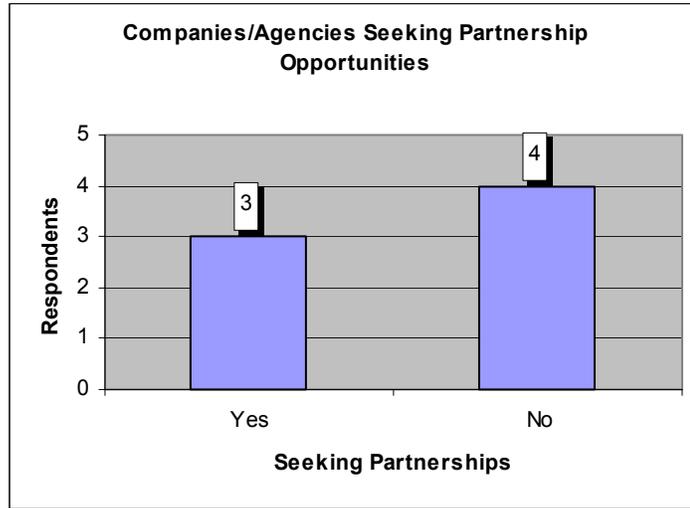
Suppliers and service providers were asked to indicate the ITS services which they are presently involved with or may have a future interest in, organized according to the user service bundles as follows:

	Currently Using	Future Interest	No Interest
Traveller Information Services	3	1	4
Traffic Management Services	1	3	3
Public Transportation Services	5	2	1
Electronic Payment Services	3	4	0
Commercial Vehicle Operations	2	3	3
Emergency Management Services	2	2	2
Vehicle Safety and Control Systems	3	1	3
Information Warehousing Services	2	4	1

1.12 IS YOUR ORGANIZATION IN NEED OF, OR SEEKING, ANY PARTNERSHIP OPPORTUNITIES TO IMPROVE YOUR BUSINESS?

Suppliers/service providers were asked to indicate their interest in seeking partnerships to enable ITS deployment, with the responses summarized as follows:

Appendix B – Web Survey Results



1.13 RATE THE BENEFITS OF ITS SERVICES THAT YOUR COMPANY/AGENCY IS CURRENTLY PROVIDING.

ITS industry suppliers/service providers were asked to rate the relative significance of the benefits of the products and services they are able to provide to their clients:

	Very Important	Important	Somewhat Important	Least Important
Customer Satisfaction	3	0	1	0
Increased Revenues	3	0	1	0
Improved Operating Efficiencies	3	1	0	0
Reduction of Pollution	0	2	0	1
Improved Safety	2	1	0	0

RESEARCH AND SPECIAL INTEREST GROUP QUESTIONS

1.14 WHAT ITS SERVICES DO YOU SEE AS HAVING THE MOST SIGNIFICANT IMPACT IN THE NEXT 5 YEARS?

Researchers and special interest groups were asked to indicate their view on the most significant ITS services, organized according to the user service bundles as shown in the following chart:

Appendix B – Web Survey Results

	Significant Impact	Moderate Impact	No Impact
Traveller Information Services	6	4	1
Traffic Management Services	7	5	0
Public Transportation Services	3	9	1
Electronic Payment Services	7	3	1
Commercial Vehicle Operations	7	3	2
Emergency Management Services	8	4	0
Vehicle Safety and Control Systems	5	7	0
Information Warehousing Services	8	3	1

1.15 DESCRIBE YOUR OVERALL EXPERIENCE IN DEALING WITH VARIOUS OWNER/OPERATORS OF ITS IN THE ATLANTIC PROVINCES.

Researchers and special interest groups were asked to provide comments on their experience in dealing with operating ITS applications in the Atlantic Region, listed as follows:

- Airline service is now expensive and poorly scheduled for the changing North South IT world.
- Mostly, experience with Québec, Ontario and US states. But, in the Canadian Roadweather Information System project, all Atlantic Provinces are involved; I produced for the provinces and Environment Canada a “first draft” together with Paul Delannoy (EC).
- Very little experience to date.
- No experience. We provide technology that can be used by companies in the transportation sector.
- Besides discussing the E.Pass issues, it has not been a big issue for us.
- A supply side mentality is predominate.
- Developed a procedural guide and computer application for updating GIS road data for NBDOT; produced a number of digital nautical navigational charts in the Atlantic region.
- Have done GIS consulting for Nfld WST.

Appendix B – Web Survey Results

- We have provided pavement temperature and general weather forecast services to the NSDOT&PW. We have had discussions with NB Road Maintenance Inc. on providing services in New Brunswick.
- Limited potential for ITS deployment in Atlantic Canada outside CVO and electronic payment. Perhaps some use of traveller info systems.

1.16 DESCRIBE YOUR PARTNERING EXPERIENCE WITH OTHER ORGANIZATIONS.

Researchers and special interest groups indicated the following comments pertaining to their experience with partnering with other organizations:

- Have partnered with several organizations involved in review and report writing. Also involved in a major highway project Maritime Road Development as Industrial Benefits Manager and assisting the Manager of Communication and Public Relations.
- Good way to grow.
- Joint ventures with other private consultants to undertake projects.
- None regarding ITS.
- Since we are in education, we must update constantly our material, therefore we are in contact with other organizations to provide us with what is happening in the industry. Our graduates must be aware of what is going on out there and actively participate in bringing forward new techniques and ways of doing things.
- Have partnered with provincial agencies and departments and many private sector organisations.
- Have partnered extensively with public, private, and academic entities.
- We have worked with equipment suppliers and other meteorological services providers in Canada.

1.17 WHAT DO YOU FEEL NEEDS TO BE DONE TO PROMOTE PARTNERSHIPS IN THE AREA OF ITS RESEARCH IN THE ATLANTIC PROVINCES?

Researchers and special interest groups provided the following recommendations for actions targeting the promotion of partnerships for the research and development of ITS applications in the Atlantic Region:

- Promote the benefits of ITS as an economic development tool, and promote partnerships as an important factor for successful ITS's.
- Among other things, use this strategic plan effort to identify a pool of resources on whom to build, identify needs of the industry in the Atlantic provinces, identify niches best suited to the combination of resources and needs, find or organize a lead agency to manage a program of research which would come from a consensus of the stakeholders. It is a very open question on which one could dissert logically.

Appendix B – Web Survey Results

- Further studies similar to this but concentrating on infrastructure improvements, i.e. faster ferry vessels, additional four lane highways, etc.
- Interest group, networking opportunities.
- Demonstration of viable applications Identification of clients.
- There must be a direct partnership between the educators, the carriers, the users, and the regulators. There is strength in numbers and until we recognize this we will always lag behind. We have a very small population scattered on a large territory; which creates major logistics problem for all the players involved. We should, first of all, educate the population as a whole on the importance of transportation; what impact it has on their daily lives and then convince the various players to overlook the competitive aspect and invest in education and research. This is being done in Europe and works very well, everyone wins and it makes a much healthier industry.
- Broaden your definitions of key sectors; stop quasi-official support for the “own or block” policies of major incumbents.
- The senior political and management levels of each provincial agency responsible for transportation must place a high priority on developing true partnerships in ITS.

1.18 IS OUR EDUCATION SYSTEM GEARED TO PRODUCING STAFF/EMPLOYEES WITH THE KNOWLEDGE OF ITS TO MEET FUTURE NEEDS OF THE ITS INDUSTRY IN THE ATLANTIC PROVINCES?

Researchers and special interest groups provided the following responses regarding the ability of the current education system to produce staff with the knowledge to meet the needs of the ITS industry. Accompanying comments are provided, as shown in the following chart:

No	Education will need to be combined with experience/knowledge in transportation for leaders in the ITS industry. However, once champions have a direction and action plan, the education system is sufficient for producing skilled people for the ITS industry.
No	Physical Distribution formal studies.
Yes	But it may need clear indications of what specializations are necessary.
No	Educational institutions need to retool.
No	In order to obtain the knowledge, the educators must, first of all, do the research. Research doesn't come cheap, therefore, there must be funding available for it. Also, the educators must be allowed the necessary time and resources to get involved in the research.
No	In our sector of it, the education needs to move away from its current focus on vendor-based qualifications.
No	The education system must look at the educational requirements of workers and develop programs to train people in the skills required to operate ITS.

1.19 WHAT ITS SERVICES DO YOU PERCEIVE AS BEING DESIRED THE MOST BY TRAVELLERS?

Researchers and special interest groups provided the following commentary pertaining to the most desired ITS user services, organized by user service bundle as follows:

	Very Desirable	Somewhat Desirable	Not Desirable
Traveller Information Services	8	2	0
Traffic Management Services	5	5	0
Public Transportation Services	4	5	0
Electronic Payment Services	4	4	1
Commercial Vehicle Operations	5	4	0
Emergency Management Services	7	5	0
Vehicle Safety and Control Systems	6	2	0
Information Warehousing Services	3	4	3

1.20 WHAT ARE THE PERCEIVED EFFECTS OF ITS SERVICES ON TRANSPORTATION SAFETY?

Researchers and special interest groups provided the following comments on the effects of ITS on transportation safety:

- Security would not be high enough.
- They should always improve safety but at different levels depending on the type of services.
- It should assist in a major way to improve highway safety.
- Since September 11, we all have seen how important safety is for everyone. Most carriers have suffered some kind of consequence. It is said that perception is reality, so we must make the general public feel at ease again when it comes to transportation issues and I am not talking only about passenger transportation. The freight carriers are constantly pictured by the medias as being the bad ones when something happens. As an industry we must talk a lot more about safety and what we are doing about it to ease the public's fears. ITS has certainly a role to play in providing the tools and/or the information required.

- Safety will be improved.

1.21 WHAT DO YOU FEEL NEEDS TO BE DONE IN ORDER TO INCREASE PUBLIC AWARENESS OF THE BENEFITS OF ITS?

Researchers and special interest groups provided the following comments regarding actions to increase the awareness of ITS benefits:

- Information sessions, newspapers advertising, focus groups, etc.
- To be aware, you must first be informed and I think that the safety aspect is one that the public is rather keen on, so information on safety aspects of ITS services should be a priority.
- There will be a need for a major publicity campaign just to make the public aware that something major is going on to improve their “driving” in the Atlantic area.
- Major campaign. ITS has virtually no public awareness.
- Demonstratable applications.
- This is not going to be an overnight solution. We must beat our message in and change our image. Let’s put in place the proper system and then as an industry start beating the drums to let everyone know what we doing and how important we are to the general public. I feel sometimes we are our worst enemies, we certainly don’t communicate very well as an industry.
- What are those benefits?
- A public education program should be implemented.

APPENDIX C

User Needs Focus Groups Summary

**ATLANTIC PROVINCES
REGIONAL ITS STRATEGIC PLANNING STUDY
USER NEEDS FOCUS GROUP**

AGENDA

SIGN-IN AND REFRESHMENTS (30 minutes) (9:30 a.m. – 10:00 a.m.)

INTRODUCTORY SESSION (1 hour) (10:00 a.m. – 11:00 a.m.)

Objective: to prepare participants to identify and prioritize ITS user needs, to make constructive contributions to the strategy development

Activities:

Introduction:

- Welcome and Opening Remarks – Steering Committee representative
- Introduction of Participants
- Introduction of Facilitators – explanation of objectives of the roundtable, and the agenda

ITS Overview:

- Description of Atlantic Provinces Draft ITS Vision
- Overview of the Canadian ITS Architecture
- Description of ITS User Services
- Discussion of the traditional barriers to ITS implementation

Break (15 minutes) (11:00 a.m. – 11:15 a.m.)

Development of Strategy Focus (45 minutes) (11:15 a.m. – noon)

Objective: to focus the strategy development on the needs and components considered to be of greatest importance

Activities:

Overview:

- Summary of the results of the web survey
- Description of the Strengths, Weaknesses, Opportunities and Threats (SWOT) process

SWOT Analysis:

- Consultant team provides some preliminary thoughts on Atlantic Provinces Strengths, Weaknesses, Opportunities and Threats
- Participants formed into groups of five

- Each group performs a SWOT analysis – context – ITS implementation in the Atlantic Provinces
- Each group presents additional or different results to entire group

Lunch (30 minutes) (noon – 12:30 p.m.)

Development of Strategy Focus (cont) (30 minutes) (12:30 p.m. – 1:00 p.m.)

User Service Prioritization:

- Names of the 8 user service bundles, and the 35 user services posted on walls
- Each participant is given markers to select 10 user services deemed to have the highest priority
- Results will be tallied

Development of Strategies (1 hour) (1:00 p.m. – 2:00 p.m.)

Objective: to actively involve the participants in the development of strategies

Activities:

Summary of the Results of the User Service Prioritization

- Consultant team provides a summary of the results from the previous activity

Strategy Development Process (Group Breakout)

- Five strategy groups identified (ATMS and Emergency Management, ATIS and Information Warehousing, CVO, Public Transport, Electronic Payment)
- Strategy Group leaders identified (may be selected in advance of roundtable)

Strategy Development

- Strategy Group Leaders oversee the development of a brainstorming session for the assigned User Service Bundle(s)
- Group to brainstorm and record a number of potential projects, based on the prioritization exercise
- Group to consider ITS goals, the needs, and the draft ITS vision
- Group to identify the benefits, champions, risks, and implementation timeframe
- Group to identify early winners, and perform an assessment
- Consultant team provides forms and materials to aid the participants in developing the strategy

Break (15 minutes) (2:00 p.m. – 2:15 p.m.)

Strategy Presentation (30 minutes) (2:15 p.m. – 2:45 p.m.)

Objective: to inform all participants of the developed strategy, and provide an opportunity for input

Activities:

- Group leaders present results

Closing (15 minutes) (2:45 p.m. – 3:00 p.m.)

Objective: to obtain feedback on the strategic plan development process, and specifically the Atlantic Canada ITS Vision

Activities:

- Ask the participants to make comments on the strategic plan development process, the focus group, and suggested activities to ensure ongoing participation of the stakeholders
- Provide opportunity for the stakeholders to provide both oral and written input

Appendix C – User Needs Focus Group Summary

NEW BRUNSWICK

Moncton, November 5

Representative	Company/Agency	Telephone #	Fax #	Email
Nancy Lynch	New Brunswick Department of Transportation	506-453-2802		nancy.lynch@gnb.ca
Dave Macfarlane	New Brunswick Department of Transportation - Policy	506-453-2600		Dave.Macfarlane@gnb.ca
Real Robichaud	Tourism Industry Association of New Brunswick	506-458-5646		realr@tianb.com
Roger Saunders	Transport Canada	506-851-7573		saunder@tc.gc.ca
Don Mason	New Brunswick Department of Transportation - Policy	506-453-2213		Don.Mason@gnb.ca
Rod Cunningham	New Brunswick Tourism	506-453-8731		Rod.Cunningham@gnb.ca
Richard Smith	Saint John Parking Commission	506-649-6009		richard.smith@city.saint-john.nb.ca
Tyrone Parsons	New Brunswick Department of Transportation - Radio Communications	506-453-3393		tyrone.parsons@gnb.ca
Robert Theriault	Royal Canadian Mounted Police - Fredericton	506-452-3452	506-452-3312	bob.theriault@rcmp.grc.gc.ca
Annette Kinder	CVE/Salisbury Scales	506-372-3290		annette.kinder@gnb.ca
Jean-Marc Thibodeau	CVE Public Safety New Brunswick	506-856-2879/ Cell: 506-536-7003		jeanmarc.thibodeau@gnb.ca
Suzanne Archibald	New Brunswick Tel	506-452-4391		Suzanne.Archibald@nbtel.nb.ca
Michael Likely	Day and Ross Group	506-375-5113		mblikely@dayandrossinc.ca
Al Soppitt	Saint John Port Authority	506-636-5611	506-636-4443	asoppitt@sjport.com
Austin MacPhee	Canada Customs	506-636-5595		Austin.Macphee@ccra-adrc.gc.ca
Roger Shannon	City of Fredericton	506-460-2442		shannonr@city.fredericton.nb.ca
Stephane Thibodeau	City of Moncton	506-383-6718		stephane.thibodeau@moncton.org
Don Good	ADI Limited	506-451-7461		dcg@adi.ca
Peter Vuillemot	SVG Consulting, Inc.	506-372-9198		vuillemo@nbnnet.nb.ca
Jack Keir	Saint John Harbour Bridge Authority	506-635-1320		sjhb@nbnnet.nb.ca
Mike Melanson	SMT	506-859-5100	506-857-7830	melanson.mike@smtbus.com
Dale Thibodeau	NB Southern Railway/ Sunbury Transport	506-453-7655		thibodeau.dale@sunburytransport.com
Eric Hildebrand	University of New Brunswick - UNB Transportation Group	506-453-4521		edh@unb.ca
Angus Armour	Armour Transport Ltd	506-857-0205		aarmour@armour.ca
John Goggin	Department of Public Safety, Prov of NB	506-453-8192		John.Goggin@gnb.ca

Appendix C – Use Needs Focus Groups Summary

PRINCE EDWARD ISLAND

Charlottetown, November 6

Representative	Company/Agency	Telephone #	Fax #	Email
Gerry Gallant	Atlantic Canada Airports Association	902-566-1701	902-628-1673	ggallant@acairports.ca
George M. Brookins	Trius Tours Ltd.	902-566-5664	902-566-3497	trius.tours@pei.sympatico.ca
Pat MacDonald	Trius Tours Ltd.	902-566-5664	902-566-3497	trius.tours@pei.sympatico.ca
Tony Glencross	Prince Edward Island Department of Agriculture and Forestry - Market and Industry Development Division	902-368-5641	902-569-7745	taglencross@gov.pe.ca
Gary Petitpas	PEI Development and Technology	902-368-4246	902-368-4242	grpetitpas@gov.pe.ca
Paul Godfrey	Prince Edward Island Department of Transportation and Public Works - Planning, Development & Building Construction	902-368-4849	902-368-5395	jpgodfrey@gov.pe.ca
Helen Blake	PEI Transportation & Public Works	902-368-5155	902-368-5395	heblake@gov.pe.ca
Cathy Worth	PEI Transportation & Public Works	902-894-0271	902-368-5395	cworth@gov.pe.ca
Frank MacEachern	Baseline Business Geographics Inc.	902-892-0300		frankm@baselinegeo.com
Christopher Ogg	Wireless Island Ltd.	902-628-2009	902-892-2671	cogg@wirelessisland.net
Jack Kelly	Bulk Carriers (PEI) Ltd./Mayor Cornwall	902-675-2600		bulkcarrier@atca.ca
John Francis	Confederation Bridge	902-437-7342	902-437-7321	johnf@scbl.net

Appendix C – Use Needs Focus Groups Summary

NOVA SCOTIA

Halifax, November 7

Representative	Company/Agency	Telephone #	Fax #	Email
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Jeremy Bernard	Diaphonics	902-452-1187	902-484-3542	Jeremyb@diaphonics.com
Mac MacLeod	Seimac Limited	902-468-3007 x210	902-468-3009	mmacleod@seimac.com
Richard Garson	Halifax International Airport Authority	902-873-3974	902-873-1258	richard.garson@hiala.ca
John MacLeod Langley	Strait of Canso Superport Corporation	902-747-2410	902-747-2453	straitsuperport2@ns.sympatico.ca
Shane McKinnon	Canada Customs and Revenue Agency	902-426-0622	902-426-5042	shane.mckinnon@ccra-adrc.gc.ca
Kent Sperian	Nova Scotia Transportation & Public Works	902-424-3510	902-424-0571	speirakd@gov.ns.ca
Brian Taylor	Halifax Regional Municipality - Transit Services	902-490-6608	902-490-6688	taylorb@region.halifax.ns.ca
Marcus Garnet	Halifax Regional Municipality- Planning and Development Services	902-490-4481	902-490-4346	garnetm@region.halifax.ns.ca
Daniel Boljkovac	Transport Canada - Coordination and Policy Advice	506-851-2943	506-851-7576	boljkod@tc.gc.ca
Janice Harland	Nova Scotia Transportation & Public Works	902-454-9928	902-424-0571	harlanja@gov.ns.ca
Mike DiPenta	MHCC Transportation Committee	902-463-0935	902-463-3705	mwline@accesswave.ca
Jim Nicoll	Halifax Port Authority	902-426-8713	902-426-8441	jnicoll@portofhalifax.ca
Steve Snider	Halifax-Dartmouth Bridge Commission	902-466-7691	902-469-6281	swsnider@hdbc.ns.ca

Appendix C – Use Needs Focus Groups Summary

NEWFOUNDLAND

St. John's, November 8th

Representative	Company/Agency	Telephone #	Fax #	Contact Info
Doug Shea	Department of Works, Services and Transportation	709-789-3637	709-729-0283	shead@gov.nf.ca
Tina Pomroy	Canadian Manufacturers & Exporters Newfoundland & Labrador Division	709-772-3337	709-772-3213	tina.pomroy@cme-mec.ca
Tim Summers	Newfoundland & Labrador Department of Industry, Trade & Rural Development	709-729-4819	709-729-4869	tsummers@gov.nf.ca
Cluney Mercer	Department of Works, Services and Transportation	709-729-6321	709-729-0283	mercercg@gov.nf.ca
Neil Campbell	Department of Works, Services and Transportation	709-729-3636	709-729-6934	campbelln@gov.nf.ca
Wanda Lundrigan	Department of Works, Services and Transportation	709-729-5347	709-729-0283	wlundrigan@gov.nf.ca
Lloyd Little	Aliant Telecom	709-739-2099	709-739-2183	lloyd.little@aliant.ca
Barry Humby	Aliant Telecom	709-739-3167	709-739-3197	barry.humby@aliant.ca
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Memo

To: Project Steering Committee
Focus Group Participants

Date: December 11, 2001

From: Project Team

Steno: ss

cc:

File No: TO-8921

Subject: *Atlantic Provinces Regional ITS Strategic Planning
User Service Focus Groups - Summary Report*

INTRODUCTION

As you are aware, a series of user service focus groups were conducted on four consecutive days commencing Monday, November 5th, 2001 and finishing on Thursday, November 9th, 2001. The major activities in each workshop included:

- Introduction to the Workshop.
- Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis.
- Identification of higher priority user services.
- Identification of “early winner projects”.

A summary of the results from the four focus groups is provided below.

NEW BRUNSWICK

There were 25 attendees. The participants included:

- Transport Canada;
- Province of New Brunswick, Department of Transportation;
- New Brunswick Tourism;
- municipalities (Fredericton, Moncton)
- Saint John Harbour, Saint John Bridge Authority, and Saint John Parking Commission;
- University of New Brunswick;
- New Brunswick Tel;
- RCMP; and
- commercial carriers.

PRINCE EDWARD ISLAND

There were 12 attendees. The participants included:

- PEI Transportation and Public Works, and Development and Technology staff;
- Confederation Bridge;

- bus operator;
- trucking firm;
- wireless communication provider;
- GIS firm.

NOVA SCOTIA

There were 14 attendees. The participants included:

- Nova Scotia Transportation and Public Works;
- Halifax Transit;
- Halifax Port Authority;
- Halifax – Dartmouth Bridge Commission;
- Halifax Airport;
- Canada Customs and Revenue Agency;
- Atlantic Provinces Trucking Association.

NEWFOUNDLAND AND LABRADOR

There were 19 attendees. The participants included:

- Transport Canada;
- Newfoundland Department of Works Services and Transportation;
- St. John's Transit and Traffic staff;
- Goose Bay Airport;
- Aliant Telecom;
- ACOA.

SWOT ANALYSIS

The participants performed a SWOT analysis for each of the eight User Service Bundles. The facilitators provided tables with an initial effort to describe the strengths, weaknesses, opportunities and threats for each of the User Service Bundles. The participants were told that they could accept, reject or modify the points provided by the facilitators. They were invited to complete the tables as they pertain to the individual respective province. Some key items of note include:

TRAVELLER INFORMATION SERVICES

New Brunswick

Opportunities	Tie in as part of new freeway opening in New Brunswick.
Threats	Low traffic demand.

Prince Edward Island

Weaknesses	Lack of corporate head offices inhibits development of technology. Overhead of public services delivery in region with a small tax base.
Threats	Telecom's policy to own new services.

Nova Scotia

Weaknesses	No central pool of information.
Opportunities	Use of commercial fleet management services to provide traveller information.

Newfoundland and Labrador

Strengths	Web-based cell services including location based services pilot project.
Threats	Inability to implement cost sharing schemes with four provinces and the private sector.

TRAFFIC MANAGEMENT**New Brunswick**

Strengths	Extensive historical data.
Opportunities	Strong funding for technical applications at various levels of government.

Prince Edward Island

Strengths	Existing RWIS data map on web site.
Opportunities	RWIS – participation on national RWIS panel.

Nova Scotia

Strengths	Some experience to date with RWIS and SCOOT.
Opportunities	Tag-equipped vehicles as probes. Campaign for work zone safety awareness.

Newfoundland and Labrador

Strengths	St. John's experience with wireless communication to traffic control signals.
Opportunities	Opportunity to demonstrate ITS as an environmental program.

PUBLIC TRANSPORT SERVICES**New Brunswick**

Weaknesses	No link between transit funding and gas taxes.
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Prince Edward Island

Strengths	Catering to seniors' market in Charlottetown.
Weaknesses	Lack of reliability and appropriate schedules as controlled by government.
Opportunities	Opportunity to reduce costs of service delivery, e.g. use school buses off-peak for other services.

Nova Scotia

Strengths	Passenger information displays at terminals.
Weaknesses	Integrate fare collection and scheduling software.
Opportunities	Multi-mode smartcard, partnered with cruise ship industry and airport parking authority.
Threats	Media reluctance to report on transit operations.

Newfoundland and Labrador

Strengths	Mile One shuttle service. Transport Canada GPS pilot project.
Opportunities	Memorial University partnership.

ELECTRONIC PAYMENT SERVICES

New Brunswick

Strengths	Nova Scotia firm developed pay and display for parking. Saint John bridge experience. Interoperability with Halifax – Dartmouth bridges.
Opportunities	Saint John Bridge expand electronic payment to Saint John parking; retailers.
Threats	Who controls back office?

Prince Edward Island

Weaknesses	Point of service front end is unique to each bank. Set up of debit account can be a barrier for small operators.
Threats	Opportunities for hidden transaction fees or taxes.

Nova Scotia

Strengths	MacPass experience
Weaknesses	No common clearinghouse.
Opportunities	More peripheral uses such as traffic management.

Newfoundland

Strengths	With a small community, it is easy to integrate with other partners.
Threats	Lack of clear champion in the community.

COMMERCIAL VEHICLE OPERATIONS

New Brunswick

Strengths	Significant fleet management technology in place. An established community of carriers.
Weaknesses	Important to achieve compatibility with north-eastern states. Incomplete wireless communications coverage.
Threats	Increased security concerns at border crossings.

Prince Edward Island

Strengths	Weigh-in-Motion experience.
Weaknesses	Truck safety inspection is not uniform across the provinces, i.e. need to harmonize standards.
Opportunities	Ongoing movement to electronic data interchange. Integration of ferry system.

Nova Scotia

Weaknesses	Lack of Hazmat standards. Canada-U.S.-Mexico – no way to track location.
Opportunities	Perimeter security at ports.

Newfoundland and Labrador

Weaknesses	Small size and low volumes. The carrier headquarters are outside of province.
Opportunities	Security of Come-By-Chance refinery shipments to U.S.

EMERGENCY MANAGEMENT SERVICES**New Brunswick**

Strengths	Consolidation of public safety organizations in New Brunswick.
Weaknesses	Lack of wireless coverage in rural areas.
Opportunities	New Brunswick wireless spectrum allocation for EMS currently under negotiation. New Brunswick announcing priority on security.

Prince Edward Island

Strengths	A common GIS for the island.
Weaknesses	RCMP cruisers cannot communicate inter-provincially (different radio systems). Inability to communicate between agencies, e.g. RCMP and ambulance services.

Nova Scotia

Weaknesses	Decentralized dispatches. Lack of consistency in road naming conventions and signage.
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Newfoundland and Labrador

Weaknesses	Failed attempt to have one province-wide radio network. Marine users are calling 911 instead of using Coast Guard VHF.
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There was less input on the remaining two bundles, namely “Information Warehousing Services” and “Vehicle Safety and Control”. However, under “Vehicle Safety and Control”, one suggestion was that New Brunswick, for example, could be a test bed for rural environment safety features, including wild life collisions and ATV/snowmobile collisions.

IDENTIFICATION OF HIGHER PRIORITY USER SERVICES

In consideration of the four focus group proceedings, the following user services were identified as having the highest priority within the Atlantic Region:

- 1.1 Traveller Information
- 1.4 Traveller Services and Reservation
- 2.1 Traffic Control
- 2.2 Incident Management
- 2.4 Environmental Conditions Monitoring
- 2.5 Operations and Maintenance
- 2.6 Automated Warning and Enforcement
- 3.1 Public Transport Management
- 4.1 Electronic Payment
- 5.1 Commercial Vehicle Electronic Clearance
- 5.5 Intermodal Freight Management
- 5.6 Commercial Fleet Management
- 6.1 Emergency Notification and Personal Safety
- 6.3 Disaster Response and Management
- 6.4 Emergency Vehicle Management
- 8.1 Weather and Environmental Data Management.

The New Brunswick session included a detailed assessment of the following user services:

- 1.1 Traveller Information
- 2.2 Incident Management
- 4.1 Electronic Payment
- 5.1 Commercial Vehicle Electronic Clearance
- 8.1 Weather and Environmental Data Management

IDENTIFICATION OF 'EARLY WINNER PROJECTS'

The following is a brief description of the early winners identified by the participants in the focus groups.

New Brunswick

1. Incident Management – Develop/enhance coordinated response to events.
2. Electronic Payment – Expand transponders to be used in areas other than toll collection (i.e. parking, fuel retail).
3. Commercial Vehicle Administration Process.

Prince Edward Island

4. Public Transport Services – Optimize fleet, GPS, private and public bussing integration.
5. Incident Management – Locate collisions and video on GIS-T.
6. Environmental Conditions Monitoring – Province-wide RWIS integration with Department of Agriculture and national system.

7. Traffic Monitoring and Control of Arterial Networks – Adapted traffic signal system for greater Charlottetown area to strengthen north-south and east-west corridors.
8. Emergency Vehicle Management – Integration of emergency services communication.
9. Electronic Payment Services – Commercial vehicles using Confederation Bridge.
10. Traveller Services and Reservations – Integrate data from various sources and disseminate over various media to facilitate travel decisions.

Nova Scotia

11. Enroute Transit Information.
12. Public Travel Security.
13. Transit Traffic Signal Pre-emption/Priority.
14. Consolidating “Just in Time” Information Gathering and Dissemination for all Modes of Transport.
15. Initiate Inter-modal Network – Based on EDIport.
16. Electronic Payment – Expand MacPass to Marine Atlantic, Bay Ferries, and parking operators.
17. Centralized Traveller Information System – 1-800, web, HAR.

Newfoundland and Labrador

18. Province-Wide Weigh-in-Motion Program.
19. Interactive Traveller Information – Provide road conditions, traffic, weather via wireless network. Priority areas are Argentia and Port Aux Basques.
20. Red Light Camera Pilot Project.
21. Implement Transportation Smartcard.
22. Signal Pre-emption for Priority Areas where fire response level of service is a concern.
23. Traffic Responsive Signal System Fixed Frequency Radio connected.

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEW BRUNSWICK FOCUS GROUP**

User Services: Traveller Information Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Public acceptance & expectations • Strong tourism industry • Telecommunications infrastructure • Weather information • Tourism information • Data collection from municipalities 	<ul style="list-style-type: none"> • Lack of interoperability and information sharing • Policies/legislation do not support partnering • Lack of inter-agency co-ordination • Credit card security • Edmunston area example • Need complete listings for any given City 	<ul style="list-style-type: none"> • Integration of ferry service schedules • Travel information distribution for tourism/trade • Lessons learned from others – e.g. TRIP USA • Using/increasing capabilities of commercial products/services • Increased penetration of mobile communications devices • Web-based products • Tie in as part of new freeway opening in New Brunswick 	<ul style="list-style-type: none"> • Protection of intellectual property • Inability to form partnerships • Inability to establish business case • Lack of ongoing funding • Ability for small businesses to access • Information overload for users • Low traffic demand

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEW BRUNSWICK FOCUS GROUP**

User Services: Traffic Management

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Public acceptance • Fewer Agencies to co-ordinate • Mature ITS industry • Good ITS mentality within some agencies • Some experience to date e.g. RWIS • Specific needs to address – rural safety, operations and maintenance, extreme climate • Extensive historical data 	<ul style="list-style-type: none"> • Perception that ITS only applies to urban congestion • No process to focus funding at the provincial or municipal level • Lack of inter-agency coordination • Policies/legislation do not support partnering • Politicians and Public do not fully understand the benefits of ITS • Lack of ITS mentality within some agencies • Not enough data sharing • Communication among municipalities <ul style="list-style-type: none"> – Learn from one another 	<ul style="list-style-type: none"> • Lessons learned from others e.g. US rural corridors • Focus on improved safety and incident response • Federal interest is growing, which may be tied to federal funding • Opportunity to demonstrate ITS as an environmental program • Dialogue with others, e.g. public transport • Strong funding for technology applications at various levels of government 	<ul style="list-style-type: none"> • Lack of funding • Perceived lack of demand • Lack of awareness at political level • Tendency to overrule expert opinions

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEW BRUNSWICK FOCUS GROUP**

User Services: Public Transport Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Regional GIS industry skill sets • Various scheduled and charter intercity services 	<ul style="list-style-type: none"> • Declining ridership • Provincial incentive for expansion is reduced • Lack of interagency/system integration • No link between transit funding and gas taxes 	<ul style="list-style-type: none"> • Help improve attractiveness of transit option • Smartcard/fare integration expansion • Commitment to Kyoto standard • Opportunities to reduce costs of service delivery 	<ul style="list-style-type: none"> • Reduced transit funding • Vehicle-centric environment

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEW BRUNSWICK FOCUS GROUP**

User Services: Electronic Payment Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Existing systems • Strong industry (tolling, Smartcard) • Societal acceptance of electronic tolling • Banking structure within Canada • Revenue application • Proven technology • Pays for itself • Nova Scotia firm developed pay and display for parking • Canadian experience with debit cards • CVO seeks electronic payment capability • Saint John bridge experience • Interoperability with Halifax-Dartmouth Bridges 	<ul style="list-style-type: none"> • Lack of integration amongst required parties (e.g. financial institutions, payment systems, etc.) • Institutional issues • Lack of universally accepted standards • Local knowledge 	<ul style="list-style-type: none"> • International standard movements (ISO, ASTM) • Commitment to Kyoto standard • Reducing operating costs • Partnering with various related stakeholders e.g. parking, retailers • Saint John Bridge, e.g. <ul style="list-style-type: none"> – Saint John Parking – Tim Hortons – Fuel retailers • Pay CVO credentials <ul style="list-style-type: none"> – Service New Brunswick 	<ul style="list-style-type: none"> • Institutional barriers (lack of autonomy) • Public concerns about privacy issues • Demonstrate cost effectiveness • Who controls back office? • Technology obsolescence

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEW BRUNSWICK FOCUS GROUP**

User Services: Commercial Vehicle Operations

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Experience with continental programs • International co-operation efforts (NAFTA) • Good regulatory environment • Significant focus on truck safety • Significant fleet management technology in place – weakness for small fleets to access • Regional GIS industry strengths • Less concerns about the “big brother” syndrome • Multiple modes • APTA relationship with province • Carriers can develop business case for participation • Established community of carriers 	<ul style="list-style-type: none"> • Lack of funding limiting full implementation • Institutional differences between Canada/US for information sharing • Legislative restrictions on data exchange • Ability of independent truckers to access programs • Important to achieve compatibility with northeastern states • Incomplete highway system • Incomplete wireless communications coverage 	<ul style="list-style-type: none"> • Expand into courier industry • Provide real time information • Partner with existing fleets • High cross-border traffic demand (NB) • High percentage of commercial vehicles • Expand WIM • Federal and provincial government interest in gateways and priority corridors • Increased needs for efficient movements at border crossings in light of delays related to security concerns. • Optimization of multi-modal terminals • National CVO programs • Ongoing movement to Electronic Data Interchange and E-Commerce • Increased demand for movement through ports • Technologies are affordable • Carriers can participate as information providers 	<ul style="list-style-type: none"> • No buy-in from the user community • Privacy, loss of competitive advantage • Lack of funding • End of consumer resistance to added cost • Increased security concerns at border crossings • Absence of standards for information exchange

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEW BRUNSWICK FOCUS GROUP**

User Services: Emergency Management Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Municipal consolidation, reducing agencies further e.g. Moncton • RCMP-regional coverage • Regional GIS industry strengths • Consolidation of public safety organizations in New Brunswick 	<ul style="list-style-type: none"> • Interagency barriers – information sharing, control at the scene • Minimal focus of emergency agencies on transportation • Lack of agreed-upon incident management procedures • Lack of management of towing industry • Lack of standards for in-vehicle applications e.g. Mayday • Lack of funding • Lack of wireless coverage in rural areas • Communication coordination between agencies at the scene 	<ul style="list-style-type: none"> • Renewed focus on emergency preparedness • Onboard equipment of emergency vehicles (in-vehicle navigation, communications) • Apply commercial fleet management systems to public services • Signal pre-emption programs • Penetration of E911 • Commercial Mayday services • New Brunswick announcing priority or security • New Brunswick wireless spectrum allocation for EMS currently under negotiation 	<ul style="list-style-type: none"> • Lack of available funding • Change in government

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEW BRUNSWICK FOCUS GROUP**

User Services: Information Warehousing Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Existing RWIS programs • Planned national RWIS program • Web site and 1-800 # for weather information • New Brunswick active in this area 	<ul style="list-style-type: none"> • Legislative restrictions regarding Canada/US information sharing in CVO • No incentive to coordinate data • Present systems cannot provide enough real-time data • Capability of existing computer systems 	<ul style="list-style-type: none"> • Better information from various ITS applications • Work with private fleet information systems to provide accurate real-time information • Build upon data from RWIS road maintenance deployment • Trucking companies need information • New Brunswick DOT – disseminates information to media, emergency dispatch (not real-time) • Revenue opportunities 	<ul style="list-style-type: none"> • Lack of funding • Reduced funding affects quality of data (e.g. collision reporting centres) • Lack of lead agency • Policies for data distribution • Lack of employee buy-in and awareness • Privacy of data

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEW BRUNSWICK FOCUS GROUP**

User Services: Vehicle Safety and Control

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • 3 main trucking companies <ul style="list-style-type: none"> – Armour – McCain – Irving 	<ul style="list-style-type: none"> • Automotive manufacturing oriented only • Lack of public infrastructure support 	<ul style="list-style-type: none"> • Early applications for specialty vehicles e.g. snow ploughs, heavy vehicles • Research initiatives • New Brunswick testbed <ul style="list-style-type: none"> – Rural environment – Wildlife collisions – ATV/snowmobile collisions • UNB vehicle safety program • MRDC project 	<ul style="list-style-type: none"> • Legal liabilities • Other countries (Europe, Japan, US) taking lead in product development

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEWFOUNDLAND & LABRADOR FOCUS GROUP**

User Services: Traveller Information Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Public acceptance & expectations • Strong tourism industry • Telecommunications infrastructure • Hardware devices already exist • St. John’s – GIS • Business case for specific users, e.g. fleet operators • Web-based cell services, including LBS pilot 	<ul style="list-style-type: none"> • Lack of interoperability and information sharing • Policies/legislation do not support partnering • Lack of inter-agency co-ordination • 10% province-wide GIS coverage • Privacy of data • Uptake of technologies • Difficulty in PPP • Need to establish public willingness to pay 	<ul style="list-style-type: none"> • Integration of ferry service schedules • Travel information distribution for tourism/trade • Lessons learned from others – e.g. TRIP USA • Using/increasing capabilities of commercial products/services • Increased penetration of mobile communications devices • Web-based products • Re-routing opportunities • Advertising potential 	<ul style="list-style-type: none"> • Lack of funding • Protection of intellectual property • Inability to form partnerships • Inability to establish business case • Ability to implement cost sharing schemes with 4 provincial governments and the private sector

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEWFOUNDLAND & LABRADOR FOCUS GROUP**

User Services: Traffic Management

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Public acceptance • Fewer Agencies to co-ordinate • Some experience to date e.g. RWIS • Specific needs to address – rural safety, operations and maintenance, extreme climate • St. John’s 25% wireless connection to signals • Autoscope payback in 2 years • Pockets of expertise • Signal pre-emption ready • Can take advantage of lessons learned 	<ul style="list-style-type: none"> • Perception that ITS only applies to urban congestion • No process to focus funding at the provincial or municipal level • Lack of inter-agency coordination • Policies/legislation do not support partnering • Politicians and Public do not fully understand the benefits of ITS • Lack of ITS identity • Demographics, low density 	<ul style="list-style-type: none"> • Lessons learned from others e.g. US rural corridors • Focus on improved safety and incident response • Federal interest is growing, which may be tied to federal funding • Opportunity to demonstrate ITS as an environmental program • Completing wireless communications over 5 years 	<ul style="list-style-type: none"> • Lack of funding • Perceived lack of demand • Lack of awareness of ITS applications • Resistance to change

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEWFOUNDLAND & LABRADOR FOCUS GROUP**

User Services: Public Transport Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Regional GIS industry skill sets • Various scheduled and charter intercity services • Only one entity for service in St. John’s and Mount Pearl • TC GPS pilot project • Large student base • DRL web site • Mile One shuttle service 	<ul style="list-style-type: none"> • Declining ridership • Provincial incentive for expansion is reduced • Lack of interagency/system integration • No link between transit funding and gas taxes • Readily available parking • Low density population • Narrow streets • Poor frequency of service • Poor image of public transit 	<ul style="list-style-type: none"> • Help improve attractiveness of transit option • Smartcard/fare integration expansion • Commitment to Kyoto standard • Opportunities to reduce costs of service delivery • Memorial University partnership • Visibility, Image, Positioning (VIP) program • Rising fuel prices 	<ul style="list-style-type: none"> • Reduced transit funding • Vehicle-centric environment • Increased insurance premiums • Rising fuel prices

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEWFOUNDLAND & LABRADOR FOCUS GROUP**

User Services: Electronic Payment Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Existing systems • Strong industry (tolling, Smartcard) • Societal acceptance of electronic tolling • Banking structure within Canada • Revenue application • Small community, easy to integrate with other partners 	<ul style="list-style-type: none"> • Lack of integration amongst required parties (e.g. financial institutions, payment systems, etc.) • Institutional issues • Lack of universally accepted standards • System failures an issue • Potential for too many cards/lack of integration • Lack of regional expertise 	<ul style="list-style-type: none"> • International standard movements (ISO, ASTM) • Commitment to Kyoto standard • Reducing operating costs • Partnering with various related stakeholders e.g. parking, retailers, MUN • Reduce cash handling costs 	<ul style="list-style-type: none"> • Institutional barriers (lack of autonomy) • Public concerns about privacy issues • Lack of natural leader in the community

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEWFOUNDLAND & LABRADOR FOCUS GROUP**

User Services: Commercial Vehicle Operations

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • International co-operation efforts (NAFTA) • Good regulatory environment • Significant focus on truck safety • Significant intermodal operations • One main highway to focus on 	<ul style="list-style-type: none"> • Lack of funding limiting full implementation • Institutional differences between Canada/US for information sharing • Legislative restrictions • Ability of independent truckers to access programs • Experience with continental programs • No experience with WIM • Small size and low volumes • Carrier HQ outside province 	<ul style="list-style-type: none"> • Expand into courier industry • Provide real time information • Partner with existing fleets • High percentage of commercial vehicles • Expand WIM; reduce drive times • Federal and provincial government interest in gateways and priority corridors • Increased needs for efficient movements at border crossings in light of delays related to security concerns. • Optimization of multi-modal terminals • National CVO programs • Ongoing movement to Electronic Data Interchange • Post schedules for carriers; ferries • Security of Come By Chance Refinery shipments to U.S. 	<ul style="list-style-type: none"> • No buy-in from the user community • Privacy, loss of competitive advantage • Lack of funding

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEWFOUNDLAND & LABRADOR FOCUS GROUP**

User Services: Emergency Management Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Small number of agencies involved • Existing provincial emergency management organizations • Municipal consolidation, reducing agencies further e.g. Moncton • Well developed telecommunications industry • RCMP-regional coverage • Regional GIS industry strengths • Signals pre-emption ready • Regular coordination meetings with RCMP 	<ul style="list-style-type: none"> • Interagency barriers – information sharing, control at the scene • Minimal focus of emergency agencies on transportation • Lack of agreed-upon incident management procedures • Lack of management of towing industry • Lack of standards for in-vehicle applications e.g. Mayday • No location reference for landline 911 calls • Failed attempt to have one province-wide radio network • Issue: marine users calling 911 instead of using Coast Guard VHF 	<ul style="list-style-type: none"> • Renewed focus on emergency preparedness • Onboard equipment of emergency vehicles (in-vehicle navigation, communications) • Apply commercial fleet management systems to public services • Signal pre-emption programs • Penetration of E911 • Commercial Mayday services 	<ul style="list-style-type: none"> • Lack of available funding

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEWFOUNDLAND & LABRADOR FOCUS GROUP**

User Services: Information Warehousing Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Existing RWIS programs • Planned national RWIS program 	<ul style="list-style-type: none"> • Lack of traffic data • No incentive to coordinate data • Legislative restrictions regarding Canada/US information sharing in CVO 	<ul style="list-style-type: none"> • Better information from various ITS applications • Work with private fleet information systems to provide accurate real-time information 	<ul style="list-style-type: none"> • Funding • Reduced funding affects quality of data (e.g. collision reporting centres) • Lack of lead agency • Policies for data distribution • Liability for data

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NEWFOUNDLAND & LABRADOR FOCUS GROUP**

User Services: Vehicle Safety and Control

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Adverse environment conditions • One main highway to focus on 	<ul style="list-style-type: none"> • Lack of public infrastructure support • Small market • Public not willing/able to pay 	<ul style="list-style-type: none"> • Early applications for specialty vehicles e.g. snow ploughs, heavy vehicles • Research initiatives 	<ul style="list-style-type: none"> • Legal liabilities • Other countries (Europe, Japan, US) taking lead in product development

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Traveller Information Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Public acceptance & expectations • Strong tourism industry • Telecommunications infrastructure • Use of highway advisory radio 	<ul style="list-style-type: none"> • Lack of interoperability and information sharing • Policies/legislation do not support partnering • Lack of inter-agency co-ordination • Low population density • No central pool of information 	<ul style="list-style-type: none"> • Integration of ferry service schedules • Government programs to encourage travel information distribution for tourism/trade • Lessons learned from others – e.g. TRIP USA • Using/increasing capabilities of commercial products/services • Increased penetration of mobile communications devices • Web-based products • Funding from tourism industry • New services such as 511 • Use of commercial fleet management services to provide traveller information 	<ul style="list-style-type: none"> • Funding • Protection of intellectual property • Inability to form partnerships • Inability to establish business case • Lack of long range planning

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Traffic Management

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Public acceptance • Fewer Agencies to co-ordinate • Some experience to date e.g. RWIS and SCOOT • Specific needs to address – rural safety, operations and maintenance, extreme climate 	<ul style="list-style-type: none"> • Perception that ITS only applies to urban congestion • No process to focus funding at the provincial or municipal level • Lack of inter-agency coordination • Policies/legislation do not support partnering • Politicians and Public do not fully understand the benefits of ITS • Lack of intra-agency coordination • Lack of infrastructure for HOV 	<ul style="list-style-type: none"> • Lessons learned from others e.g. US rural corridors • Focus on improved safety and incident response • Federal interest is growing, which may be tied to federal funding • Opportunity to demonstrate ITS as an environmental program • Mature ITS industry (not well understood) • Campaign for work zone safety awareness • Tag-equipped vehicles as probes • Ramp metering? • Not using RWIS to full potential 	<ul style="list-style-type: none"> • Lack of funding • Perceived lack of demand • Lack of political coordination • Focus on short term vs. long term goals • Departmental/agency empire building

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Public Transport Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Regional GIS industry skill sets • Various scheduled and charter intercity services • GO Time system • SCOOT signal pre-emption • Transit vehicle MacPass through toll plazas • Web site • Passenger information displays at terminals 	<ul style="list-style-type: none"> • Lack of interagency/system integration • No link between transit funding and gas taxes • No funding from province • Antiquated fare collection and scheduling software • Geographically constrained city centre • Need for low density community services 	<ul style="list-style-type: none"> • Increasing ridership • Help improve attractiveness of transit option • Smartcard/fare integration expansion • Commitment to Kyoto standard • Opportunities to reduce costs of service delivery • Include ferry services in GO Time system • GPS – based GO Time • Multi-mode smart card; partner with cruise ship industry; airports; parking authority • Visibility Image and Positioning (VIP) marketing initiative • Metro transit strategy 	<ul style="list-style-type: none"> • Reduced transit funding • Vehicle-centric environment • Aging buses and facilities • Media reluctance to report on transit operations

- Discussion on role of airport as hub for the region. Atlantic Province Chamber of Commerce – Improve connections and traveller services at airport.

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Electronic Payment Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Existing systems • Strong industry (tolling, Smartcard) • Societal acceptance of electronic tolling • Banking structure within Canada • Revenue application • Toll collection as early adopter • MacPass experience <ul style="list-style-type: none"> – Fiscal control 60-80% reduction in collection cost – 80-95% MacPass adoption for heavy vehicles – 30% penetration overall 	<ul style="list-style-type: none"> • Lack of integration amongst required parties (e.g. financial institutions, payment systems, etc.) • Institutional issues • Lack of universally accepted standards • Start-up costs • No common clearinghouse • Fear of invasion of privacy 	<ul style="list-style-type: none"> • International standard movements (ISO, ASTM) • Commitment to Kyoto standard • Reducing operating costs • Partnering with various related stakeholders e.g. parking, service stations • Coming US standards • More peripheral uses such as traffic management • Lower cost transponders • OEM installed transponders 	<ul style="list-style-type: none"> • Institutional barriers (lack of autonomy) • Public concerns about privacy issues and abuse of data • Emerging technologies • EFT stored value media • OEM installed transponders

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Commercial Vehicle Operations

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Experience with continental programs • International co-operation efforts (NAFTA) • Significant focus on truck safety • Significant fleet management technology in place • Regional GIS industry strengths 	<ul style="list-style-type: none"> • Lack of funding limiting full implementation • Institutional differences between Canada/US for information sharing • Legislative restrictions on data exchange • Ability of independent truckers to access programs • Regulatory inconsistency between road/rail/marine/air and international borders, and HAZMAT • Ability of small operators to access technology • Lack of HAZMAT standards <ul style="list-style-type: none"> – Canada/US/Mexico – No way to track location • Container traffic in downtown 	<ul style="list-style-type: none"> • Expand into courier industry • Provide real time information • Partner with existing fleets • High cross-border traffic demand (NB) • High percentage of commercial vehicles • Expand WIM • Federal and provincial government interest in gateways and priority corridors • Increased needs for efficient movements at border crossings in light of delays related to security concerns. • Optimization of multi-modal terminals • National CVO programs • Ongoing movement to Electronic Data Interchange • Perimeter security at ports 	<ul style="list-style-type: none"> • No buy-in from the user community • Privacy, loss of competitive advantage • Funding • Increased security concerns at border crossings

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Emergency Management Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Small number of agencies involved • Existing provincial emergency management organizations • Municipal consolidation, reducing agencies further e.g. Moncton • Well developed telecommunications industry • RCMP-regional coverage • Regional GIS industry strengths 	<ul style="list-style-type: none"> • Interagency barriers – information sharing, control at the scene • Minimal focus of emergency agencies on transportation • Lack of agreed-upon incident management procedures • Lack of management of towing industry • Lack of standards for in-vehicle applications e.g. Mayday • Decentralized dispatches • Lack of consistency in road naming conventions and signage 	<ul style="list-style-type: none"> • Renewed focus on emergency preparedness • Onboard equipment of emergency vehicles (in-vehicle navigation, communications) • Apply commercial fleet management systems to public services • Signal pre-emption programs • Penetration of E911 • Commercial Mayday services • Renewed interest after 9/11 • 311 for incident reporting 	<ul style="list-style-type: none"> • Lack of available funding • Could be confusing if using common radio frequency

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Information Warehousing Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Existing RWIS programs • Planned national RWIS program • Relatively strong IT sector 	<ul style="list-style-type: none"> • Lack of traffic data • No incentive to coordinate data • Legislative restrictions regarding Canada/US information sharing in CVO • Lack of widely accepted standards 	<ul style="list-style-type: none"> • Better information from various ITS applications • Work with private fleet information systems to provide accurate real-time information • Access to private fleet information • Long term archive • Instrumentation of trucks as probes • Web-based data access methods 	<ul style="list-style-type: none"> • Funding • Reduced funding affects quality of data (e.g. collision reporting centres) • Lack of lead agency • Policies for data distribution • Security of data <ul style="list-style-type: none"> – e.g. CVO black box reporting

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Vehicle Safety and Control

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Large market in North America • Automotive manufacturers – ability to influence future designs • Market driven, public willingness to pay • Some carriers have purchased obstacle detection systems and get insurance premium break 	<ul style="list-style-type: none"> • Automotive manufacturing oriented only • Lack of public infrastructure support • Lack of public education to support • Low population density to support infrastructure deployment • Willingness of the consumer to pay? 	<ul style="list-style-type: none"> • Early applications for specialty vehicles e.g. snow ploughs, heavy vehicles • Research initiatives • Vehicle safety marketing tools • Vehicle presence notification “beeper” e.g. airport aprons; emergency vehicles 	<ul style="list-style-type: none"> • Legal liabilities • Other countries (Europe, Japan, US) taking lead in product development • Drivers may become too reliant

User Services: Traveller Information Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Strong tourism industry • GIS database • Excellent opportunity for pilot projects, i.e. microcosm • Road database updated 	<ul style="list-style-type: none"> • Lack of interoperability and information sharing • Policies/legislation do not support partnering • Lack of inter-agency co-ordination • Telecommunications infrastructure • Inaccessibility of GIS data because of high price charged for access • Policy of public sector on IP rights • Small market • Lack of corporate head offices inhibits development of technology • Overhead of public service delivery in Region with small tax base. 	<ul style="list-style-type: none"> • Public acceptance & expectations • Integration of ferry service schedules Northumberland Ferries; new tours announced Quebec-Magdellan-PEI • Travel information distribution for tourism/trade • Lessons learned from others – e.g. TRIP USA • Using/increasing capabilities of commercial products/services • Increased penetration of mobile communications devices • Web-based products • Partnerships to manage access to wireless spectrum and R.O.W. • Lessons learned from other agencies 	<ul style="list-style-type: none"> • Lack of funding • Protection of unwarranted intellectual property* • Inability to form partnerships • Inability to establish business case • Existing little start-ups/service providers can get squeezed out • Telecoms policy to own or block, i.e. can be technology inhibitor as they become vertically integrated content and service provider

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Traffic Management

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Public acceptance • Fewer Agencies to co-ordinate • Mature ITS industry • Good ITS mentality within agencies • Some experience to date e.g. RWIS • Specific needs to address – rural safety, operations and maintenance, extreme climate • Existing RWIS data map on web site • 42 vehicle classification sites • Permanent counting station using IR detection • Resources/references available, e.g. Confederation Bridge TMS, Halifax SCOOT • Open to pilot programs • GIS-T • Signal coordination on perimeter by-pass 	<ul style="list-style-type: none"> • Perception that ITS only applies to urban congestion • No process to focus funding at the provincial or municipal level • Lack of inter-agency coordination • Policies/legislation do not support partnering • Politicians and Public do not fully understand the benefits of ITS • Lack of public awareness • Lack of inter-departmental coordination 	<ul style="list-style-type: none"> • Lessons learned from others e.g. US rural corridors • Focus on improved safety and incident response • Federal interest is growing, which may be tied to federal funding • Opportunity to demonstrate ITS, e.g. Confederation Bridge • RWIS – Province has stations and Bridge has monitoring and dedicated forecasts. Participation national RWIS panel • Opportunities to link collision data and images to GIS-T 	<ul style="list-style-type: none"> • Lack of funding • Perceived lack of traffic demand • People have expectations of no delay, i.e. low tolerance for unscheduled events

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Public Transport Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Regional GIS industry skill sets • Various scheduled and charter intercity services • Catering to seniors market in Charlottetown 	<ul style="list-style-type: none"> • Provincial incentive for expansion is reduced • Lack of interagency/system integration • No link between transit funding and gas taxes • Frustration over scheduled service limitation in Charlottetown • Lack of reliability and appropriate schedules as controlled by government • Focus on seniors vs. broader population 	<ul style="list-style-type: none"> • Help improve attractiveness of transit option • Smartcard/fare integration expansion • Commitment to Kyoto standard • Opportunities to reduce costs of service delivery e.g. use school vehicles off-peak for other services • Need student transport services 	<ul style="list-style-type: none"> • Reduced transit funding • Vehicle-centric environment • Reduced tourism demand if not reliable intercity transit

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Electronic Payment Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Existing systems • Strong industry (tolling, Smartcard) • Revenue application • Commercial carrier acceptance 	<ul style="list-style-type: none"> • Lack of integration amongst required parties (e.g. financial institutions, payment systems, etc.) • Institutional issues • Lack of universally accepted standards • Banking structure does not allow change to front end systems • POS front end is unique to each bank • Set-up of debit account can be a barrier for small operators • Privacy issues 	<ul style="list-style-type: none"> • International standard movements (ISO, ASTM) • Reducing operating costs • Partnering with various related stakeholders e.g. parking, retailers • Common back-office would reduce everyone's cost • New technology applications <ul style="list-style-type: none"> – Proximity readers • Opportunities for rewards programs 	<ul style="list-style-type: none"> • Institutional barriers (lack of autonomy) • Public concerns about privacy issues • High start-up costs • Technology obsolescence • Opportunities for hidden transaction fees or taxes

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Commercial Vehicle Operations

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Experience with continental programs • International co-operation efforts (NAFTA) • Good regulatory environment • Significant fleet management technology in place • Regional GIS industry strengths • WIM experience 	<ul style="list-style-type: none"> • Lack of funding limiting full implementation • Institutional differences between Canada/US for information sharing • Legislative restrictions on data exchange • Ability of independent truckers to access programs • Truck safety inspection not uniform across provinces, i.e. need to harmonize standards • Concerns over ability of schools to supply drivers 	<ul style="list-style-type: none"> • Expand into courier industry • Provide real time information • Partner with existing fleets • High cross-border traffic demand (NB) • High percentage of commercial vehicles • Expand WIM • Federal and provincial government interest in gateways and priority corridors • Increased needs for efficient movements at border crossings in light of delays related to security concerns. • Optimization of multi-modal terminals • National CVO programs • Ongoing movement to Electronic Data Interchange • Integration of ferry system 	<ul style="list-style-type: none"> • No buy-in from the user community • Privacy, loss of competitive advantage • Funding • Increased security concerns at border crossings

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Emergency Management Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Small number of agencies involved • Existing provincial emergency management organizations • Municipal consolidation, reducing agencies further e.g. Moncton • Well developed telecommunications industry • RCMP-regional coverage • Regional GIS industry strengths • Common GIS for Island 	<ul style="list-style-type: none"> • Interagency barriers – information sharing, control at the scene • Minimal focus of emergency agencies on transportation • Lack of agreed-upon incident management procedures • Lack of management of towing industry • Lack of standards for in-vehicle applications e.g. Mayday • Inability to communicate between agencies, e.g. <ul style="list-style-type: none"> – RCMP – ambulance services cannot communicate en-route in some cases • RCMP cruisers cannot communicate inter-provincially – different radio systems 	<ul style="list-style-type: none"> • Renewed focus on emergency preparedness • Onboard equipment of emergency vehicles (in-vehicle navigation, communications) • Apply commercial fleet management systems to public services • Signal pre-emption programs • Penetration of E911 • Commercial Mayday services 	<ul style="list-style-type: none"> • Lack of available funding • Implementation of measures in response to 9/11 without adequate planning

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Information Warehousing Services

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Existing RWIS programs • Planned national RWIS program 	<ul style="list-style-type: none"> • Lack of traffic and road network data • No incentive to coordinate data • Legislative restrictions regarding Canada/US information sharing in CVO • Lack of skill sets to analyze data • Lack of policies for use of data 	<ul style="list-style-type: none"> • Better information from various ITS applications • Work with private fleet information systems to provide accurate real-time information 	<ul style="list-style-type: none"> • Funding • Reduced funding affects quality of data (e.g. collision reporting centres) • Lack of lead agency • Policies for data distribution

**ATLANTIC ITS STRATEGIC PLAN – STRENGTHS, WEAKNESSES, OPPORTUNITIES & THREATS (SWOT) ANALYSIS
NOVA SCOTIA FOCUS GROUP**

User Services: Vehicle Safety and Control

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Large market • Automotive manufacturers – ability to influence future designs • Market driven, public willingness to pay 	<ul style="list-style-type: none"> • Automotive manufacturing oriented only • Lack of public infrastructure support 	<ul style="list-style-type: none"> • Early applications for specialty vehicles e.g. snow ploughs, heavy vehicles • Research initiatives 	<ul style="list-style-type: none"> • Legal liabilities • Other countries (Europe, Japan, US) taking lead in product development

APPENDIX D

USER SERVICE ANALYSIS

Appendix D – Use Service Analysis

Each candidate user service has been analyzed against a set of criteria in consultation with the stakeholder community. The user service analysis criteria are an aggregation and elaboration of those established in previous ITS strategic planning studies in Canada and abroad. A brief description of these criteria is provided as follows:

- **Ability to Address Need** – Does a widely recognized need currently exist and can the facilities/services included in the user service be deployed to address these priorities?
- **Compatibility with Vision** – Does the user service correspond with the fundamentals of the Atlantic Provinces ITS Vision as outlined in Section 3.0?
- **Potential Benefit** – Which of the user services will be of the most benefit in terms of magnitude, payback period, and potential beneficiaries?
- **Practicality** – Can the user service be ready in the time and are potential users and beneficiaries positioned to make use of the service?
- **Availability of Champion(s)** – Are there individuals, groups or agencies willing to spearhead the planning/implementation to move the initiative along?
- **Risk Management** – Are there risks involved and can they be overcome and managed in the implementation time frame?
- **Capability of Integration** – Can the ITS service be easily integrated into mainstream transportation and management activities within the Atlantic Provinces? Can the user service be integrated across modes, jurisdictions and geographic areas?

A set of “User Service Assessment” summaries are included on the following pages for the higher priority/ more relevant user services. A review of the user service assessments yields the following observations:

- Most of the user services are characterized by a high degree of compatibility with the vision and the stated needs, stemming from a readily identifiable and proven set of benefits.
- Most of the user services under consideration employ proven applications and hence can be considered practical for implementation in the Atlantic Region. However, some user services, such as Automated Warning and Enforcement are characterized by significant implementation hurdles to overcome, such as legislative changes, and are considered less practical for near term implementation.
- Many of the user services, such as Traveller Services and Reservations, involve a broad range of stakeholders on a region-wide scale. This presents challenges in terms of identifying appropriate champions to secure funding and lead a deployment and operations effort.
- Virtually all of the user services under consideration offer some level of capability to integrate and exchange information with other companion user services. In many cases, enabling standards to support this integration exist or are under development.

Appendix D – Use Service Analysis

ITS USER SERVICE: 1.1 Traveller Information		
<p>The Traveller Information user service provides travellers with information prior to their departure to assist them in making mode choices, travel time estimates, and route decisions. The sub-services of the Traveller Information user service address four major functions, which are: (1) Available Services Information, (2) Current Situation Information, (3) Trip Planning Service, and (4) User Access. Information is integrated from various transportation modes and other information sources and is presented to the user for decision making.</p>		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	Address needs associated with ferry operations/service, provision of road condition information and the tourism growth/information.	●
Compatibility with Vision	Support the safety, efficiency and improved service provision of the vision.	●
Potential Benefit	Generate tourism interest and permit the trip planning functions Reduce collisions through the early notification/dissemination of adverse conditions Provide improved service provision for ferry and parking operations	●
Practicality	The implementation of traveller information services can be undertaken in the short term, given the availability of supporting data, information and web services at the provincial and municipal levels	●
Availability of Champion(s)	Road authorities, tourism agencies and ferry operators.	○
Risk Management	Too many stakeholders providing information. May lead to overlap and contradiction.	◐
Capability for Integration	PEI, NB, NFLD, NS have existing telephone and/or web based information systems relating to road conditions and travel opportunities.	◐
LEGEND		
High	●	Medium
	◐	Low
		○
GENERAL COMMENTS		

Appendix D – Use Service Analysis

ITS USER SERVICE: 1.4 Traveller Services and Reservations		
<p>The Traveller Services Information user service provides the traveller with access to “yellow pages” type information regarding a variety of travel-related services and facilities. The information will be accessible to the traveller in the home or office to support pre-trip planning and while enroute, either in the vehicle or at public facilities such as public transit terminals or highway rest stops.</p>		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	The capability to monitor facility utilization/operations and provide information to potential users will increase tourist interest in the Atlantic Provinces and will improve the ferry and parking operations.	●
Compatibility with Vision	Supports the vision in improving economy through increase in tourism activity and assisting agencies/operators in the management of their existing resources/operations.	●
Potential Benefit	Improved information dissemination to ferry users Efficient use of existing parking facilities Increase tourism expenditures	●
Practicality	Systems to support this user service can be established in the short term.	●
Availability of Champion(s)	Parking authorities/operators, tourism agencies and ferry operators.	○
Risk Management	Lack of funding and the ability to build a solid business case to attract private/tourism funding and consider cost sharing	○
Capability for Integration	Integration opportunities with existing public web-based information services and with traveller information services.	◐
LEGEND		
High	●	Medium
	◐	Low
		○
GENERAL COMMENTS		
User Services 1.4 and 1.1 should be pursued together.		

Appendix D – Use Service Analysis

ITS USER SERVICE: 2.1 Traffic Control		
<p>The Traffic Control user service manages the movement of traffic on streets and highways. It includes surface street controls such as traffic signal systems, adaptive traffic control systems and freeway control techniques such as ramp metering and lane control. Between the eight sub-services of the Traffic Control user services, the following four functions are provided which are (1) Traffic Flow Optimization, (2) Traffic Surveillance, (3) Control Function, and (4) Provide Information.</p>		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	ITS traffic control technologies have been proven to address operations and safety.	
Compatibility with Vision	Supports the operation efficiency and safety goals of the vision.	
Potential Benefit	Reduced delay and congestion Improved safety. Improved monitoring and traffic data collection abilities	
Practicality	Traffic control technologies are readily available.	
Availability of Champion(s)	Municipalities take the lead.	
Risk Management	Interagency coordination. Ability to secure funding.	
Capability for Integration	Opportunities exist to integrate new systems/technologies with existing traffic control systems.	
LEGEND		
High 	Medium 	Low 
GENERAL COMMENTS		

Appendix D – Use Service Analysis

ITS USER SERVICE: 2.2 Incident Management		
<p>The Incident Management user service enhances existing capabilities to identify incidents, formulate response actions, and support initiation and ongoing co-ordination of those response actions. The single sub-service of the Incident Management user service provides six major functions such as: (1) Scheduled Planned Incidents, (2) Identify Incidents, (3) Formulate Response Actions, (4) Support Co-ordinated Implementation of Response Actions, (5) Support Initialization of Response to Actions, and (6) Predict Hazardous Conditions.</p>		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	Incident management systems have been proven to reduce incident detection, confirmation and response times.	
Compatibility with Vision	Supports increased efficiency and collision reduction objectives.	
Potential Benefit	Reduce cost of congestion resulting from emergency and non-emergency incidents Reduce severity of collisions and potential for secondary collisions Increase capacity of existing infrastructure	
Practicality	Proven applications.	
Availability of Champion(s)	All government agencies have a mandate to manage their own infrastructure.	
Risk Management	Lack of Funding In some cases, existing intra-jurisdiction and agency communications are poor/not available. Lack of wireless communications in rural areas.	
Capability for Integration	Incident management could be integrated into existing traffic control centres.	
LEGEND		
High 	Medium 	Low 
GENERAL COMMENTS		

Appendix D – Use Service Analysis

ITS USER SERVICE: 2.4 Environmental Conditions Monitoring		
<p>The Environmental Conditions and Monitoring user service provides government agencies with the capability to enhance their air quality control strategies. The function provides both wide area and Wayside emissions monitoring as well as Road Weather Systems and Services. Information is used by Traffic Demand Management in the Traffic Management Centre to mitigate pollution and may be provided to enforcement agencies to compel offenders to comply with standards. In addition, road weather information and forecasts provide inputs to other systems such as ATMS and ATIS to increase safety and efficiency.</p>		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	The advance notice of environmental hazards such as fog, freezing rain and heavy snowfalls can be accomplished through the use of environmental monitoring equipment and associated information dissemination abilities.	●
Compatibility with Vision	Improve safety of the traveling public and commercial vehicles.	●
Potential Benefit	Increase ability to provide advance warning of hazardous roadway conditions Timely deployment of maintenance equipment.	●
Practicality	It may be less practical to provide environmental monitoring on low volume roadways.	●
Availability of Champion(s)	Provinces have initiated/established environmental conditions monitoring programs.	●
Risk Management	From a funding perspective, coverage in rural areas may be difficult to justify given lower traffic volumes.	●
Capability for Integration	Integration into existing RWIS sites/programs. Integration with traveller information and operations and maintenance user services.	●
LEGEND		
High ●	Medium ◐	Low ○
GENERAL COMMENTS		

Appendix D – Use Service Analysis

ITS USER SERVICE: 2.5 Operations and Maintenance		
The Operations and Maintenance user service provides government agencies, as well as contractors with the resources to manage the operations and maintenance of vehicle fleet and equipment assets, and monitor and manage traffic flow around work zone areas.		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	Provide more cost-effective management of facilities.	
Compatibility with Vision	Improve safety of the traveling public and commercial vehicles.	
Potential Benefit	Reduce operating expenditures by maintenance departments. Provide improved road maintenance activities.	
Practicality	Proven applications.	
Availability of Champion(s)	Each infrastructure operator.	
Risk Management	Operational transition to new technologies is challenging. Upfront funding requirements are substantial and must be justified versus other municipal needs.	
Capability for Integration	Opportunities to share with adjacent. Integration with traveller information and operations and maintenance user services.	
LEGEND		
High 	Medium 	Low 
GENERAL COMMENTS		

Appendix D – Use Service Analysis

ITS USER SERVICE: 2.6 Automated Warning and Enforcement		
The Automated Dynamic Warning and Enforcement user service provides systems which warn vehicles or motorists of imminent danger, and provide electronic enforcement of traffic control and regulations.		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	Maybe for specific locations? Need some help here? Clearly recognized in industry.	●
Compatibility with Vision	Supports safety goals of the vision.	●
Potential Benefit	Reduction in frequency and severity of collisions.	●
Practicality	High start-up costs for a low population base. Legislative changes required.	○
Availability of Champion(s)	Municipalities.	●
Risk Management	Low traffic volumes on some rural roadways may make it difficult to justify expenditures.	○
Capability for Integration	Autonomous capabilities support remote applications.	◐
LEGEND		
High	●	Medium
	◐	Low
		○
GENERAL COMMENTS		

Appendix D – Use Service Analysis

ITS USER SERVICE: 3.1 Public Transport Management		
The Public Transport Management user service applies advanced vehicle electronic systems to various public transportation modes and uses the data generated by these modes to improve service to the public. It includes operation of vehicles and facilities, planning and scheduling, and personnel management.		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	Public transport ITS services have permitted transit operators to better manage their assets and to provide real-time information at key locations in their system	●
Compatibility with Vision	Supports efficiency and traveller quality of service goals included in the vision.	●
Potential Benefit	Improve transportation service to the public Increase efficiency and optimize use of existing assets	●
Practicality	Mature GPS industry. Communications and information dissemination technologies readily available.	●
Availability of Champion(s)	Existing transit operations are present in most major centres.	●
Risk Management	Substantial upfront funding requirements. Operational transition to new technologies/systems is challenging.	●
Capability for Integration	Tie into other information sources.	●
LEGEND		
High ●	Medium ◐	Low ○
GENERAL COMMENTS		

Appendix D – Use Service Analysis

ITS USER SERVICE: 4.1 Electronic Payment Systems		
The Electronic Payment Services user service allows travellers to pay for transportation services by electronic means. Between the four sub-services of the Electronic Payment user services the following functionality is provided: (1) Electronic Toll Collection, (2) Electronic Fare Collection, (3) Electronic Parking Payment, and (4) Electronic Payment Services Integration. It may, as envisioned, also serve broad non-transportation functions and may be integrated with credit and debit cards in banking and other financial transactions.		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	Provides efficiency in ticketing and payment of fares. Assesses demand compared to capacity through tracking of parked vehicles or transit riders, which in turn provides opportunities to accommodate excessive demands through signing for supplemental parking or additional buses.	●
Compatibility with Vision	Minimizes delays and congestion resulting from capacity problems. Manages travel demand by providing parking availability information or additional buses as required.	●
Potential Benefit	Improves throughput into/out of parking venues, reducing delays, improves speed of boarding transit, reduces demands for personnel at monetary collection points	●
Practicality	Requires upgrade of equipment to collect fees and distribution of Smart Cards. Can be achieved for pilot projects initially and expanded to larger catchment areas subsequently.	●
Availability of Champion(s)	Pilot project could be launched by a single transit operator or commuter-parking venue. The initiator of a project of this type can anticipate operational efficiencies.	●
Risk Management	There is some onus on the public to change their normal approach to paying for parking or transit, that may be frustrating initially	◐
Capability for Integration	Parking and transit rider information can be used internally by proponent for analysis purposes that may lead to improvements and increased efficiencies to business. Personal information could be used in many ways, if deemed acceptable.	◐
LEGEND		
High	●	Medium
	◐	Low
		○
GENERAL COMMENTS		
The use of electronic payment is a rapidly increasing area of growth internationally and many projects have reported successes through the implementation of these technologies.		

Appendix D – Use Service Analysis

ITS USER SERVICES: 5.1 Commercial Vehicle Electronic Clearance		
<p>The Commercial Vehicle Electronic Clearance user service consists of both domestic and international border electronic clearances. Domestic electronic clearance allows commercial vehicles to continue past inspection stations without stopping. International border clearance allows vehicles to bypass international border checkpoints without stopping, or at least with expedited checks. As a vehicle approaches an inspection station or checkpoint, vehicle to Wayside communications take place that identify the vehicle and make available to authorities the necessary data about credentials, vehicle weight, safety status, cargo, and occupants. Enforcement personnel can then select potentially unsafe vehicles for inspection and allow safe and legal vehicles to bypass the inspection station/checkpoint.</p>		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	Border crossings have become of critical importance to economic trade between Canada and the US. Use of electronic clearance technologies will improve flow.	●
Compatibility with Vision	Minimizes delays and congestion at border crossings and at weigh points on the highway system. It improves data collection, management and sharing to assist agencies to manage their operations.	●
Potential Benefit	By improving the flow of traffic and in particular trucks, economic trade increases viability, fuel costs are reduced, emissions are reduced and staff requirements at borders/ weigh stations are reduced.	●
Practicality	Due to recent interest from a national security perspective, all levels of government, the business community including carriers and the general public all support the use of technologies to ease delays and improve national security.	●
Availability of Champion(s)	For WIM stations, a provincial DOT would be involved and may initiate a private venture to transfer responsibility. For border crossings, the federal government has recently made budget available to initiate introduction of new technologies.	◐
Risk Management	Use of new technologies for these applications is becoming a standard approach and is endorsed by the Federal Governments of Canada and the US. Carriers must buy in to the use of new equipment.	●
Capability for Integration	Required information for border clearance or vehicle loads can be used by several different agencies since there are issues of customs, immigration, safety, agriculture/food/drug and environmental regulations that must be covered off. One-stop portal for credentialing, WIM and automated safety inspection systems (Advantage I-75) could use the same equipment.	◐
LEGEND		
High	●	Medium
	◐	Low
		○
GENERAL COMMENTS		
<p>Timing for introduction of new technologies at border crossings is very much in the immediate term. Financial support by the Federal Government will likely be in place for application to new technologies.</p>		

Appendix D – Use Service Analysis

ITS USER SERVICE: 5.5 Intermodal Freight Management		
The Intermodal Freight Management user service provides systems which will monitor the status of freight in-transit and at freight terminals.		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	To remain competitive/efficient carriers and operating agencies will need to seek out ways of expediting Intermodal transfers and clearances. Use of electronic clearance technologies and freight monitoring/tracking systems will improve flow through these critical links	●
Compatibility with Vision	Supports the efficiency goals of the vision.	●
Potential Benefit	Minimizes delays associated with the access to and within Intermodal terminals. Agencies and private companies will have the ability to better monitor their operations and thus improve efficiency.	●
Practicality	Due to recent interest from a national security perspective, all levels of government, the business community including carriers and the general public all support the use of technologies to ease delays and improve national security.	●
Availability of Champion(s)	Intermodal terminal operators, port authorities and carriers.	◐
Risk Management	Carriers must buy in to the use of new equipment and to the fact that increased monitoring does not translate into increased regulations/delays.	◐
Capability for Integration	A challenge will be the transfer from the existing system and practices to the newer technologies, all while maintaining existing or better levels of service in the facilities.	◐
LEGEND		
High	●	Medium
	◐	Low
		○
GENERAL COMMENTS		

Appendix D – Use Service Analysis

ITS USER SERVICE: 5.6 Commercial Fleet Management		
<p>The Commercial Fleet Management user service provides real-time communications for vehicle location, dispatching and tracking between commercial vehicle drivers, dispatchers, and intermodal transportation providers, thereby reducing delays for drivers and providing commercial drivers and dispatchers with real-time routing information in response to congestion or incidents. Commercial fleet management includes the management of taxi fleets.</p>		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	To remain competitive and efficient, new GPS technologies can be used to provide better reliability, convenient delivery timing, improved delivery turn-around.	●
Compatibility with Vision	Fleet management can reduce delay costs and boost economic activity. It can also help delivery and recipient operations better manage operations.	●
Potential Benefit	Introduction of fleet management will provide integration with the North Eastern US, improve uniformity of truck safety inspection, allows tracking of vehicles throughout the Canada-US-Mexico corridor and provide perimeter security at ports.	●
Practicality	There is current interest in fleet management since there is significant fleet management in place in NB and NS and an established community of carriers that will be proactive. There is also an ongoing movement to electronic data interchange.	●
Availability of Champion(s)	With the growing interest in this area within the trucking community, there is likely to be interest to lead in this area and to integrate with US and other Canadian provincial fleet management opportunities.	●
Risk Management	Although CVO can provide benefits, there are concerns about retaining efficiencies at the US border. There are also issues related to the size of truck fleets in PEI and Newfoundland, the latter of which has headquarters for trucking organizations out of province.	●
Capability for Integration	There do not appear to be major obstacles to integration however some provinces are further ahead in the use of the technologies currently. Data from CVO could be used in other ways and integration of data management with other agencies is achievable.	●
LEGEND		
High	●	Medium
	◐	Low
		○
GENERAL COMMENTS		
<p>A strategy can be readily developed to build on current use of CVO, available technologies and coverage by available wireless communications and expanded to suit growing requirements and growing interest from the other provinces.</p>		

Appendix D – Use Service Analysis

ITS USER SERVICE: 6.1 Emergency Notification and Personal Security		
<p>The Emergency Notification And Personal Security user service provides the capability for the user to manually initiate a distress signal for incidents like mechanical breakdown or non-injury collisions. An automated system would help mitigate the consequences of a serious collision by automatically sending information regarding the location, nature and severity of the collision to an emergency services dispatcher and/or to hospital and emergency room personnel.</p>		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	The use of wireless communications technologies to alert agencies of emergency conditions is important. The use of ITS for personal well being is of critical interest to the local communities.	
Compatibility with Vision	The opportunity to improve safety for the travelling public and to provide fast and coordinated responses to incidents and other emergencies are important goals within the vision.	
Potential Benefit	The ability to respond to emergencies quickly with the appropriate responses is a major benefit of ITS and specifically EMS. This improvement in responsiveness can improve chances of a positive outcome to the emergency and reduce overall impacts.	
Practicality	At present there are issues of inconsistent wireless spectrums among emergency service agencies. There is however growing consolidation of emergency services within each province. The use of separate dispatches for emergency services is also an issue.	
Availability of Champion(s)	There are several agencies in each province providing services. Some of the communities have consolidation amongst agencies. The identification of a champion is not currently apparent.	
Risk Management	The requirement to coordinate among several agencies and jurisdictions to provide suitable response opens the potential for inappropriate response and confusion, which may have an increased impact to the emergency.	
Capability for Integration	The use of communications networking, the coordination between agency dispatches and other aspects of a management system will likely have many integration opportunities beyond the essential needs of notification and security.	
LEGEND		
High		Medium
		Low
		
GENERAL COMMENTS		
<p>Inter-agency coordination is a challenging goal and the benefits of achieving it are important enough to attempt this on a Provincial or Regional basis.</p>		

Appendix D – Use Service Analysis

ITS USER SERVICES: 6.3 Disaster Response and Management		
The Disaster Response and Management user service co-ordinates disaster response strategies from a virtual control centre, and disseminates information to agencies and individuals on traffic conditions, diversion routes etc.		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	The ability to respond to infrequent major transportation emergency events in which significant impact has/will occur is a critical need and a coordinated response including information dissemination is required as responses.	
Compatibility with Vision	Improving safety for the traveling public and commercial vehicles together with minimizing delays and congestion, managing travel demand and providing fast and coordinated responses to incident and other emergencies should be pursued.	
Potential Benefit	Any opportunity to reduce the magnitude of a disaster through appropriate means will likely result in limited impacts and more efficient use of emergency service resources.	
Practicality	Providing a suitable disaster response often requires coordinating with special emergency services if available in addition to local emergency services which therefore makes the coordination more challenging to build up.	
Availability of Champion(s)	There are several agencies in each province providing services. Some of the communities have consolidation amongst agencies. The identification of a champion is not currently apparent.	
Risk Management	The requirement to coordinate among several agencies and jurisdictions to provide suitable response opens the potential for inappropriate response and confusion, which may have an increased impact to the emergency.	
Capability for Integration	The use of communications networking, the coordination between agency dispatches and other aspects of a management system will likely have many integration opportunities beyond the essential needs of notification and security.	
LEGEND		
High 	Medium 	Low 
GENERAL COMMENTS		
Coordination of special emergency service agencies together with local service agencies is a challenging goal however the benefits of achieving it are important enough to attempt this on a Provincial or Regional basis.		

Appendix D – Use Service Analysis

ITS USER SERVICE: 6.4 Emergency Vehicle Management		
<p>The Emergency Vehicle Management Service user service is oriented towards reducing the time from the receipt of notification of an incident by an emergency services dispatcher, and the arrival of emergency vehicles on the scene. It includes emergency vehicle fleet management, route guidance to the incident scene or a suitable hospital, and pre-emption of traffic signals on an emergency vehicle's route to receive more green displays.</p>		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	The use of wireless communications technologies to enable a management strategy to address situations appropriately is important. The use of ITS where personal well being is involved is of critical interest to the local communities.	
Compatibility with Vision	The opportunity to improve safety for the travelling public and to provide fast and coordinated responses to incidents and other emergencies are important goals within the vision.	
Potential Benefit	The ability to respond to emergencies quickly with the appropriate responses is a major benefit of ITS and specifically EMS. This improvement in responsiveness can improve chances of a positive outcome to the emergency and reduce overall impacts. It can also improve the use of the available emergency service resources.	
Practicality	At present there are issues of inconsistent wireless spectrums among emergency service agencies. There is however growing consolidation of emergency services within each province. The use of separate dispatches for emergency services is also an issue.	
Availability of Champion(s)	There are several agencies in each province providing services. Some of the communities have consolidation amongst agencies. The identification of a champion is not currently apparent.	
Risk Management	The requirement to coordinate among several agencies and jurisdictions to provide suitable response opens the potential for inappropriate response and confusion, which may have an increased impact to the emergency.	
Capability for Integration	The use of communications networking, the coordination between agency dispatches and other aspects of a management system will likely have many integration opportunities beyond the essential needs of notification and security.	
LEGEND		
High 	Medium 	Low 
GENERAL COMMENTS		
Inter-agency coordination is a challenging goal and the benefits of achieving it are important enough to attempt this on a Provincial or Regional basis.		

Appendix D – Use Service Analysis

ITS USER SERVICE: 8.1 Weather and Environmental Data Management		
The Weather and Environmental Data Management user service provides system wide gathering, fusion, and dissemination of information on roadway weather conditions and forecasts.		
CRITERION	ASSESSMENT	RATING
Ability to Address Need	As a key component of an RWIS service, information must be assembled and analysed to provide meaningful output as road reports and instructions to road maintenance vehicles/patrols.	●
Compatibility with Vision	As a means of improving data collection, management and sharing, Information Warehousing is an important component.	●
Potential Benefit	The ability to manipulate data provides users with relevant and timely information, which in turn assists agencies in better managing their operations and infrastructure.	●
Practicality	The warehousing aspect of this service requires allowing several data nodes to communicate in real time. Aspects of communications architecture must be considered in this assessment. At present this potential is expected to be weak.	○
Availability of Champion(s)	There would be incentive for road winter maintenance operators to initiate IW to permit the use of RWIS which in turn assists their operations to be more effective and efficient in terms of resources.	○
Risk Management	RWIS is a standard approach to road winter maintenance that relies on IW and does not represent onerous use of technology or agency interaction.	◐
Capability for Integration	IW is a most appropriate source of data for many applications that relate to road operations. Data relating to road conditions and weather conditions can be used to provide forecasts for future use and collision analyses to assess patterns in maintenance activity.	●
LEGEND		
High ●	Medium ◐	Low ○
GENERAL COMMENTS		
Communications between field sample stations and data nodes is required, as are communications links between data nodes to support data transfers in real time.		

APPENDIX E

EARLY WINNERS ASSESSMENT

Appendix E – Early Winner Assessments

One means of examining the merits of a given user service is to assess the validity of an early winner, or pilot project undertaking. Such undertakings can serve as a microcosm of a broader deployment, and test the abilities to bring together project partners in resolving barriers to implementation, and demonstrate the effectiveness of the application. The user service focus groups held in each Atlantic Province included an activity where participants were invited to develop strategies, focusing on “early winner” projects that could be implemented fairly quickly and easily, and promote ITS implementation.

The following is a summary of the criteria for which the participants were asked to address for each early winner project:

- **Meets perceived need** – The project meets a perceived need and addresses a higher priority issue;
- **Consensus support** – The initiative has received a level of consensus among stakeholders that it is a worthwhile project to pursue;
- **Minimal technological barriers** – Has a low risk of being held-up or defeated by a technological barrier;
- **Minimal institutional barriers** – Has a low risk of being held-up or defeated by a institutional barrier;
- **Business case** – Can be implemented at a reasonable cost and provide obvious and real benefits to a large stakeholder group;
- **Attracts champions** – Will catch the attention of potential champions among legislators, business leaders, the public and the media; and
- **Contributes to ITS profile/Vital to mainline strategy** – Showcases ITS as a viable component of the mainline transportation strategy.

Table 1 is a summary of the potential early winner projects identified by the participants. Appendix C includes summary sheets, which assess each candidate project against the stated criteria.

The identified early winner projects provide a solid starting point for implementation planning, and these projects are carried forward for further analysis under subsequent steps of the project.

Appendix E – Early Winner Assessments

Table 1 – Candidate “Early Winner” Projects

Project Name	Province
Incident Management	New Brunswick
Electronic Payment	New Brunswick
Commercial Vehicle Administrative Process	New Brunswick
Province-wide Weigh-In-Motion Program	Newfoundland and Labrador
Interactive Traveller Information	Newfoundland and Labrador
Red Light Camera Pilot Project	Newfoundland and Labrador
Implementation of Transportation Smart Card	Newfoundland and Labrador
Signal Pre-Emption for Priority Areas	Newfoundland and Labrador
Traffic Responsive Signal System	Newfoundland and Labrador
En-Route Transit Information	Nova Scotia
Public Travel Security	Nova Scotia
Transit Traffic Light Pre-Emption/Priority	Nova Scotia
Consolidation of “Just-in-time” Information Gathering and Dissemination for all Modes of Transportation	Nova Scotia
Initiate Intermodal Network	Nova Scotia
Electronic Payment	Nova Scotia
Centralized Traveller Information System	Nova Scotia
Public Transport Services – Optimize Fleet GPS	Prince Edward Island
Incident Management	Prince Edward Island
Environmental Conditions Monitoring	Prince Edward Island
Adaptive Traffic Signal System	Prince Edward Island
Emergency Vehicle Management	Prince Edward Island
Electronic Payment Services	Prince Edward Island
Demand Responsive Transit	Prince Edward Island
Traveller Information System	Prince Edward Island

Appendix E – Early Winner Assessments

“Early Winner” Assessment – NB Focus Group						
Project Description			Champion(s)			
Incident Management – Implement a plan to develop/enhance a system to coordinate response to events. This would include elements to identify and locate incidents and coordinate response (RCMP, ambulance, tow trucks).			<ul style="list-style-type: none"> Provincial (DPS/DOT) Federal (RCMP) Municipal 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> Meet – very proactive approach. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> Yes – agreed that timely response saves lives. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> Proven technology (COMPASS). 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> Requires high degree of cooperation. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> Yes – life saving and cost – proper response effort. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> Yes – benefits and quickly achieved – attracts attention. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> Yes – Builds upon other success (COMPASS) 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> Clients toward fast/timely service – fulfills public expectations. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – NB Focus Group						
Project Description			Champion(s)			
Electronic Payment – Expand transponders to be used in other areas that toll collection (i.e. parking, gas).			<ul style="list-style-type: none"> • Toll Facilities • Municipalities • Private Sector. 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> • Toll collection is in place now and working well. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> • NB and WS have agreement now, PEI considering. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> • No technical problems. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> • You have to deal with backroom issues. 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> • Cost and timesavings to user and provider. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> • Halifax/Dartmouth, Cobequid Pass and St. John National Bridge. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> • Highly visible. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> • Overcome institutional barriers and convincing end users its available system. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – NB Focus Group						
Project Description			Champion(s)			
Commercial Vehicle Administrative Process			Public Safety			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> Yes 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> Industry – yes. Inter-provincial – yes. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> Base exists currently. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> High – cooperation between OVTS. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> Significant but medium-high start-up costs. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> Existing successes in North America. Addresses high priority need. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> Yes. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> Absolutely. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – NF Focus Group						
Project Description			Champion(s)			
Province-wide WIM program			Trucking Industry CME			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> Existing requirements 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> Carriers are supportive Requires seed money from government 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> Proven technology 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> Funding Awareness campaign 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> Hours of service requirements could reduce trip from 2 days to 1 day by saving 1 hour of drive time 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> Trucking community 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> High profile and visibility to public 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> Contributes to all factors 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – NF Focus Group						
Project Description			Champion(s)			
Interactive Traveller Information – provide road conditions, traffic, weather via wireless network Priority areas: Argentia and Port Aux Basques			<ul style="list-style-type: none"> • Transportation, Federal & Provincial Government • Tourism • Carrier (wireless-telecom) 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> • Road conditions, amenities, tourism – attractions 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> • Currently available in other media – radio, TV • Proven to work 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> • Existing infrastructure <ul style="list-style-type: none"> – Cellular, internet – Wide area is larger problem 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> • Inter-Governmental coordination required 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> • Initial capital outlay • Revenue potential? 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> • Yes – Business potential 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> • Yes – High profile 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> • Enhances safety • Promotes regional economics 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

<i>“Early Winner” Assessment – NF Focus Group</i>						
Project Description			Champion(s)			
Red Light Camera Pilot Project			City of St. John’s			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> Reduced collisions 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> Proven technology 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> Legislative changes 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> Significant cost benefit Self funding 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Attracts champions		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> Improves safety Public visibility 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vital to mainline strategy		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Overall Probability of Success as “Early Winner”</i>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – NF Focus Group						
Project Description			Champion(s)			
Implement Transportation Smart Card Fuel, Car Maintenance, Buses, Taxis, Parking, Vehicle Registration, Provincial Ticketing, DRL, Intercity Buses, Airlines, Marine Atlantic			<ul style="list-style-type: none"> • Provincial Government • City • Metrobus • MUN 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> • Convenience – Too many cards 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> • Will increase overtime • Possibly slow to start • Public demand will increase participation 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> • Technology currently exists 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> • Consensus may be hard to reach (Government, MUN, banks, etc.) 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> • Equipment investment may be expensive • Ease of use increased business 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> • Due to convenience to the public 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> • Focuses on integration 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> • Essentially public convenience “Increases safety and efficiency of surface transportation” 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

<i>“Early Winner” Assessment – NF Focus Group</i>						
Project Description			Champion(s)			
Signal Pre-Emption for priority areas where fire response LOS is a concern			City of St. John’s			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> Always need to reduce delay in emergency response 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> Significant benefits 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> Off-the-shelf technology 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> No significant barriers other than cost 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> Public safety 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> Success in other locations 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> Yes 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> Highly localized 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Overall Probability of Success as “Early Winner”</i>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – NF Focus Group						
Project Description			Champion(s)			
Traffic Responsive Signal System Fixed Frequency Radio Connected Consider key corridors: Thompson; Torbay			City of St. John’s			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> Congestion reduction Green house gas reduced 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> Argument that reduced delays public benefit 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> Proven off-the-shelf applications 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> No significant barriers 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Business case	<ul style="list-style-type: none"> Significant benefit minimal overall cost 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> To some extent 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> Easier flow of traffic ?? ?? projection 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> Largely localized 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

<i>“Early Winner” Assessment – NS Focus Group</i>						
Project Description			Champion(s)			
En-Route Transit Information			Metro Transit			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> Go Time is not always seen as reliable. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> Go Time already in use, but not GPS-based. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> Go Time is already supported. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> GPS and dot matrix displays would make between use of existing Go Time equipment? 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Attracts champions		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> New dot matrix displays would be highly visible. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Overall Probability of Success as “Early Winner”</i>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

<i>“Early Winner” Assessment – NS Focus Group</i>						
Project Description			Champion(s)			
En-Route Transit Information			Metro Transit			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> Go Time is not always seen as reliable. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> Go Time already in use, but not GPS-based. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> Go Time is already supported. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> GPS and dot matrix displays would make better use of existing Go Time equipment? 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Attracts champions		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> New dot matrix displays would be highly visible. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Overall Probability of Success as “Early Winner”</i>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

<i>“Early Winner” Assessment – NS Focus Group</i>						
Project Description			Champion(s)			
Public Travel Security			<ul style="list-style-type: none"> • Metro Transit • Police Services 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> • Both police and transit are under HRM. Cost may be an issue. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> • Reduce vandalism to buses, ferries and shelters; encourage more off-peak riders. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Attracts champions		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Overall Probability of Success as “Early Winner”</i>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

<i>“Early Winner” Assessment – NS Focus Group</i>						
Project Description			Champion(s)			
Transit Traffic Light Pre-Emption/Priority			Metro Transit			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> Buses get seriously delayed in traffic. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> Some debate likely, from car drivers and Traffic Department 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> Already used by emergency vehicles 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> Debate likely between transit and Traffic Departments. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> Improved bus utilization, ridership and revenue. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> Innovative approach to bus transit. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> Helps motorists by getting more people onto buses. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> Would do much to increase transit ridership. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Overall Probability of Success as “Early Winner”</i>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – NS Focus Group						
Project Description			Champion(s)			
Consolidating “Just In Time” Information Gathering and Dissemination for all Modes of Transport			Provincial in Partnership with Private Sector			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	• Info is there it needs to be easily shared.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support	• We can all benefit from shared data.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	• Perfect project for “IT”.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	• Encourage partnerships private, all levels of government.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Business case	• Immediate benefits for minimal investment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Attracts champions	• Crosses many boundaries. Attracts interested parties.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Contributes to ITS profile	• User needs access through “IT”.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vital to mainline strategy	• Safety, efficiencies.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Appendix E – Early Winner Assessments

<i>“Early Winner” Assessment – NS Focus Group</i>						
Project Description			Champion(s)			
Initiate Intermodal Network			<ul style="list-style-type: none"> • Ports • Shippers • Commercial Carriers • EDI Port 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> • Identify stakeholders and “IT” potential. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> • EDI port past success. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> • Proven technologies. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> • Numerous stakeholders. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> • Improve the competitiveness of ports. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> • Goods movement industry. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> • Goods movement industry only. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> • Goods movement. • Intermodalism. • Regional competitiveness. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Overall Probability of Success as “Early Winner”</i>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – NS Focus Group						
Project Description			Champion(s)			
Electronic Payment – Expand MacPass to Marine Atlantic, Bay Ferries, Parking Operators			<ul style="list-style-type: none"> • H-D Bridge Commission • Marine Atlantic • Bay Ferries • Parking Operators 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> • Improved convenience. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consensus support		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> • Proven technology. • Existing tag population. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> • High start-up cost. 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> • Reduced operating costs. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> • Facility operators. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> • Visible to public. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> • Improved mobility. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

<i>“Early Winner” Assessment – NS Focus Group</i>						
Project Description			Champion(s)			
Centralized Traveller Information System – 1-800, Web, HAR			<ul style="list-style-type: none"> • Province • Tourism/Industry • Private Road Operators • Commercial Carriers • Chamber of Commerce • Ferries 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> • Consolidated information source. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> • Recognized need. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> • Proven technologies. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> • Partnering/funding mechanism? 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> • Requires investment. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> • Many potential stakeholders. • Who takes load? 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> • Very visible. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> • Improved mobility. • Creation of wealth. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Overall Probability of Success as “Early Winner”</i>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – PE Focus Group						
Project Description		Champion(s)				
Public Transport Services 3.1 Optimized Fleet GPS Private and Public Busing Integration		<ul style="list-style-type: none"> • Municipal/Provincial/Federal Government • Existing Operators • Schools 				
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> • Enhanced mobility. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> • Lower at start; evolving with service and terms. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> • None. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> • Unions/politicians (municipal & provincial). 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> • Infrastructure exists low startup costs. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> • Proven method of public and educational systems. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> • Web integration would be easy. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> • Less fossil fuel usage alleviate parking problems (city, Holland College, UPEI) 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

<i>“Early Winner” Assessment – PE Focus Group</i>						
Project Description			Champion(s)			
2.2 Incident Management – Locate Collisions on GIS-T			<ul style="list-style-type: none"> • Province • City • Enforcement • Utilities 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> • Collision location. • Provides drive public with real time events. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> • Enforcement. • Planners/road design. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> • GPS technology in vehicle. • of GPS field/office tec. 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> • They want to know this information. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> • Identify problem areas/location. • Improvements to road. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> • Enforcement. • Planners. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> • Yes. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Overall Probability of Success as “Early Winner”</i>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – PE Focus Group						
Project Description			Champion(s)			
2.4 Environmental Conditions Monitoring <ul style="list-style-type: none"> Province-wide RWIS system integration with Department of Agriculture and national proposed system. Upgrade 4 existing sites, add 2 new sites. 			<ul style="list-style-type: none"> Province Environment Canada Confederation Bridge 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> Improved highway safety and improves efficiency of highway maintenance operations. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> Sharing of information. No duplication. TPW’s, agriculture, all benefit. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> Technology exists, but learning curve is substantial. Standardization of equipment. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> Some inter-departmental cooperation. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> Cost/benefit ratio report high significant savings to highway maintenance. Insurance companies. User’s cost. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> TPW, Environment Canada, insurance agencies. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> Invisible to user, but significant benefits. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> Improves safety and service to public. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – PE Focus Group						
Project Description			Champion(s)			
2.1 Traffic Control Monitoring & Control of Arterial Networks Adaptive traffic signal system for Greater Charlottetown Area to strengthen north-south and east-west corridors.			• TPW and City of Charlottetown			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	• Public want better traffic flow.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consensus support	• Public, city, business, retail.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	• Technology exists, but would require investment in infrastructure and learning curve.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimal institutional barriers	• Only two governments, provincial and municipal.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	• Not a big problem to solve, but would improve economic growth in downtown core.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attracts champions	• Provincial government; city.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contributes to ITS profile	• Not leading edge ITS, somewhat invisible to user, but large ongoing project.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

<i>“Early Winner” Assessment – PE Focus Group</i>						
Project Description			Champion(s)			
6.4 Emergency Vehicle Management Integration of emergency services communication			<ul style="list-style-type: none"> Government Emergency Services 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> Inability of all main EMS agencies to communicate. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> Agreement that safety and lives depend on early and adequate response. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> Major differences in communication systems. 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> Federal government budget constraints. 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> High cost of re-initializing systems. Federal vs. Provincial. 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> EMS. 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> Uses current systems. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> High priority to save lives. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Overall Probability of Success as “Early Winner”</i>		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – PE Focus Group						
Project Description			Champion(s)			
4.1 Electronic Payment Services Electronic payment for commercial vehicles – regular users of Confederation Bridge.			<ul style="list-style-type: none"> • APTA • Strait Crossing 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> • Payment arrears and maintain confidentiality of financial data. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> • Currently used in other locations in Atlantic Canada. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> • Existing technology. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> • User willingness to participate other agency cooperation. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> • Low cost to user. • Admin support to user. • Confidential data. • High initial cost. 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> • User driven. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> • Uses ITS direct application. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> • Low priority. 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – PE Focus Group						
Project Description			Champion(s)			
3.3 Demand Responsive Transit Management of flexibly routed transit vehicles.			<ul style="list-style-type: none"> • Municipalities • SIG’s (i.e. seniors, handicapped) • Environmental Groups • Tourism Industry 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> • Best option for rural/low density. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> • Nova Scotia government has implemented a pilot project. • Private and charitable groups providing services in PEI. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> • Prototype application built with NS. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> • Unknown. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> • Makes more efficient use of existing transportation services. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> • Benefits groups mentioned above. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> • Atlantic Canada has a relatively decentralized population. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> • Supports mobility. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Appendix E – Early Winner Assessments

“Early Winner” Assessment – PE Focus Group						
Project Description			Champion(s)			
1.1 Traveller Information 1.4 Traveller Services & Reservation Develop Traveller Information System which will integrate data from various sources and disseminate over various media to facilitate travel decisions.			<ul style="list-style-type: none"> • Tourism Industry • Dept. of Transportation • Dept. of Tourism • Wireless Providers • Content Providers. 			
Criteria	Comments	Rating				
		1	2	3	4	5
Meets perceived need	<ul style="list-style-type: none"> • Requirement of traveller for advanced information and timely on-route information. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Consensus support	<ul style="list-style-type: none"> • Both government and private sector have made attempts to provide some or all components of this service. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimal technological barriers	<ul style="list-style-type: none"> • Many delivery platforms available – some not historically successful (e.g. radio/cassette signal overrides with local road or weather info). • Pre-trip wireless 2.5/3G technology on-route. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimal institutional barriers	<ul style="list-style-type: none"> • Control of network infrastructure and content not currently separate creating barriers to market for non-telco projects. 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business case	<ul style="list-style-type: none"> • Business case is solid if you own the network unknown if you don't. 	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attracts champions	<ul style="list-style-type: none"> • Attracts user, content, infrastructure and industry champions. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Contributes to ITS profile	<ul style="list-style-type: none"> • Early delivery of benefits of perceived value to wide range of audiences and stakeholders. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vital to mainline strategy	<ul style="list-style-type: none"> • Will be more significant if focused on user needs rather than supply side objectives. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Overall Probability of Success as “Early Winner”		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

APPENDIX F

Opportunities Analysis Workshop

January 23, 2002

**ATLANTIC PROVINCES
REGIONAL ITS STRATEGIC PLANNING STUDY
ITS OPPORTUNITIES WORKSHOP**

JANUARY 31, 2002

AGENDA

Sign-in and Refreshments (30 minutes) (8:00 a.m. – 8:30 a.m.)

Introductory Session (90 minutes) (8:30 a.m. – 10:00 a.m.)

Objective: to prepare participants to identify ITS opportunities, and build on the work performed during the User Needs Focus Groups

Activities:

Introduction:

- Welcome and Opening Remarks - Mr. David Johnstone, Deputy Minister, New Brunswick Department of Transportation
- Introduction of Participants
- Introduction of Facilitators – explanation of objectives of the workshop

ITS Overview:

- Description of Atlantic Provinces Draft ITS Vision
- Overview of the Canadian ITS Architecture, and ITS User Services
- Description of Results of the four User Needs Focus Groups

Break (15 minutes) (10:00 a.m. – 10:15 a.m.)

Operations Plan (60 minutes) (10:15 a.m. – 11:15 a.m.)

Objective: to provide input to the User Service Assessments

Activities:

Overview:

- Description of the “attributes” to be assessed for each of the fourteen “higher priority” user services
- Summary of the traditional barriers to ITS deployment

User Service Assessments:

- Consultant team provides assessment forms with some preliminary thoughts
- Participants divided into groups of five
- Group exercise – participants to review User Service Assessment forms and provide specific input on the attributes to be used, and the barriers to be overcome, in the Atlantic Provinces

Appendix F – Opportunities Analysis Workshop

Presentation of Results (45 minutes) (11:15 a.m. – noon)

Informal Presentations:

- Group leaders to present highlights of their discussions

Lunch (45 minutes) (noon – 12:45 p.m.)

Keynote Speaker:

- Brian Plant, Acting Director- ITS Office, Transport Canada

Presentations on Atlantic ITS Projects (30 minutes) (12:45 p.m. – 1:15 p.m.)

Speakers:

- (3 speakers from participants to be confirmed)

Assessment of “Early Winner” Projects (75 minutes) (1:15 p.m. – 2:30 p.m.)

Objective: to develop more details on the proposed “Early Winner” projects

Activities:

Project Development

- Product Cycle Development Process (Concept Development, Product Development, Research, Pilot, Manufacturing, Marketing, Implementation, Management)
- Plans must include:
 - Milestones by 2 years, 2-5 years, 5+ years
 - Description of each stage of product cycle development
 - Roles of stakeholders in each stage product cycle development
 - Identification of specific challenges in the areas of financing, approvals, organizational co-ordination, regulations and legislation, standards and architecture, and some specific ideas for dealing with them.
- Consultant team provides forms and materials to aid the participants in developing the projects

Break (15 minutes) (2:30 p.m. – 2:45 p.m.)

Project Presentations (1 hour) (2:45 p.m. – 3:45 p.m.)

Objective: to inform all participants of some example project designs

Activities:

- Group leaders present one example project

Closing (15 minutes) (3:45 p.m. – 4:00 p.m.)

- Economic Development and Academic Research work
- Next Steps

Appendix F – Opportunities Analysis Workshop

First Name	Company	Address	City	Prov	Postal Code	Telephone No.	Email Address
Andrew Parsons	ACOA	1801 Hollis Street, PO Box 2284, Stn. M.	Halifax	NS	B3J 3C8	(902) 426-9085	aparson@acoa-apeca.gc.ca
Angus Armour	Armour Logistics	350 English Drive	Moncton	NB		506-861-0270	aarmour@armour.ca
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Brian Ahern	Approach Navigation Systems Inc.	409 Dieppe Blvd	Dieppe	NB	E1A 6P8	(506) 854-2967	bahern@approach.nb.ca
Brian Plant	Transport Canada	27th Floor, Tower C, Area D 330 Sparks Street, Place de Ville	Ottawa	ON	K1A 0N5	(613) 998-9834	plantb@tc.gc.ca
Brian Stevens	Canadian Manufacturers & Exporters - PEI Division	PO Box 426	Charlottetown	PE	C1A 7K7	(902) 629-1555	pei@cme.ca
Brian Taylor	Halifax Regional Municipality - Metro Transit	200 Ilsley Ave	Dartmouth	NS	B3B 1V1	(902) 490-6608	taylor@region.halifax.ns.ca
Cathy Worth	PEI DOT	P.O. Box 2000	Charlottetown	PE	C1A 7N8	(902) 894-0271	ceworth@gov.pe.ca
Dale Peabody	Maine DOT	110 State House Station	Augusta	ME	04333	(207) 624-3270	dale.peabody@state.me.us
Daniel Boljkovac	Transport Canada	95 Foundry Street, Suite 105, PO Box 42	Moncton	NB	E1C 8K6	(506) 851-2943	boljkod@tc.gc.ca
Daryell Nowlan	ACOA	570 Queen Street, PO Box 578	Fredericton	NB	E3B 5A6	(506) 452-3104	dnowlan@acoa-apeca.gc.ca
Dave MacFarlane	NBDOT	PO Box 6000	Fredericton	NB	E3B 5H1	(506) 453-2600	Dave.Macfarlane@gnb.ca
David Johnstone	NBDOT						Dave.Johnstone@gnb.ca
David Loukes	Geoplan Consultants Inc	919 Prospect Street	Fredericton	NB	E3B 2T7	(506) 451-0055	loukesd@geoplan.nb.ca
David McCusker	Halifax Regional Municipality	PO Box 1749	Halifax	NS		902-490-6696	mccuskd@region.halifax.ca
Don Mason	NBDOT	PO Box 6000	Fredericton	NB	E3B 5H1	(506) 453-2213	Don.Mason@gnb.ca
Doug Shea	NFL DOT	6th Floor, Confederation Building, West Block P.O. Box 8700	St. John's	NF	A1B 4J6	(709) 729-3637	shead@mail.gov.nf.ca
Eric Gionet	Approach Navigation Systems Inc.	409 Dieppe Blvd.	Dieppe	NB	E1A 6P8	(506) 854-2967	egionet@approach.nb.ca
Eric Hildebrand	UNB Transportation Group	Head Hall, Room D126 P.O. Box 4400	Fredericton	NB	E3B 5A3	(506) 453-4521	edh@unb.ca

Appendix F – Opportunities Analysis Workshop

First Name	Company	Address	City	Prov	Postal Code	Telephone No.	Email Address
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Frank Schwartz	KPMG Consulting	Suite 400, 5121 Sackville Street	Halifax	NS	B3J 1K1	902-474-7050	frankschwartz@kpmg.ca
Gene Smallwood	McCormick Rankin & Associates Limited	2655 North Sheridan Way	Mississauga	ON	L5K 2P8	(905) 823-8500	gene.smallwood@mrc.ca
George Brooking	Trius Tours Ltd.	PO Box 2288	Charlottetown	PEI	C1A 8C1	(902) 566-5664	trius.tours@pei.aibn.com
Ginette Vienneau	CCNB - Dieppe	505, rue du College	Dieppe	NB	E1A 6X2	(506) 856-2127	ginette.vienneau@gnb.ca
Harold Hefferton	Transport Canada			NF		(709) 772-2586	hefferh@tc.gc.ca
Jack Keir	Saint John Harbour Bridge	PO Box 3728, Station B	Saint John	NB	E2M 5C1	(506) 635-1320	sihb@nbnet.nb.ca
Janet Bradshaw	St. John's Transportation Commission	245 Freshwater Road	St. John's	NF	A1B 1B3	(709) 570-2130	janetb@metrobus.com
Janice Harland	NSDOT & Public Works	PO Box 186	Halifax	NS	B3J 2N2	(902) 424-4206	HARLANDJA@gov.ns.ca
Jean-Marc Thibodeau	Public Safety/Compliance Branch	414 Collishaw Street	Moncton	NB	E1C 3C7	(506) 856-2958	Jean-Marc@gov.nb.ca
Jim Nicoll	Halifax Port Authority	PO Box 336	Halifax	NS	B3J 2P6	902-426-8713	Jnicoll@portofhalifax.ca
John Allain	Codiac Transit Commission	280 Pacific Ave.	Moncton	NB	E1E 2G8	(506) 857-2008	john.allain@moncton.org
John Francis	Confederation Bridge (Strait Crossing Bridge Ltd)	PO Box 2032	Borden-Carleton	PE	C0B 1X0	(902) 437-7342	johnf@scbl.net
John Gaudet	AnyWare Group Inc.	15 Market Square, Suite 1602	Saint John	NB	E2L 1E8	506-650-5429	john.gaudet@anywaregroup.com
John Goggin	Public Safety - Operational Policy Branch	PO Box 6000	Fredericton	NB	E3B 5H1	(506) 453-8192	John.Goggin@gnb.ca
John Palmer	NBDOT - Policy Branch	PO Box 6000	Fredericton	NB	E3B 5H1	(506) 453-2802	John.Palmer@gnb.ca
Kendall McMenamon	AnyWare Group Inc.	15 Market Square, Suite 1602	Saint John	NB	E2L 1E8	506-643-6601	kendall.memenamon@anywaregroup.com
Kenny Silver	Halifax Regional Municipality- Metro Transit	200 Ilesley Ave	Dartmouth	NS	B3B 1V1	(902) 490-6689	silverk@region.halifax.ns.ca
Kevin Bebenek	IBI Group	240 Richmond Street W., 5th Floor	Toronto	ON	M5V 1V6	(416) 596-1930	kbebenek@ibigroup.com
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Mark Clancey	St. John's Transportation Commission	245 Freshwater Road	St. John's	NF	A1B 1B3	(709) 570-2100	mark@metrobus.com
Mark Gourley	ACOA		Moncton	NB		(506) 851-6078	mgourley@acoa-apeca.gc.ca

Appendix F – Opportunities Analysis Workshop

First Name	Company	Address	City	Prov	Postal Code	Telephone No.	Email Address
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Pat MacDonald	Trius Tours Ltd.	PO Box 2288	Charlottetown	PEI	C1A 8C1	(902) 566-5664	trius.tours@pei.aibn.com
Peter Buillemot	SVG Consulting Inc.	2141 Coverdale Road	Upper Coverdale	NB	E1J 1Z8	(506) 372-9198	vuillemo@nbnnet.nb.ca
Pierre La Fontaine		1192 de la Rivière	Cap-Rouge	PQ	G1Y 2A5	(418) 658-8482	plafontaine@info-genie.com
Raymond Dufour	NB Community College	505 College Hill Street	Dieppe	NB	E1A 6X2	(506) 856-2201	raymond.defour@gnb.ca
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Ron Stewart	IBI Group	240 Richmond Street W., 5th Floor	Toronto	ON	M5V 1V6	(416) 596-1930	rstewart@ibigroup.com
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Appendix F – Opportunities Analysis Workshop

First Name	Company	Address	City	Prov	Postal Code	Telephone No.	Email Address
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Memo

To: Project Steering Committee
ITS Working Group
Workshop Participants

Date: February 20, 2002

From: Project Team

Steno: rs

cc:

File No: TO-8921

Subject: *Atlantic Provinces Regional ITS Strategic Planning Study
Opportunities Workshop - Summary Report*

INTRODUCTION

The Opportunities Workshop was held on Thursday January 31st, 2002 in Moncton, New Brunswick. There were approximately sixty participants, with representation from all four provinces. The major activities in the workshop included:

- Welcome and Opening Remarks – Mr. David Johnstone, Deputy Minister, New Brunswick Department of Transportation.
- Introductory Session – to prepare the participants to identify ITS opportunities, and build on the work performed during the User Needs Focus Groups.
- Operations Plan – to provide input to the User Service Assessments, by addressing the attributes of each of the higher priority user services.
- Presentations on Atlantic ITS Projects – Jack Keir of Saint John Harbour Bridge, Janet Bradshaw of St. John’s Transportation Commission, and David Loukes of Geoplan Consultants Inc. made short presentation of ITS strategies that they have been implementing.
- Presentation by Nicole Galvin, Transport Canada, on the federal ITS program.
- Assessment of “Early Winner” Projects – to develop more details on proposed “Early Winner” projects.

OPERATIONS PLAN

During the Operations Plan segment of the Workshop, the participants were asked to provide input to the draft User Assessment Sheets. On the basis of the numbers of participants, 10 groups were formed to address the User Services that had been identified for consideration.

The following tables provide an abbreviated summary of the input as received as comments on the sheets provided to the groups. This input will be used to complete the assessment sheets, for inclusion in the Step 3 final document.

For completeness, 16 User Services (US) are included. The additional US is *5.5 Intermodal Freight Management* which was added based on the demonstrated need, and interest in intermodal operations.

1.1 Traveller Information

Key Beneficiaries	<ul style="list-style-type: none"> Primarily owners/operators, customers, service providers and travellers
Delivery Participants	<ul style="list-style-type: none"> Largely, Provincial Government participation is critical, and private sector involvement is important
Availability of Technologies	<ul style="list-style-type: none"> Practically all types of communications are important including use of internet and real time aspects of the information
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> Skill sets are not high issue
Potential Barriers	<ul style="list-style-type: none"> Organizational issues (include availability of resources), user acceptance (timely, accurate information), and financial challenges Identification of a “champion”, possibly is tourism, would be appropriate to resolve issues

1.4 Traveller Services and Reservations

Key Beneficiaries	<ul style="list-style-type: none"> Primarily owners/operators, customers, service providers and travellers, extending to rail and air modes
Delivery Participants	<ul style="list-style-type: none"> Federal and Provincial Governments should be involved, in addition to the private sector
Availability of Technologies	<ul style="list-style-type: none"> Centre to Centre and Centre to Vehicle are critical linkages, possibly web-based
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> Skill sets are not high issue
Potential Barriers	<ul style="list-style-type: none"> Agency coordination, general buy-in from services and the public, the sustainability of revenue generation Possible to initiate a pilot project to address these issues

2.1 Traffic Control

Key Beneficiaries	<ul style="list-style-type: none"> Primarily owners/operators, customers, service providers, travellers, enforcement authorities and emergency service providers
Delivery Participants	<ul style="list-style-type: none"> Provincial and Municipal Governments, private sector are key agencies
Availability of Technologies	<ul style="list-style-type: none"> Centre to Wayside and reciprocal are available regionally
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> Skill sets are not high issue
Potential Barriers	<ul style="list-style-type: none"> No major barriers exist since this is a mature technology application

2.2 Incident Management

Key Beneficiaries	<ul style="list-style-type: none"> primarily owners/operators, suppliers, customers, service
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	providers and travellers
Delivery Participants	<ul style="list-style-type: none"> ▪ Federal Government could have a role in a 511 system nationally, otherwise Provinces and municipal road authorities are major participants
Availability of Technologies	<ul style="list-style-type: none"> ▪ Centre to Wayside and Wayside to Vehicle are most important
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> ▪ Skill sets are not high issue
Potential Barriers	<ul style="list-style-type: none"> ▪ Organizational issues including coordination with other User Services, funding challenges and issues of servicing a large rural area where incidents occur inconsistently ▪ Overcoming barriers should include improving awareness of and promoting incident management

2.4 Environmental Conditions Management

Key Beneficiaries	<ul style="list-style-type: none"> ▪ Primarily owners/operators to reduce liability, and travellers
Delivery Participants	<ul style="list-style-type: none"> ▪ All levels of government should participate
Availability of Technologies	<ul style="list-style-type: none"> ▪ Wayside to Centre and Centre to Centre technologies are critical although NTCIP is not extensively used
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> ▪ Skill sets are important to support data analysis requirements
Potential Barriers	<ul style="list-style-type: none"> ▪ Organizational issues, financial challenges and technological inconsistencies ▪ There are several achievable means of addressing barriers

2.5 Operations and Maintenance

Key Beneficiaries	<ul style="list-style-type: none"> ▪ Primarily owners/operators, suppliers and travellers
Delivery Participants	<ul style="list-style-type: none"> ▪ All levels of government should participate
Availability of Technologies	<ul style="list-style-type: none"> ▪ Centre to vehicle and reciprocal are most important
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> ▪ As a relatively new technology, appropriate skill sets are required regionally
Potential Barriers	<ul style="list-style-type: none"> ▪ Project financing and technological advancement are issues ▪ There are several achievable means of addressing barriers

2.6 Automated Dynamic Warning and Enforcement

Key Beneficiaries	<ul style="list-style-type: none"> ▪ Primarily owners/operators, suppliers, travellers and enforcement authorities
Delivery Participants	<ul style="list-style-type: none"> ▪ Provincial and Municipal Governments, private sector are key agencies
Availability of Technologies	<ul style="list-style-type: none"> ▪ Wayside to Vehicle and reciprocal are important linkages for which technologies are continuing to become more available
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> ▪ As a relatively new technology, appropriate skill sets are required regionally

Potential Barriers	<ul style="list-style-type: none"> ▪ Financial, legal and user acceptance issues are likely ▪ Means of addressing issues are improved as technologies become more widely used
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3.1 Public Transport Management

Key Beneficiaries	<ul style="list-style-type: none"> ▪ Primarily owners/operators, suppliers, customers and service providers although should include taxpayers
Delivery Participants	<ul style="list-style-type: none"> ▪ All levels of government should participate through funding and policy changes to support transit, also private sector to participate
Availability of Technologies	<ul style="list-style-type: none"> ▪ Centre to Traveller and reciprocal are most important as GPS technologies come into increased use
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> ▪ Skill sets are not high issue
Potential Barriers	<ul style="list-style-type: none"> ▪ Several organizational issues including union issues, employee resistance, also funding challenges ▪ There are several achievable means of addressing barriers

4.1 Electronic Payment Services

Key Beneficiaries	<ul style="list-style-type: none"> ▪ Primarily owners/operators, customers, service providers and travellers but many others also
Delivery Participants	<ul style="list-style-type: none"> ▪ All levels of government can participate as can the private sector in several financially feasible ways
Availability of Technologies	<ul style="list-style-type: none"> ▪ Centre to Wayside and Wayside to Vehicle are key, for which technologies are available
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> ▪ Skill sets are not high issue
Potential Barriers	<ul style="list-style-type: none"> ▪ Primary barrier to common payment methods is the control/ownership/expenses of the “backroom”, also legal issues and software requirements ▪ There are several achievable means of addressing barriers

5.1 Commercial Vehicle Electronic Clearance

Key Beneficiaries	<ul style="list-style-type: none"> ▪ Primarily owners/operators, suppliers, customers and service providers, the Atlantic Trucking Association and travellers
Delivery Participants	<ul style="list-style-type: none"> ▪ Participation mainly by Federal and Provincial Government, the CCMTA and private sector
Availability of Technologies	<ul style="list-style-type: none"> ▪ Most important linkages are Wayside to Centre (WIM), Centre to Centre (weighing between stations) and Wayside to Vehicle (dynamic signing)
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> ▪ Skill sets are not high issue
Potential Barriers	<ul style="list-style-type: none"> ▪ Several barriers are anticipated including organizational issues, financial issues and legal issues including inter-Provincial aspects ▪ Pilot projects would be appropriate means of addressing

	issues (VMS, WIM)
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5.5 Intermodal Freight Management

Key Beneficiaries	<ul style="list-style-type: none"> Primarily owners/operators, customers and service providers
Delivery Participants	<ul style="list-style-type: none"> Federal Government as relates to rail, air and port activity, private sector
Availability of Technologies	<ul style="list-style-type: none"> Technologies are readily available and in particular Wayside to Vehicle and Wayside to Centre
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> Skill sets are not high issue
Potential Barriers	<ul style="list-style-type: none"> Several barriers are anticipated including organizational issues, financial issues and legal issues

5.6 Commercial Fleet Management

Key Beneficiaries	<ul style="list-style-type: none"> Primarily owners/operators, suppliers, customers, service providers, enforcement authorities
Delivery Participants	<ul style="list-style-type: none"> Federal and Provincial Government should have roles in delivery however largely private sector
Availability of Technologies	<ul style="list-style-type: none"> Practically all means of communication and the associated technologies are important and readily available
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> Providing appropriate skill sets is an important requirement
Potential Barriers	<ul style="list-style-type: none"> Many barriers spanning all areas of consideration Methods to harmonize and improve communications would be suitable key means of addressing issues

6.1 Emergency Notification and Personal Security

Key Beneficiaries	<ul style="list-style-type: none"> Primarily owners/operators, suppliers, customers, service providers and emergency service providers
Delivery Participants	<ul style="list-style-type: none"> All levels of government should be involved as relates to road jurisdictions, transit authorities, private sector (i.e. OnStar™)
Availability of Technologies	<ul style="list-style-type: none"> Technologies exist regionally including Centre to Vehicle / Traveller and reciprocal
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> Providing appropriate skill sets is an important requirement
Potential Barriers	<ul style="list-style-type: none"> Relate to individual willingness to pay for a service Marketing is underway by vehicle manufacturers linked to OnStar™

6.3 Disaster Response and Management

Key Beneficiaries	<ul style="list-style-type: none"> Primarily owners/operators, suppliers, travellers and emergency service providers
Delivery Participants	<ul style="list-style-type: none"> All levels of government should be actively participating

	in disaster response
Availability of Technologies	<ul style="list-style-type: none"> ▪ Communications of all types are important to support real time updates and responses
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> ▪ Providing appropriate skill sets is an important requirement
Potential Barriers	<ul style="list-style-type: none"> ▪ Organizational issues are most critical to a large management effort

6.4 Emergency Vehicle Management

Key Beneficiaries	<ul style="list-style-type: none"> ▪ Primarily owners/operators, customers, service providers and travellers, enforcement agencies and emergency service providers
Delivery Participants	<ul style="list-style-type: none"> ▪ Want to include Federal and Provincial and Municipal Governments however private sector is less important
Availability of Technologies	<ul style="list-style-type: none"> ▪ All aspects of technologies are required to implement this
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> ▪ Providing appropriate skill sets is an important requirement
Potential Barriers	<ul style="list-style-type: none"> ▪ Achieving funding is viewed as a major barrier, as are organizational issues, legal issues and user acceptance ▪ There are several achievable means of addressing barriers

8.1 Weather and Environmental Data Management

Key Beneficiaries	<ul style="list-style-type: none"> ▪ Primarily owners/operators, data researchers, travellers and emergency service providers
Delivery Participants	<ul style="list-style-type: none"> ▪ All levels of government should participate and the private sector
Availability of Technologies	<ul style="list-style-type: none"> ▪ Wayside to Centre and Centre to Centre communications are important
Operations & Maintenance Considerations of Services Provided	<ul style="list-style-type: none"> ▪ Skill sets are important to support data analysis requirements
Potential Barriers	<ul style="list-style-type: none"> ▪ Inter-agency coordination, partnering, covering rural expanses of roads, data ownership ▪ Opportunities exist to readily address barriers

ASSESSMENT OF “EARLY WINNER” PROJECTS

In the afternoon, the workshop participants were asked to develop early winner projects. They were asked to identify a project and then take that project through the entire product cycle development process. The stages in the process include:

- concept development;
- product development;
- research;
- pilot project;
- marketing;
- implementation; and
- management.

As a starting point, the participants were provided with the early winner assessments that had been performed during the four focus groups conducted in November. They were also provided with a listing of 13 sample projects for consideration. Project leaders were identified to take on the task of developing a project and the participants were divided into groups based on their interests.

For each early winner project, the teams were required to identify a name, a list of stakeholders and a list of barriers. Then, for each of the stages, the participants were asked to describe the activities, stakeholder roles, dealing with barriers and milestones. The projects that were developed are listed below. In some cases, we've provided a brief description of the concept:

- Atlantic Provinces Advanced Traveller Information System – the concept is to begin with the Province of New Brunswick, and then extend the system to other provinces;
- Atlantic Cities Red Light Camera Pilot Project;
- Quebec and Atlantic Provinces RWIS – Road and Weather Information System network, with links to a network in Quebec;
- Atlantic ITS Rural Deer and Moose Detection System – pilot project to reduce the number of vehicle/animal collisions on rural roads
- Halifax Operational Information Extranet – development of a website to provide a single portal for real-time information regarding the port operations;
- Newfoundland Integrated Information System (Weigh-in-Motion) – to provide pre-clearance for commercial vehicles across the island;
- Commercial Vehicle Border Crossing – Electronic Clearance for St. Stephen-Calais and Houlton-Woodstock International Border Crossings.
- Implementation of FAST Systems – to improve road surface conditions (safety) on bridges;
- Atlantic Canada Transaction Tag – create one transaction tag to be used on transportation facilities in different cities;
- Atlantic Canada Common Mapping Standards Transportation Network Information Warehouse.

The information collected from the product development sheets will be used in the generation of project plans at the completion of the study.

NEXT STEPS

Participants should keep in mind the following dates:

- ITS Canada annual meeting, March 25 and 26, in Toronto.
- Atlantic ITS Workshop and ITS Showcase on April 25 in Halifax.
- CTRF conference, with wrap-up Atlantic ITS Workshop, May 12 to 15, in St. John's.

We once again thank the participants for their input and enthusiasm.

APPENDIX G

USER SERVICES ASSESSMENT OPPORTUNITIES ANALYSIS

ITS USER SERVICE: 1.1 Traveller Information

The Traveller Information user service provides travellers with information prior to their departure to assist them in making mode choices, travel time estimates, and route decisions. The sub-services of the Traveller Information user service address four major functions, which are: (1) Available Services Information, (2) Current Situation Information, (3) Trip Planning Service, and (4) User Access. Information is integrated from various transportation modes and other information sources and is presented to the user for decision making.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> • Government agencies: proactive approach to safer and more efficient roads • Parking Lot operators • Airports • Seaports • Rail Operators • Tourism Agencies • Ferry Service Providers • Transit Agencies • Fleet Operators (i.e. taxis) • Carriers 	●
Suppliers	<ul style="list-style-type: none"> • Potential for financial gain in the wireless/telecom industries • IT providers 	◐
Customers and Service Providers	<ul style="list-style-type: none"> • Customers better informed on the availability and status of transportation services. Media can provide updated reports on traffic, etc. 	◐
Researchers	<ul style="list-style-type: none"> • Archived data can be used in weather pattern/pavement behaviour studies 	◐
Special Interest Groups	<ul style="list-style-type: none"> • Construction Contractors in work zone areas: improved safety through provision of work zone status and traffic control information 	◐
Travellers	<ul style="list-style-type: none"> • Travellers better informed on the availability and status of transportation services. • Tourists: promotes trip planning. • Transit patrons • Parking lot users • Ferry patrons • Airline customers • Commercial Vehicle Operators • Taxi customers • Rail Users 	●
Enforcement Authorities	<ul style="list-style-type: none"> • Advanced information to approaching travellers could reduce enforcement demands 	◐

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Emergency Service Providers	<ul style="list-style-type: none"> Real-time information on traffic conditions is useful for emergency service providers in responding to incidents 	
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> Transport Canada Parks Canada ACOA Environment Canada 	
Provincial Government	<ul style="list-style-type: none"> Departments of Transportation, Tourism, Environment Emergency Service Providers 	
Municipal Government	<ul style="list-style-type: none"> Traffic and transit agencies Emergency service providers 	
Non Profit / Advisory	<ul style="list-style-type: none"> Tourism Agencies 	
Private Sector	<ul style="list-style-type: none"> Wireless / Telecom Carriers Ferry Operators Parking Lot Operators Transit Agencies 	
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside	<ul style="list-style-type: none"> Communications infrastructure is available in some areas Real-time 	
Centre to Centre	<ul style="list-style-type: none"> Products have been developed an implemented in locations outside the Atlantic Provinces 	
Centre to Vehicle / Traveller	<ul style="list-style-type: none"> Existing telephone and web-based information available regarding road conditions and travel opportunities in PEI, NB, NFLD & NS Comprehensive Real-time 511 	
Wayside to Vehicle	<ul style="list-style-type: none"> Primarily through Dynamic Message Signs, and Highway Advisory Radio 511 Internet Web-based cell services including LBS pilot 	
Wayside to Wayside		
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets	<ul style="list-style-type: none"> Most skills available regionally 	

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> • Inter-agency coordination • Intra-agency coordination • Partnerships • Changing skill sets • Customer Focus 	<ul style="list-style-type: none"> • Lack of inter-agency coordination • Buy-in by Agencies • Lack of jurisdiction resources (i.e. human, technical, financial) 	●
Project Finance	<ul style="list-style-type: none"> • Lack of ongoing funding • Operational revenue • Keeping up with technology 	●
Legal <ul style="list-style-type: none"> • Liability • Privacy • Intellectual Property • Procurement Practices • Policy / Legislations 	<ul style="list-style-type: none"> • Lack of policies supporting partnering • Protection of intellectual property • Privacy of data 	◐
User Acceptance <ul style="list-style-type: none"> • Technology Adaptations • Public Perceptions 	<ul style="list-style-type: none"> • Public will be in favour of these services • Accurate • Timely • Need to establish public willingness to pay for this service 	●
Technical <ul style="list-style-type: none"> • Standards and Architecture • Availability of Enabling Technologies • Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> • In NF and Labrador – only 10% province wide GIS coverage • No central pool for information • Wireless gaps • GIS links to mapping / GPS • Lack of common access - 511 	◐
Potential Actions to Resolve Barriers <ul style="list-style-type: none"> • Financial Grants • Improved Electronic Communications • Changes to Policies / Legislation • Introduce Standards • Improve Skill Sets • Privatization/Partnerships • Public Education 	<ul style="list-style-type: none"> • Identification of a champion, possibly tourism would be appropriate to resolve issues 	

RECOMMENDED TIMEFRAME			
0 - 3	4 - 7	8 - 10	YEARS
“Early winner”	Medium term	Longer term	
			Primary ● Secondary ◐ Not Applicable ○

ITS USER SERVICE: 1.4 Traveller Services and Reservations

The Traveller Services Information user service provides the traveller with access to “yellow pages” type information regarding a variety of travel-related services and facilities. The information will be accessible to the traveller in the home or office to support pre-trip planning and while enroute, either in the vehicle or at public facilities such as public transit terminals or highway rest stops.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> Ferry Service Providers Hospitality Industry (e.g. Hotels, restaurants) Airline Companies Rail Operators Transit Agencies Tourism Agencies Parking Lot Operators Rental Car Agencies 	●
Suppliers	<ul style="list-style-type: none"> Potential for financial gain in the wireless/telecom industries IT providers 	◐
Customers and Service Providers	<ul style="list-style-type: none"> Tourism Industry CAA 	◐
Researchers	<ul style="list-style-type: none"> No direct benefit 	○
Special Interest Groups	<ul style="list-style-type: none"> Disabled persons groups 	○
Travellers	<ul style="list-style-type: none"> Tourists Ferry Patrons Airline Customers Rail Users Transit Patrons Taxi Customers Parking Lot Users 	●
Enforcement Authorities	<ul style="list-style-type: none"> No direct benefit 	○
Emergency Service Providers	<ul style="list-style-type: none"> No direct benefit 	○
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> Promotes tourism in Canada Parks Canada Heritage Canada 	◐
Provincial Government	<ul style="list-style-type: none"> Departments of Tourism 	●
Municipal Government	<ul style="list-style-type: none"> Promotes tourism 	○

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Non Profit / Advisory		○
Private Sector	<ul style="list-style-type: none"> • Wireless / Telecom Carriers • Tourist Boards, Chambers of Commerce • Entire Tourism sector 	●
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside	<ul style="list-style-type: none"> • Applicable standards 	○
Centre to Centre		●
Centre to Vehicle / Traveller	<ul style="list-style-type: none"> • Existing telephone and web-based information available regarding road conditions and travel opportunities in Prince Edward Island, New Brunswick, Newfoundland and Nova Scotia • cell and phone • 511 (travel info) 	●
Wayside to Vehicle	<ul style="list-style-type: none"> • Tourism signing • Electronic signing 	○
Wayside to Wayside		○
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets	<ul style="list-style-type: none"> • Most skills available regionally 	◐
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> • Inter-agency coordination • Intra-agency coordination • Partnerships • Changing skill sets • Customer Focus 	<ul style="list-style-type: none"> • Lack of inter-agency coordination • Lack of “champion” to lead a consolidated effort • Buy in 	●
Project Finance	<ul style="list-style-type: none"> • Availability of “seed” money to start up a service • Beneficiaries would be interested in proof of value before contributing to operation • Sustainable revenue 	●
Legal <ul style="list-style-type: none"> • Liability • Privacy • Intellectual Property • Procurement Practices • Policy / Legislations 	<ul style="list-style-type: none"> • Lack of policies supporting partnering • Protection of intellectual property 	◐
User Acceptance <ul style="list-style-type: none"> • Technology Adaptations • Public Perceptions 	<ul style="list-style-type: none"> • Public will be in favour of these services 	●

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING	
<p>Technical</p> <ul style="list-style-type: none"> Standards and Architecture Availability of Enabling Technologies Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> Web-based reservation systems already widely in use In-vehicle use limited by market penetration of in-vehicle products Cell phones to access travel information on 511 Gaps in wireless coverage Gaps in GIS coverage 		
<p>Potential Actions to Resolve Barriers</p> <ul style="list-style-type: none"> Financial Grants Improved Electronic Communications Changes to Policies / Legislation Introduce Standards Improve Skill Sets Privatization/Partnerships Public Education 	<ul style="list-style-type: none"> Pilot project to support business case Need to identify champion for the Region 		
RECOMMENDED TIMEFRAME			
 <p>0 - 3 "Early winner"</p>	<p>4 - 7 Medium term</p>	<p>8 - 10 Longer term</p> <p>YEARS</p>	<p>Primary </p> <p>Secondary </p> <p>Not Applicable </p>

ITS USER SERVICE: 2. 1 Traffic Control

The Traffic Control user service manages the movement of traffic on streets and highways. It includes surface street controls such as traffic signal systems, adaptive traffic control systems and freeway control techniques such as ramp metering and lane control. Between the eight sub-services of the Traffic Control user services, the following four functions are provided which are (1) Traffic Flow Optimization, (2) Traffic Surveillance, (3) Control Function, and (4) Provide Information.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> • Can lead to reduced fuel costs and emissions • Government agencies: proactive approach to safe and efficient roads 	●
Suppliers	<ul style="list-style-type: none"> • Equipment manufacturers 	●
Customers and Service Providers	<ul style="list-style-type: none"> • More efficient and safer transportation systems • Road users • Pedestrians, cyclists 	◐
Researchers	<ul style="list-style-type: none"> • Researchers can study the impact and effectiveness of implementing traffic control systems 	◐
Special Interest Groups	<ul style="list-style-type: none"> • Insurance companies 	◐
Travellers	<ul style="list-style-type: none"> • All road users benefit from safer and more efficient traffic operations 	●
Enforcement Authorities	<ul style="list-style-type: none"> • Fewer collisions to investigate • Policing agencies 	●
Emergency Service Providers	<ul style="list-style-type: none"> • Provides ability to implement emergency vehicle priority systems 	◐
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> • As part of greenhouse gases reduction strategy 	◐
Provincial Government	<ul style="list-style-type: none"> • Participate in funding and operations where provincial roads are present 	●
Municipal Government	<ul style="list-style-type: none"> • Design, fund, operate and maintain the systems 	●

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Non Profit / Advisory		○
Private Sector	<ul style="list-style-type: none"> • Provide the system components 	●
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside	<ul style="list-style-type: none"> • Mature market • Signal actuation 	●
Centre to Centre	<ul style="list-style-type: none"> • Products have been developed and implemented in locations outside the Atlantic Provinces 	◐
Centre to Vehicle / Traveller		○
Wayside to Vehicle	<ul style="list-style-type: none"> • Mature market – traffic control signals, dynamic message signs 	●
Wayside to Wayside	<ul style="list-style-type: none"> • Some systems developed for highway/rail crossings • Red light camera technologies readily available 	◐
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets	<ul style="list-style-type: none"> • Basic skill sets available – challenge is to keep staff current with developing technologies and systems 	●
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> • Inter-agency coordination • Intra-agency coordination • Partnerships • Changing skill sets • Customer Focus 	<ul style="list-style-type: none"> • Lack of inter-agency coordination 	●
Project Finance	<ul style="list-style-type: none"> • Lack of ongoing funding 	●
Legal <ul style="list-style-type: none"> • Liability • Privacy • Intellectual Property • Procurement Practices • Policy / Legislations 	<ul style="list-style-type: none"> • Debate over ownership of systems software • Procurement practices treating traffic control systems as a commodity can lead to problems 	●
User Acceptance <ul style="list-style-type: none"> • Technology Adaptations • Public Perceptions 	<ul style="list-style-type: none"> • Travellers may be resistant to the implementation of more sophisticated traffic control strategies. 	◐
Technical <ul style="list-style-type: none"> • Standards and Architecture • Availability of Enabling Technologies • Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> • Pace of development of industry standards such as NTCIP 	●

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
<p>Potential Actions to Resolve Barriers</p> <ul style="list-style-type: none"> • Financial Grants • Improved Electronic Communications • Changes to Policies / Legislation • Introduce Standards • Improve Skill Sets • Privatization/Partnerships • Public Education 	<ul style="list-style-type: none"> • Increased public acceptance/awareness through education/advertising • Pass legislation to support automated traffic control strategies 	
RECOMMENDED TIMEFRAME		<p>Primary <input checked="" type="radio"/></p> <p>Secondary <input type="radio"/></p> <p>Not Applicable <input type="radio"/></p>
		
0 - 3	4 - 7	8 - 10
“Early winner”	Medium term	Longer term
YEARS		

ITS USER SERVICE: 2.2 Incident Management

The Incident Management user service enhances existing capabilities to identify incidents, formulate response actions, and support initiation and ongoing co-ordination of those response actions. The single sub-service of the Incident Management user service provides six major functions such as: (1) Scheduled Planned Incidents, (2) Identify Incidents, (3) Formulate Response Actions, (4) Support Co-ordinated Implementation of Response Actions, (5) Support Initialization of Response to Actions, and (6) Predict Hazardous Conditions.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> Incident Management systems have been proven to reduce congestion, secondary collisions, improve safety and efficiency of road systems Can lead to reduced fuel costs and emissions 	●
Suppliers	<ul style="list-style-type: none"> Potential of financial gain in wireless / Telecom industries Systems are equipment intensive 	●
Customers and Service Providers	<ul style="list-style-type: none"> More efficient and safer transportation systems All road users 	●
Researchers	<ul style="list-style-type: none"> Data collection can be used to test incident management strategies 	◐
Special Interest Groups	<ul style="list-style-type: none"> Of interest to public road safety groups Hazardous materials/spills Collision investigation groups 	◐
Travellers	<ul style="list-style-type: none"> Retaining roadway efficiency provides all road users, including commuters, tourists and commercial traffic better accessibility and reduces economic impacts to those industries. 	●
Enforcement Authorities	<ul style="list-style-type: none"> Early detection and timely clearing of an incident can minimize the potential for secondary collisions 	◐
Emergency Service Providers	<ul style="list-style-type: none"> Improved response times can save lives and minimize delays in treatment of injuries 	◐
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> Trans Canada Highway As part of greenhouse gases reduction strategy As part of an Atlantic "511" system 	◐
Provincial Government	<ul style="list-style-type: none"> Provincial highways and roads 	●
Municipal Government	<ul style="list-style-type: none"> Urban and other rural arterial roads 	●
Non Profit / Advisory		○

STRATEGIC PLAN ATTRIBUTES		ASSESSMENT	RATING
Private Sector	<ul style="list-style-type: none"> Financial opportunity if partnered with road authority 		◐
AVAILABILITY OF TECHNOLOGIES			
Centre to Wayside	<ul style="list-style-type: none"> Widespread wireless availability Experience in Atlantic provinces with RWIS Confederation Bridge TMS Halifax SCOOT 		●
Centre to Centre			◐
Centre to Vehicle / Traveller	<ul style="list-style-type: none"> Cell phones Web-based products 		◐
Wayside to Vehicle	<ul style="list-style-type: none"> Dynamic message signs (Confederation Bridge) 		●
Wayside to Wayside			○
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED			
Available Skill Sets	<ul style="list-style-type: none"> Most skills available regionally 		◐
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS			
Organizational Issues <ul style="list-style-type: none"> Inter-agency coordination Intra-agency coordination Partnerships Changing skill sets Customer Focus 	<ul style="list-style-type: none"> Lack of mechanisms available for inter-agency coordination Coordination with other user services interlinked with traveler information 		●
Project Finance	<ul style="list-style-type: none"> Lack of appropriate funding. Large geographic areas, low density population 		●
Legal <ul style="list-style-type: none"> Liability Privacy Intellectual Property Procurement Practices Policy / Legislations 	<ul style="list-style-type: none"> Lack of policies supporting partnering 		◐
User Acceptance <ul style="list-style-type: none"> Technology Adaptations Public Perceptions 	<ul style="list-style-type: none"> Reductions in delays and improved incident response should be positive 		◐
Technical <ul style="list-style-type: none"> Standards and Architecture Availability of Enabling Technologies Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> Lack of standards and the issue of interoperability Lack of wireless communications in rural areas 		◐

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
<p>Potential Actions to Resolve Barriers</p> <ul style="list-style-type: none"> • Financial Grants • Improved Electronic Communications • Changes to Policies / Legislation • Introduce Standards • Improve Skill Sets • Privatization/Partnerships • Public Education 	<ul style="list-style-type: none"> • Raising awareness of the benefits of incident management • Pilot programs (i.e. Confederation Bridge) • Opportunities to link accident data and images to GIS-T 	
RECOMMENDED TIMEFRAME		<p>Primary <input checked="" type="radio"/></p> <p>Secondary <input type="radio"/></p> <p>Not Applicable <input type="radio"/></p>
<p>0 - 3</p> <p>“Early winner”</p>	<p>4 - 7</p> <p>Medium term</p>	

ITS USER SERVICE: 2.4 Environmental Conditions Management

The Environmental Conditions and Monitoring user service provides government agencies with the capability to enhance their air quality control strategies. The function provides wide area and Wayside emissions monitoring as well as Road Weather Systems and Services. Information is used by Traffic Demand Management in the Traffic Management Centre to mitigate pollution and may be provided to enforcement agencies to compel offenders to comply with standards. In addition, road weather information and forecasts provide inputs to other systems such as ATMS and ATIS to increase safety and efficiency.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> Government agencies – more efficient management of road maintenance activities (eg. Snow removal) Reduced liability exposure 	●
Suppliers	<ul style="list-style-type: none"> Market potential in equipment manufacture/installation 	◐
Customers and Service Providers	<ul style="list-style-type: none"> Provides road patrols with data to be more efficient with winter road maintenance 	◐
Researchers	<ul style="list-style-type: none"> Studies of weather patterns/pavement behaviour / de-icing 	◐
Special Interest Groups	<ul style="list-style-type: none"> Environmental groups Agricultural Fire Protection Aviation Construction Contractors 	◐
Travellers	<ul style="list-style-type: none"> Enhanced air quality, road surface during adverse weather, traveler warnings 	●
Enforcement Authorities	<ul style="list-style-type: none"> Used to monitor emissions violators 	◐
Emergency Service Providers	<ul style="list-style-type: none"> Reduced number of collisions – reduced demands on emergency service providers 	○
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> Transport Canada Environment Canada 	◐
Provincial Government	<ul style="list-style-type: none"> Departments of Transportation and Environment Agriculture Forestry 	●
Municipal Government	<ul style="list-style-type: none"> On urban and other rural roads 	●
Non Profit / Advisory		○

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Private Sector	<ul style="list-style-type: none"> • Wireless / Telecom Carriers • Road Maintenance Services • Weather Forecasters 	
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside	<ul style="list-style-type: none"> • Readily available locally 	
Centre to Centre	<ul style="list-style-type: none"> • Readily available locally • NTCIP standard not complete 	
Centre to Vehicle / Traveller	<ul style="list-style-type: none"> • Existing telephone and web-based information available regarding road conditions in PEI, NB, NFLD & NS 	
Wayside to Vehicle		
Wayside to Wayside		
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets	<ul style="list-style-type: none"> • Lack of existing skills to analyze data 	
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> • Inter-agency coordination • Intra-agency coordination • Partnerships • Changing skill sets • Customer Focus 	<ul style="list-style-type: none"> • Lack of mechanisms available for inter-agency coordination 	
Project Finance	<ul style="list-style-type: none"> • Lack of appropriate funding 	
Legal <ul style="list-style-type: none"> • Liability • Privacy • Intellectual Property • Procurement Practices • Policy / Legislations 	<ul style="list-style-type: none"> • Lack of policies supporting partnering 	
User Acceptance <ul style="list-style-type: none"> • Technology Adaptations • Public Perceptions 		
Technical <ul style="list-style-type: none"> • Standards and Architecture • Availability of Enabling Technologies • Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> • Standardization of equipment required 	

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING			
<p>Potential Actions to Resolve Barriers</p> <ul style="list-style-type: none"> • Financial Grants • Improved Electronic Communications • Changes to Policies / Legislation • Introduce Standards • Improve Skill Sets • Privatization/Partnerships • Public Education 					
RECOMMENDED TIMEFRAME					
	0 - 3	4 - 7	8 - 10	YEARS	<p>Primary <input checked="" type="radio"/></p> <p>Secondary <input type="radio"/></p> <p>Not Applicable <input type="radio"/></p>
“Early winner”	Medium term	Longer term			

ITS USER SERVICE: 2.5 Operations and Maintenance

The Operations and Maintenance user service provides government agencies, as well as contractors with the resources to manage the operations and maintenance of vehicle fleet and equipment assets, and monitor and manage traffic flow around work zone areas.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> Government Agencies Road agencies Construction Contractors 	●
Suppliers	<ul style="list-style-type: none"> New markets and field Opportunities internationally for test bed Modern fleets in Atlantic Canada (electronic engine and spreader controls) 	●
Customers and Service Providers		○
Researchers	<ul style="list-style-type: none"> Use of ITS for operations and maintenance activities is a relatively new field. Opportunity for University traffic, safety and mechanical centers of excellence 	◐
Special Interest Groups	Non-government operators	◐
Travellers	<ul style="list-style-type: none"> Safer roads 	●
Enforcement Authorities	<ul style="list-style-type: none"> Safety enforcement in work zones 	○
Emergency Service Providers		○
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> Trans Canada Highway NHS 	●
Provincial Government	<ul style="list-style-type: none"> Department of Transportation 	●
Municipal Government	<ul style="list-style-type: none"> Municipal fleet groups Road maintenance groups 	●
Non Profit / Advisory		○
Private Sector	<ul style="list-style-type: none"> Road maintenance groups Fleet agencies 	○
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside		○

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Centre to Centre		
Centre to Vehicle / Traveller	<ul style="list-style-type: none"> Operations and maintenance vehicles tracked using GPS 	
Wayside to Vehicle	<ul style="list-style-type: none"> Some technologies are based on communication between Wayside markers, and in-vehicle systems Service center 	
Wayside to Wayside		
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets	<ul style="list-style-type: none"> Relatively new technology 	
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> Inter-agency coordination Intra-agency coordination Partnerships Changing skill sets Customer Focus 	<ul style="list-style-type: none"> Introduction of sophisticated technology to operations and maintenance activities 	
Project Finance	<ul style="list-style-type: none"> Can require substantial financing 	
Legal <ul style="list-style-type: none"> Liability Privacy Intellectual Property Procurement Practices Policy / Legislations 	<ul style="list-style-type: none"> Liability if systems fail 	
User Acceptance <ul style="list-style-type: none"> Technology Adaptations Public Perceptions 	<ul style="list-style-type: none"> Operations and maintenance staff not accustomed with operating ITS 	
Technical <ul style="list-style-type: none"> Standards and Architecture Availability of Enabling Technologies Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> Relatively new technology 	

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
<p>Potential Actions to Resolve Barriers</p> <ul style="list-style-type: none"> • Financial Grants • Improved Electronic Communications • Changes to Policies / Legislation • Introduce Standards • Improve Skill Sets • Privatization/Partnerships • Public Education 	<ul style="list-style-type: none"> • Public Private Partnerships 	
RECOMMENDED TIMEFRAME		
<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; width: 100px; height: 15px; margin-right: 5px;"></div> <div style="background-color: black; width: 100px; height: 15px; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 100px; height: 15px; margin-right: 5px;"></div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="text-align: center;"> <p>0 - 3 "Early winner"</p> </div> <div style="text-align: center;"> <p>4 - 7 Medium term</p> </div> <div style="text-align: center;"> <p>8 - 10 Longer term</p> </div> </div> <div style="text-align: right; margin-top: 10px;">YEARS</div>		<p>Primary <input checked="" type="radio"/></p> <p>Secondary <input type="radio"/></p> <p>Not Applicable <input type="radio"/></p>

ITS USER SERVICE: 2.6 Automated Dynamic Warning and Enforcement

The Automated Dynamic Warning and Enforcement user service provides systems, which warn vehicles or motorists of imminent danger, and provide electronic enforcement of traffic control and regulations.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> Government agencies: proactive approach to safe and efficient roads Road agencies Carriers 	●
Suppliers	<ul style="list-style-type: none"> Supply and operation of equipment and systems 	●
Customers and Service Providers		○
Researchers	<ul style="list-style-type: none"> Relatively new field Candidate for research 	◐
Special Interest Groups	<ul style="list-style-type: none"> Road maintenance groups 	◐
Travellers	<ul style="list-style-type: none"> Safer roadways for all road users (commercial, cyclists, pedestrians, commuters) 	●
Enforcement Authorities	<ul style="list-style-type: none"> Another tool to increase enforcement of traffic control and regulations 	●
Emergency Service Providers	<ul style="list-style-type: none"> Reduced number of collisions – reduced demands on emergency service providers 	◐
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> Transport Canada 	◐
Provincial Government	<ul style="list-style-type: none"> Departments of Transportation Police Forces Public Safety Departments 	●
Municipal Government	<ul style="list-style-type: none"> Traffic Departments Policing agencies 	●
Non Profit / Advisory		○
Private Sector	<ul style="list-style-type: none"> Equipment and system installation Potential system operators 	●
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside		○
Centre to Centre		○

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Centre to Vehicle / Traveller	<ul style="list-style-type: none"> Signal pre-emption 	◐
Wayside to Vehicle	<ul style="list-style-type: none"> Speed enforcement devices Red light camera devices Dynamic speed limit signs 	●
Wayside to Wayside		○
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets	<ul style="list-style-type: none"> As a relatively new technology, appropriate skill sets are required regionally 	◐
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> Inter-agency coordination Intra-agency coordination Partnerships Changing skill sets Customer Focus 	<ul style="list-style-type: none"> May require partnerships to justify implementation 	◐
Project Finance	<ul style="list-style-type: none"> Systems are costly to implement and operate Ability to offset costs with revenue generation is a significant issue 	●
Legal <ul style="list-style-type: none"> Liability Privacy Intellectual Property Procurement Practices Policy / Legislations 	<ul style="list-style-type: none"> Privacy is an issue when using image recording equipment Legislation required to implement electronic enforcement 	●
User Acceptance <ul style="list-style-type: none"> Technology Adaptations Public Perceptions 	<ul style="list-style-type: none"> Public may perceive electronic enforcement as primarily a revenue generation strategy 	●
Technical <ul style="list-style-type: none"> Standards and Architecture Availability of Enabling Technologies Availability and Infiltration of Field Equipment 		○
Potential Actions to Resolve Barriers <ul style="list-style-type: none"> Financial Grants Improved Electronic Communications Changes to Policies / Legislation Introduce Standards Improve Skill Sets Privatization/Partnerships Public Education 	<ul style="list-style-type: none"> Means of addressing issues are improved as technologies become more widely used 	

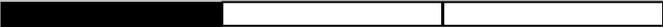
STRATEGIC PLAN ATTRIBUTES			ASSESSMENT	RATING
RECOMMENDED TIMEFRAME				
0 - 3 "Early winner"	4 - 7 Medium term	8 - 10 Longer term	YEARS	Primary <input checked="" type="radio"/> Secondary <input type="radio"/> Not Applicable <input type="radio"/>

ITS USER SERVICE: 3.1 Public Transport Management

The Public Transport Management user service applies advanced vehicle electronic systems to various public transportation modes and uses the data generated by these modes to improve service to the public. It includes operation of vehicles and facilities, planning and scheduling, and personnel management.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> • Transit system operators • Fleet management agencies • Monitor during vehicle operation • Better planning tools • Improve response to emergencies 	●
Suppliers	<ul style="list-style-type: none"> • Systems are equipment intensive • Opportunity to develop new system technology 	●
Customers and Service Providers	<ul style="list-style-type: none"> • Improved transit services – more efficient operations • Increased usage • Reduced complaints • Improved customer access to information 	●
Researchers	<ul style="list-style-type: none"> • More opportunities to expand technologies and its uses • Find new application for existing technologies • Improve reliability of existing technologies 	●
Special Interest Groups	<ul style="list-style-type: none"> • Disabled people services to improve reliability and accessibility • To promote public transit as an alternate use to single occupancy vehicles • taxpayers 	●
Travellers	<ul style="list-style-type: none"> • Availability of real-time information makes public transit more attractive to tourists • Cost-effective service • Reduce traffic congestion and air pollution 	●
Enforcement Authorities	<ul style="list-style-type: none"> • Improved fare adherence • Assistance in dispatching emergency services 	●
Emergency Service Providers		○
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> • As part of greenhouse gases reduction strategy • Currently not very active in public transit funding • Need increased level of fiscal support 	●
Provincial Government	<ul style="list-style-type: none"> • Departments of Transportation • Need to increase fiscal support • Develop transit friendly legislation 	●

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Municipal Government	<ul style="list-style-type: none"> • Transit Agencies • Traffic Departments 	●
Non Profit / Advisory	<ul style="list-style-type: none"> • CUTA • Local advisory committee • Advocacy groups 	◐
Private Sector	<ul style="list-style-type: none"> • Equipment and system installation suppliers • Private operators • Other lien companies • Advertisers using travel medium 	●
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside	<ul style="list-style-type: none"> • Mature market • More communication with vehicle 	●
Centre to Centre	<ul style="list-style-type: none"> • Interface with road operators, snow ice central • Intermodal connection • Emergency services 	●
Centre to Vehicle / Traveller	<ul style="list-style-type: none"> • Changing technology (GPS) • Growing use by operators • Costs are reducing 	●
Wayside to Vehicle	<ul style="list-style-type: none"> • Customer information • Location identification • Expand applications for technology 	●
Wayside to Wayside	<ul style="list-style-type: none"> • Not commonly used 	○
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets	<ul style="list-style-type: none"> • Requires training on integrating electronics and software on vehicles • Regional GIS industry skill sets • GO-Time system • SCOOT signal pre-emption 	●
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> • Inter-agency coordination • Intra-agency coordination • Partnerships • Changing skill sets • Customer Focus 	<ul style="list-style-type: none"> • Technical support from supplier • Employer resistency • Various government levels • Increase need to train employers on operation and maintenance • Enhance information and usability of service 	●
Project Finance	<ul style="list-style-type: none"> • Systems are costly to implement and operate – require a sound business case • Need funding partners 	●

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Legal <ul style="list-style-type: none"> • Liability • Privacy • Intellectual Property • Procurement Practices • Policy / Legislations 	<ul style="list-style-type: none"> • Liability is not a major risk • There may be privacy issues with employees or fare technologies • Transit agencies interested in using technologies rather than selling it 	
User Acceptance <ul style="list-style-type: none"> • Technology Adaptations • Public Perceptions 	<ul style="list-style-type: none"> • Need to get operation to change management practices and public acceptance • Improved information to customers • Reduced ridership 	
Technical <ul style="list-style-type: none"> • Standards and Architecture • Availability of Enabling Technologies • Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> • Technology is evolving – from use of Wayside “markers”, to GPS 	
Potential Actions to Resolve Barriers <ul style="list-style-type: none"> • Financial Grants • Improved Electronic Communications • Changes to Policies / Legislation • Introduce Standards • Improve Skill Sets • Privatization/Partnerships • Public Education 	<ul style="list-style-type: none"> • Educate employees to get buy in • Market importance of advances to maintain a modern alternative to car • Proactive in enhancing transit use to reduce car use • Multi-level government funding support • Financial potential for transit through gas tax • Smartcard / fare integration expansion • Commitment to Kyoto commitment • Increased ridership • Improve attractiveness of transit option 	
RECOMMENDED TIMEFRAME		<ul style="list-style-type: none"> Primary  Secondary  Not Applicable 
 <p style="text-align: center;"> 0 - 3 4 - 7 8 - 10 YEARS “Early winner” Medium term Longer term </p>		

ITS USER SERVICE: 4.1 Electronic Payment Services

The Electronic Payment Services user service allows travellers to pay for transportation services by electronic means. Between the four sub-services of the Electronic Payment user services the following functionality is provided: (1) Electronic Toll Collection, (2) Electronic Fare Collection, (3) Electronic Parking Payment, and (4) Electronic Payment Services Integration. It may, as envisioned, also serve broad non-transportation functions and may be integrated with credit and debit cards in banking and other financial transactions.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> • Tolling operators • Transit system operators • Commercial vehicle operators • Parking operators • Drive-thrus • Gas stations • Ferry Terminals • Airports • Taxis • Commercial / retail developers 	●
Suppliers	<ul style="list-style-type: none"> • Provide equipment 	○
Customers and Service Providers	<ul style="list-style-type: none"> • Commuters experience reduced travel times • More efficient payment methods • One backroom • More security – less chance of fraud • Better management for customer 	●
Researchers	<ul style="list-style-type: none"> • Trend analysis • Peak traffic periods • Technology research 	○
Special Interest Groups	<ul style="list-style-type: none"> • Transportation associations • Auto associations • Environmental groups • Government agencies 	○
Travellers	<ul style="list-style-type: none"> • Efficiency for tourists, truck drivers, daily commuters, business travellers 	●
Enforcement Authorities	<ul style="list-style-type: none"> • RCMP • Local police • Commercial vehicle enforcement • Parking enforcement 	○
Emergency Service Providers	<ul style="list-style-type: none"> • Police • Fire • Ambulance • EMR's • Tow Trucks 	○

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> • Border Crossings • Toll collection • Revenue generation • Subsidy payments 	●
Provincial Government	<ul style="list-style-type: none"> • Encourage partnerships • Tourism • Highway maintenance / safety 	◐
Municipal Government	<ul style="list-style-type: none"> • Transit Agencies • Parking Authorities • Bridge authorities 	●
Non Profit / Advisory	<ul style="list-style-type: none"> • Trucker associations • Charities 	◐
Private Sector	<ul style="list-style-type: none"> • Financial institutions • Tolling Operators • Parking Facilities • Retailers • Gas stations • Drive Thru operators • Suppliers (i.e. software and hardware) 	●
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside	<ul style="list-style-type: none"> • Available tolling infrastructure 	●
Centre to Centre		○
Centre to Vehicle / Traveller		○
Wayside to Vehicle	<ul style="list-style-type: none"> • Available tolling infrastructure • MacPass experience (30% in Nova Scotia) 	●
Wayside to Wayside		○
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets	<ul style="list-style-type: none"> • Well developed industry 	◐
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> • Inter-agency coordination • Intra-agency coordination • Partnerships • Changing skill sets • Customer Focus 	<ul style="list-style-type: none"> • Lack of integration amongst required parties (e.g. financial institutions, payment systems, etc.) • Requires one backroom – who gets the backroom becomes the barrier 	●

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING	
Project Finance	<ul style="list-style-type: none"> Substantial initial investment, including back office functions (financial transactions) Expenses of running the backroom 		
Legal <ul style="list-style-type: none"> Liability Privacy Intellectual Property Procurement Practices Policy / Legislations 	<ul style="list-style-type: none"> Privacy issues Intellectual property issue Contractual issues 		
User Acceptance <ul style="list-style-type: none"> Technology Adaptations Public Perceptions 	<ul style="list-style-type: none"> Public required to change payment habits This barrier is changing now 		
Technical <ul style="list-style-type: none"> Standards and Architecture Availability of Enabling Technologies Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> Standards still evolving Custom software 		
Potential Actions to Resolve Barriers <ul style="list-style-type: none"> Financial Grants Improved Electronic Communications Changes to Policies / Legislation Introduce Standards Improve Skill Sets Privatization/Partnerships Public Education 	<ul style="list-style-type: none"> Government funding for start-ups Resolution of backroom Good business case 		
RECOMMENDED TIMEFRAME		Primary  Secondary  Not Applicable 	
 0 - 3 "Early winner"	 4 - 7 Medium term		 8 - 10 Longer term

ITS USER SERVICE: 5.1 Commercial Vehicle Electronic Clearance

The Commercial Vehicle Electronic Clearance user service consists of both domestic and international border electronic clearances. Domestic electronic clearance allows commercial vehicles to continue past inspection stations without stopping. International border clearance allows vehicles to bypass international border checkpoints without stopping, or at least with expedited checks. As a vehicle approaches an inspection station or checkpoint, vehicle to Wayside communications take place that identify the vehicle and make available to authorities the necessary data about credentials, vehicle weight, safety status, cargo, and occupants. Enforcement personnel can then select potentially unsafe vehicles for inspection and allow safe and legal vehicles to bypass the inspection station/checkpoint.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> Carriers and shippers Road agencies Canada Customs and Revenue U.S. Customs through reduced congestion 	●
Suppliers	<ul style="list-style-type: none"> Equipment supply 	●
Customers and Service Providers	<ul style="list-style-type: none"> Transportation productivity will lower the cost of goods and services to the public 	○
Researchers		○
Special Interest Groups	<ul style="list-style-type: none"> Atlantic Trucking Association but lacks full membership to be represented 	○
Travellers	<ul style="list-style-type: none"> Increased efficiency for CV operators (i.e. reduced stop/idling time, expedited checks at inspection points) Safety improved as more resources freed to monitor at-risk vehicles Province as a whole benefits – 70% trade 	●
Enforcement Authorities	<ul style="list-style-type: none"> Enforcement agencies can potentially select unsafe vehicles for inspection and allow safe vehicles to bypass checkpoint 	◐
Emergency Service Providers	<ul style="list-style-type: none"> No direct benefit 	○
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> Border Crossings (International) Customs and Revenue Agencies 	●
Provincial Government	<ul style="list-style-type: none"> Vehicle safety enforcement Education for developing HR and assisting with the transfer of technology 	●
Municipal Government		○

STRATEGIC PLAN ATTRIBUTES		ASSESSMENT	RATING
Non Profit / Advisory	<ul style="list-style-type: none"> CCMTA for communication and to bring other provinces on side 		○
Private Sector	<ul style="list-style-type: none"> Carriers and shippers Suppliers – transferable technology to user 		●
AVAILABILITY OF TECHNOLOGIES			
Centre to Wayside	<ul style="list-style-type: none"> Vehicle/driver records Weigh-in-motion 		●
Centre to Centre	<ul style="list-style-type: none"> Norpass etc. Weighing between stations (need technology) 		◐
Centre to Vehicle / Traveller			○
Wayside to Vehicle	<ul style="list-style-type: none"> In-vehicle data collection and management Road signs Variable messaging 		●
Wayside to Wayside			○
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED			
Available Skill Sets	<ul style="list-style-type: none"> Outside of Atlantic Region 		◐
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS			
Organizational Issues <ul style="list-style-type: none"> Inter-agency coordination Intra-agency coordination Partnerships Changing skill sets Customer Focus 	<ul style="list-style-type: none"> Requires information sharing between Canada and US (institutional differences exist) Negotiate a sharing arrangement for permit revenues 		●
Project Finance	<ul style="list-style-type: none"> Financing is an issue for smaller operators Purchasing transponders Communication infrastructure Public/private mix 		●
Legal <ul style="list-style-type: none"> Liability Privacy Intellectual Property Procurement Practices Policy / Legislations 	<ul style="list-style-type: none"> Legislative restrictions on data exchange Drivers/operators may have privacy concerns Uniform standards for loads in Atlantic Canada – reciprocal agreements Safety of trucks when weigh in motion is used 		◐
User Acceptance <ul style="list-style-type: none"> Technology Adaptations Public Perceptions 	<ul style="list-style-type: none"> Adoption of technology may be an issue for smaller operators 		◐

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
<p>Technical</p> <ul style="list-style-type: none"> Standards and Architecture Availability of Enabling Technologies Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> Incomplete wireless communications coverage Absence of standards for information exchange and safety inspections across provinces Confusion among truckers about when to stop or proceed 	
<p>Potential Actions to Resolve Barriers</p> <ul style="list-style-type: none"> Financial Grants Improved Electronic Communications Changes to Policies / Legislation Introduce Standards Improve Skill Sets Privatization/Partnerships Public Education 	<ul style="list-style-type: none"> Pilot projects (border crossing, weigh-in-motion) provide opportunity to visit operation / policy concerning ITS deployment Interprovincial legislation Safety (i.e. allowing enforcement staff to concentrate on unsafe vehicles) 	
RECOMMENDED TIMEFRAME		
 <p style="text-align: center;">0 - 3 4 - 7 8 - 10 YEARS</p> <p style="text-align: center;">“Early winner” Medium term Longer term</p>		<p>Primary </p> <p>Secondary </p> <p>Not Applicable </p>

ITS USER SERVICE: 5.5 Intermodal Freight Management

The intermodal freight management user service provides systems which will monitor the status of freight-in-transit and at freight terminals.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> Carriers and shippers Intermodal terminals (e.g. Halifax, St. John, Moncton) Ferry services operators Sea ports 	●
Suppliers	<ul style="list-style-type: none"> Equipment suppliers 	●
Customers and Service Providers	<ul style="list-style-type: none"> More efficient fleet operations Shippers (i.e. improved ability to operate “just-in-time”, reduced delay, better management control, more effective integration with regulating agencies/systems) Atlantic Trucking Association 	●
Researchers	<ul style="list-style-type: none"> Improved data in freight movement to extent information is not proprietary 	◐
Special Interest Groups		○
Travellers		○
Enforcement Authorities		○
Emergency Service Providers	<ul style="list-style-type: none"> Improved access to electronic information on loads particularly hazardous materials GPS type system linked to cargo type – immediate awareness 	◐
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> Implementation for own fleets (e.g. Canada Post) 	◐
Provincial Government		○
Municipal Government		◐
Non Profit / Advisory		○
Private Sector	<ul style="list-style-type: none"> Carriers and shippers (including couriers) - system Implementation 	●
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside		○

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Centre to Centre		
Centre to Vehicle / Traveller		
Wayside to Vehicle	<ul style="list-style-type: none"> • Vehicle identification and station information transmittal systems are in use 	
Wayside to Wayside		
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets	<ul style="list-style-type: none"> • Outside of Atlantic Region 	
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> • Inter-agency coordination • Intra-agency coordination • Partnerships • Changing skill sets • Customer Focus 		
Project Finance	<ul style="list-style-type: none"> • Financing is an issue for smaller operators • New technologies are available at a premium price 	
Legal <ul style="list-style-type: none"> • Liability • Privacy • Intellectual Property • Procurement Practices • Policy / Legislations 	<ul style="list-style-type: none"> • Legislative restrictions on data exchange • Shippers, drivers and operators may have privacy concerns – proprietary / competitive information 	
User Acceptance <ul style="list-style-type: none"> • Technology Adaptations • Public Perceptions 	<ul style="list-style-type: none"> • Adoption of technology may be an issue for smaller operators • Training 	
Technical <ul style="list-style-type: none"> • Standards and Architecture • Availability of Enabling Technologies • Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> • Incomplete wireless communications coverage • Communication and information exchange standards 	

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
<p>Potential Actions to Resolve Barriers</p> <ul style="list-style-type: none"> • Financial Grants • Improved Electronic Communications • Changes to Policies / Legislation • Introduce Standards • Improve Skill Sets • Privatization/Partnerships • Public Education 	<ul style="list-style-type: none"> • Choose one intermodal terminal for pilot project. 	
RECOMMENDED TIMEFRAME		<p>Primary <input checked="" type="radio"/></p> <p>Secondary <input type="radio"/></p> <p>Not Applicable <input type="radio"/></p>
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>0 - 3 "Early winner"</p> </div> <div style="text-align: center;"> <p>4 - 7 Medium term</p> </div> <div style="text-align: center;"> <p>8 - 10 Longer term</p> </div> <div style="text-align: center;"> <p>YEARS</p> </div> </div>		

ITS USER SERVICE: 5.6 Commercial Fleet Management

The Commercial Fleet Management user service provides real-time communications for vehicle location, dispatching and tracking between commercial vehicle drivers, dispatchers, and intermodal transportation providers, thereby reducing delays for drivers and providing commercial drivers and dispatchers with real-time routing information in response to congestion or incidents. Commercial fleet management includes the management of taxi fleets.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> • Carriers and shippers • Taxi Fleet • Intermodal terminal (airports, ports, railway terminals) • Other fleets 	●
Suppliers	<ul style="list-style-type: none"> • Equipment suppliers 	●
Customers and Service Providers	<ul style="list-style-type: none"> • More efficient fleet operations • Shippers (i.e. improved ability to operate “just-in-time”, reduced delay, better management control, more effective integration with regulating agencies/systems) • Taxi customers (i.e. reduced service delays) 	●
Researchers	<ul style="list-style-type: none"> • Improved data in freight movement to extent information is not proprietary 	◐
Special Interest Groups		○
Travellers	<ul style="list-style-type: none"> • Taxi passengers • Shuttle bus passengers 	○
Enforcement Authorities	<ul style="list-style-type: none"> • Terminal operators can better control vehicle movements 	◐
Emergency Service Providers		○
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> • Implementation for own fleets (e.g. Canada Post) • Integration with customs and revenue • CCRA • Agriculture • U.S federal agencies • Weather services 	○
Provincial Government	<ul style="list-style-type: none"> • Implementation for own fleets (e.g. maintenance, etc.) • Integration with safety, weight regulation functions 	◐
Municipal Government	<ul style="list-style-type: none"> • Implementation for own fleets (e.g. transit, etc.) • Integration (transit) with public traveler information systems 	◐

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Non Profit / Advisory	<ul style="list-style-type: none"> • APTA • Community college • Chamber of Commerce • Economic Council 	○
Private Sector	<ul style="list-style-type: none"> • Carriers and shippers (including couriers) - system Implementation • Taxi operators 	●
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside	<ul style="list-style-type: none"> • Electronic credentialing (including safety) systems are in use (for public sector regulatory functions) 	●
Centre to Centre	<ul style="list-style-type: none"> • Electronic credentialing (including safety) systems are in use (for public sector regulatory functions) 	●
Centre to Vehicle / Traveller	<ul style="list-style-type: none"> • Electronic credentialing (including safety) systems are in use (for public sector regulatory functions) • Taxi, courier dispatch systems are in use • Carrier, shipper dispatch systems are in use 	●
Wayside to Vehicle	<ul style="list-style-type: none"> • Vehicle identification and station information transmittal systems are in use 	●
Wayside to Wayside		○
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets	<ul style="list-style-type: none"> • Outside of Atlantic Region 	◐
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> • Inter-agency coordination • Intra-agency coordination • Partnerships • Changing skill sets • Customer Focus 	<ul style="list-style-type: none"> • Skill sets of terminal operator's staff 	◐
Project Finance	<ul style="list-style-type: none"> • Financing is an issue for smaller operators • New technologies are available at a premium price 	●
Legal <ul style="list-style-type: none"> • Liability • Privacy • Intellectual Property • Procurement Practices • Policy / Legislations 		○
User Acceptance <ul style="list-style-type: none"> • Technology Adaptations • Public Perceptions 	<ul style="list-style-type: none"> • Adoption of technology may be an issue for smaller operators • Training 	◐

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
<p>Technical</p> <ul style="list-style-type: none"> Standards and Architecture Availability of Enabling Technologies Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> Incomplete wireless communications coverage Communication and information exchange standards 	
<p>Potential Actions to Resolve Barriers</p> <ul style="list-style-type: none"> Financial Grants Improved Electronic Communications Changes to Policies / Legislation Introduce Standards Improve Skill Sets Privatization/Partnerships Public Education 	<ul style="list-style-type: none"> Retain third party to implement 	
RECOMMENDED TIMEFRAME		
 <p style="text-align: center;">0 - 3 4 - 7 8 - 10 YEARS</p> <p style="text-align: center;">“Early winner” Medium term Longer term</p>		<p>Primary </p> <p>Secondary </p> <p>Not Applicable </p>

ITS USER SERVICE: 6.1 Emergency Notification and Personal Security

The Emergency Notification And Personal Security user service provides the capability for the user to manually initiate a distress signal for incidents like mechanical breakdown or non-injury collisions. An automated system would help mitigate the consequences of a serious collision by automatically sending information regarding the location, nature and severity of the collision to an emergency services dispatcher and/or to hospital and emergency room personnel.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> Government agencies: proactive approach to safe and efficient roads Other Operators of public transportation facilities and services 	●
Suppliers	<ul style="list-style-type: none"> Supply systems 	●
Customers and Service Providers	<ul style="list-style-type: none"> Provide emergency notification monitoring services 	●
Researchers	<ul style="list-style-type: none"> No direct benefit 	○
Special Interest Groups		○
Travellers	<ul style="list-style-type: none"> Quicker response to emergencies 	●
Enforcement Authorities		○
Emergency Service Providers	<ul style="list-style-type: none"> Quickly and accurately notified of emergencies 	●
DELIVERY PARTICIPANTS		
Federal Government		○
Provincial Government	<ul style="list-style-type: none"> Emergency Services, Transportation 	●
Municipal Government	<ul style="list-style-type: none"> Emergency Services, Transportation 	●
Non Profit / Advisory		○
Private Sector	<ul style="list-style-type: none"> Wireless / Telecom Carriers Emergency notification – conveyed to Emergency Service providers 	●
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside		○
Centre to Centre		○

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Centre to Vehicle / Traveller	<ul style="list-style-type: none"> Automotive companies 	●
Wayside to Vehicle		○
Wayside to Wayside		○
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets		○
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> Inter-agency coordination Intra-agency coordination Partnerships Changing skill sets Customer Focus 		○
Project Finance	<ul style="list-style-type: none"> Primarily based on customer payment 	●
Legal <ul style="list-style-type: none"> Liability Privacy Intellectual Property Procurement Practices Policy / Legislations 		○
User Acceptance <ul style="list-style-type: none"> Technology Adaptations Public Perceptions 	<ul style="list-style-type: none"> Public willingness to pay for service 	●
Technical <ul style="list-style-type: none"> Standards and Architecture Availability of Enabling Technologies Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> Installation of equipment in vehicles Lack of standards for in-vehicle applications (e.g. Mayday) 	●
Potential Actions to Resolve Barriers <ul style="list-style-type: none"> Financial Grants Improved Electronic Communications Changes to Policies / Legislation Introduce Standards Improve Skill Sets Privatization/Partnerships Public Education 	<ul style="list-style-type: none"> Introduce legislation to make the service mandatory 	

STRATEGIC PLAN ATTRIBUTES		ASSESSMENT		RATING
RECOMMENDED TIMEFRAME				
0 - 3 "Early winner"	4 - 7 Medium term	8 - 10 Longer term	YEARS	Primary <input checked="" type="radio"/>
				Secondary <input type="radio"/>
				Not Applicable <input type="radio"/>

ITS USER SERVICE: 6.3 Disaster Response and Management

The Disaster Response and Management user service co-ordinates disaster response strategies from a virtual control centre, and disseminates information to agencies and individuals on traffic conditions, diversion routes etc.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> Government agencies: proactive approach to safe and efficient roads 	●
Suppliers	<ul style="list-style-type: none"> Supply systems 	●
Customers and Service Providers		○
Researchers		○
Special Interest Groups		○
Travellers	<ul style="list-style-type: none"> Clear information on actions to take in the event of a disaster 	●
Enforcement Authorities		○
Emergency Service Providers	<ul style="list-style-type: none"> Clear response plans with the required tools 	●
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> Transport Canada 	◐
Provincial Government	<ul style="list-style-type: none"> Transportation, Health 	●
Municipal Government	<ul style="list-style-type: none"> Transportation, Emergency Services 	●
Non Profit / Advisory		○
Private Sector		○
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside	<ul style="list-style-type: none"> Traffic control systems Dynamic message signs 	●
Centre to Centre	<ul style="list-style-type: none"> Through radio systems, internet 	●
Centre to Vehicle / Traveller		○

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Wayside to Vehicle	<ul style="list-style-type: none"> • Highway advisory radio • Dynamic message signs 	●
Wayside to Wayside		○
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets		○
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> • Inter-agency coordination • Intra-agency coordination • Partnerships • Changing skill sets • Customer Focus 	<ul style="list-style-type: none"> • Information sharing, control at the scene • Before September 11, 2001, disasters considered rare and therefore disaster planning had lower priority. 	●
Project Finance		○
Legal <ul style="list-style-type: none"> • Liability • Privacy • Intellectual Property • Procurement Practices • Policy / Legislations 		○
User Acceptance <ul style="list-style-type: none"> • Technology Adaptations • Public Perceptions 	<ul style="list-style-type: none"> • Agencies responsible for disaster response planning may be resistant to technological solutions 	◐
Technical <ul style="list-style-type: none"> • Standards and Architecture • Availability of Enabling Technologies • Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> • Lack of standards for in-vehicle applications (e.g. Mayday) 	○
Potential Actions to Resolve Barriers <ul style="list-style-type: none"> • Financial Grants • Improved Electronic Communications • Changes to Policies / Legislation • Introduce Standards • Improve Skill Sets • Privatization/Partnerships • Public Education 	<ul style="list-style-type: none"> • Educate agencies responsible for disaster response planning – role that ITS can play 	

STRATEGIC PLAN ATTRIBUTES		ASSESSMENT		RATING
RECOMMENDED TIMEFRAME				
				
0 - 3 "Early winner"	4 - 7 Medium term	8 - 10 Longer term	YEARS	Primary <input checked="" type="radio"/>
				Secondary <input type="radio"/>
				Not Applicable <input type="radio"/>

ITS USER SERVICE: 6.4 Emergency Vehicle Management

The Emergency Vehicle Management Service user service is oriented towards reducing the time from the receipt of notification of an incident by an emergency services dispatcher, and the arrival of emergency vehicles on the scene. It includes emergency vehicle fleet management, route guidance to the incident scene or a suitable hospital, and pre-emption of traffic signals on an emergency vehicle's route to receive more green displays.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> Timely cleanup of incidents reduces potential for secondary collisions, and alleviates congestion related to incident 	●
Suppliers	<ul style="list-style-type: none"> Potential for financial gain (e.g. material supply and systems) 	◐
Customers and Service Providers	<ul style="list-style-type: none"> More confidence More reliable information 	●
Researchers	<ul style="list-style-type: none"> Actual field data could be used to assess effectiveness of emergency vehicle management systems 	◐
Special Interest Groups	<ul style="list-style-type: none"> Insurance agencies 	◐
Travellers	<ul style="list-style-type: none"> expedited response at the scene of a collision may save lives 	●
Enforcement Authorities	<ul style="list-style-type: none"> Faster response times Integration 	◐
Emergency Service Providers	<ul style="list-style-type: none"> efficient fleet management improved accident response times 	●
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> Standards with respect to equipment and information flow National coordination in terms of regional meetings, consultation 	◐
Provincial Government	<ul style="list-style-type: none"> More involved in regional opportunities 	●
Municipal Government	<ul style="list-style-type: none"> Fire service / police / ambulance 	●
Non Profit / Advisory		○
Private Sector		○

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside	<ul style="list-style-type: none"> Emergency vehicle pre-emption systems at traffic signals 	●
Centre to Centre	<ul style="list-style-type: none"> Telecommunications systems links between emergency vehicle dispatch centres 	●
Centre to Vehicle / Traveller	<ul style="list-style-type: none"> Hospitals to ambulances 	◐
Wayside to Vehicle	<ul style="list-style-type: none"> Several different vehicle pre-emption systems available 	●
Wayside to Wayside		○
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets	<ul style="list-style-type: none"> High 	◐
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> Inter-agency coordination Intra-agency coordination Partnerships Changing skill sets Customer Focus 	<ul style="list-style-type: none"> Development and implementation of STR 	●
Project Finance	<ul style="list-style-type: none"> Pre-emption systems require extensive field equipment 	●
Legal <ul style="list-style-type: none"> Liability Privacy Intellectual Property Procurement Practices Policy / Legislations 	<ul style="list-style-type: none"> Private information on airways Dispatch to wrong locations 	○
User Acceptance <ul style="list-style-type: none"> Technology Adaptations Public Perceptions 	<ul style="list-style-type: none"> Public perception 	○
Technical <ul style="list-style-type: none"> Standards and Architecture Availability of Enabling Technologies Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> Interoperability 	◐

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
<p>Potential Actions to Resolve Barriers</p> <ul style="list-style-type: none"> • Financial Grants • Improved Electronic Communications • Changes to Policies / Legislation • Introduce Standards • Improve Skill Sets • Privatization/Partnerships • Public Education 	<ul style="list-style-type: none"> • Promote as a potential strategy to deal with stress on emergency services budgets • Regional meetings 	
RECOMMENDED TIMEFRAME		
 <p style="text-align: center;">0 - 3 4 - 7 8 - 10 YEARS</p> <p style="text-align: center;">“Early winner” Medium term Longer term</p>		<p>Primary <input checked="" type="radio"/></p> <p>Secondary <input type="radio"/></p> <p>Not Applicable <input type="radio"/></p>

ITS USER SERVICE: 8.1 Weather and Environmental Data Management

The Weather and Environmental Data Management user service provides system wide gathering, fusion, and dissemination of information on roadway weather conditions and forecasts.

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
KEY BENEFICIARIES		
Owners/Operators	<ul style="list-style-type: none"> Road authorities; increased road safety and efficiency Road winter maintenance operators – effective management of resources (e.g. fleet, salt) 	●
Suppliers	<ul style="list-style-type: none"> Data management system suppliers 	◐
Customers and Service Providers		○
Researchers	<ul style="list-style-type: none"> Provides a data warehouse for research 	●
Special Interest Groups		○
Travellers	<ul style="list-style-type: none"> Supports early detection and notification of adverse conditions for route selection or trip planning 	●
Enforcement Authorities		○
Emergency Service Providers	<ul style="list-style-type: none"> Realtime information and advance notification of adverse conditions useful to response agencies 	●
DELIVERY PARTICIPANTS		
Federal Government	<ul style="list-style-type: none"> Environment Canada 	●
Provincial Government	<ul style="list-style-type: none"> Transportation, Environment 	●
Municipal Government	<ul style="list-style-type: none"> Transportation Department 	●
Non Profit / Advisory		○
Private Sector	<ul style="list-style-type: none"> Database management systems 	●
AVAILABILITY OF TECHNOLOGIES		
Centre to Wayside	<ul style="list-style-type: none"> Data transfer from field equipment to centre 	●
Centre to Centre	<ul style="list-style-type: none"> Web-based data sharing 	●
Centre to Vehicle / Traveller		○
Wayside to Vehicle		○

STRATEGIC PLAN ATTRIBUTES	ASSESSMENT	RATING
Wayside to Wayside		○
OPERATIONS AND MAINTENANCE CONSIDERATION OF SERVICES PROVIDED		
Available Skill Sets		●
KNOWN BARRIERS TO IMPLEMENTATION BY DELIVERY PARTICIPANTS		
Organizational Issues <ul style="list-style-type: none"> • Inter-agency coordination • Intra-agency coordination • Partnerships • Changing skill sets • Customer Focus 	<ul style="list-style-type: none"> • Inter-agency coordination • Partnerships to create data warehouses 	●
Project Finance	<ul style="list-style-type: none"> • Coverage in rural areas may be financially difficult to justify given low traffic volumes 	●
Legal <ul style="list-style-type: none"> • Liability • Privacy • Intellectual Property • Procurement Practices • Policy / Legislations 	<ul style="list-style-type: none"> • Ownership of data 	●
User Acceptance <ul style="list-style-type: none"> • Technology Adaptations • Public Perceptions 		○
Technical <ul style="list-style-type: none"> • Standards and Architecture • Availability of Enabling Technologies • Availability and Infiltration of Field Equipment 	<ul style="list-style-type: none"> • Integration into existing ARWIS sites / programs 	◐
Potential Actions to Resolve Barriers <ul style="list-style-type: none"> • Financial Grants • Improved Electronic Communications • Changes to Policies / Legislation • Introduce Standards • Improve Skill Sets • Privatization/Partnerships • Public Education 	<ul style="list-style-type: none"> • Start with pilot project involving public/public partnership, or public/private partnership 	

STRATEGIC PLAN ATTRIBUTES			ASSESSMENT	RATING
RECOMMENDED TIMEFRAME				
				
0 - 3 "Early winner"	4 - 7 Medium term	8 - 10 Longer term	YEARS	Primary <input checked="" type="radio"/> Secondary <input type="radio"/> Not Applicable <input type="radio"/>

APPENDIX H

DETAILED TECHNOLOGY DESCRIPTIONS

SURVEILLANCE

The functional area of surveillance is broken into 9 technology areas:

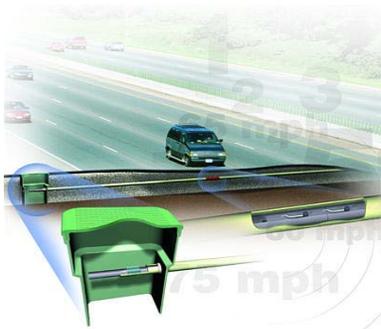
- Traffic – Table H.1
- Vehicle Status – Table H.2
- Environmental – Table H.3
- Vehicle Monitoring – Table H.4
- Driver Monitoring – Table H.5
- Cargo Monitoring – Table H.6
- Obstacle Ranging and Lane Tracking – Table H.7
- Security – Table H.8
- Location Determination – Table H.9

Each of the above technology areas is detailed more extensively in the following tables. Icons indicating each technology's existing maturity are provided. These maturity assignments are defined as follows (referring to the year 2010 as the end of the “near term” deployment window):

- **Mature:** Current commercially available technology supports the identified ITS requirements in this area. Deployment of the candidate ITS Services is not predicated on further research and development of these technologies. *Candidate ITS Services with dependencies only on these mature technologies should be deployable prior to 2010 with low risk.*
- ◐ **Mature with rapid innovation:** Current commercially available technology supports the identified ITS requirements. The area is one of rapid technology growth that indicates that the basic support provided by current technologies will likely be superseded within the period to 2010. While further research and development is not required to support ITS, future deployment may benefit from technology enhancements that should not be precluded by excessive rigidity in the architecture or deployment definitions. *Candidate ITS Services with dependencies only on this class of technologies should be deployable prior to 2010 with low performance risk and medium cost risk, based on obsolescence.*
- ◑ **Mixed:** This technology area is required to satisfy a range of ITS requirements including some that are not supported by current technology. Useful services may be deployed using currently available technologies; however, satisfying all ITS Service requirements will require additional research and development to bolster the identified deficiencies. Where this assignment is made, the associated description in highlights the specific areas where technology advancement is required. *Candidate ITS Services with dependencies only on these “mixed” technologies may not be deployable prior to 2010 without significant technical risk.*
- ◒ **Immature:** Additional research and development is required before technologies in this area can be cost-effectively and reliably applied to support the candidate ITS Services. In some cases, potentially suitable technologies have been applied in defence or aerospace applications, but not in commercial transportation applications. Additional research and development is still required in these areas to address the unique mass production, safety, and cost issues associated with larger commercial markets. *Candidate ITS Services with dependencies only on these immature technologies may not be deployable prior to 2010 under any risk scenario.*

Table H.1 – Traffic Sensors

TECHNOLOGY AREA: TRAFFIC SENSORS	
<p>Traffic sensor technologies monitor overall traffic flow conditions and enable collection of basic aggregate measures such as occupancy, volume, and speed. These traffic sensors may be installed in three locations, On Pavement, In Pavement and/or on the Roadside.</p> <p>On Pavement: There are a number of devices that may be placed on the pavement that may be used for vehicle detection, including loop mats, pressure plates, and magnetometers.</p> <p>In Pavement: There are three devices used for detecting vehicles that are embedded in the pavement, namely inductive loops, magnetic probes, and sensing cables. Since the devices are embedded in the pavement they are disruptive to traffic flow during installation and maintenance and are prone to problems with pavement deterioration. In-pavement detection is currently the prevailing detection sensor technology.</p> <p>Roadside/Overhead Mounted: Off-pavement sensors such as video imaging, radar, laser, ultrasonic sensing, and automatic vehicle identification (AVI) are now challenging in-pavement technologies for market share. Off-pavement sensors are typically mounted on overhead or roadside structures and therefore are less disruptive to traffic during installation and maintenance.</p> <p>Below, is a more detailed description for each of the different technologies. Each technology is grouped together in their respective location for installation (i.e. On-pavement, In-pavement and Roadside/Overhead Mounted).</p>	
ON-PAVEMENT	<p>Loop Mats </p> <p>Loop Mats are similar to conventional inductive loops, in that they generate an electromagnetic field, which is disturbed as a vehicle passes over, except loop mats are not embedded in the pavement. Designed for temporary use.</p> 
	<p>Pressure Plates </p> <p>Pressure Plates detect vehicles because when wheels pass over the pressure plate electrical contact occurs. Limited to detecting axles, not vehicles, and therefore cannot measure most traffic parameters.</p> 
	<p>Magnetometer </p> <p>A Magnetometer measures changes in Earth's magnetic field as a vehicle passes over.</p>

TECHNOLOGY AREA: TRAFFIC SENSORS	
IN-PAVEMENT	<p>Inductive Loops ●</p> <p>Inductive Loops are the most common type of detector and generate an electromagnetic field, which is disturbed as vehicles pass over. Inductive loops are widely used in various applications such as traffic signal intersections, toll gates and free flowing highways. Inductive Loops, with the help of an amplifier, generate a magnetic field. As a vehicle passes over the loop, the loop's magnetic field decreases. The amplifier is then tuned to detect this change in magnetic field therefore detecting the presence of a vehicle.</p> 
	<p>Magnetic Probes ●</p>  <p>Magnetic Probes measure changes in the Earth's magnetic field in order to determine when vehicles pass over.</p> 
IN-PAVEMENT	<p>Sensing Cable ●</p> <p>When vehicles pass over sensing cable, the wheels compress piezo-electric cable, which in turn generates an electric signal. Cannot measure most traffic parameters, limited to detecting axles.</p> 
ROADSIDE MOUNTED	<p>Video Imaging ●</p> <p>Video image processing sensors utilize the visible light and near infrared bandwidths to sense various user-configurable traffic parameters. Video imaging allows for traffic flow information to be obtained for multi-lane and multi-zone applications. However, the requirement to digitize the video images and invoke pattern recognition routines requires significant processing power in the field. A video imaging sensor can provide speed and volume information and can also be used for incident detection and traffic signal control. Video imaging sensors represent a very promising future standard for traffic flow detection, due in part to steadily improving performance, increased features/flexibility and decreased costs.</p> 

TECHNOLOGY AREA: TRAFFIC SENSORS

Radar 

Two technologies are:

- 1) Doppler radar sensors provide very accurate speed measurements and can distinguish between approaching and receding traffic. The principal drawback characteristic of this technology is the inability to measure presence and therefore it cannot provide traffic flow or occupancy information. However, many traffic authorities use this sensor when collection of speed data is a priority, such as for travel time monitoring. Doppler radar technology is robust, and performs well under all ambient environment conditions. It is typically mounted overhead. 

- 2) True presence microwave radar using frequency modulated continuous wave (FMCW) detects volume, presence and calculates speeds over multiple independent zones. Unlike Doppler microwave radar sensors, FMCW radar can be mounted in a side-fire configuration. However, speed data in side-fire mode presently has limited accuracy. The advantages of the FMCW radar sensors are its ease of installation and integration into existing systems, its high accuracy, programmability to support a variety of applications, and its low cost

Laser 

Laser detection systems utilize a very narrow beam width, which allows for the spatial positioning of a vehicle on the road and the resolution of the vehicle shapes within an accuracy of $\pm 10\text{cm}$. Laser based sensor technologies offer high accuracy and reliability, however this is sensitive to mounting height and sensor position over the roadway. One drawback is the requirement for a high signal to noise ratio in all prevailing weather conditions in order to reliably process a reflection from the vehicle target. Laser sensors can collect lane specific speed, volume and occupancy and can operate remotely with batteries and a solar panel, and use a spread spectrum radio link to transmit traffic data from the remote site to a traffic control data collection/transmission location. 

Ultrasonic Sensing 

Ultrasonic sensors transmit and receive an acoustic wave that is analyzed to determine vehicle volume. A local microprocessor can process the data to determine vehicle speed, occupancy and perform some limited vehicle classification. Reported results indicate that ultrasonic sensing provides fairly good accuracy. 

Appendix H – Detailed Technology Descriptions

TECHNOLOGY AREA: TRAFFIC SENSORS	
<p>Automatic Vehicle Identification </p>	<p>Automatic Vehicle Identification (AVI) technology deployed for ETC and CVO applications may be used to provide road link travel time data between AVI antennae for both freeway and arterial networks. This relatively accurate travel time data is well-suited to ATIS applications. In addition, AVI technology can provide information on traffic volumes based upon measured levels of penetration of AVI equipped vehicles. Agencies such as the Inter Agency Group in the New York City area have successfully demonstrated large scale deployment of AVI probe-based ATMS/ATIS applications.</p> <div style="text-align: right; margin-top: 20px;">  </div>

Table H.2 – Vehicle Status Sensors

TECHNOLOGY AREA: VEHICLE STATUS SENSORS					
<p>Vehicle Status Sensors which determine individual characteristics of passing vehicles. Technologies which assess individual vehicle length, weight, number of axles, lane position, and speed are available. Enforcement application technologies that monitor emissions, passenger counts, and operational status for specific vehicles are less mature.</p>					
<p>Vehicle Classification </p> <p>Classification of vehicles is undertaken for the purpose of regulatory compliance, automatic toll collection, commercial vehicle operation, and historical data collection. Vehicle classification is generally performed through devices embedded in the pavement, or mounted along the roadside. The table below indicates what vehicle information can be obtained by the applicable technologies.</p> <p>Looking ahead, there is continuing development of infrared or radar based profile technologies. The market will continue to be driven by CVO and ETC applications.</p>					
VEHICLE CLASSIFICATION	Technology	Weigh-in-Motion	Vehicle Height	Vehicle Length	Axles
	<p>Inductive Loops: Inductive loops can be used for classification on the principle that the percentage change in conductance can be used to determine the type of vehicle on the basis of vehicle length. Loops are not as accurate as other classification technologies.</p>			X	
	<p>Pressure Sensors: Pressure sensors, such as a pressure plate, and piezo-electric strips are used extensively for weigh-in-motion applications.</p>	X			X

Appendix H – Detailed Technology Descriptions

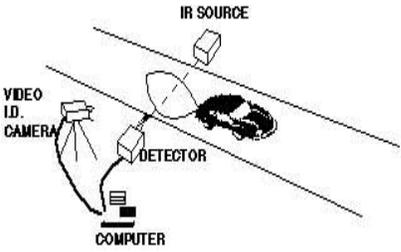
TECHNOLOGY AREA: VEHICLE STATUS SENSORS				
	<p>Profile Identifiers: Profile identifiers may include a variety of mounting configurations and technologies. Most applications are either mounted overhead or side-fired and utilize reflective beam technologies such as infrared, optical, ultrasonic or microwave/radar. A beam of energy is continuously monitored by the detection device, which essentially measures the physical dimensions of a vehicle as it passes through the detection zone. Profile identifiers may also be used as overheight detectors at low overpasses.</p>		X	
<p>Vehicle Emissions ●</p> <p>A variety of enabling technologies have been developed outside of the ITS arena to detect harmful vehicle emissions. These technologies include conductive polymers, fibre optic, and infrared sensors. In order to integrate these technologies into ITS applications, sensor(s) must be configured such that they can distinguish specific pollutants (HC_x, CO, and NO_x), and be bundled with related field components and processing. Emission sensing may be done from the vehicle or from the roadside.</p>				
		<p>An example of an ITS application of emissions sensing is in California, where the emission sensors are used to trigger plate readers with optical character recognition for passive emissions enforcement on freeway entrance ramps. Currently, the market for this type of application is limited, however it is expected to increase as more authorities take a proactive approach to vehicle pollution.</p>		

Table H.3 – Environment

TECHNOLOGY AREA: ENVIRONMENT	
<p>Environmental Sensors ●</p>	<p>Environment sensor technologies monitor local climate (temperature, humidity, precipitation, wind, pollution) and road surface status (dry, wet, ice, snow). A road weather information system (RWIS) monitors current conditions on and immediately adjacent to the roadway. Road temperature and condition sensors embedded in the surface of the pavement typically measure road surface temperature, moisture, and residual chemical factor in either a passive or active mode. Environment sensors measure air temperature and relative humidity as well as wind speed and direction. Other atmospheric sensors may include precipitation sensors as well as visibility sensors. More modern sensors include infrared cameras to assess road surface condition.</p>
	

Appendix H – Detailed Technology Descriptions



Meteorologists use the road data collected from the sensors to provide road condition forecasting services for road maintenance and various road user groups. The collected road weather information is monitored and analyzed to detect and forecast environmental hazards such as icy road conditions, dense fog, and approaching severe weather fronts. This information can be used to more effectively deploy road maintenance resources, issue general traveller advisories, and support location specific warnings to drivers using

Traffic Information Dissemination. Technical advancements in this area focus on the integration of sensor data with predictive algorithms.

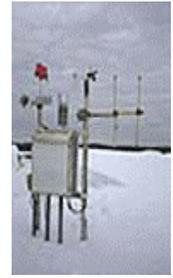


Table H.4 – Vehicle Monitoring

TECHNOLOGY AREA: VEHICLE MONITORING

Closed-Circuit Television (CCTV) Cameras

CCTV is an essential element of visual surveillance for ITS. CCTV consists of various elements of security industry grade equipment including the CCTV camera/lens unit, control equipment and the communication system, which connects the camera to a control centre.



The primary objective of a CCTV camera is to provide surveillance of freeway / highway segments or intersections and visual confirmation of incidents, however it may also be used to detect incidents. A secondary benefit is the monitoring of environmental conditions including precipitation and visibility. CCTV supports other applications including vehicle classification and enforcement.

The performance of CCTV cameras can be affected by the speed at which they pan/tilt and their level of zoom capabilities. Digital signal processing (DSP) provides a number of improvements over conventional analogue signal processing. CCTV technologies evolve rapidly, driven by the security industry. Near term evolutions will include increasingly compact, low cost imagers, with compressed digital video output.

Table H.5 – Driver Monitoring

TECHNOLOGY AREA: DRIVER MONITORING	
<p>Driver Monitoring Sensors ◐</p> <p>Driver Monitoring Sensors are technologies which monitor driver condition by monitoring driving characteristics and/or other psycho-physiological symptoms associated with impaired performance.</p> <p>A variety of organizations including major auto-makers are developing and testing sensors intended to identify driver fatigue or impairment and initiate alarms. Examples include infrared sensors to detect driver eye movement. While these technologies are in their infancy, future widespread deployment could significantly improve road and rail safety.</p>	

Table H.6 – Cargo Monitoring

TECHNOLOGY AREA: CARGO MONITORING	
<p>Cargo Monitoring Sensors ●</p> <p>Cargo Monitoring Technologies monitor various indicators of cargo status. Load distribution, temperature, acceleration, and pressure are among potential indicators that may be monitored depending on the nature of the cargo.</p>	 <p>Freight administration processes track cargo location and the cargo security/condition. This information can be communicated to a central fleet and freight management system via a range of wireless communications infrastructure such as DSRC. Interconnections are provided to intermodal shippers and intermodal freight depots for tracking the cargo from source to destination. Sensors can provide monitoring of various parameters such as temperature and humidity.</p> 

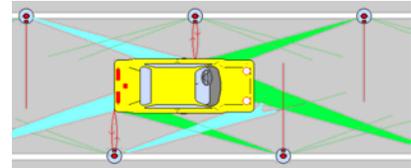
Table H.7 – Obstacle Ranging and Lane Tracking

TECHNOLOGY AREA: OBSTACLE RANGING AND LANE TRACKING	
<p>Obstacle Ranging Sensors ◐</p> <p>Obstacle Ranging Technologies detect and characterize potential obstacles (other vehicles, people, road debris) in a vehicle's vicinity. Supports family of applications with variable performance requirements. Advanced headway maintenance requires high frequency and precision. Driver warning systems may have reduced requirements due to human time scale. Vision enhancement sensors must support overall environment imaging.</p>	

TECHNOLOGY AREA: OBSTACLE RANGING AND LANE TRACKING

Lane Tracking Sensors ◐

Lane tracking technologies located on-board a vehicle monitor the position of the vehicle with respect to the travel lane and optionally support interpretation of travel lane geometry ahead of the vehicle. For situations where no roadway support (e.g. magnetic tape) is added, the technology rating drops to “immature”.



The externally mounted longitudinal and lateral sensors establish definable fields for object detection. These sensors are used to detect vehicles (or objects) that the vehicle is approaching, or that are approaching the vehicle, in order to provide warnings and/or assume temporary control of the vehicle if a collision is imminent.

Longitudinal/lateral control sensing is predominantly a research and development area, with few products currently emerging into the ITS market. Enabling technologies being explored include microwave, radar, lidar, ultrasonic sensing, and video image processing. Currently, the trend in in-vehicle sensor technology is focused on radar and lidar technology.

A number of technologies are available and are being developed to enhance vision capabilities for ITS vehicles. These technologies include infrared, video image processing and ultraviolet headlamps. These enhancement systems will improve visually acquired information in situations where driving visibility is low, such as at night or reduced visibility due to an obstruction to vision such as fog or falling snow.

Table H.8 – Security

TECHNOLOGY AREA: SECURITY

Security ●

Security technologies provide surveillance of, and restrict access to, secure public areas. Card readers that restrict access and closed circuit television cameras are examples.

The ITS industry draws upon a number of security industry technologies and hence there are opportunities to add value to ITS applications through security system inter-operability. Parking facilities offer particular opportunities. CCTV can be used for occupancy monitoring and site security; and DSRC technology as deployed for toll applications can be used for access control.



Transit security provides for the physical security of transit passengers. An on-board security system is deployed to perform surveillance and warn of potentially hazardous situations. Public areas (e.g. stops, park and ride lots, stations) are also monitored. Information is communicated to the Transit Management Subsystem using the existing or emerging wireless (vehicle-to-centre) or wireline (area-to-centre) infrastructure. Security related information is also transmitted to the Emergency Management Subsystem when an emergency is identified that requires an external response.

Table H.9 – Location Determination

TECHNOLOGY AREA: LOCATION DETERMINATION	
<p>Location Determination is a technology which determines absolute position. Examples include GPS and other systems which apply multi-lateration to known locations, either terrestrial or space based. Augmenting these technologies are those that measure travel path and distance (e.g., odometer, compass, gyroscope) from a known location. Very high-precision systems associated with vehicle control applications are one remaining research area.</p>	
<p>Global Positioning System (GPS) ●</p>	
<p>GPS is a Satellite Navigation System that is funded by and controlled by the U.S. Department of Defense. While there are many thousands of civil users of GPS world-wide, the system was designed for and is operated by the U.S. military. GPS provides specially coded satellite signals that can be processed in a GPS receiver, enabling the receiver to compute position, velocity and time. Four GPS satellite signals are used to compute positions in three dimensions and the time offset in the receiver clock.</p> <p>There are two different levels of GPS service, the Precise Positioning Service (PPS) and the Standard Positioning Service (SPS). PPS uses cryptographic equipment and keys and specially equipped receivers and is limited to U.S. military and government agencies use. SPS is available to civil users world-wide, but has less accuracy when compared to PPS. Accuracy is typically within 10m, and performance in urban canyons is a particular issue. Accuracy can be significantly improved using a differential GPS (DGPS) service which uses a commercial pager network or FM subcarrier service to calibrate the GPS receiver based upon local reference points with known co-ordinates.</p> <p>GPS is relatively mature technology. Looking ahead, the focus will be on integrating GPS with other applications. For example, GPS may be used in intelligent vehicles, or in cellular phones within vehicles, in order to perform Automatic Vehicle Location (AVL).</p>	

DATA PROCESSING

Inherent to carrying out each of the ITS user services is data processing. This is the process by which the information gathered from a variety of sources is brought together, managed, manipulated and disseminated to some output by one form or another.

Data Processing is broken into two main functional areas: algorithms and information management. Processing technology and advanced algorithms enable advanced vehicle and traffic control applications. The function of information management is made up of information storage, fusion, and retrieval systems management.

Table H.10 – Data Processing

TECHNOLOGY AREA: DATA PROCESSING

Algorithms 

There are a number of custom software programs that are used to effectively and efficiently manage traffic conditions. These include incident/congestion detection algorithms, real-time traffic signal optimization, route optimization, and traffic simulation models.

Detection Algorithms: Detection algorithms include automatic incident detection (AID) algorithms, queue detection and tracking algorithms and route optimization. AID algorithms are generally based on either pattern recognition techniques or prediction models and can be classified as either comparative or single station algorithms. Comparative algorithms are those that compare traffic characteristics at adjacent stations and single station algorithms perform temporal comparisons at a single station. In Canada, two AID algorithms have had practical application for ATMS. These algorithms are the McMaster Algorithm and the All-Purpose Incident Detection (APID) Algorithm.

Looking ahead, there is increasing emphasis on congestion detection versus incident detection. Queue detection logic is used to detect congestion (with no concern as to the cause) at each detector station. Queue tracking logic is then applied to monitor the end and beginning of the queue. The major purpose of queue detection and tracking is safety. The back of a queue is turbulent and dangerous. Given proper information, DMS messages can alert a motorist of congestion ahead.

Real-time Signal Optimization: There are a number of software packages developed that may be used in real-time to optimize signal timings on a road network so that the total throughput is maximized or the total delay is minimized. This section examines two common real-time signal optimization systems, SCOOT and SCATS.

SCOOT

SCOOT (Split Cycle Offset Optimization Technique) is an advanced implementation of computer-based urban traffic control. It is an adaptive traffic control strategy that operates in concert with a discreet UTC. The key functions of SCOOT are to:

- Measure Cyclic Flow Profiles (CFP's) in real-time. This allows the arrival of platoons of vehicles at a signal to be forecast;
- Update an on-line model of queues continuously. This provides an estimate of stop line congestion;
- Incrementally optimize signal settings. Split, cycle and/or offset can be adjusted by a few seconds each cycle to best address the demands on all approaches.

SCOOT uses vehicle detectors to measure traffic flow profiles in real-time. The detectors are placed near the upstream end of each link to measure the demand pattern of vehicles approaching the downstream signal. Information from the detector on the downstream link is also utilized to update the estimated saturation flow rate. The traffic data is continuously processed by the SCOOT algorithm to allow signal timing to adapt in real-time to traffic changes.

TECHNOLOGY AREA: DATA PROCESSING

SCATS

SCATS (Sydney Co-ordinated Adaptive Traffic System) is a computer based area traffic control system. It is a complete system consisting of hardware, software, and control strategy. Operating in real-time, it adjusts signal timings throughout the system in response to variations in traffic demand and system capacity. As with any area traffic control system, the purpose of SCATS is to optimize traffic flow on an area-wide basis, rather than on the basis of individual intersections.

SCATS operates in real-time through the regional computer which analyses detector information pre-processed by intersection controllers. The algorithms in the regional computer select, in response to detected flow and occupancy data, the appropriate splits, offsets and cycle lengths for each subsystem and the offsets that apply between subsystems.

Route Optimization: Efficient route management not only reduces the number of vehicles required to perform a given operation, but also impacts on traffic and environmental conditions. For commercial fleets, especially in the pickup and delivery business, route optimization software and implicit algorithms are the key technology. This is a point-to-point or node-based routing application that automatically determines the optimum street sequences to perform a desired task.

In waste management and street/roadway maintenance operations such as snow ploughing, salting/sanding and street cleaning, a more sophisticated link-based routing is employed that considers both sides of the street and multiple lanes. Route optimization software can reduce the number of vehicles required to perform a given set of tasks by 15% to 30%.

Information Management



Regional Traffic Control: Regional traffic control advances Surface Street Control and Freeway Control by adding the communications links and integrated control strategies that enable integrated interjurisdictional traffic control. This regional traffic control provides for the sharing of traffic information and control among traffic management centres to support a regional control strategy. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. Regional traffic control relies principally on roadside instrumentation supported by the Surface Street Control and Freeway Control and adds hardware, software, and wireline communications capabilities to implement traffic management strategies which are co-ordinated between allied traffic management centres. Several levels of co-ordination are supported from sharing of information through sharing of control between traffic management centres. This information sharing is facilitated through the application of open systems and database technologies.

Incident Management System: An incident management system manages both predicted and unexpected incidents so that the impact to the transportation network and traveller safety is minimized. Requisite incident detection capabilities are included in the Freeway Control System (or ATMS) and through regional co-ordination with other traffic management and emergency management centres, weather service entities, and event promoters supported by this market package. Information from these diverse sources is collected and correlated by the incident management systems to detect and verify incidents and implement an appropriate response. An incident management system provides Traffic Management Subsystem equipment that supports traffic operations personnel in developing an appropriate response in co-ordination with emergency management and other incident response personnel to confirmed incidents. The response may include traffic control strategy modifications and presentation of information to

Appendix H – Detailed Technology Descriptions

TECHNOLOGY AREA: DATA PROCESSING

affected travellers using traffic information dissemination. The same equipment assists the operator by monitoring incident status as the response unfolds. The co-ordination with emergency management might be through a CAD system or through other communication with emergency field personnel. This co-ordination is facilitated through the application of open systems and database technologies. The co-ordination can also extend to tow trucks and other field service personnel.

CONTROL

The technology area of “Control” can be divided into three categories: Signals – Table H.11; Signs – Table H.12 and Vehicle – Table H.13.

Signal control technologies include freeway and arterial lane control signs, freeway ramp metering, and arterial intersection traffic signals.

Sign control technologies provide a variety of Dynamic Message Signs including those which include interface to vehicle-roadside communications technologies enabling complementary in-vehicle displays.

Automated vehicle control technologies that provide on-board collision avoidance and auto-navigation systems are in relative infancy.

Table H.11 – Signals

TECHNOLOGY AREA: SIGNALS

Lane Control ●

A lane control system provides signing for lane use and speed limits. Motorists are advised of safe maximum speeds in relation to road surface, weather and/or traffic conditions. Speeds and throughputs during congestion may be improved. Lane closures in response to incidents, maintenance or construction may be expedited. A lane control system may reduce shock waves and resultant secondary collisions. The use of lane signals also enables counter-flow operations.



Ramp Metering ●

The objective of a ramp metering system is to reduce the recurring congestion on freeways without increasing overall network delay. This is achieved by regulating access to the expressway by signal control of the on-ramp. The flow of entering traffic is smoothed, reducing bottleneck and shock wave effects. Drivers using metered ramps may alter their driving pattern either spatially (using an alternate route) or temporally (leaving earlier or later) which may reduce the peak load on the system.



TECHNOLOGY AREA: SIGNALS

Traffic Signals ●

Intersection traffic signal controllers have traditionally employed custom industry-standard controllers such as the National Equipment Manufacturers Association (NEMA) standard. Additionally, signal control can be facilitated using a standard PC-based field microprocessor known as the Advanced Traffic Controller (ATC), or the California standard 2070 controller.



Table H.12 – Signs

TECHNOLOGY AREA: SIGNS

Light Emitting Diodes (LED) ●

Light Emitting Diode (LED) displays use pixels comprised of clusters of high intensity LEDs. Each LED is recessed in a black cylinder to minimize the impact from direct sunlight.



The main characteristics of LED DMS are:

- Solid state construction with availability of multiple colours for a broad range of applications;
- Low routine maintenance requirements;
- Rapid pace of technological development and improvement;
- Potential for long term degradation of LED output;
- Higher power consumption and heat generation relative to other DMS technologies.



LED signs are gaining widespread acceptance and are evolving as the standard technology of the future for DMS.

TECHNOLOGY AREA: SIGNS

Liquid Crystal Display ●

Liquid Crystal Display (LCD) technology has been traditionally used for a wide variety of indoor signing applications. LCDs are usually used as solid-state shutters with fluorescent tubes being used as the back light source. However, the light passed through a LCD in its “light transmission mode” is insufficient for outdoor applications and the technology has not developed to the point where it can be used with confidence in the outdoor roadway environment. Introducing reflective material to the LCD to reflect more light through it in its “light transmission mode” improves outdoor performance. These so-called transreflective LCDs have been applied to shuttering light emitted from fibre optics, but this requires two LCDs in series to effectively interrupt the light. In addition, the LCDs have a high attenuation thus demanding greater light source power. Other major obstacles to the use of LCDs for roadway applications are insufficient contrast ratios and operating temperature restrictions.



In recent years, there have been extensive amounts of research initiated to increase contrast ratio thus increasing visibility. There are several characteristics that make LCD’s attractive for DMS applications, including completely solid state, compact design, and wide viewing angle. LCD may emerge as a viable DMS technology over the next five years.

Hybrid Signs ●

There are two types of hybrid signs: Fibre/Flip Disk and LED/Flip Disk. Fibre/Flip Disk signs employ reflective flip disks with each disk having a small opening to expose the end of an illuminated fibre strand. The disk employs a shield, which blocks the fibre end, when the disk is blank. Hybrid LED/Flip disks employs a similar configuration with disk openings exposing an LED pixel. The main characteristics of these technologies are improved visibility over conventional LED and fibre displays when display is exposed to direct sunlight, uninterrupted operation in the event of power failure (if desired), and potentially high maintenance requirements associated with degradation of moving parts and reflective disks.

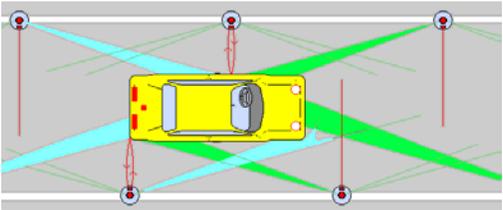


Rotating Drums ●

The rotating drum, or limited state, sign is capable of displaying a variety of different messages depending on the number of drums and the number of sides of its drums. For example, if a sign has two drums with 4 sides, this provides a theoretical limit of 16 message combinations. However, only a fraction of message combinations would be valid. The resulting small message library severely limits the amount and type of information that can be displayed on the sign.



Table H.13 – Vehicle

TECHNOLOGY AREA: VEHICLE	
<p>Vehicle Control </p> <p>Automated vehicle control technologies are in relative infancy. Most of the world’s major automakers have developed demonstration applications, such as the San Diego pilot by the National Automated Highway Consortium in the U.S. These technologies will emerge on the market as a collection of discrete market driven features, such as the adaptive cruise control feature offered by Daimler Chrysler. Control applications will only become viable following widespread proliferation of driver warning applications.</p>	

TRAVELLER INTERFACE

Technologies in this area have audio, visual and tactile interface capabilities that interact with travellers (e.g. with a driver during vehicle operation, or with an operator at a control centre). There are three main areas that traveller interface can be divided into: Driver Interface – Table H.14; Traveller Interface – Table H.15 and Operator Interface – Table H.16.

Console displays, heads up displays and synthesized speech are primary examples of mature technologies in the driver interface category. Technologies enabling voice input and non-distracting visual enhancement of the driver’s view are less mature. For the traveller and operator interfaces, the same technologies used in driver interface applications are used with some varied constraints. For example, extreme portability requirements restrict interface options for hand-held devices. Additional capabilities, including hard copy options, for fixed presentation devices may also be required.

Table H.14 – Driver Interface

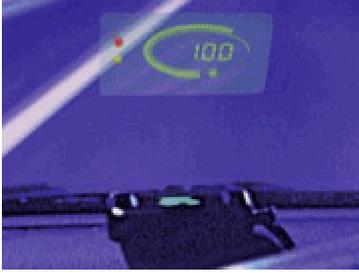
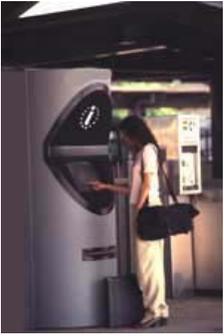
TECHNOLOGY AREA: DRIVER INTERFACE	
Driver Interface 	
<p>Drivers and passengers within a vehicle are able to obtain a variety of information, through a variety of methods. Tailored information may also be obtained based on real-time interactive response to a traveller's request and based on a submitted traveller profile. Information obtained may include: environmental conditions; road surface conditions, including sanding/salting status; traffic conditions including: indications of congestion levels, possible incidents, road maintenance or closures, and expected travel times; vehicle conditions; collision warnings; ride share/ride match; parking management; pricing.</p>	
	<p>This information may be obtained within the vehicle through audio in the form of Highway Advisory Radio (HAR), regular radio reports, interactive voice response (IVR) or visually through the use of a heads-up-display (HUD), Liquid Crystal Display (LCD) or Cathode Ray Tube (CRT). The information obtained from within the vehicle may also be used as input into a route selection and guidance system. Current efforts are focussing on the management and presentation of information to the motorist.</p>

Table H.15 – Traveller Interface

TECHNOLOGY AREA: TRAVELLER INTERFACE	
Traveller Interface 	
<p>Interactive traveller information provides tailored information in response to a traveller request. Both real-time interactive request/response systems and information systems that “push” a tailored stream of information to the traveller based on a submitted profile are supported. The traveller can obtain current information regarding traffic conditions, transit services, traveller services, ride share/ride match, parking management, and pricing information.</p>	

TECHNOLOGY AREA: TRAVELLER INTERFACE

A range of two-way wide-area wireless and wireline communications systems may be used to support the required digital communications between the traveller and the information service provider. A variety of interactive devices may be used by the traveller to access information prior to a trip or en-route, including telephone, pager, kiosk, Personal Digital Assistant, personal computer, and a variety of in-vehicle devices. Successful deployment of interactive traveller information relies on availability of real-time transportation data from roadway instrumentation, probe vehicles or other means.



Transit traveller information provides transit users at transit stops and on-board transit vehicles with ready access to transit information. The information services include transit stop annunciation, imminent arrival signs, and real-time transit schedule displays that are of general interest to transit users. Systems that provide custom transit trip itineraries and other tailored transit information services are also represented by transit traveller information.

Table H.16 – Operator Interface

TECHNOLOGY AREA: OPERATOR INTERFACE

Operator Interface

There is a wide range of related industries (defence, sports media, etc.) that use control centre displays suitable for ITS. The size of the market drives the size of manufacturing base and results in wide range of products and competitive prices. The main technologies used in control centre applications are:

- front projection (CRT or LCD light valve);
- rear projection (CRT or LCD light valve);
- monitor wall;
- LED flat screen.

Front projection technology has found a limited implementation in ITS control centre applications. It does not provide adequate picture quality in office levels of illumination. In addition, a projector unit hanging from the ceiling may obstruct the view of the operators or other staff involved. However, new technology developments offer significant improvement in picture quality.

Rear projection technology is widely used to display high-resolution graphics and live video images. The technology is configurable in the sense that it is available in a variety of forms including:

- stand-alone pedestal mounted units marketed as standard products;

TECHNOLOGY AREA: OPERATOR INTERFACE

- standard products stackable rear-projection cubes which can be configured to suit custom display requirements;
- custom-built rear-projection wall using standard projector components into the facility.



CRT or light valve based rear-projection technology is proven, widely available and provides suitable intensity in office level illumination. The primary drawback for this technology is the space requirements to accommodate the systems.

Traditional ITS control rooms incorporate banks of monitors, or monitor walls to display live video images from surveillance cameras. The primary drawback of this display media is the inability to display large high-resolution graphic images across a wall of monitors. The current trend is towards a media-wall approach incorporating a matrix of integrated high resolution rear projection.

NAVIGATION

Navigation systems use technologies that determine absolute position, which in turn can be used to plot courses, etc. Examples include GPS and other systems which apply multi-lateration to known locations, either terrestrial or space based. Augmenting these technologies are those that measure travel path and distance (e.g., odometer, compass, gyroscope) from a known location. Very high-precision systems associated with vehicle control applications are one remaining research area.

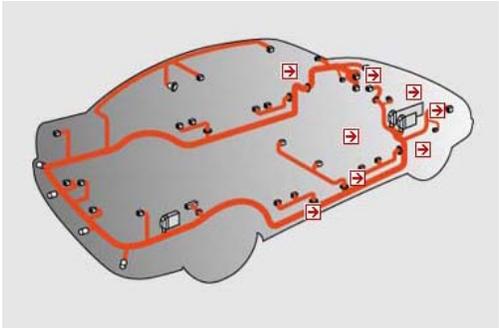
Table H.17 – Navigation

TECHNOLOGY AREA: NAVIGATION	
<p>Route Selection and Guidance</p> <p>A vehicle may be equipped with a route selection and guidance device or route selection and guidance information may be obtained from an Information Service Provider (ISP). Route selection and guidance can be either autonomous or dynamic.</p> <p>Autonomous route selection and guidance relies on in-vehicle sensory, location determination, computational, map database and interactive driver interface equipment to enable planning and detailed route guidance based on static, stored information. Information is stored in a Geographic Information System (GIS) that analyses, stores, and displays both spatial and non-spatial data.</p> <p>Dynamic navigation and guidance utilizes a dynamic GIS and is therefore responsive to current traffic, weather, and road conditions. ISP based route guidance is likely to utilize dynamic route selection and guidance technology. Future technical directions in this area focus on data fusion and system integration of data sources, communication service providers, and on-board equipment.</p>	

IN-VEHICLE SENSORS

In-vehicle sensors encompass a broad range of on-board sensor technologies that monitor vehicle condition (e.g. engine, brake, tire, and suspension status) and performance (current speed, acceleration, yaw, traction, current steering, throttle, braking, and transmission status).

Table H.18 – In-Vehicle Sensors

TECHNOLOGY AREA: IN-VEHICLE SENSORS	
<p>In-Vehicle Sensors</p> <p>The automotive industry has introduced a wide range of on-board vehicle sensors and diagnostics for engine management and dynamic stability. Sensors monitor parameters such as fluid levels/pressures, temperature, electrical current, etc. and initiate a response which may include control/actuation, visual signal or error code which identifies the fault condition. With the advent of the J-bus on-board communications networks, a variety of vehicle status information can be collected and reported to a centralized fleet management service using DSRC technology, interfaces at filling stations, or wide area communications.</p>	

COMMUNICATIONS

Many of the technologies described in this Appendix are identified as “Mature with Rapid Innovation”. Of these technology areas, perhaps none is more crucial to the initial success and continued viability of ITS than communications.

Over the last two decades, a massive worldwide telecommunication infrastructure has evolved in the developed nations, both for wired and wireless communication. The reliability and capacity of wireline networks has increased exponentially, enabling a wide array of new services and capabilities. As performance has increased, prices of most wireline telecommunication services have dropped in most countries. At the same time, the wireless communications consumer market was born and has since witnessed unprecedented growth.

Over the next twenty years, many new communication technologies and techniques, from multiple access to transport to switching, will be introduced at a rapid pace to support the demands of our information age. Presently available and emerging technologies will offer extensive opportunities to handle many candidate ITS Services.

Table H.19 – Extended Range 2-Way Communications

TECHNOLOGY AREA: EXTENDED RANGE 2-WAY COMMUNICATIONS	
Personal Communication Service (PCS) ●	
<p>Analogue cellular telephone service was launched in the U.S. in 1984 and in Canada in 1986. Its subscription growth has been rapid. In Canada the analogue cellular service is available to 93 % of the population and digital PCS service presently reaches over 40 % of the population, mainly in urban areas. By the end of 1999, cellular/PCS subscriptions reached over 6.5 million accounts. In the U.S. the subscription exceeds 70 million and the ratio of analogue to PCS should be the same as in Canada. It should be noted however that the growth of the 2G PCS is accelerating due to the range of digital service features, and performance of the service.</p>	
<p>Analog: Analog cellular telephone service provides voice communications and some data capability to 14.8Kb/s. There are two organizations offering cellular services in Atlantic Canada – Aliant and Rogers AT&T. Both organizations offer cellular services across the country.</p>	
<p>Digital: Several digital systems are available in the marketplace using Time Division Multiple Access (TDMA) or Code Division Multiple Access (CDMA) technology. The three systems deployed in Canada are CDMA ANSI-95B operated by Former Mobility Canada and by Clearnet, the TDMA ANSI-136 operated by Cantel and the TDMA PCS 1900(GSM) operated by Microcell. The digital systems are deployed in both the 2 GHz PCS and the 800 MHz cellular bands.</p>	

Appendix H – Detailed Technology Descriptions

TECHNOLOGY AREA: EXTENDED RANGE 2-WAY COMMUNICATIONS

Enhanced Specialized Mobile Radio (ESMR) ●

ESMR is a form of high mobility telephony and dispatch service that is offered using 2nd generation technology systems.



Microwave ●

Microwave communication utilizes a number of microwave radios. Point-to-point radios are connected in a serial trunk configuration, with repeater nodes connecting terminal ends. Access to a specific radio from any location is possible only through another radio, and access to a remote terminal is restricted to the one hop next to it. Repeater locations can be accessed from more than one spur direction in what is known as trunk and spur topology.

Wireless network links offer a low cost, high bandwidth alternative to a fibre network build. A network of microwave radios typically spans a large geographic area, and the network may connect to a wireline private network at various access points, or not at all.



Table H.20 – Dedicated Short Range Communications

TECHNOLOGY AREA: DEDICATED SHORT RANGE COMMUNICATIONS (DSRC)

Dedicated Short Range Communications (DSRC) ●

DSRC consists of wireless devices that are capable of transferring data at a high rate between mobile and/or stationary devices, but are limited to a short-range. At present, the most common application of DSRC within ITS is the communication of information between an in-vehicle transponder and a roadside antenna. This information may be used for electronic tolling,



automatic vehicle location, device control, commercial vehicle operations, and traffic monitoring. However, future uses of DSRC are likely to include communication between vehicles, as well as communication between roadside devices. The 2-way communication capabilities of DSRC make it possible to use DSRC devices as a link between other wireless and wireline connections to build a complete communication network.



DSRC is a mature technology and has been widely used throughout Canada, and the world, for ITS initiatives. However, it has become apparent that there is a need to standardize DSRC and associated equipment, to provide a common path between the vehicles and devices which support ITS applications. The specific transmit/receive frequencies, as well as the communication protocols, are issues that need to be resolved for standardization. The following table presents a brief comparison of the emerging DSRC

Appendix H – Detailed Technology Descriptions

TECHNOLOGY AREA: DEDICATED SHORT RANGE COMMUNICATIONS (DSRC)			
standards in Japan, Europe, and North America.			
Emerging DSRC Standards			
Region	Standard	Electromagnetic Spectrum	
Japan		5.8 GHz active – A battery powered transponder receives and transmits in the 5.8 GHz frequency range	
Europe	CEN-278	5.8 GHz passive backscatter – A transponder reflects transmissions in the 5.8 GHz frequency range.	
North America	ASTM 6.0 / 7.0	900 MHz and 5.850-5.925 GHz active – A battery powered transponder receives and transmits in either the 900 MHz range, or the 5.8 GHz frequency range.	

Table H.21 – Vehicle-to-Vehicle Communications

TECHNOLOGY AREA: VEHICLE-TO-VEHICLE COMMUNICATIONS	
<p>Vehicle to Vehicle Communications </p> <p>Vehicle-to-vehicle communications is one of the lesser-developed areas within ITS. Short-range, wireless communications is used to exchange information between vehicles in close proximity for applications such as intersection collision avoidance and vehicle platooning. Candidate communications technologies include dedicated RF, spread spectrum RF, and infrared. It is likely that the development of vehicle-to-vehicle communications technologies and standards will closely parallel the development of vehicle-to-infrastructure applications (i.e. DSRC).</p>	

Table H.22 – Broadcast Communications

TECHNOLOGY AREA: BROADCAST COMMUNICATIONS	
<p>Broadcast Communications </p> <p>Highway advisory radio (HAR) systems are the primary application of extended range broadcast communications within ITS. A licensed AM frequency (530-1700 kHz) or licensed FM frequency (88-108 MHz) may be used for extended range broadcast. The higher bandwidth of FM frequencies offers an improved signal, with a shorter range when compared to AM frequencies.</p> <p>Digital Audio Broadcast (DAB) is a wireless audio and data transmission system developed for point-to-multipoint data broadcast applications. There are a number of ITS agencies world-wide that are considering applications that utilize DAB for traffic information broadcasting as well GPS system integration. Canadian broadcasters have adopted the Eureka 147 system and the CRTC has allocated L-Band frequency for this application. The U.S. is currently considering their own proprietary IBOC system for DAB transmission which would make use of the existing AM / FM frequency allocations. These potential</p>	

TECHNOLOGY AREA: BROADCAST COMMUNICATIONS

differences in spectrum allocation and communication protocol may lead to significant differences in the overall standards or requirements for any future DAB ITS applications.

Europe and Japan have recently embraced DAB, which provides a significant communications improvement over FM signal capabilities. DAB service is commencing in Canada; as nineteen radio stations in Toronto and nine in Montreal are broadcasting using DAB and receivers are readily available on the market. Commercial broadcasters are active in the DAB market, and a demonstration of ATIS services using DAB is planned for the Toronto area.

It will take time before a significant number of subscribers will embrace DAB services and it can be expected that for many years the simulcasting of the same programming on existing FM or AM stations and DAB will be required to reach audiences. Also, several years will be required for the expansion of DAB coverage outside main market areas.

It should be noted that Digital TV (DTV) under a common over the air standard is quickly being implemented in the U.S. DTV technology is based on ATM and each 6 MHz TV channel can provide up to 19Mb/s which can accommodate HDTV plus approximately 3 Mb/s of datacasting, or up to 4 TV programs of advanced formats, or a mixture of TV programs and datacasting. The Canadian Industry has greatly participated in the standards, the allotment plans, and the technology, to move towards the implementation of DTV. However, so far no firm commitment has been articulated as to when the industry will begin.

Table H.23 – Fixed Wireline Communications

TECHNOLOGY AREA: FIXED WIRELINE COMMUNICATIONS													
Fixed Wireline Communications ●													
<p>Dedicated and leased wireline communications wide area networks are used to integrate various ITS field components. Principal network design considerations include:</p> <ul style="list-style-type: none"> • The system must provide a high degree of reliability achieved through the use of components with a high mean time between failure, combined with a high level of redundancy in the network configuration; • Capacity for system growth must be provided to accommodate the life of the system. Expansion is achieved through incorporation of spare fibres and a migration path for upgraded electronics; • The system must be monitored for failures and loading using a central network management system; • Standard industry communications protocols must be employed to minimize deployment, operations and maintenance costs. <p>In recent years there has been a movement away from proprietary communications architectures to industry standards such as Synchronous Optical Network (SONET) and Asynchronous Transfer Mode (ATM). As a result, there is a wide range of commercial products available for dedicated network and WAN/LAN network for ITS.</p> <p><i>Synchronous Optical Network (SONET):</i> SONET is a multiplexing standard for fibre-optic transmission systems. SONET was proposed by Bellcore in the mid-1980s and is now an ANSI standard. SONET defines interface standards at the physical layer of the OSI seven-layer model. The standard defines a hierarchy of interface rates that allow data streams at different rates to be multiplexed. SONET establishes Optical Carrier (OC) levels from 51.8 Mbps (about the same as a T-3 line) to 2.48 Gbps, as follows:</p>													
													
	<table border="1"> <thead> <tr> <th style="background-color: #ffffcc;">OC Level</th> <th style="background-color: #ffffcc;">Data Rate</th> </tr> </thead> <tbody> <tr> <td align="center">OC-1</td> <td align="center">51.85 Mbps</td> </tr> <tr> <td align="center">OC-3</td> <td align="center">155.52Mbps</td> </tr> <tr> <td align="center">OC-12</td> <td align="center">622.08 Mbps</td> </tr> <tr> <td align="center">OC-24</td> <td align="center">1.244 Gbps</td> </tr> <tr> <td align="center">OC-48</td> <td align="center">2.488 Gbps</td> </tr> </tbody> </table>	OC Level	Data Rate	OC-1	51.85 Mbps	OC-3	155.52Mbps	OC-12	622.08 Mbps	OC-24	1.244 Gbps	OC-48	2.488 Gbps
OC Level	Data Rate												
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OC-3	155.52Mbps												
OC-12	622.08 Mbps												
OC-24	1.244 Gbps												
OC-48	2.488 Gbps												
<p>Prior rate standards used by different countries specified rates that were not compatible for multiplexing. With the implementation of SONET, communication carriers throughout the world can interconnect their existing digital carrier and fibre optic systems. The international equivalent of SONET, standardized by the ITU, is called Synchronous Digital Hierarchy (SDH).</p>													

Appendix H – Detailed Technology Descriptions

TECHNOLOGY AREA: FIXED WIRELINE COMMUNICATIONS

Asynchronous Transfer Mode (ATM): Asynchronous Transfer Mode is a packetization standard which facilitates the transfer of data in cells or packets of a fixed size. The cell used with ATM is relatively small compared to units used with older technologies. The small, constant cell size allows ATM equipment to transmit video, audio, and computer data over the same network, and assure that no single type of data dominates the line bandwidth. Current implementations of ATM support data transfer rates of from 25 to 622 Mbps. This compares to a maximum of 100 Mbps for Ethernet, the current technology used for most LANs. ATM creates a virtual fixed channel, or route, between two points whenever data transfer begins.

The recent deregulation of the communications environment and the evolution of industry-wide standards have lead to opportunities for sharing communication networks. Partnerships can now be developed to defray initial fibre optic installation costs either through fibre for right of way, shared ownership, or leased communication services.

APPENDIX I

DEPLOYMENT PLANNING WORKSHOP

April 25, 2002 - ITS Deployment Workshop & ITS Capabilities Showcase, Westin Nova Scotian, Halifax

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May 15, 2002 - ITS Deployment Workshop & ITS Capabilities Showcase, Delta St. John's Hotel & Conference Centre

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??	Angus	Armour	Called to say he has to check if he can attend this one.	Apr. 18/02					
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13	Bernie	Molloy	Aliant Telecom	4th Floor, FWB	St. John's	NF	A1C 5H6	(709) 758-6323	bernie.molloy@aliant.ca
14	Patricia	Byrne	Aliant Telecom	4th Floor, FWB	St. John's	NF	A1C 5H6	(709) 758-6320	patricia.byrne@aliant.ca
15	Bill	MacDonald	City of St. John's	P.O. Box 908	St. John's	NF	A1C 5M2	(709) 576-6125	bmacdonald@city-st-johns.nf.ca
16	Michelle	Brophy	Stratos					709-748-4286	michelle_brophy@stratosglobal.com

**ATLANTIC PROVINCES
REGIONAL ITS STRATEGIC PLANNING STUDY
DEPLOYMENT PLANNING WORKSHOP
And
SHOWCASE/PRESENTATIONS**

**APRIL 25, 2002
THE WESTIN NOVA SCOTIAN HOTEL
1181 HOLLIS STREET
HALIFAX, NOVA SCOTIA**

DRAFT AGENDA

Sign-in and Refreshments (30 minutes) (8:00 a.m. – 8:30 a.m.)

Introductory Session (90 minutes) (8:30 a.m. – 9:30 a.m.)

OBJECTIVE: to prepare participants to provide input on the deployment plan, and build on the work performed during the its opportunities workshop

Activities:

Introduction:

- Welcome and Opening Remarks
- Introduction of Facilitators and Advisors
- Introduction of Participants
- Objectives of the workshop

ITS Planning Study Overview:

- Description of Strategic Plan Development Process
- Description of Results of the ITS Opportunities Workshop
- Presentation of Project Prospecti

Break (15 minutes) (9:30 a.m. – 9:45 a.m.)

Project Prospecti Assessment (30 minutes) (9:45 a.m. - 10:15 a.m.)

Objective: to provide input on the Project Prospecti

Activities:

Project Prospecti Assessments:

- Consultant team provides two page summaries defining proposed projects
- Participants divided into groups of five, based on their interests in particular projects
- Group exercise – participants to review the project outlines, and provide input on the contents

Appendix I – Deployment Planning Workshop

Presentation of Results (30 minutes) (10:15 a.m. – 10:45 a.m.)

Informal Presentations:

- Group leaders to present highlights of their discussions

Break (15 minutes) (10:45 a.m. – 11:00 a.m.)

Deployment Planning (60 minutes) (11:00 a.m. – noon)

Objective: to obtain input on the deployment program through a scheduling exercise

Activities:

- Consultant team provides and manages a large scale GANTT chart
- Consultant team facilitates a group exercise to schedule the deployment of the “early winners”, followed by the deployment of the higher priority user services

Closing (5 minutes)

- Next Steps



May 15, 2002

**ATLANTIC PROVINCES
REGIONAL ITS STRATEGIC PLANNING STUDY**

DEPLOYMENT PLANNING WORKSHOP

**MAY 15, 2002
THE DELTA ST. JOHN'S HOTEL & CONFERENCE CENTRE
120 NEW GOWER STREET
ST. JOHN'S, NEWFOUNDLAND**

AGENDA

Introductory Session (45 minutes) (1:30 p.m. – 2:15 p.m.)

Objective: to prepare participants to provide input on the deployment plan, and build on the work performed during the ITS Opportunities Workshop

Activities:

Introduction:

- Welcome and Opening Remarks
- Introduction of Facilitators and Advisors
- Introduction of Participants
 - Objectives of the workshop

ITS Planning Study Overview:

- Description of Strategic Plan Development Process
- Description of Results of the ITS Opportunities Workshop
- Presentation of Project Profiles

Break (15 minutes) (2:15 p.m. – 2:30 p.m.)

Project Profiles Assessment (60 minutes) (2:30 p.m. - 3:30 p.m.)

Objective: to provide input on the project profiles

Activities:

Project Profile Assessments:

- Consultant team provides two page summaries defining proposed projects
- Participants divided into groups of five, based on their interests in particular projects
- Group exercise – participants to review the project outlines, and provide input on the contents

Appendix I – Deployment Planning Workshop

Break (15 minutes) (3:30 p.m. – 3:45 p.m.)

Presentation of Results (30 minutes) (3:45 p.m. – 4:45 p.m.)

Informal Presentations:

- Group leaders to present highlights of their discussions

Closing (15 minutes) (4:45 p.m. – 5:00 p.m.)

PROPOSED PROJECT PROSPECTUS

INDEX

PROJECT NUMBER	PROJECT NAME
TI-1	Atlantic Provinces Advanced Traveler Information System
TI-2	Atlantic Canada Transportation Network Information Warehouse
TI-3	Atlantic Provinces Tourist Reservation System
TM-1	Atlantic Provinces ARWIS Expansion
TM-2	Wildlife Detection in New Brunswick, Scoping Study and Pilot Project
TM-3	Implementation of Fixed Automated Spray Technology (FAST) for Bridge De-icing
TM-4	Atlantic Red Light Camera Pilot Project
TM-5	Portable Changeable Message Sign (PCMS) for Work Zones
TM-6	Smart Snowplow Expansion
TM-7	Halifax Bridge Incident Management Scoping Study
PT-1	Halifax Transit Real-Time Information Service
PT-2	PEI Community Transit
EP-1	Saint John Parking Commission, Parking Electronic Payment/Monitoring
EP-2	Atlantic Canada Transaction Tag
EP-3	St. John's Smart Card Pilot Project
CV-1	Newfoundland Integrated Information System (WIM)
CV-2	New Brunswick Electronic Inspection
CV-3	New Brunswick Border Crossing
CV-4	New Brunswick Border Security
CV-5	New Brunswick Electronic Permitting for Oversized and Overweight Vehicles
CV-6	Port of Halifax Operational Information Extranet
CV-7	Port of Halifax Container Security
CV-8	Halifax Airport Groundside Transportation Management
CV-9	Commercial Fleet Management Program
EM-1	Wireless Network Expansion
EM-2	Atlantic Provinces Disaster Response Plan Scoping Study

APPENDIX J

Glossary of Terms

Appendix J – Glossary of Terms

AVL (Automatic Vehicle Location) – AVL refers to the use of spatial-recognition technology to identify and communicate the location of a fleet of vehicles. This can boost dispatch efficiency and service reliability.

CMS (Changeable Message Signs) – Changeable Message Signs are used to provide drivers with up-to-date information on congestion levels, road closures, etc.

Geomatics - Geomatics encompasses the science, technology and management of geographically referenced information, including its acquisition, storage, analysis, processing, display and dissemination.

GIS (Geographic Information Systems) - GIS is a computer system capable of assembling, storing, manipulating, and displaying geographically referenced information, i.e. data identified according to their locations.

GPS (Global Positioning System) – GPS is a system whereby a network of satellites is used to locate the longitude, latitude and altitude of the receiver. A minimum of three satellites must be in the scope of the receiver to function, with increasing accuracy as more satellites come into view.

Market Packages – Market packages refers to a group of pieces from the ITS Architecture required to implement a service.

PCMS (Portable Changeable Message Signs) – PCMS are most commonly used at construction sites to provide drivers with up-to-date information on congestion levels, road closures, etc.

RWIS (Road Weather Information Systems) – Monitors current road and weather conditions using a combination of weather service information and data collected from environmental sensors deployed on and about the roadway. The collected road weather information is monitored and analysed to detect and forecast environmental hazards. This information can be used to more effectively deploy road maintenance resources, issue general traveller advisories, improve emergency management and response, and support location specific warnings to drivers.

SCOOT (Split Cycle Offset Optimization Technique) – SCOOT is a traffic control system that uses traffic adaptive control. Under traffic adaptive control, the system continuously monitors traffic flow and optimizes traffic signal operation based on an on-line traffic flow model.

User Services – User services document what ITS should do from the user's perspective. A broad range of users are considered, including the traveling public as well as many different types of system operators. The concept of user services allows system or project definition to begin by establishing the high level services that will be provided to address identified problems and needs. Some examples of user services from the Canadian ITS Architecture are: Incident Management, En-Route Transit Information, Intermodal Freight Management, etc.

User Service Bundles – The bundles are a logical grouping of user services that provides a convenient way to discuss the range of requirements in a broad stakeholder area. Examples include: Traffic Management Services, Commercial Vehicle Operations, etc.

User Sub-Services – User Services and User Sub-Services represent what the system will do from the perspective of the user. A user might be the public or a system operator.

Appendix J – Glossary of Terms

WIM (Weigh-in-Motion) – WIM is a sensory technology that is capable of measuring the weight of a vehicle (typically used for Commercial Vehicle Operations) while in motion, thus saving the vehicle time and eliminating possible resulting congestion.

APPENDIX K

Roundtable Participants

Appendix K – Roundtable Participants

Firm/Agency	Province	Address	Contact	Phone	Fax	e-mail	Player Type
Business New Brunswick - Knowledge Industry & Technology	NB	Centennial Bldg, PO Box 6000, King St, Fredericton E3B 5H1	Len Weeks, Manager	506-453-4845	506-453-2727	len.weeks@gnb.ca	Facilitator
CARIS Universal Systems	NB	264 Rookwood Ave., Fredericton NB E3B 2M2	Heather MacLean	506-459-3849	506-458-8533	info@caris.ca	Provider/GIS
J.D. Irving*	NB	300 Union Street, P.O. Box 5777, Saint John, NB E2L 4M3	Robert Youden, VP Irving Transportation Services	506-632-5150	506-633-5540	youden.bob@jdirving.com	User
University of New Brunswick - Transportation Group	NB	Head Hall, Room D126, P.O. Box 4400 Fredericton, NB E3B 5A3	Eric Hildebrand	506447-3440	506-452-6229	edh@unb.ca	Researcher
Approach Navigation System	NB	409 Dieppe Blvd., Dieppe NB E1A 6P9	Eric Gionet	506-854-0030	506-854-2967	bahern@approach.nb.ca	Provider
New Brunswick Community College - Dieppe	NB	505 College Street, Dieppe, NB, E1A 6X2	Raymond Dufour, Instructor Business Technology Transportation	506-856-2125	506-856-2201	raymond.dufour@gnb.ca	Researcher
Instrumar Limited	NF	PO Box 13246 St. A, 39 Pippy Place, 3rd Floor, St. John's NF A1B 4A5	Michael Chan	709-726-8613	709-726-8460	michael.chan@instrumar.com	Provider (integrator)
Aliant Inc. - NewTel Communications & Public Affairs	NF	PO Box 2110, St. John's A1C 5H6	Lloyd Little	709-739-2099	709-739-2183	lloyd.little@aliant.ca	Provider (integrator)
Newfoundland & Labrador Department of Industry, Trade & Rural Development - Information Services	NF	Newfoundland & Labrador Department of Industry, Trade & Rural Development - Information Services	Robert Parsons	709-729-4819	709-729-4869	tsummers@gov.nf.ca	Facilitator
Halifax-Dartmouth Bridge Commission	NS	Administration Building, Wyse Rd, PO Box 40, Dartmouth B2Y 3Y2	Steve Snider, General Manager	902-469-6281	902-463-2800	bridges@hdbc.ns.ca	Owner
Seimac Limited	NS	271 Brownlow Ave., Dartmouth NS B3B 1W6	Mac McCloud	902-468-3007 x210	902-468-3009	mmacleod@seimac.com	Provider (integrator)
Halifax Regional Municipality - Traffic and Transportation	NS	PO Box 1749, Halifax B3J 3A5	David Mc Cusker, Manager	902-490-6904	902-490-6696	mccuskd@region.halifax.ns.ca	Owner
Halifax Port Authority	NS	1215 Marginal Rd, PO Box 336, Halifax B3J 2P6	Jim Nicoll	902-426-7335	902-426-3643	dbelle@portofhalifax.ca	User
Meteocean	NS	21 Thornhill Drive, Dartmouth NS B3B 1R9		902-468-4442	902-468-2505	webmfr@meteocean.com	Provider (integrator)
Confederation Bridge	PE	104 Abegweit Boul, PO Box 2032, Borden-Carleton C0B 1X0	John Francis	902-437-7342	902-437-7321	johnf@scbl.net	Owner
Baseline Business Geographics	PE	PO Box 123, 209 Queen St., suite 205, Charlottetown PEI C1A 7K2	Frank MacEachern, President	902-628-0300	877-351-2244 902-892-0300	frankm@baselinegeo.com	Researcher
DeltaWare Systems Inc.	PE	535 North River Road, Charlottetown PE C1E 1J6	Ed Lawlor	902-628-4660	902-368-8122	elawlor@deltaware.com	Provider (software)

LEGEND	Number
Public Sector	6
Private Sector	8
Academic	1
Other	2

* Alternate Contacts: Dale Thibodeau, Sunbury
Mike Likely, Day & Ross

APPENDIX L

ITS Enabling Technologies Associated with Profiled ITS-Capable Companies

Appendix L – ITS Enabling Technologies Associated with Profiled ITS-Capable Companies

Company	Sensing, monitoring, surveillance and, data- logging	Position determination, tracking, navigation, routing	Control systems	User interfaces	Electronic payment	Information communication, management, analysis	Consulting
Accesstec Inc.						*	
ADI Group							*
Advatek Systems Inc	*	*				*	
ALT Group Inc						*	
AMIRIX Systems Inc.	*					*	
AnyWare Group Inc.					*	*	
Approach Navigation Systems Inc.	*	*				*	
Atlantic Data Group	*					*	
Baseline Business Geographics Inc.						*	
Beltek Systems Design Inc.						*	
Canpolar East Inc.	*					*	
CARIS		*				*	
Centre for Education and Research in Safety							*
C-CORE	*					*	
Compusult Limited		*				*	
Consolidated Technologies Inc.	*					*	
DPL Group		*				*	
Delphi Systems							*
DPL Group	*	*				*	
Engineering Technologies Canada Ltd.	*			*		*	
Enseignes Imperial Signs			*				*
GeoNet Technologies Inc.						*	
Geoplan Consultants Inc.						*	
International Communications and Navigation Ltd.	*	*				*	
Intrignia Solutions Inc.			*			*	
Jacques Whitford Environment							*
J.J. Mackay Canada Limited				*	*	*	
Kinek Ltd.						*	
Measurand Inc.	*						
PEI Innovations Inc.	*					*	
Pintér Consulting						*	*
Satlantic Inc.	*		*			*	
Seimac Limited	*	*				*	
SGE Group Inc.						*	*
Spatial Decision Support Systems						*	*
SVG Consulting Inc.							*
Trip Data & Safety Management Inc.						*	
xwave		*	*		*	*	

APPENDIX M

Atlantic Provinces ITS Company Profiles

COORDINATES

Head Office: Fredericton NB

Mailing Address: 590 Brunswick Street
Fredericton, NB
E3B 1H5

Telephone: 506-452-9780
Facsimile: 506-450-1103
Internet: www.accesstec.ca

PRODUCTS/SERVICES RELATED TO ITS

- Wireless parking management systems. Handheld units allow parking officers to access vehicle information (including parking violations) and parking meter history.
- Potential expansion to include on-board systems such as those used by police officers to access moving violation and other information.

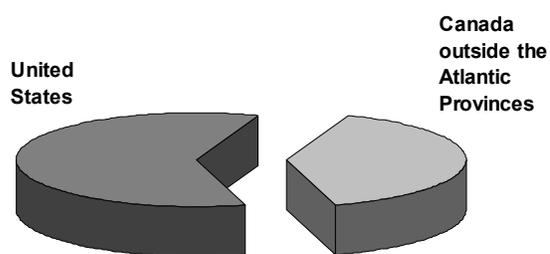
PRESENCE IN ATLANTIC CANADA

Years in operation: 7
Number of Employees: 27
Employees in Atlantic Region: 75%

PRINCIPAL ACTIVITIES

- Product development, systems integration, e-learning, and related consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Fredericton NB

Mailing Address: 1133 Regent Street, Suite
300
Fredericton, NB
E3B 3Z2

Telephone: 506-452-9000
Facsimile: 506-459-3954
Internet: www.adi.ca

PRODUCTS/SERVICES RELATED TO ITS

- ITS planning.
- Traffic control systems planning/installation, planning of information centres and wayfinding systems, public transit routing and monitoring, network modelling and simulation, border crossing planning and evaluation.

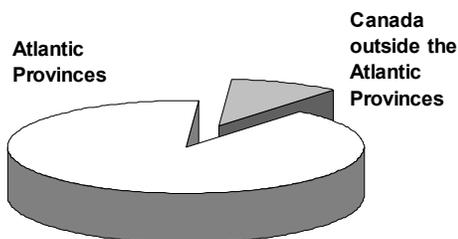
PRESENCE IN ATLANTIC CANADA

Years in operation: 46
Number of Employees: 200
Employees in Atlantic Region: 90%

PRINCIPAL ACTIVITIES

- Consulting engineering services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Moncton NB

Mailing Address: P.O. Box 966
Moncton NB
E1C 8N8

Telephone: 506-857-0909
Facsimile: 506-858-9271
Internet:

PRODUCTS/SERVICES RELATED TO ITS

- Radio frequency-based ID tag and bar code scanning and monitoring for tracking and data collection
- Weigh-scales; currently static but could adapt to weigh-in-motion

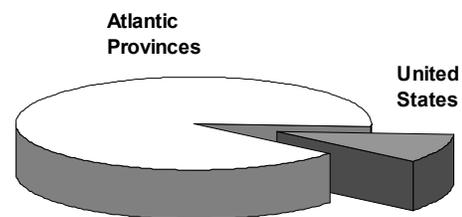
PRESENCE IN ATLANTIC CANADA

Years in operation: 15
Number of Employees: 8
Employees in Atlantic Region: 100%

PRINCIPAL ACTIVITIES

- Product development, system integration, manufacturing, and related consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Miramichi NB

Mailing Address: PO Box 185
Miramichi, NB
E1N 3A6

Telephone: 506-773-9203
Facsimile: 506-773-4645
Internet: www.altgroupinc.com

PRODUCTS/SERVICES RELATED TO ITS

- efueltax.com internet-based reporting and filing system for IFTA fuel tax, using PDA's for data input.
- Potential expansion of efueltax.com system (with appropriate components) to incorporate other fleet management functions.

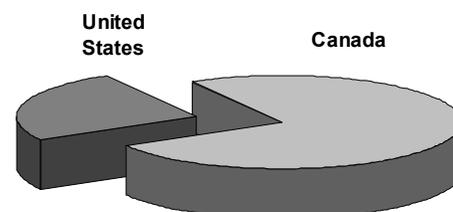
PRESENCE IN ATLANTIC CANADA

Years in operation: 6
Number of Employees: 8-10
Employees in Atlantic Region: 100%

PRINCIPAL ACTIVITIES

- Product development (software) and related consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Halifax NS

Mailing Address: 77 Chain Lake Drive
Halifax, NS
B3S 1E1

Telephone: 902-450-1700
Facsimile: 902-450-1704
Internet: www.amirix.com

PRODUCTS/SERVICES RELATED TO ITS

- RF-based asset identification and tracking system.
- Custom embedded hardware systems and related software.

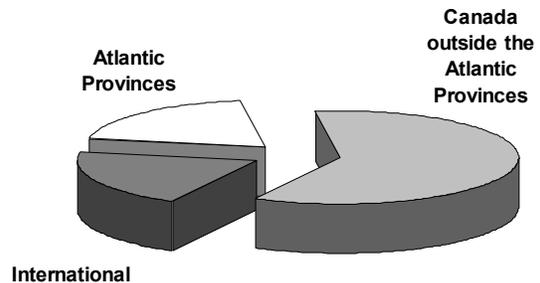
PRESENCE IN ATLANTIC CANADA

Years in operation: 21
Number of Employees: 50
Employees in Atlantic Region: 97%

PRINCIPAL ACTIVITIES

- Product development (software and hardware), systems integration, and research.

MARKET GEOGRAPHY



COORDINATES

Head Office: Saint John NB

Mailing Address: 15 Market Square,
Suite 1602
Saint John, NB
E2L 1E8

Telephone: 506-643-6600
Facsimile: 506-643-6605
Internet: www.anywaregroup.com

PRODUCTS/SERVICES RELATED TO ITS

- Billing engine and related account management system that operates either with a transponder or a smart card and uses a wireless data communications network.
- Billing engine/accounts management system is applicable to toll roads, public transit and ferry services, fuel purchases, traveller reservation systems, and other electronic payment situations.

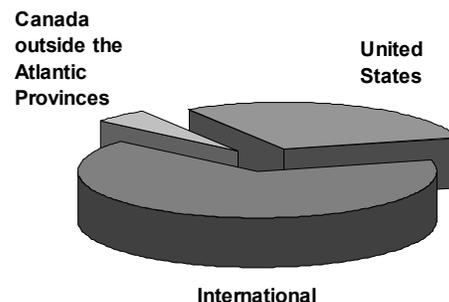
PRESENCE IN ATLANTIC CANADA

Years in operation: 2
Number of Employees: 25
Employees in Atlantic Region: 100%

PRINCIPAL ACTIVITIES

- Product development (software), systems integration, consulting, training.

MARKET GEOGRAPHY



COORDINATES

Head Office: Dieppe NB

Mailing Address: 409 Dieppe Boulevard
Dieppe, NB
E1A 6P8

Telephone: 506-854-2967
Facsimile: 506-854-0030
Internet: www.approach.nb.ca

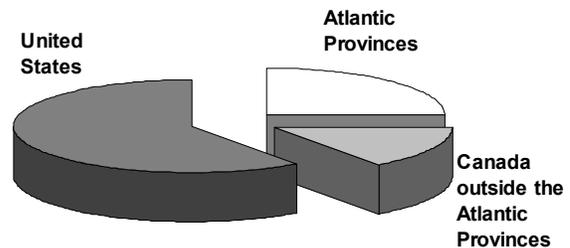
PRODUCTS/SERVICES RELATED TO ITS

- Road weather information systems (RWIS). Have installed 8 RWIS systems in Nova Scotia, with a contract for 16 more.
- GPS-based air navigation systems and related telecommunications systems potentially adaptable to monitoring and dynamic control of ground maintenance operations (e.g. snow removal).

PRESENCE IN ATLANTIC CANADA

Years in operation: 6
Number of Employees: 6
Employees in Atlantic Reaion: 100%

MARKET GEOGRAPHY



PRINCIPAL ACTIVITIES

- Product development (software), assembly, systems integration, installation and servicing, consulting, and quality assurance.

COORDINATES

Head Office: Halifax NS

Mailing Address: 6025 North Street
Halifax, NS
B3K 1N9

Telephone: 902-423-6889
Facsimile: 902-455-5189
Internet: www.eagleeyedvr.com

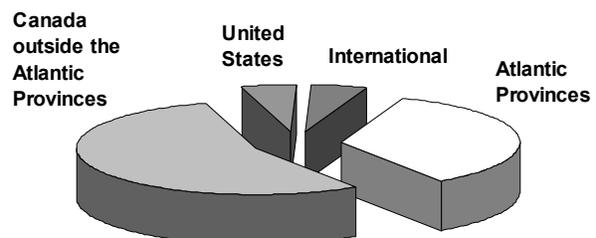
PRODUCTS/SERVICES RELATED TO ITS

- Intelligent remote video surveillance monitoring and motion detection based on a digital video recorder. Facial recognition capabilities.
- Video surveillance system with facial recognition capabilities is applicable to passenger security systems, border security systems, and other similar applications.

PRESENCE IN ATLANTIC CANADA

Years in operation: 25
Number of Employees: 25
Employees in Atlantic Reaion: 90%

MARKET GEOGRAPHY



PRINCIPAL ACTIVITIES

- Product development, system integration, installation and servicing, and training.

COORDINATES

Head Office: Charlottetown PEI

Mailing Address: PO Box 123
Charlottetown, PEI
C1A 7K2

Telephone: 902-892-0030

Facsimile: 902-628-0300

Internet: www.baselinegeo.com

PRODUCTS/SERVICES RELATED TO ITS

- RF propagation modelling and network planning using GIS tools.
- Existing paratransit transportation scheduling system could serve as basis for real-time transit routing/navigation or delivery routing systems.

PRESENCE IN ATLANTIC CANADA

Years in operation: 8

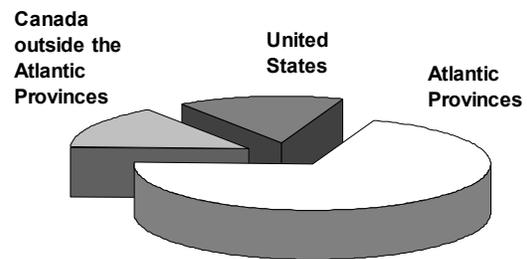
Number of Employees: 5

Employees in Atlantic Reaion: 100%

PRINCIPAL ACTIVITIES

- Product development (software), systems integration, training, and related consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Dieppe NB

Mailing Address: 884 Champlain Avenue
Dieppe, NB
E1A 1P7

Telephone: 506-857-4196

Facsimile: 506-857-0194

Internet: www.beltek.com

PRODUCTS/SERVICES RELATED TO ITS

- Commercial delivery vehicle route accounting and invoicing using handheld PC's.
- Commercial vehicle safety monitoring (driver hours).
- Potential expansion to other fleet management functions.
- Possible enhancement to provide wireless operation when coverage permits.

PRESENCE IN ATLANTIC CANADA

Years in operation: 12

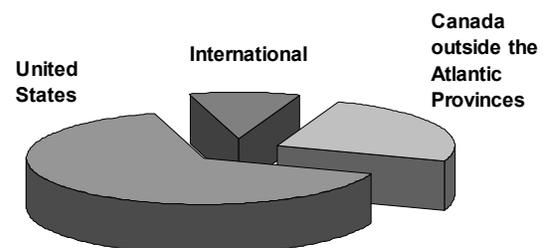
Number of Employees: 20

Employees in Atlantic Reaion: 90%

PRINCIPAL ACTIVITIES

- Product development (software), systems integration, and related consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: St. John's NFLD & LAB

Mailing Address: 702 Water Street
St. John's, NFLD & LAB
A1E 1C1

Telephone: 709-722-6067
Facsimile: 709-722-1138
Internet: www.canpolar.com

PRODUCTS/SERVICES RELATED TO ITS

- Post-contact crash sensors and occupant sensors for the automobile industry. Collaboration with major auto manufacturers.
- Potential application to rural "mayday" and other emergency notification systems.

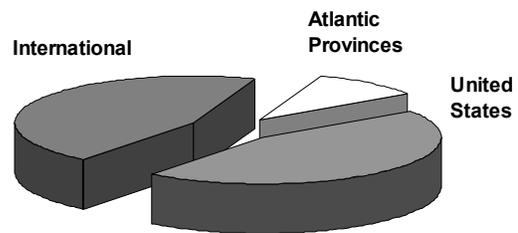
PRESENCE IN ATLANTIC CANADA

Years in operation: 20
Number of Employees: 1
Employees in Atlantic Region: 100%

PRINCIPAL ACTIVITIES

- Product development (hardware).

MARKET GEOGRAPHY



COORDINATES

Head Office: Fredericton NB

Mailing Address: 264 Rookwood Avenue
Fredericton, NB
E3B 2M2

Telephone: 506-773-9203
Facsimile: 506-773-4645
Internet: www.altgroupinc.com

PRODUCTS/SERVICES RELATED TO ITS

- GIS/GPS-based:
 - automatic vehicle location
 - asset tracking
 - routing
 - navigation.
- Potential enhancements to existing applications, possibly real-time operation.

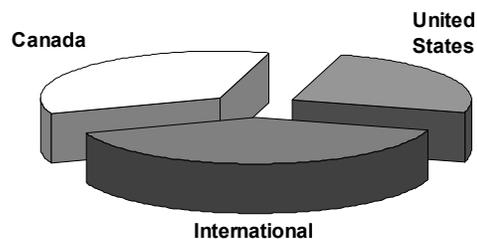
PRESENCE IN ATLANTIC CANADA

Years in operation: 22
Number of Employees: 150
Employees in Atlantic Region: 80%

PRINCIPAL ACTIVITIES

- Product development (software) and related consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: St. John's NFLD & LAB

Mailing Address: Cptn Robert A. Bartlett
Bldg
Morrisey Road
St. John's, NFLD & LAB
A1B 3X5

Telephone: 709-737-8354

Facsimile: 709-737-4706

PRODUCTS/SERVICES RELATED TO ITS

- Remote ground movement sensing and security monitoring (for pipelines).
- Potential adaptation to transportation systems monitoring.
- Potential adaptation to transportation vehicle/facility security monitoring.

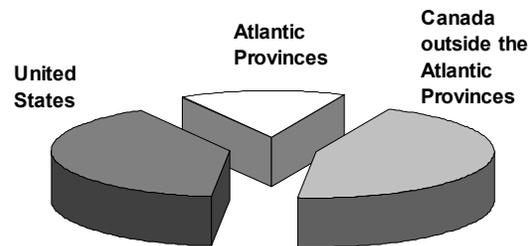
PRESENCE IN ATLANTIC CANADA

Years in operation: 27

Number of Employees: 57

Employees in Atlantic Region: 100%

MARKET GEOGRAPHY



PRINCIPAL ACTIVITIES

- Product research and development and related consulting.

Centre for Education and Research in Safety

COORDINATES

Head Office: Shediac NB

Mailing Address: PO Box 5221
Shediac NB
E4P 8T9

Telephone: 506-532-2501

Facsimile: 506-532-1453

Internet: www.cers-safety.com

PRODUCTS/SERVICES RELATED TO ITS

- Human factors analysis
- Enforcement programs
- Signage and signals research, development and design

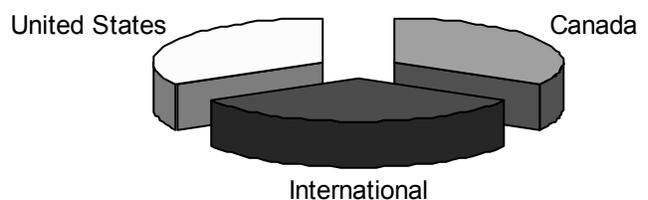
PRESENCE IN ATLANTIC CANADA

Years in operation: 13

Number of Employees: 2

Employees in Atlantic Region: 100%

MARKET GEOGRAPHY



PRINCIPAL ACTIVITIES

- Development of programs to reduce collisions and improve the safety related behaviour of motorists, cyclists, and pedestrians

COORDINATES

Head Office: Mount Pearl NFLD & LAB

Mailing Address: P.O. Box 1000
Mount Pearl
NFLD & LAB
A1N 3C9

Telephone: 709-745-7914

Facsimile: 709-745-7927

Internet: www.compusult.nf.ca

PRODUCTS/SERVICES RELATED TO ITS

- Asset tracking software (e.g. for containers) using bar code scanning or RF tag identification.
- Data mining and data warehousing.

PRESENCE IN ATLANTIC CANADA

Years in operation: 17

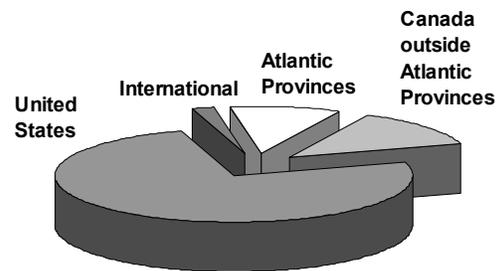
Number of Employees: 32

Employees in Atlantic Region: 100%

PRINCIPAL ACTIVITIES

- Product development, system integration, and related consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: St. John's NF & LA

Mailing Address: 37 Stavenger Drive
St. John's, NF
A1A 5E8

Telephone: 709-576-0748

Facsimile: 709-576-0746

Internet: www.contechnav.com

PRODUCTS/SERVICES RELATED TO ITS

- Embedded custom data interfaces (hardware and software) between systems, including data logging and sensors. Toolbox for system integrators.
- Primarily marine-related but some land-based systems.
- Adaptable to a range of ITS applications

PRESENCE IN ATLANTIC CANADA

Years in operation: 17

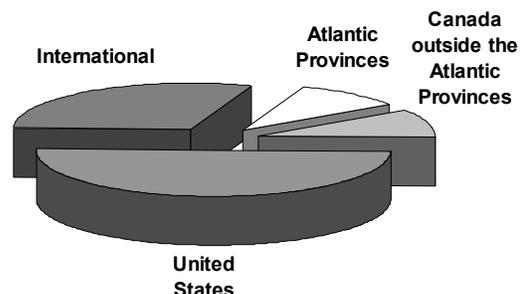
Number of Employees: 8

Employees in Atlantic Region: 100%

PRINCIPAL ACTIVITIES

- Product development, manufacturing, research, and related consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Scotsburn NS
Mailing Address: P.O. Box 362
 Scotsburn, NS
 B0K 1R0
Telephone: 902-485-2222
Facsimile: 902-485-2121
Internet: www.delphi-

PRODUCTS/SERVICES RELATED TO ITS

- ITS planning, evaluation, training.
- ITS strategic plan for Canada, Planning for an ITS Industrial Base.

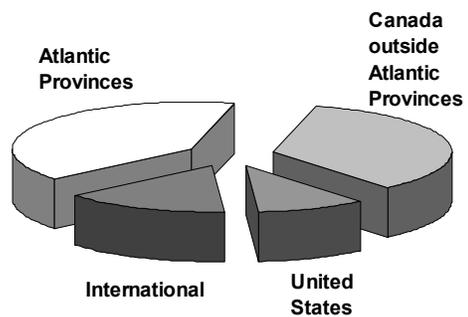
PRESENCE IN ATLANTIC CANADA

Years in operation: 9
Number of Employees: 5
Employees in Atlantic Region: 40%

PRINCIPAL ACTIVITIES

- Consulting and training services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Saint John NB
Mailing Address: 1216 Sand Cove Road
 Saint John, NB
 E2M 5V8
Telephone: 506-635-1055
Facsimile: 506-635-1057
Internet: www.dpl.ca

PRODUCTS/SERVICES RELATED TO ITS

- Asset location and tracking, including vehicles.
- Engine/vehicle status monitoring.
- Remote data monitoring and retrieval using cellemetry and the internet.
- Potential enhancement of existing systems to include real-time monitoring and fleet management capabilities.

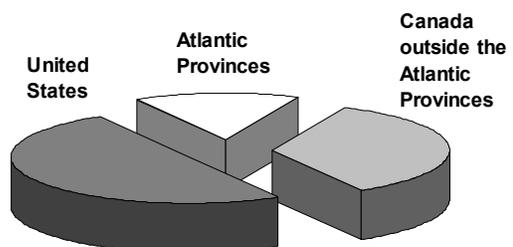
PRESENCE IN ATLANTIC CANADA

Years in operation: 17
Number of Employees: 80
Employees in Atlantic Region: 100%

PRINCIPAL ACTIVITIES

- Product development, system integration, manufacturing, set-up.

MARKET GEOGRAPHY



COORDINATES

Head Office: Charlottetown PEI
Mailing Address: 24 Humphrey Drive
 Charlottetown, PEI
 C1B 1K2
Telephone: 902-628-1705
Facsimile: 902-628-1703
Internet: www.engtech.ca

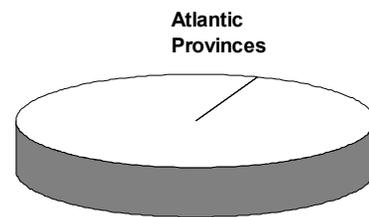
PRODUCTS/SERVICES RELATED TO ITS

- Intelligent sensor and data-logging micro-electronics.
- Consulting on kiosks, LCD touch-screens, and other user interfaces.
- Custom micro-electronics adaptable according to requirements.
- Adaptable to a range of ITS services.

PRESENCE IN ATLANTIC CANADA

Years in operation: 6
Number of Employees: 5
Employees in Atlantic Reaion: 100%

MARKET GEOGRAPHY



PRINCIPAL ACTIVITIES

- Product development and related consulting services.

COORDINATES

Head Office: Edmunston NB
Mailing Address: 113 – 44 E Avenue
 Edmunston, NB
 E3V 3A4
Telephone: 506-735-5506
Facsimile: 506-737-1734
Internet: www.enseignes.com

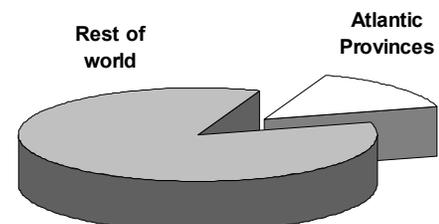
PRODUCTS/SERVICES RELATED TO ITS

- Electronic signs and message centres; e.g. the software-controlled, tri-vision signs developed for the Fredericton-Moncton Highway.
- A variety of sign types, including fibre-optic LED.
- Adaptable for a range of ITS services, including traffic management and traveler information systems.

PRESENCE IN ATLANTIC CANADA

Years in operation: 39
Number of Employees: 400
Employees in Atlantic Reaion: 65%

MARKET GEOGRAPHY



PRINCIPAL ACTIVITIES

- Product development, manufacturing, research, systems integration, and related consulting services.

COORDINATES

Head Office: Central Bedeque PEI
Mailing Address: P.O. Box 3989
 966 Callbeck Street
 Central Bedeque, PEI
 COB 1G0
Telephone: 902-887-3170
Facsimile: 902-887-2349
Internet: www.geonet-tech.com

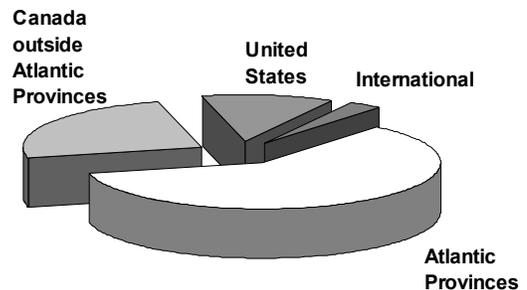
PRODUCTS/SERVICES RELATED TO ITS

- Civic addressing for 911 emergency response dispatching support.
- Asset location and inventory.
- Off-line highway information.

PRESENCE IN ATLANTIC CANADA

Years in operation: 8
Number of Employees: 15
Employees in Atlantic Region: 100%

MARKET GEOGRAPHY



PRINCIPAL ACTIVITIES

- Product development and related consulting and training.

COORDINATES

Head Office: Fredericton NB
Mailing Address: 919 Prospect Street W
 Fredericton, NB
 E3B 2T7
Telephone: 506-451-0055
Facsimile: 506-450-4838
Internet: www.geoplan.nb.ca

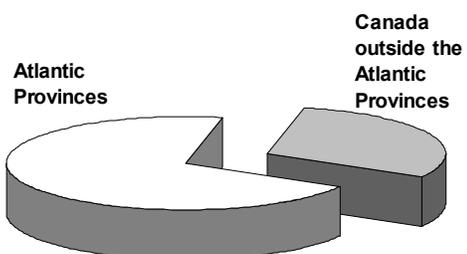
PRODUCTS/SERVICES RELATED TO ITS

- Civic addressing for enhanced 911 services.
- Other geomatics-related applications adaptable to a range of ITS position determination and navigation functions.

PRESENCE IN ATLANTIC CANADA

Years in operation: 14
Number of Employees: 15
Employees in Atlantic Region: 95%

MARKET GEOGRAPHY



PRINCIPAL ACTIVITIES

- Product development (software) and related consulting services.

COORDINATES

Head Office: St. John's NF & LA

Mailing Address: 27 Austin Street
St. John's, NF
A1B 4C3

Telephone: 709-754-0400
Facsimile: 709-754-0419
Internet: www.ican.nf.net

PRODUCTS/SERVICES RELATED TO ITS

- Electronic charting and integration of navigation with other data.
- Data communications, security, and surveillance systems.
- Tracking systems, transponders, and collision avoidance systems.
- Mostly marine-related but potentially adaptable to land-based ITS requirements.

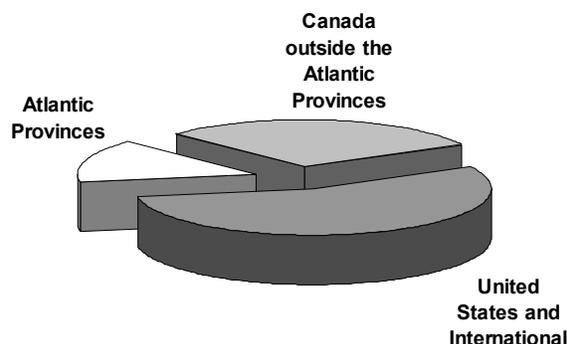
PRESENCE IN ATLANTIC CANADA

Years in operation: 6
Number of Employees: 23
Employees in Atlantic Region: 95%

PRINCIPAL ACTIVITIES

- Product development, system integration, e-learning, and related consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: St John's NF & LA

Mailing Address: PO Box 23228
St John's NF
A1B 4J9

Telephone: 709-682-4219
Facsimile: 709-772-2462
Internet: www.intrignia.com

PRODUCTS/SERVICES RELATED TO ITS

- Robotics, computer vision, control systems, instrumentation.
- Intelligent and automated control systems.
- Multi-vehicle route and task planning and optimization.
- Primarily related to mining and marine applications but potentially adaptable to a range of ITS services.
- Emerged from Memorial University Instrumentation, Automation and Control Lab

PRESENCE IN ATLANTIC CANADA

Years in operation: 2
Number of Employees: 3
Employees in Atlantic Region: 100%

PRINCIPAL ACTIVITIES

- Product development, system integration, and related consulting services.

MARKET GEOGRAPHY

INFORMATION NOT AVAILABLE

COORDINATES

Head Office: Saint John NB
Mailing Address: 15 Market Square, 12th Floor
 Saint John, NB
 E2L 1E8
Telephone: 506-694-1250
Facsimile: 506-694-1260
Internet: www.kinek.com

PRODUCTS/SERVICES RELATED TO ITS

- Delivery fleet routing optimization based on dynamic assignment to collection points and electronic messaging.
- Potential adaptability to other fleet management functions.

PRESENCE IN ATLANTIC CANADA

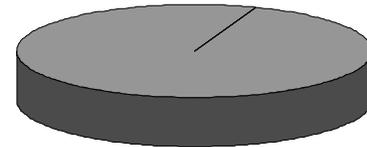
Years in operation: 2
Number of Employees: 55
Employees in Atlantic Reaion: 95%

PRINCIPAL ACTIVITIES

- Product development, system integration, and related training and consulting services.

MARKET GEOGRAPHY

United States and International



COORDINATES

Head Office: Halifax NS
Mailing Address: 1525 Birmingham St.
 Halifax NS
 B3J 2J6
Telephone: 902-423-5585
Facsimile: 902-423-5433
Internet:

PRODUCTS/SERVICES RELATED TO ITS

- Licensing, development and operation of a traveler information FM radio service for the Confederation Bridge

PRESENCE IN ATLANTIC CANADA

Years in operation: 7
Number of Employees: 1
Employees in Atlantic Reaion: 100%

PRINCIPAL ACTIVITIES

- Development and operation of radio services

MARKET GEOGRAPHY

INFORMATION NOT AVAILABLE

COORDINATES

Head Office: New Glasgow NS
Mailing Address: 1342 Abercrombie Road
 P.O. Box 338
 New Glasgow, NS
 B2H 5E3
Telephone: 902-752-5124
Facsimile: 902-752-5955
Internet: www.jjmackay.com

PRODUCTS/SERVICES RELATED TO ITS

- Intelligent parking meters using smart cards. Programmable for different parking pricing strategies. Provides parking data.
- Networked pay-and-display units.
- Potential tie-in to parking information systems and traveller information systems.
- Smart-card could be multi-purpose (transit fares etc.)

PRESENCE IN ATLANTIC CANADA

Years in operation: 40
Number of Employees: 150
Employees in Atlantic Region: 80%

MARKET GEOGRAPHY

INFORMATION NOT AVAILABLE

PRINCIPAL ACTIVITIES

- Product development, manufacturing, and related consulting services.

COORDINATES

Head Office: Fredericton NB
Mailing Address: 2111 Hanwell Road
 Fredericton, NB
 E3C 1M7
Telephone: 506-462-9119
Facsimile: 506-462-9095
Internet: www.measurand.com

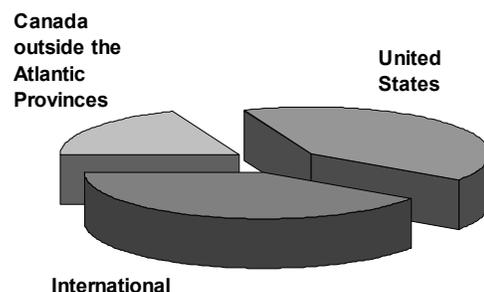
PRODUCTS/SERVICES RELATED TO ITS

- Fibre-optic shape and curvature sensors applicable to occupant detection and impact detection in automobiles.

PRESENCE IN ATLANTIC CANADA

Years in operation: 9
Number of Employees: 12
Employees in Atlantic Region: 100%

MARKET GEOGRAPHY



PRINCIPAL ACTIVITIES

- Research, product development, and manufacturing.

COORDINATES

Head Office: Cardigan PEI

Mailing Address: P.O. Box 21014
Cardigan RR#5
Cardigan, PEI
C0A 1G0

Telephone: 902-583-2000

Facsimile: 902-583-3067

Internet: www.pei-

PRODUCTS/SERVICES RELATED TO ITS

- Shock, pressure, temperature, acceleration sensors – used to monitor condition of products.
- Associated data-logging and interface with handheld PC's.
- Cargo and freight status and location monitoring system under development.
- Investigating road-salt monitoring system.

PRESENCE IN ATLANTIC CANADA

Years in operation: 3

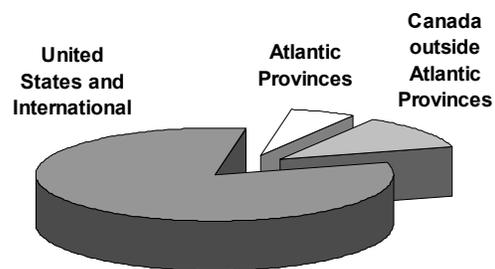
Number of Employees: 6

Employees in Atlantic Reaion: 100%

PRINCIPAL ACTIVITIES

- Product development, systems integration, research, and some fabrication.

MARKET GEOGRAPHY



COORDINATES

Head Office: Halifax NS

Mailing Address: 129 Glenforest Drive
Halifax, NS
B3M 1J2

Telephone: 902-443-5910

Facsimile: 902-431-5100

Internet: www.is.dal.ca/~jdpinter

PRODUCTS/SERVICES RELATED TO ITS

- Systems modelling and optimization.
- Routing and scheduling systems.
- Methods applicable to a variety of ITS services.

PRESENCE IN ATLANTIC CANADA

Years in operation: 8

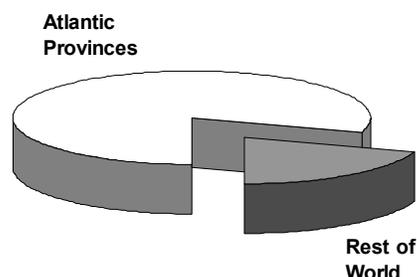
Number of Employees: 1

Employees in Atlantic Reaion: 100%

PRINCIPAL ACTIVITIES

- Research, product development, and related consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Halifax NS

Mailing Address: 3481 Marginal Road N
Richmond Terminal Pier 9
Halifax, NS

Telephone: 902-492-4780
Facsimile: 902-492-4781
Internet: www.satlantic.com

PRODUCTS/SERVICES RELATED TO ITS

- Passive optical remote sensing for oceanographic applications.
- Remote system control and power management.
- Data transmission using cellular network, RF/satellite, internet.
- Data fusion.
- Experience is potentially transferrable to ITS applications.

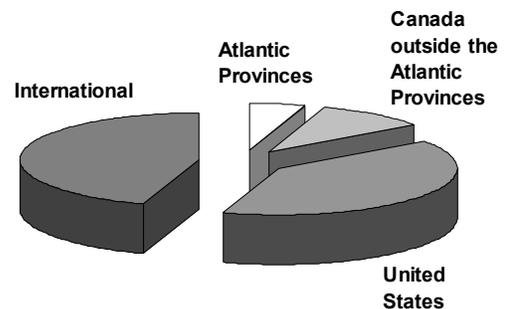
PRESENCE IN ATLANTIC CANADA

Years in operation: 12
Number of Employees: 40
Employees in Atlantic Reaion: 100%

PRINCIPAL ACTIVITIES

- Research, product development, system integration, and manufacturing/assembly.

MARKET GEOGRAPHY



COORDINATES

Head Office: Dartmouth NS

Mailing Address: 271 Brownlow Avenue
Dartmouth, NS
B3B 1W6

Telephone: 902-468-3007
Facsimile: 902-468-3009
Internet: www.seimac.com

PRODUCTS/SERVICES RELATED TO ITS

- Meteorological forecasting for RWIS systems in NS. Looking into RWIS for NFLD & LAB. Looking also at route-based forecasting.
- Sensor-capable satellite-based transmitters distributed as OEM product.
- GPS-based asset tracking, positioning, and dispatching (trucks, containers, etc.).

PRESENCE IN ATLANTIC CANADA

Years in operation: 24
Number of Employees: 55
Employees in Atlantic Reaion: 100%

PRINCIPAL ACTIVITIES

- Research, product development, system integration, and manufacturing..

MARKET GEOGRAPHY

INFORMATION NOT AVAILABLE

COORDINATES

Head Office: St. John's NF & LA
Mailing Address: P.O. Box 13144
 St. John's, NF
 A1B 4A4
Telephone: 709-576-7344
Facsimile: 709-576-0374
Internet: www.accesstec.ca

PRODUCTS/SERVICES RELATED TO ITS

- Transportation consulting related to advanced traffic signal control systems (SCOOT), parking information systems, remote traffic data collection, automated billing systems.
- Transportation information systems design and other information-related technology

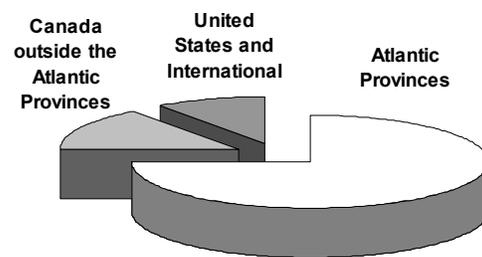
PRESENCE IN ATLANTIC CANADA

Years in operation: 30
Number of Employees: 120
Employees in Atlantic Region: 100%

PRINCIPAL ACTIVITIES

- Product development, system integration, e-learning, and related consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Charlottetown PEI
Mailing Address: 38 University Avenue
 Charlottetown, PEI
 C1A 4K6
Telephone: 902-368-1901
Facsimile:
Internet:

PRODUCTS/SERVICES RELATED TO ITS

- GIS-based school-bus routing optimization.
- Potential expansion to fleet management and emergency services routing applications.

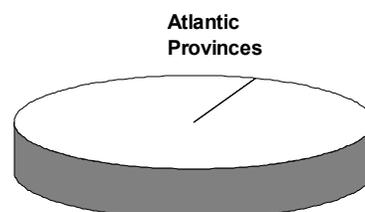
PRESENCE IN ATLANTIC CANADA

Years in operation: 8
Number of Employees: 3
Employees in Atlantic Region: 100%

PRINCIPAL ACTIVITIES

- Product development and related consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Upper Coverdale NB
Mailing Address: 2141 Coverdale Road
 Upper Coverdale, NB
 E1J 1Z8
Telephone: 506-372-9198
Facsimile:
Internet:

PRODUCTS/SERVICES RELATED TO ITS

- ITS strategic planning and policy.
- Transportation planning and policy.

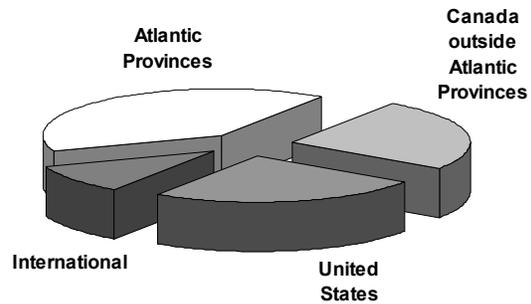
PRESENCE IN ATLANTIC CANADA

Years in operation: 2
Number of Employees: 2
Employees in Atlantic Reaion: 100%

PRINCIPAL ACTIVITIES

- Consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Moncton NB
Mailing Address: 383 Baig Boulevard
 Moncton, NB
 E1E 4H8
Telephone: 506-853-7522
Facsimile: 506-853-7612
Internet: www.tdsm.com

PRODUCTS/SERVICES RELATED TO ITS

- Commercial vehicle drivers log audit and reporting systems. Can be integrated with GPS and with other modules such as fuel tax reporting, safety deficiencies logging, etc.
- Potential adaptability to more comprehensive fleet management system.

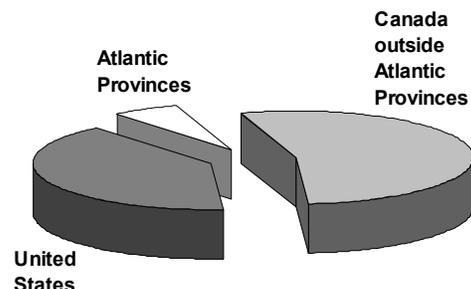
PRESENCE IN ATLANTIC CANADA

Years in operation: 23
Number of Employees: 5
Employees in Atlantic Reaion: 100%

PRINCIPAL ACTIVITIES

- Product development, and related training and consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Dartmouth NS

Mailing Address: 3 Spectacle Lake Drive
Dartmouth, NS
B3B 1W8

Telephone: 902-468-7777
Facsimile: 902-468-9009
Internet:

PRODUCTS/SERVICES RELATED TO ITS

- Transportation infrastructure management, including radar-based bridge deck condition assessment at highway speeds
- Transportation systems expertise applicable to a range of ITS initiatives including RWIS and real-time control of maintenance operations.

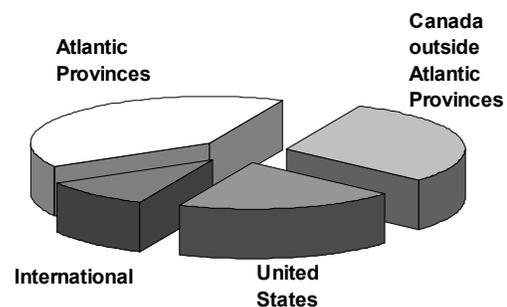
PRESENCE IN ATLANTIC CANADA

Years in operation: 30
Number of Employees: 900
Employees in Atlantic Region: 45%

PRINCIPAL ACTIVITIES

- Consulting services.

MARKET GEOGRAPHY



COORDINATES

Head Office: Halifax NS

Mailing Address: 36 Solutions Drive
Halifax, NS
B3S 1N2

Telephone: 902-495-2000
Facsimile: 902-495-2095
Internet: www.xwave.com

PRODUCTS/SERVICES RELATED TO ITS

- Mobile police information systems.
- Parking enforcement management systems.
- Emergency (911) systems.
- Real-time communications and control.
- Many of systems applicable to ITS as-is or with some adaptation.

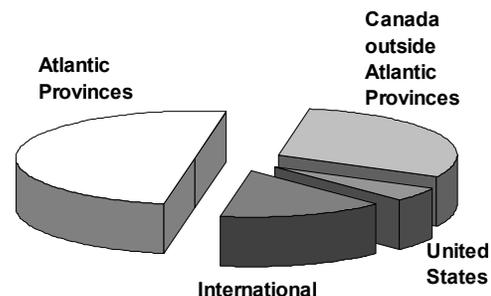
PRESENCE IN ATLANTIC CANADA

Years in operation: 4
Number of Employees: 2800
Employees in Atlantic Region: 60%

PRINCIPAL ACTIVITIES

- Research and product development, system integration, custom manufacturing, and related consulting services.

MARKET GEOGRAPHY



APPENDIX N

Information Technology Association Members

Appendix N – Information Technology – Association Members

NEW BRUNSWICK (Business New Brunswick)		
BUSINESS	LOCATION	INTERNET ADDRESS
A Bound Corporation	Miramichi	
Accesstec Inc.	Fredericton	www.accesstec.ca
ADI Group Inc.	Fredericton	www.adi.ca
Adtech Manufacturing Ltd.	Fredericton	
Advanced Business Services	Fredericton	www.abs.ca
Advanced Monitoring Technologies Inc.	Keswick	www.amt.nb.ca
Advatek Systems Inc.	Moncton	
ALT Group Inc.	Miramichi	www.altgroupinc.com
Anyware Group	Saint John	www.anywaregroup.com
Approach Navigation Systems Inc	Dieppe	www.approach.nb.ca
Atlantic Data Group	Moncton	www.eagleeyedvr.com
Beltek Systems Design Inc.	Dieppe	www.beltek.com
CARIS	Fredericton	www.caris.com
Content Alive Inc.	Fredericton	www.contentalive.com
DealerMine Inc.	Saint John	www.dealertrack.ca
DOVICO	Dieppe	www.dovico.com
DPL Group	Saint John	www.dpl.ca
e-Novations Comnet Inc.	Fredericton	www.e-novations.ca
Enseigne Imperial Signs	Edmunston	www.enseignes.com
Geo Research Systems Inc.	Fredericton	www.geodaci.com
Geodat Information Services Ltd.	Fredericton	www.geodat.nb.ca
Geoplan Consultants Inc.	Fredericton	www.geoplan.nb.ca
InteliSys Aviation Systems Inc.	Shediac	www.ameliasoftware.com
Interactive Visualization Systems Inc.	Fredericton	www.ivs.unb.ca
Kinek Technologies Inc.	Saint John	www.kinek.com
Learnstream Inc.	Fredericton	www.learnstream.com
Lexi-tech Inc.	Dieppe	www.lexitech.ca
Measurand Inc.	Fredericton	www.measurand
Nanoptix Inc.	Dieppe	www.nanoptix.com
Optex Inc.	Fredericton	www.optex.nb.ca
Rydan Customer Management Inc.	Moncton	www.rydan.com
Spectral Visualization Development	Fredericton	www.svdinc.com
SVG Consulting Inc.	Upper Coverdale	
Trip Data & Safety Management Inc.	Moncton	www.tdsm.com
Twisted Air Technologies Inc.	Fredericton	www.twistedair.com
xwave	Fredericton	www.xwave.com

Appendix N – Information Technology – Association Members

NEWFOUNDLAND & LABRADOR (Newfoundland and Labrador Association of Technology Industries)		
BUSINESS	LOCATION	INTERNET ADDRESS
Academy Canada	Corner Brook	www.academycanada.com
Breton Solutions Information Systems	St John's	
Canadian Centre for Marine Communications	St. John's	www.ifmt.nf.ca
Canpolar East Inc.	St. John's	www.canpolar.com
CanSomebodyHelpMe.com	Stephenville	www.cansomebodyhelpme.com
C-CORE	St. John's	www.c-core.ca
Ceridian Canada Ltd.	St. John's	www.ceridian.ca
CGI Information Systems and Management Consultants Inc.	St. John's	
College of the North Atlantic	Clareville	www.northatlantic.nf.ca
Compusult Ltd.	Mount Pearl	www.compusult.nf.ca
Computers and Communications Ltd.	Deer Lake	www.micsystems.ca
Consolidated Technologies Ltd	St. John's	www.contechnav.com
Coretec Inc.	St. John's	www.coretec.nf.net
Cyber Zone Network	St. John's	www.cyber-zone.net
Earth Information Technologies (NF) Ltd.	St. John's	
Edwards & Associates Ltd.	Marystown	www.ncf.ca/~cr975/charity1.html
Exploits Centre for Information Technology Excellence	Windsor	www.exploitsvalley.nf.ca
GeoData Ltd.	St. John's	
Geographic Data Services Inc.	St. John's	www.gds.nf.net
Geo-Matics Services Ltd	Topsail	
Graduate Centre of Applied Technology	St. John's	www.graduatecentre.com
Group Telecom	St. John's	www.gt.ca
Guigne Technologies Ltd.	St. John's	www.guigne.com
iMIRADOR.com Inc.	St. John's	
In Corp.	St. John's	
InfoTech Canada Inc.	St. John's	www.infotechcanada.com
Innovative Business Solutions, Inc.	Mount Pearl	
Instrumar Ltd.	St. John's	www.instrumar.com
Intrignia Solutions Inc.	St. John's	www.intrignia.com
Kittiwake Economic Development Corporation	Gander	www.kittiwake.nf.ca
MIRA Incorporated	Lumsden	
MUN (Memorial University) - Office of Research	St. John's	www.mun.ca/research/
Northstar Network Ltd.	St. John's	www.northstar-network.net
Nautical Data International Inc.	St. John's	www.ndi.nf.ca
PATHFINDER Information Technologies Ltd.	St. John's	www.pathfinder.nf.net
Plato Group Inc.	St. John's	www.platogroup.com
PNI (Pivot)	St. John's	www.pni-corp.ca
Professional Institute of Applied Technology	St. John's	www.piat-it.com
Resource Concepts Inc.	St. John's	
SGE Group Inc.	Clareville	www.sgegroupp.com
Systems 'N' Solutions Limited	St. John's	www.sns-nf.com
Team IT	St. John's	www.teamit.net
Triton Data Inc.	St. John's	www.triton.nf.ca
Triware Technologies Inc.	St. John's	www.triware.nf.ca
W.G. Smith Associates	St. John's	
Where? Media	St. John's	www.wheremedia.com

Appendix N – Information Technology – Association Members

NOVA SCOTIA (Information Technology Industrial Alliance of Nova Scotia)		
BUSINESS	LOCATION	INTERNET ADDRESS
Aardvark Computer Solutions, Inc.	Halifax	www.aardvarkinc.com
Acadia University	Wolfville	www.acadiau.ca
AgendaTech Inc.	Bedford	www.agendatech.com
Alan Bailey Consulting	Bedford	www.abaileyconsult.com
Aliant Telecom Inc.	Halifax	www.aliant.ca
AlgoPlus Consulting Limited	Halifax	www.aviationsos.com
Altimax Network Service Limited	Dartmouth	www.altimax.com
Amirix Systems Inc.	Halifax	www.amirix.com
APSCON Software Specialist	Halifax	www.apskon.com
Arc 9 Interactive (Vertigo)	Halifax	www.vertigo-interactive.com
Atlantec Solutions Inc.	Halifax	www.atlantecsolutions.com
Atlantic Data Group	Halifax	www.eagleeyedvr.com
Blanchard, Ian	Halifax	
BROADleaf Technology Solutions	Halifax	www.broadleaf.ca
Business Internetworks Technologies Inc.	Halifax	
C.L. Douglas Centre for Computer Studies	Bedford	www.cldouglas.com
CABCO Communications Group	Dartmouth	www.cabco.ca
Campbell, Paul	Porter's Lake	
CANIMPEX Enterprises Ltd. [CPX-Solutions]	Halifax	www.canimpex.ns.ca
CDI College of Business & Technology	Halifax	www.cdi.ca
Centre of Geographic Sciences (COGS)	Lawrencetown	www.cogs.ns.ca
CGI Information Systems & Management Consultants Inc.	Halifax	www.cgi.ca
Collanet Solutions	Truro	
CompuCollege School of Business	Halifax	www.compucollegeatlantic.ca
Computerease Limited	Dartmouth	www.computerease.ca
Cornerstone Project Management Group Inc.	Halifax	www.strongerbusiness.com
CorporaTel	Halifax	www.corporatel.ca
Cybergarden Inc.	Halifax	www.cybergarden.ca
DDA Computer Consultants Ltd.	Halifax	www.dda.ns.ca
Delphi Systems Inc.	Scotsburn	
Dicks, Dion	Halifax	
DMR (Fujitsu) Consulting Group Inc.	Halifax	www.dmr.ca
Dymaxion Research Limited	Halifax	www.dymaxion.com
eCENTRICS	Bedford	www.ecentrics.ca
EDS Systemhouse Inc.	Halifax	www.eds.ca
e-Hub.net	Moncton, NB	www.e-hub.net
Ernst & Young	Halifax	www.eycan.com
Garvin-Allen Solutions Ltd.	Halifax	www.garvin-allen.com
Genesis Technology Alliance	Fall River	
Gigablink Learning Technologies	Dartmouth	www.gigablink.com
Gough Technology Group Inc.	Halifax	www.goughtechgroup.com
Group Telecom	Halifax	www.gt.ca
GSA Search Consultants	Bedford	www.gsa-search.com
GWA Training Brokers Inc.	Halifax	www.GWATrainingBrokers.com
Hayne Web Design	Dartmouth	
Imperatore, Marco	Bedford	
inmedia Public Relations	Halifax	www.inmedia.ca

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BUSINESS	LOCATION	INTERNET ADDRESS
Iramp Incorporated	Halifax	www.iramp.ca
Island Career Academy	Sydney	www.islandcareeracademy.ns.ca
ITIC-UCCB	Sydney	
JNL Data	Halifax	
KBT Training Solutions	Halifax	
Know IT Consulting	Halifax	www.knowitconsulting.com
Lans-2-Wans Networks Incorporated	Halifax	
Lucas Technology	Halifax	
J.J. Mackay Canada Ltd.	New Glasgow	www.jjmackay.com
Maximizing Today's Telecommunications Inc. (MTTI)	Dartmouth	www.mtti.ns.ca
Metoccean Data Systems Ltd.	Dartmouth	www.metoccean.com
Mister Webpage	Waterville	
Nicom Ltd.	Dartmouth	www.nicomltd.com
NorthSeas Software, Inc.	Dartmouth	
Nova Scotia Community College	Halifax	www.nscs.ns.ca
one80 Knowledge Systems Inc.	Halifax	
Open Source Information Systems	Halifax	www.opensource-is.com
Pictorius Incorporated	Halifax	www.pictorius.com
Pinter Consulting Services Inc.	Halifax	is.dal.ca/~jdpinter
Plan B Solutions	Halifax	www.planbsolutions.net
Preclarus Inc.	Truro	www.preclarus.ca
Proactive Media Consultants Inc.	Halifax	
Productivity Solutions Inc.	Hubbards	
Quality Business Results Inc.	Springhill	
Rising Sun Computer Software	Halifax	
Satlantic Inc.	Halifax	www.satlantic.com
Scientific Decisions Inc.	Halifax	www.ScientificDecisions.com
SDI Systems Inc.	Halifax	
Seimac Limited	Dartmouth	www.seimac.com
Semaphore Solutions	Halifax	www.semaphoresupport.com
ServiceOne Incorporated	Halifax	
Sierra Systems Consultants Inc.	Halifax	www.sierrasys.com
Smith, Rodney	Mineville	
St. F.X. Enterprise Development Centre	Antigonish	www.stfx.ca
St. Mary's University	Halifax	www.stmarys.ca
Syntel Consultancy Inc	Halifax	
Tecsult-EduPlus Inc.	Dartmouth	www.eduplus.ca
Telecom Applications Research Alliance (TARA)	Halifax	www.tara.ca
The daVinci Institute	Dartmouth	www.the-davinci-institute.com
ThinWEB Technologies Inc.	Halifax	www.thinweb.com
Tilde Business Intelligence	Halifax	www.tilde.ca
TM Software Inc.	Halifax	www.tm-soft.com
Trihedral Engineering	Bedford	www.trihedral.com
Umbrella Technologies	Dartmouth	www.angelfire.com/weird2/kevinatwood/%20ut.htm
Visible Knowledge Consulting Inc.	Halifax	
Wilkie Consulting Group	Fall River	

Appendix N – Information Technology – Association Members

NOVA SCOTIA (Information Technology Industrial Alliance of Nova Scotia)		
BUSINESS	LOCATION	INTERNET ADDRESS
XIOtech	Bedford	
xwave	Halifax	www.xwave.com

Appendix N – Information Technology – Association Members

PRINCE EDWARD ISLAND (Information Technologies Association of Prince Edward Island)		
BUSINESS	LOCATION	INTERNET ADDRESS
AcA Digital Knowledge	Wellington	www.uniglobal.com
Academy of Learning	Charlottetown	www.academyol.com
Advantage Communications Inc.	Charlottetown	www.advantagecall.com
Auracom Internet Services	Charlottetown	www.pei.auracom.com
Baker Consulting Inc.	Charlottetown	www.bcinc.pe.ca
Baseline Business Geographics	Charlottetown	www.baselinegeo.com
Bongen Communications Inc.	Stanhope	
Business Technology Consulting	Charlottetown	www.btc.pe.ca
Caltech Information Technologies	Charlottetown	www.caltech.ca
Canadian Cable Ad Productions	Summerside	www.tvadspei.com
Career Skills	Charlottetown	www.careerskills.pe.ca
CIFTA Technologies	Wellington	www.cifta.com
Cellar Door Productions	Charlottetown	www.cellardoor.tv
Coastal Destination	Charlottetown	www.peisland.com
Cogsdale Corporation	Charlottetown	www.cogsdale.com
CompuCollege School of Business	Charlottetown	www.compucollegeatlantic.ca
Computer Dynamics	Charlottetown	
Computer Renaissance	Charlottetown	www.compren.pe.ca
CSC Services Limited	Stratford	www.watchcan.com
Cymbiant Technologies Inc	Charlottetown	www.cymbiant.ca
Dealer Soft	Charlottetown	www.dealersoft.com
Deja Design Studio	Charlottetown	www.dejawebs.com
DeltaWare Systems	Charlottetown	www.deltaware.com
EastLink Communications	Charlottetown	www.eastlink.ca
EDS Canada Inc.	Charlottetown	www.eds.com
Engineering Technologies Canada Ltd.	Stratford	www.engtech.ca
ExaComm Computers	Charlottetown	www.exacomm.net
Future Learning Inc.	Charlottetown	www.futurelearning.com
G/COM	Summerside	
Garden Isle Computing Inc.	Charlottetown	www.gardenisle.pe.ca
GE Capital IT Solutions	Charlottetown	www.gectms.ca
GeoNet Technologies	Central Bedeque	www.geonet-tech.com
Grant Thornton	Charlottetown	www.grantthornton.ca
Graphic Communications Inc	Charlottetown	www.graphcom.pe.ca
Hamlin Alliance Group Ltd.	Charlottetown	www.hamlinalliance.com
Holland College	Charlottetown	www.hollandc.pe.ca
HomePage Design Inc	Charlottetown	www.peisland.com
HR Associates	Charlottetown	
Icon Data Systems	Summerside	www.icodata.com
ImageWorks PEI Inc.	Charlottetown	www.iwpei.com
InternetWorks Ltd.	Charlottetown	www.internetworks.ca
Island Services Network	Charlottetown	www.isn.net
Island Telecom Inc.	Charlottetown	www.islandtel.pe.ca
Island Tel Advanced Solutions	Charlottetown	www.itas.net
iWave.com	Charlottetown	www.iwave.com
Lomar Inc. / One Stop Info Shop	RR#3 Summerside	
L.P. Computer Solutions	Wellington	

Appendix N – Information Technology – Association Members

PRINCE EDWARD ISLAND (Information Technologies Association of Prince Edward Island)		
BUSINESS	LOCATION	INTERNET ADDRESS
MacIsaac Younker Roche Soloman	Charlottetown	www.myrs.pe.ca
M.F. Schurman Company Ltd.	Summerside	
MicroAge Computer Centres	Charlottetown	www.microagepei.com
Minolta Business Equipment Canada	Charlottetown	
NextWave Corporation	Charlottetown	www.nextwavecorp.ca
NIX Information Systems	Stratford	
N.R. Computronics Ltd.	Charlottetown	www.make-it-simple.com
Montague Computer Inc. 1997	Montague	www.mci97.com
On-Line Support Inc	Charlottetown	www.onlinesupport.ca
Patterson Palmer Hunt Murphy	Charlottetown	www.pphm.com
PEI Innovations Inc.	Charlottetown	www.pei-innovations.com
Point of Sale Advantage	York	www.retailmagic.com
PricewaterhouseCoopers	Charlottetown	
Printer Works / Laser Solutions Inc.	Charlottetown	www.printerworks.ca
Redisletechnology.com	Charlottetown	redisletechnology.com
Renewal Consulting Group Inc.	Charlottetown	www.renew.com
Results Marketing	Charlottetown	
Revolution Media	Summerside	www.revolution.ca
Shared Solutions Inc.	Charlottetown	
Silverorange	Charlottetown	www.silverorange.com
Softworld 2002	Charlottetown	www.softworld2002.com
Spatial Decision Support Systems Ltd.	Charlottetown	
Spell Read P.A.T.	Charlottetown	www.spellread.com
Stewart McKelvey Stirling Scales	Charlottetown	www.smss.com
TACS Software Programming	Charlottetown	www.tacsltd.com
Tech-Rep Limited	Charlottetown	www.tech-rep.net
Technomedia Inc.	Charlottetown	www.technomediapei.com
Timeless Technologies	Belfast, Charlottetown	www.timelesstech.com
Unisys Canada	Charlottetown	www.unisys.com
University of Prince Edward Island	Charlottetown	www.upei.ca
Virtual Art	Mount Stewart	www.virtuo.com
VisionQuest	Charlottetown	www.vision-quest.ca
Website Advantage Inc	Charlottetown	www.wsadvantage.com
Watts Communication Inc.	Charlottetown	
Wireless Island	Summerside	www.wirelessisland.net

APPENDIX O

Members of Selected Clusters

Appendix O – Members of Selected Clusters

CANADIAN CENTRE FOR MARINE COMMUNICATIONS (Multi-disciplinary) (www.ccmc.nf.ca)
Algoma Central Marine
Aliant Telecom Inc
AMEC
Atlantic Canada Opportunities Agency
Atlantic Communications Enterprises Ltd
Atlantic Electronics Limited
C-CORE
Canadian Coast Guard
Canadian Hydrographic Service
Canadian Wireless Telecommunications
CanStar Innovations Inc.
CARIS
Centre for Research in Earth and Space Technology
CMC Electronics Inc.
Coflexip Stena Offshore Newfoundland Limited
Collaborative Network Technologies Inc.
Communications Research Centre
Compusult Limited
Consilient Technologies Corp.
Consolidated Technologies Limited
CORETEC Incorporated
Corriolus Novatech
Earth Information Technologies (NFLD) Limited
Fugro Jacques Geosurveys
GeoNet Technologies Inc.
Geo-Resources Inc.
Government of Canada, Department of National Defence
Government of Newfoundland and Labrador, Department of Industry, Trade and Technology
Government of Nova Scotia.
Guigné International Ltd.
Helical Systems Ltd.
Heynetwork.com Canada, Inc.
Husky Oil.
Hyperspectral Data International Inc.
IDON East Corporation
InfoMagnetics Technologies Corporation.
Information Technology Industry Alliance of Nova Scotia.
Infotech Canada.
Innova Quest Inc.
Institute for Pacific Ocean Science & Technology
INSTRUMAR
Interactive Visualization Systems Inc. (IVS).
International Communications & Navigation Ltd.
International Hydrographic Management Consulting (IHMC) Ltd.
International Submarine Engineering Ltd.
LOTEK Marine Technologies Inc.
MacDonald Dettweiler

Appendix O – Members of Selected Clusters

CANADIAN CENTRE FOR MARINE COMMUNICATIONS (Multi-disciplinary)

(www.ccmc.nf.ca)

Marine Institute.
Memorial University of Newfoundland
NATI
Nautical Data International, Inc.
NewTel Communications Inc.
Northern Radar Systems Ltd.
Northstar Technical Inc.
Oceans.
Offshore Systems International Ltd.
OKAMLogic Inc.
Operation ONLINE.
Precarn Inc.
Provincial Airlines Limited.
Quester Tangent.
Raytheon Canada Limited.
Remas Inc.
Rutter Technologies Inc.
Sable Offshore Energy Inc.
SeaQuest Technologies.
Seimac Ltd.
Sigma Engineering Limited.
Stratos Global Corporation.
Telehealth & Educational Technology Resources Agency.
Thales Systems Canada.
TLC Corporation.
Transport Canada.
TwoLofts Inc.
Western Marine Community Coalition.
xwave Solutions.
ZenTech Limited.

Appendix O – Members of Selected Clusters

**MacDonnell Group (primarily Geomatics)
(www.mgnet.ca)**

Ati Consulting
Eastcan Geomatics
Marineserve.mg
Phoenix.mg
Sargent & Vaughan Engineering
Vaughan Engineering
Vaughan International
Vaughan International (India) Limited

**Northstar Network Ltd. – East Coast
(Defence, aerospace, marine)
(www.northstar-network.net)**

Canadian Centre for Marine Communications
Century 2K
CHC Composites Incorporated
College of the North Atlantic
Compusult Limited
CORETEC Incorporated
IDON East
Media Touch Technologies Limited
NEWDOCK St. John's Dockyard Limited
Northstar Technical Incorporated.
Steelcor Manufacturing Corporation
Terra Nova Marine Company Limited
TwoLofts Incorporated
ZeddComm Incorporated

**CHAMPLAIN INSTITUTE (Geomatics)
(www.champlain-gis.com)**

Atlantic Air Survey Limited
CARIS
CEF Consultants Ltd.
DATAQC
Earth Information Technologies
GeoNet Technologies Inc.
Geoplan Consultants
Hyperspectral Data Incorporated
Nova Spatial Inc.

APPENDIX P

Atlantic Provinces ITS Project Profiles

Appendix P – Atlantic Provinces ITS Project Profiles

OBJECTIVES:

- Improve public safety.
- Advance warning of ice and snow affecting roads.
- Efficient allocation of winter maintenance effort.

ITS Project Profile: Province of Nova Scotia

Road Weather Information System (RWIS)

SOLUTION:

- Installation of RWIS (Road Weather Information Systems) to monitor road pavement condition and micro-climatic data.
- Land-line or cellular modem connections to intranet serving maintenance personnel.
- Use of Environment Canada services for forecasting.

THE SYSTEM:

- RWIS stations monitor pavement conditions and local atmospheric conditions, as well as providing CCTV coverage.

- CCTV images enable visual monitoring of road/weather conditions.
- RWIS data enables further functionality such as possible thermal mapping.

- Data used to generate short-term forecasts and predicted pavement surface temperatures.

- Advance warning of icing conditions enables timely de-icing measures at critical locations.

- Prediction of snowfall start-time and duration enables timely deployment and efficient management of snow-removal and salting operations.

- Existing installations by Approach Navigation Systems Inc.
- Environment Canada and Seimac Ltd. have provided meteorological forecasting services.

CURRENT STATUS:

- Currently 13 RWIS stations, 5 of these have operated for 5 years.
- 5 new stations are being installed in each of 2002 and 2003: with these, 70% of service area will be covered.
- Data access via intranet.

FUTURE OPTIONS:

- Extend geographic coverage.
- Investigate area-wide thermal mapping through fusing of RWIS inputs with inputs from mobile sources (snowplows).
- Use of internet for data

CONTEXT:

- There are 26,000 km of roads in Nova Scotia.
- A road condition reporting service is provided during the winter months (www.gov.ns.ca/tran/RoadConditions/road_conditions.stm)

ITS Project Profile: Metrobus Schedule Management System St. John's, Newfoundland & Labrador

OBJECTIVES:

- Enhance customer service by providing real-time bus schedule information.
- Improve schedule adherence by providing real-time information to drivers on whether bus is ahead of or behind schedule.

SOLUTION:

- An AVL (Automatic Vehicle Location) system that pinpoints bus locations, facilitating schedule management.
- System also provides real-time information on bus arrivals so that patrons can plan their arrival at the bus stop to minimize their waiting time, particularly in inclement weather.

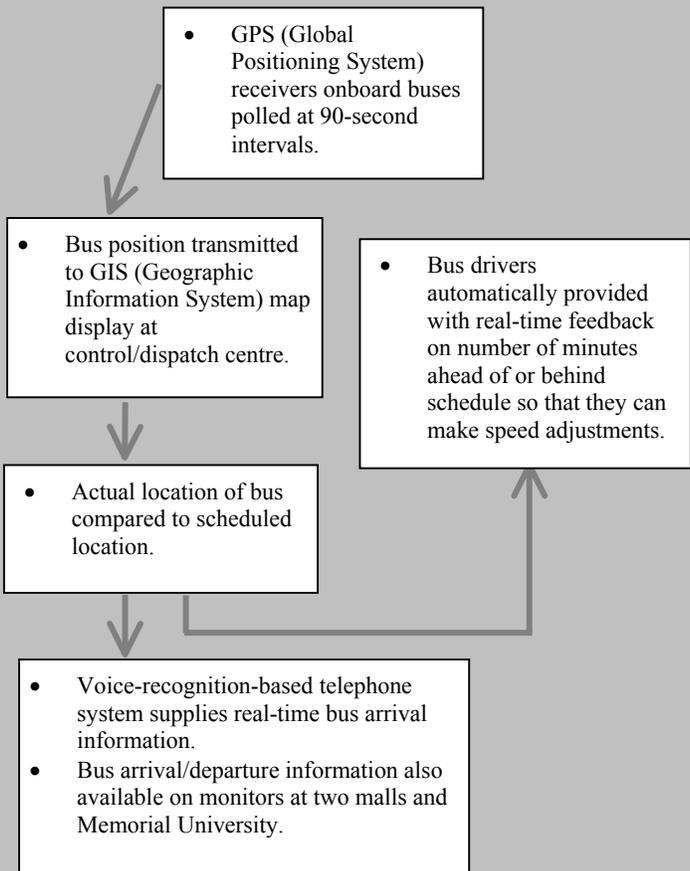
CURRENT STATUS:

- System is planned to be fully operational by June, 2002.
- Radio communications system is in place, the GPS receivers are being installed, and the software is being finalized.

FUTURE OPTIONS:

- Possible sharing of system infrastructure with public utilities to facilitate management of their fleets.
- Possible extension of schedule information system to Internet.

THE SYSTEM:



CONTEXT:

- Metrobus operates a fleet of 53 buses, of which 43 are on the road during peak operating periods.
- The system consists of 20 bus routes, of which 5 operate at 30 minute headways and the remainder at 60 minute headways.
- 3.2 million riders use the Metrobus system annually.

OBJECTIVES:

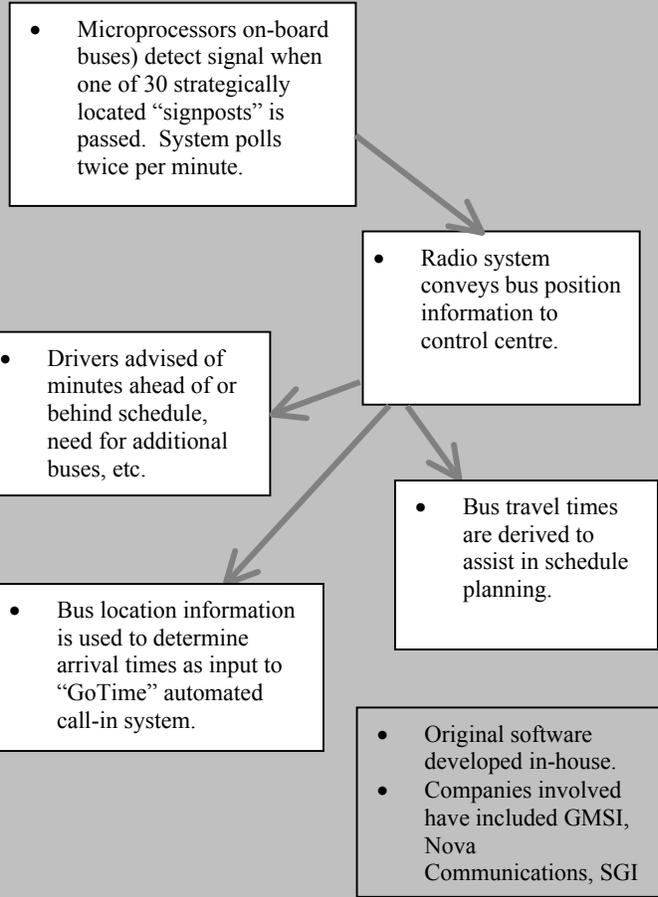
- Enhance ability to effectively allocate buses to high-demand situations and respond to traffic congestion.
- Enhance ability to manage schedule adherence and other aspects of bus fleet

**ITS Project Profile:
Metro Transit
“GoTime” Real-time Tracking System
Halifax, Nova Scotia**

SOLUTION:

- AVL (Automatic Vehicle Location) system to track location of buses.
- Radio communications with drivers.
- Automated telephone system and monitors at key locations to provide bus arrival times.

THE SYSTEM:



CURRENT STATUS:

- Initial deployment in 1987. Recent \$2 million upgrade (1997).
- Benefits most obvious if system is down – need to deploy field supervisors.
- Benefits lie more in ability to move people better rather than better schedule adherence.

FUTURE OPTIONS:

- Possible future upgrade to GPS technology.
- Possible expansion to accessible (flexible-route) buses and service vehicles.
- Considering advanced fare collection technology.

CONTEXT:

- Metro Transit carries 50,000 riders/day, 14 million/year.
- 155 buses are operated during peak periods on 48 routes.
- Average of 8,000 calls/day to “Go Time”; 15,000 calls/day during snowstorms with error rate of only 1%.

OBJECTIVES:

- Enhance safety and security for bridge users.
- Enhance safety for bridge work crews.

**ITS Project Profile:
Strait Crossing Bridge Limited
Confederation Bridge Traffic
Surveillance and Management System**

SOLUTION:

- Complete coverage of bridge with CCTV surveillance cameras.
- Traffic control system incorporating CMS (Changeable Message Signs) at either end of bridge, traffic signals every 1,500 metres, and variable speed limit signs.
- Emergency call boxes every 750 metres.
- 2 RWIS sites.
- Traveller information radio service
- Central control centre connected to all cameras and control equipment.

THE SYSTEM:

- CCTV camera images conveyed to control centre via fibre-optic cable.

- Scheduled maintenance activities requiring lane closures

- Control centre staff monitor driving conditions, driver behaviour and HazMat movements, and watches for incidents.

- Pre-established work-zone management traffic control plans.

- Traffic signals used to manage traffic stream when lanes are partially or fully blocked.
- Assistance dispatched to manage incidents.
- Bridge users kept informed of situation via CMS (Changeable Message Signs) and FM radio Traveller Information.

- System designed, provided and installed by IBI Group and Intrex Systems.

CURRENT STATUS:

- System is fully operational.
- Recently installed additional cameras to enhance coverage.
- Adding Strait Pass commercial vehicle electronic toll collection in October 2002.

CONTEXT:

- The Confederation Bridge is a vital economic connection to Prince Edward Island, providing a significantly faster and more reliable alternative to the ferries connecting the Island with New Brunswick.

OBJECTIVES:

- Enhance customer service by reducing service times and congestion at toll plazas.
- Increase toll plaza throughput to accommodate future demand.
- Reduce cost of toll collection.
- Safely operate reversible-lane

SOLUTION:

- A transponder-based, pre-paid electronic payment system.
- CMS (Changeable Message Signs) to regulate use of reversible lane and post speed advisories.

CURRENT STATUS:

- Fully operational on the Macdonald and MacKay bridges. Transponders interoperable with Saint John Harbour Pass and Cobequid Pass E-Pass.
- Number of transponders held locally is approaching 40,000.
- 36% of all toll payments use MacPass. Use by commercial vehicles is between 70% and 80%. Use by buses is over 90%.
- Toll plaza congestion has been reduced dramatically. Using MacPass takes 1-2 seconds compared to 9-12 seconds for a cash transaction.
- Transaction cost reduced to 6.5 cents.

FUTURE OPTIONS:

- Success of MacPass may allow tokens to be discontinued.

**ITS Project Profile:
Halifax-Dartmouth Bridge Commission**

**“MacPass” Electronic Toll Payment
Bridge Traffic Management**

THE SYSTEM:

- Passive ‘backscatter’ transponders in vehicles read by overhead antennae.

- Bridge deck condition sensors advise of potential for ‘black-ice’ conditions (20-minute warning).

- Toll deducted from pre-paid account. Drivers advised if account is low. There is also a voice-recognition-based telephone system to allow MacPass users to query their account status.

- CMS (Changeable Message Signs) post speed advisories based on conditions. Other electronically-controlled signs regulate reversible lane use.

- Amtech supplied the toll collection system.

CONTEXT:

- The Macdonald and MacKay bridges connect Halifax and Dartmouth across the Halifax Harbour.
- Approximately 31 million vehicles cross the bridges annually.

OBJECTIVES:

- Reduce delay to road users.
- Improve performance of traffic signal system. Need to optimize operation since physical expansion is constrained in mature areas of City.
- Reduce staff resource requirements associated with updating signal-timing plans.

SOLUTION:

- Implementation of SCOOT advanced traffic control system to improve response to changing traffic conditions and enhance traffic signal coordination.

CURRENT STATUS:

- Operational since 1991.
- Benefit in terms of delay reduction to road users is most noticeable when system is down.
- Estimate \$2-3 million in fuel savings over 3 years.

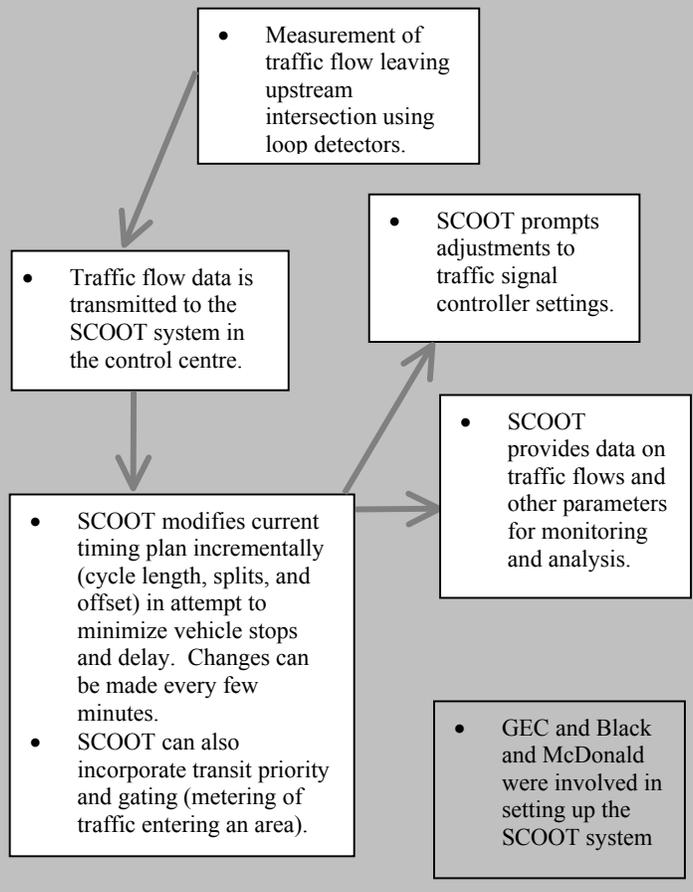
FUTURE OPTIONS:

- Expand geographical coverage of system.
- More fully utilize advanced features of SCOOT such as transit priority and gating.
- More fully utilize data outputs from SCOOT.

**ITS Project Profile:
Halifax Regional Municipality**

**SCOOT Advanced Traffic Signal
Control System**

THE SYSTEM:



Context:

- SCOOT operates approximately 90 of 98 total traffic signals on the road system of the Halifax Regional Municipality within the limits of the former City of Halifax.

OBJECTIVES:

- Improve compliance with maximum commercial vehicle weight regulations at the Longs Creek facility on Route 2. The new highway alignment is not visible from the existing weighing facility and control room. WIM is an alternative to relocating the existing control facility.
- Reduce delay for commercial highway users and increase throughput and capacity.
- Increase safety for other road users.
- Utilize this installation as a pilot project to evaluate business case for more widespread implementation of WIM (Weigh-In-Motion) technology.

SOLUTION:

- WIM (Weigh-In-Motion) installation to allow vehicles to be weighed at highway speeds.
- Camera-based enforcement.

CURRENT STATUS:

- Project has been awarded.
- Expected to be fully operational by the summer of 2002.

FUTURE OPTIONS:

- Application to other weighing facilities.
- Combine with electronic vehicle safety credentialing.

**ITS Project Profile:
Province of New Brunswick**

Commercial Vehicle Weigh-in-Motion (WIM) System at Longs Creek on Route 2.

THE SYSTEM:

- WIM (Weigh-In-Motion) scale in highway weighs commercial vehicle as it crosses at highway speeds.

- If compliant, commercial vehicle permitted to continue (advised by CMS – Changeable-Message-Sign) unless requested to pull in for a random safety inspection.

- If not compliant, CMS (Changeable Message Sign) advises driver to pull into facility.

- Camera records commercial vehicle license plates in case a non-compliant vehicle disregards request to pull in.

- WIM system to be implemented by IRD.

Context:

- An average of 860 vehicles per day are currently weighed and/or inspected at the Longs Creek facility.

OBJECTIVES:

- Increase attractiveness of Atlantic Provinces by providing access to up-to-date information on accommodation, travelling conditions, ferry services, activities, events, etc.
- Improve convenience of making reservations for ferries, accommodation, events, etc.

SOLUTION:

- Internet-based tourist and traveller information and reservation systems to supplement print and telephone services.

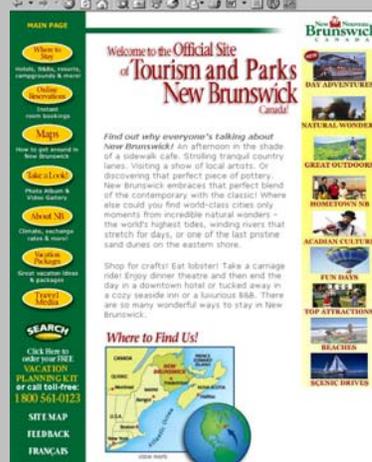
CURRENT STATUS:

- Each of the four Atlantic Provinces has a fully operational web-site which includes some or all of the following:
- travel and accommodations information
- travel conditions
- accommodation, event reservations
- ferry schedules and reservations
- vacation planning.
- and more!

**ITS Project Profile:
Governments of New Brunswick,
Newfoundland & Labrador, Nova
Scotia, Prince Edward Island**

**Tourist Information and Reservation
Systems**

THE WEB-SITES:



OBJECTIVES:

- Provide improved level of service for winter maintenance.
- Reduce salt usage.
- Reduce impact on the environment.

SOLUTION:

- Road temperature sensor.
- Computerized salt control.

CURRENT STATUS:

- Of the fleet of 24 plows, 4 are outfitted, with plans to upgrade 3 more in 2002/03

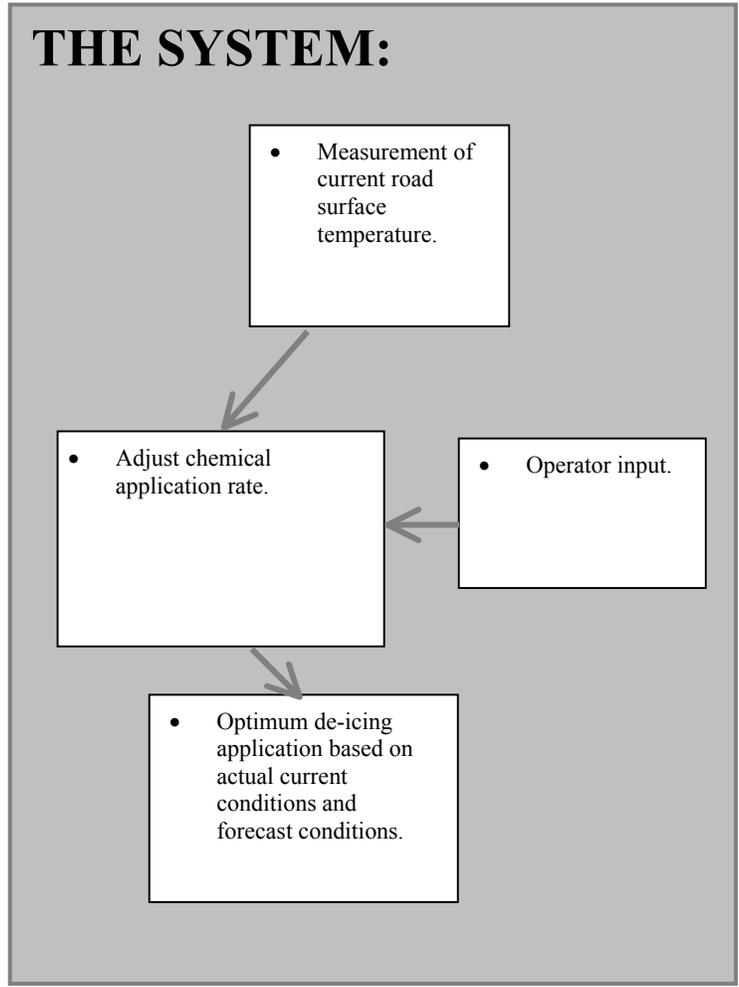
FUTURE OPTIONS:

- Integration of plough operations and fleet management with RWIS and forecasting.

**ITS Project Profile:
Province of Nova Scotia**

“Smart” snowplow

THE SYSTEM:



Context:

- Currently servicing the high volume roads in the Halifax area, representing 225km of coverage, expanding to 400km in 2002/03.

APPENDIX Q

Showcased Atlantic Provinces ITS Company Profiles

Appendix Q – Showcased Atlantic Provinces ITS Company Profiles

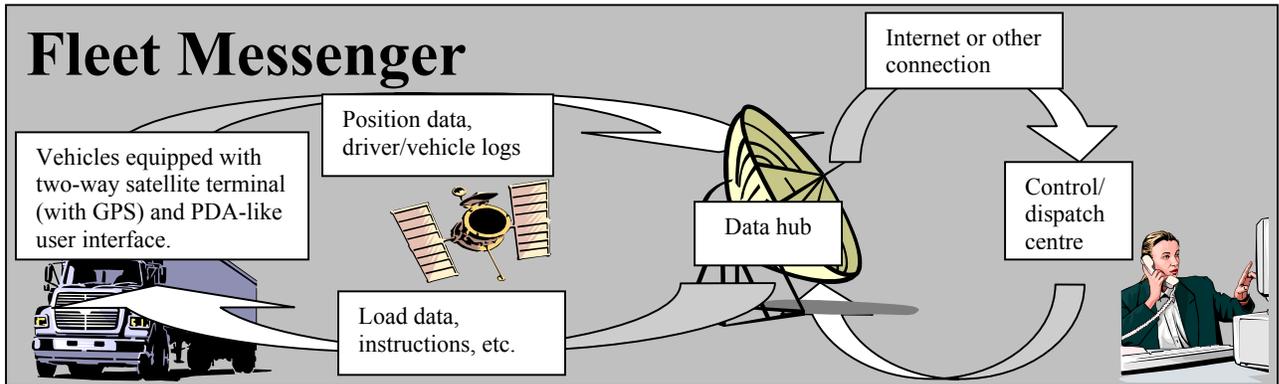
COMPANY INFO:

- Employs 55
- 24 years in business
- Headquartered in Dartmouth, Nova Scotia
- Seimac is a developer and integrator, packaging systems, designing/customizing or assembling electronics, developing software, outsourcing sensors and other components.
- Information on market geography is not available.

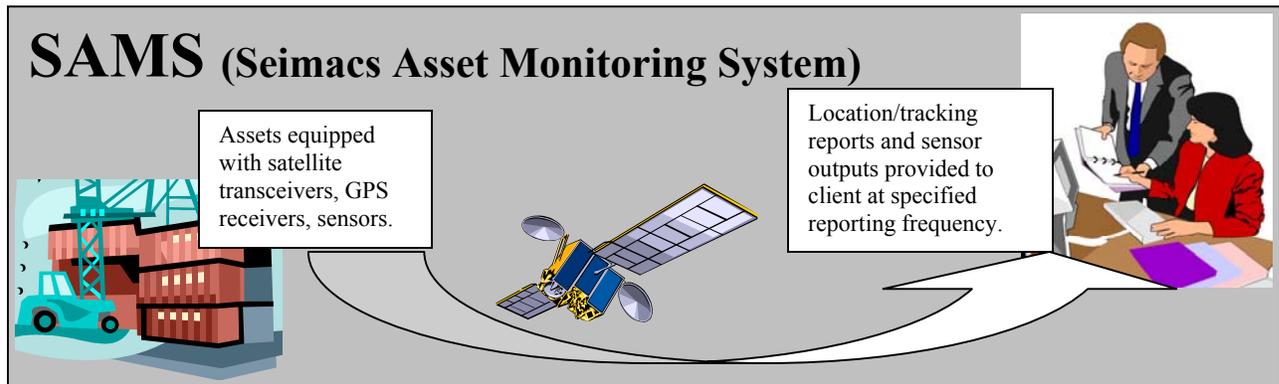
ITS Company Profile:

Seimac Limited

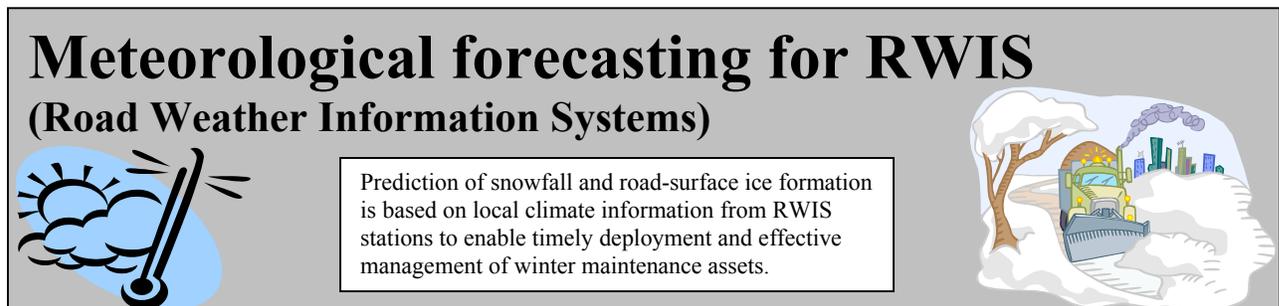
Fleet Messenger



SAMS (Seimacs Asset Monitoring System)



Meteorological forecasting for RWIS (Road Weather Information Systems)

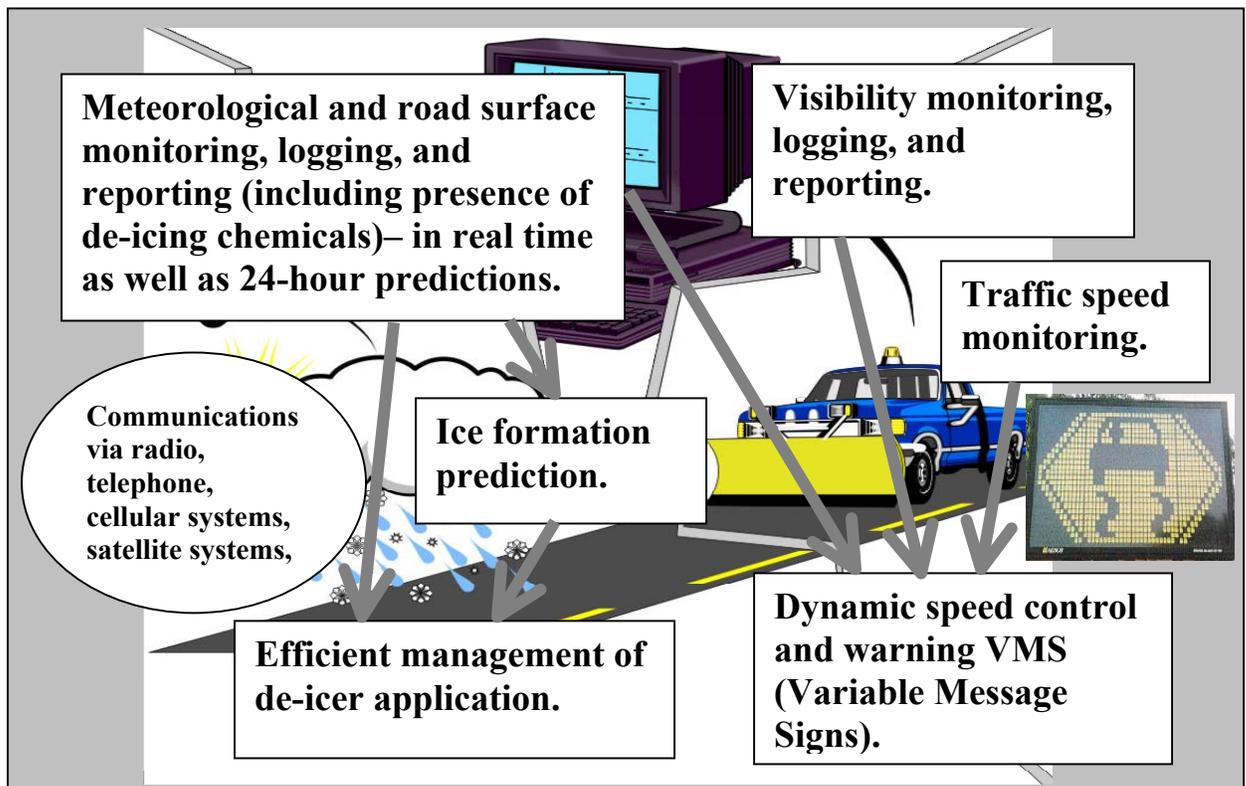


COMPANY INFO:

- Employs 6
- 6 years in business
- Headquartered in Dieppe, New Brunswick
- ANS is an integrator, assembler, installer, and project engineer for RWIS and related systems (most of their activity, however, is in field of air navigation and landing systems)
- 25% of market is in Atlantic Region, 15% is across Canada, remainder is international.

ITS Company Profile:

Approach Navigation Systems Inc.



Other capabilities in VMS (Variable Message Signs), vehicle tag locating and monitoring, traffic flow and speed monitoring, CCTV monitoring. Hazmat incident response, and related training and maintenance.

COMPANY INFO:

- Employs 15
- 14 years in business
- Headquartered in Fredericton, New Brunswick
- Geoplan provides geomatics services and collaborates on turnkey solutions.
- 25% of market is in Atlantic Region, the remainder is across Canada.

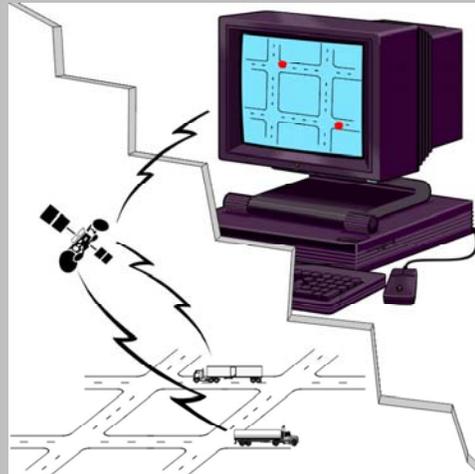
ITS Company Profile:

Geoplan Consultants Inc.

ITS-related Geomatics services

GIS/GPS requirements for fuel delivery route optimization (with University of New Brunswick).

Development of functional requirements for pupil transportation routing and scheduling system.



Development of architectures and implementation of spatially-enabled (GIS-based) data warehouse environments.

Conceptual development, standards, technical requirements, maintenance procedures, implementation strategies and civic addressing/mapping in support of enhanced 9-1-1 initiatives.

Other road network GIS and mapping requirements identification, standards, procedures, and implementation.

COMPANY INFO:

- 30 partners and associates across Canada.
- Based in Charlottetown, PEI.
- Specialize in customized e-learning solutions.
- Majority of projects in Atlantic Canada; with activities elsewhere in Canada and the U.S.

ITS Company Profile:

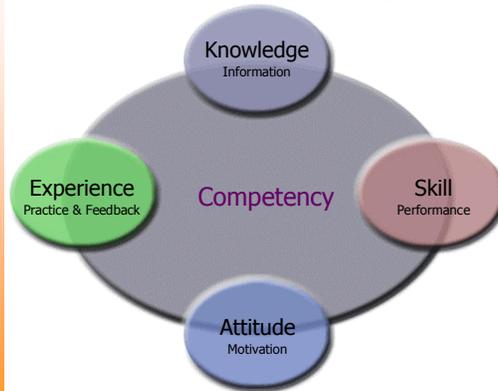
Future Learning Inc.

Computer-Based Winter Operations Training

Computer-based online training program to embrace skills in winter road operations/maintenance.

Modular and flexible to target needs of user group, with online accessibility anyplace, anytime.

Elements of a competency



Competency-based approach includes:

- Identify winter operations.
- Conduct competency analysis
- Expert input from operators and managers.
- Scan of information sources.
- Creation of competency skills chart.
- Groups skills into logical clusters for training modules.

Competency/skill approach applicable in many ITS areas:

- Driving simulation.
- ATMS/incident management.
- Fleet management/dispatch.
- Emergency preparedness.

APPENDIX R

User Services Suited for Atlantic Canada

Appendix R – User Services Suited for Atlantic Canada

User Services Suited for Atlantic Canada

	User Service	Description	Key Enabling Technologies
1.1	Traveller Information	Provides travellers with information prior to their departure to assist them in making mode choices, travel time estimates, and route decisions	Fundamental: Inductive loops, Video imaging or Radar; Driver, traveller, operator interface; Personal Communication Service or Microwave; Broadcast Communications; Fixed Wireline Communications Secondary: Environmental sensors; GPS; Route selection and guidance
1.4	Traveller Services and Reservation	Provides the traveller with access to “yellow pages” type information regarding a variety of travel-related services and facilities. The information will be accessible to the traveller in the home or office to support pre-trip planning and while enroute, either in the vehicle or at public facilities such as public transit terminals or highway rest stops.	Fundamental: Driver, traveller, operator interface; Personal Communication Service or Microwave; Fixed Wireline Communications Secondary: GPS; Route selection and guidance
2.1	Traffic Control	Manages the movement of traffic on streets and highways. It includes surface street controls such as traffic signal systems, adaptive traffic control systems and freeway control techniques such as ramp metering and lane control.	Fundamental: Inductive loops, Video imaging or Radar; UTC systems, Rotating drum, LED or Hybrid Displays; Operator interface; Fixed Wireline Communications; Lane Control and Ramp Metering Secondary: Environmental sensors; CCTV cameras; GPS; PCS or Microwave; Dedicated short range communications
2.2	Incident Management	Enhances existing capabilities to identify incidents, formulate response actions, and support initiation and ongoing co-ordination of those response actions.	Fundamental: Inductive loops, Video imaging or Radar; CCTV cameras; GPS; Rotating drum, LED or Hybrid Displays; Operator interface; Personal Communication Service or Microwave; Fixed Wireline Communications; Lane Control and Ramp Metering
2.4	Environmental Conditions Management	Provides government agencies with the capability to enhance their air quality control strategies. The function provides both wide area and roadside emissions monitoring as well as Road Weather Systems and Services. Information is used by Traffic Demand Management in the Traffic Management Centre to mitigate pollution and may be provided to enforcement agencies to compel offenders to comply with standards.	Fundamental: Vehicle classification; Environmental sensors; Operators interface; Fixed Wireline Communications Secondary: CCTV cameras; Rotating drum, LED or Hybrid Displays; Driver interface; In-vehicle sensors; Personal Communication Service or Microwave
2.5	Operations and Maintenance	Provides government agencies, as well as contractors with the resources to manage the operations and maintenance of vehicle fleet and equipment assets, and monitor and manage traffic flow around work zone areas.	Fundamental: Environmental sensors; CCTV cameras; GPS; Personal Communication Service or Microwave Secondary: Inductive loops, Video imaging or Radar; Driver monitoring sensors; UTC systems; Rotating drum, LED or Hybrid Displays; Vehicle control sensors; Driver and operators interface; In-vehicle sensors; Lane Control and Ramp Metering
2.6	Automated Dynamic Warning and Enforcement	Provides systems which warn vehicles or motorists of imminent danger, and provide electronic enforcement of traffic control and regulations.	Fundamental: Inductive loops, Video imaging or Radar; Environmental sensors; UTC systems; Rotating drum, LED or Hybrid Displays; Lane Control and Ramp Metering
3.1	Public Transport Management	Applies advanced vehicle electronic systems to various public transportation modes and uses the data generated by these modes to improve service to the public. It includes operation of vehicles	Fundamental: GPS; Operator interface; Personal Communication Service or Microwave Secondary: CCTV cameras; Driver monitoring sensors; Driver, traveller interface; In-vehicle sensors; Dedicated

Appendix R – User Services Suited for Atlantic Canada

	User Service	Description	Key Enabling Technologies
		and facilities, planning and scheduling, and personnel management.	short range communications
4.1	Toll Roads, Parking and Transit	Allows travellers to pay for transportation services by electronic means. The following functionality is provided: Electronic Toll Collection, Electronic Fare Collection, Electronic Parking Payment, and Electronic Payment Services Integration. It may also serve broad non-transportation functions and may be integrated with credit and debit cards in banking and other financial transactions.	Fundamental: Security sensors; Dedicated short range communications; Fixed Wireline Communications Secondary: GPS; Personal Communication Service or Microwave
5.1	Commercial Vehicle Electronic Clearance	Consists of both domestic and international border electronic clearances. As a vehicle approaches an inspection station or checkpoint, vehicle to roadside communications take place that identify the vehicle and make available to authorities the necessary data about credentials, vehicle weight, safety status, cargo, and occupants. Enforcement personnel can select potentially unsafe vehicles for inspection and allow safe and legal vehicles to bypass the inspection.	Fundamental: Rotating drum, LED or Hybrid Displays; Driver and operators interface; Dedicated short range communications; Fixed Wireline Communications; Lane Control and Ramp Metering Secondary: Vehicle classification; CCTV cameras; Cargo monitoring sensors; Security sensors; Route selection and guidance; In-vehicle sensors; Personal Communication Service or Microwave
5.5	Intermodal Freight Management	Provides systems which will monitor the status of freight in-transit, and at freight terminals.	Fundamental: Cargo monitoring sensors; Security sensors; GPS; Driver and operators interface; Personal Communication Service or Microwave; Dedicated short range communications Secondary: CCTV cameras
5.6	Commercial Fleet Management	Provides real-time communications for vehicle location, dispatching and tracking between commercial vehicle drivers, dispatchers, and intermodal transportation providers, thereby reducing delays for drivers and providing commercial drivers and dispatchers with real-time routing information in response to congestion or incidents. Commercial fleet management includes the management of taxi fleets.	Fundamental: CCTV cameras; GPS; Driver and operators interface; Personal Communication Service or Microwave; Dedicated short range communications Secondary: Security sensors; In-vehicle sensors; Fixed Wireline Communications
6.1	Emergency Notification and Personal Safety	Provides the capability for the user to manually initiate a distress signal for incidents like mechanical breakdown or non-injury collisions.	Fundamental: GPS; Driver, traveller, operator interface; Personal Communication Service or Microwave; Fixed Wireline Communications Secondary: Vehicle classification
6.3	Disaster Response and Management	Co-ordinates disaster response strategies from a virtual control centre, and disseminates information to agencies and individuals on traffic conditions, diversion routes etc.	Fundamental: Security sensors; Fixed wireline communications Secondary: Personal Communication Service or Microwave
6.4	Emergency Vehicle Management	Oriented towards reducing the time from the receipt of notification of an incident by an emergency services dispatcher, and the arrival of emergency vehicles on the scene. It includes emergency vehicle fleet management, route guidance to the incident scene or a suitable hospital, and pre-emption of traffic signals on an emergency vehicle's route to receive more green displays.	Fundamental: Security sensors; GPS; Driver and operators interface; Personal Communication Service or Microwave; Fixed Wireline Communications Secondary: CCTV cameras; Route selection and guidance; In-vehicle sensors; Dedicated short range communications

Appendix R – User Services Suited for Atlantic Canada

	User Service	Description	Key Enabling Technologies
8.1	Weather and Environmental Data	Provides system wide gathering, fusion, and dissemination of information on roadway weather conditions and forecasts.	Fundamental: Environmental sensors; Fixed wireline communications Secondary: Broadcast communications

APPENDIX S

Transport Canada ITS Partnerships 2002 Awards

Appendix S – Transport Canada ITS Partnerships 2002 Awards

Canada's Intelligent Transportation Systems (ITS) Proposals Selected for Funding for Fiscal Years 2002-03 to 2003-04

Funding Recipient and Project Description	Federal Funding
<p>Vancouver Port Authority: Enhance and expand the PortView software to include the movement of dangerous goods in and out of port jurisdictions in British Columbia (Phase II - CoastView).</p>	\$200,000
<p>British Columbia Ministry of Transportation: Deploy a southbound Advanced Traveller Information System (ATIS) at the Peace Arch and Pacific Highway border crossings in Surrey, British Columbia.</p> <p>Partners include B.C. Ministry of Transportation, B.C. Transportation Financing Authority, U.S. Department of Transportation, and Canada Customs and Revenue Agency.</p>	\$250,000
<p>Alberta Ministry of Transportation: Assess and develop an Advanced Traveller Information and Traffic Management Systems Blueprint for Highway 2 between Edmonton and Calgary.</p>	\$250,000
<p>Alberta Ministry of Transportation: Deploy Variable Message Signs along Highway 2 in the vicinity of Red Deer.</p>	\$250,000
<p>The City of Edmonton: Deploy a video traffic management system that provides information to various departments and a traveller information system that provides live and still image data via cable television and Internet.</p> <p>Partners include the City of Edmonton, IBI Group, EPCOR, Shaw Communications, and the City of St. Albert.</p>	\$250,000
<p>The City of Calgary: Expand the Traffic Signal Priority (TSP) System and the Automatic Vehicle Tracking System (AVTS) for Calgary Transit Buses, Phase II.</p>	\$250,000
<p>The City of Saskatoon: Modernize traffic signal technology, through the deployment of an Advanced Traffic Management System.</p> <p>Partners include the City of Saskatoon, Fortran Traffic Systems, and Naztec Inc.</p>	\$250,000
<p>The City of Toronto: Establish a Road Access and Disruption Management Program (ROADMAP) system to manage disruptions to the arterial and expressway road network in the City of Toronto.</p> <p>Partners include the City of Toronto, IBI Group, and Fortran Traffic Systems.</p>	\$250,000

Appendix S – Transport Canada ITS Partnerships 2002 Awards

Funding Recipient and Project Description	Federal Funding
<p>GO Transit: Develop and deploy a Rail Operations Information Network to monitor GO Transit’s rail operations and to distribute the information on service status to passengers, GO Transit staff, and business staff.</p> <p>Partners include GO Transit and Delcan Corporation.</p>	\$250,000
<p>GO Transit: Enhance GO Transit’s smart card-based fare collection system to prepare it for use by other transit service providers in the Greater Toronto Area.</p> <p>Partners include GO Transit, Roderick McDougal Ltd., ERG Transit Systems, and Toronto Area Municipalities.</p>	\$243,425
<p>York Region Transportation and Works Department: Design and deploy a Transit Priority System along selected transit routes operated by the region.</p> <p>Partners include the York Region and LEA Consulting Ltd.</p>	\$250,000
<p>The Regional Municipality of Durham: Develop an Incident Management System for Brock Road, the eastern terminus of Highway 407 ETR and the primary link to Highway 401 east of the City of Toronto.</p> <p>Partners include the Regional Municipality of Durham, IBI Group, Fortran Traffic Systems, Globe Network Integrators and Guild Electric.</p>	\$250,000
<p>The City of Ottawa - Transit Services: Deploy an Intelligent Transit Vehicle Subsystem to enhance vehicle tracking and schedule adherence.</p>	\$250,000
<p>Agence métropolitaine de transport: Conduct a strategic plan study on an automated real-time system for determining traffic delays.</p>	\$250,000
<p>L-P Tardif & Associés Inc: Deploy an ITS system to help school bus drivers detect children near school buses.</p> <p>Partners include the Quebec Bus Owners Association and Quebec Ministry of Transportation.</p>	\$90,385
<p>Technologies Lynx: Evaluate an automated system for detecting traffic incidents.</p> <p>Partners include Technologies Lynx, Gestion Paul R. Ouimet Inc., Citilog, and the Quebec Ministry of Transportation.</p>	\$98,700
<p>Strait Crossing Development Inc.: Deploy an electronic payment system on the Confederation Bridge.</p>	\$93,500

Total Funding = \$3,726,010

APPENDIX T

U.S. Department of Transportation Fiscal Year 2002 ITS Allocations

Appendix T – U.S. Department of Transportation Fiscal Year 2002 ITS Allocations

U.S. DOT Fiscal Year 2002 ITS Allocations

State		Amount	Rural	Border/ Corridor	Small Urban	Large Urban	Other
AK	Alaska Statewide	2500000	✓				
AL	Automated Crash Notification System, UAB, Alabama	2500000	✓				
AZ	Arizona statewide EMS	500000	✓				
AZ	University of Arizona ATLAS Center, Arizona	500000					✓
CA	Alameda-Contra Costa, California	500000				✓	
CA	Chinatown intermodal transportation center, California	1750000				✓	
CA	Inglewood, California	500000			✓		
CA	Monterey-Salinas, California	750000			✓		
CA	Port of Long Beach, California	500000				✓	
CA	Sacramento, California	3000000				✓	
CA	San Diego joint transportation operations center, California	1500000				✓	
CA	San Francisco central control communications, California	250000				✓	
CA	Santa Anita, California	300000			✓		
CA	Silicon Valley transportation management center, California	700000				✓	
CO	Southeast Corridor, Colorado	7000000		✓			
DC	Washington, DC metropolitan region	2000000				✓	
DE	Integrated transportation management system, Delaware statewide	2000000				✓	
FL	Bay County Area wide traffic signal system, Florida	500000				✓	
FL	Miami-Dade, Florida	1000000				✓	
GA	Atlanta smart corridors, Georgia	1000000				✓	
HI	Hawaii statewide	1000000	✓				
ID	Moscow, Idaho	1000000	✓		✓		
IL	Army trail road traffic signal coordination project, Illinois	300000			✓		
IL	Illinois statewide	2000000	✓				
IL	Libertyville traffic management center, Illinois	760000			✓		
IN	Hoosier SAFE-T, Indiana	2000000	✓				
IA	Iowa Statewide	562000	✓				
KS	Wichita, Kansas	1200000				✓	
KS	Kansas City, Kansas	500000				✓	
KY	Eastern Kentucky rural highway information	2000000	✓				
KY	Lexington, Kentucky	750000				✓	
KY	Statewide transportation operations center, Kentucky	2000000	✓				
LA	Houma, Louisiana	1000000	✓		✓		
LA	Shreveport, Louisiana	750000	✓		✓		
MA	Pioneer Valley, Massachusetts	1500000	✓		✓		
MD	Maryland statewide	1000000	✓		✓		
MD	Montgomery County ECC & TMC, Maryland	1000000				✓	
ME	Maine statewide (rural)	500000	✓				
MI	Detroit, Michigan (airport)	1500000				✓	
MI	Genesee County, Michigan	1000000	✓		✓		
MI	Great Lakes, Michigan	1500000	✓		✓		
MI	Lansing, Michigan	750000				✓	
MI	Macomb, Michigan (border crossing)	1000000	✓	✓		✓	
MI	St. Louis Missouri	1000000				✓	
MI	Wayne County road information management system, Michigan	1500000	✓				

Appendix T – U.S. Department of Transportation Fiscal Year 2002 ITS Allocations

State		Amount	Rural	Border/ Corridor	Small Urban	Large Urban	Other
MN	Guidestar, Minnesota	600000				✓	
MS	Harrison County, Mississippi	500000	✓		✓		
MS	Jackson Metropolitan, Mississippi	500000	✓		✓		
MS	Oxford, Mississippi	500000	✓		✓		
MS	Spillway road incident management system, Mississippi	600000	✓				
MT	Roadside animal detection test-bed, Montana	500000	✓				
NC	Durham, Wake Counties, North Carolina	500000	✓		✓		
NC	Forsyth, Guilford Counties, North Carolina	1000000	✓		✓		
ND	Fargo, North Dakota	1000000	✓		✓		
NE	Nebraska statewide	4000000	✓				
NM	Santa Teresa, New Mexico	750000	✓	✓			
NV	Las Vegas, Nevada	1450000				✓	
NV	Southern Nevada (bus)	1100000	✓				
NY	Cargo mater logistics and intermodal management, New York	1250000					✓
NY	Commercial vehicle information systems and networks, New York	450000	✓				✓
NY	I-90 connector testbed, New York	1000000	✓	✓			
NY	Long Island rail road grade crossing deployment, New York	1000000					✓
NY	New York Statewide information exchange systems, New York	500000	✓		✓		
NY	New York, New Jersey, Connecticut (TRANSCOM)	2500000				✓	
NY	North Greenbush, New York	1000000	✓		✓		
NY	Rochester-Genesee, New York	800000			✓		
OH	Central Ohio	1500000	✓		✓		
OH	Dayton, Ohio	1250000			✓		
OK	Oklahoma statewide	3000000	✓		✓		
PA	Beaver County transit mobility manager, Pennsylvania	800000	✓		✓		
PA	Carbondale technology transfer center, Pennsylvania	1000000					✓
PA	Pennsylvania statewide (turnpike)	500000	✓				
PA	Philadelphia, Pennsylvania	1033000				✓	
PA	Philadelphia, Pennsylvania (Drexel)	1500000				✓	
SC	South Carolina DOT	3000000	✓				
SD	Travel Network, South Dakota	2325000	✓				
TN	Chattanooga, Tennessee	2000000			✓		
TX	Austin, Texas	125000				✓	
TX	Brownsville, Texas	250000			✓		
TX	Texas statewide	2000000	✓				
UT	Utah statewide	560000	✓		✓		
VA	Alexandria, Virginia	750000			✓		
VA	James Madison University, Virginia	1500000					✓
VT	Rutland, Vermont	750000	✓		✓		
VT	Vermont statewide (rural)	1500000	✓		✓		
WA	Clark County, Washington	1000000			✓		
WA	Kittitas County workzone traffic safety system, Washington	450000	✓				
WA	Port of Tacoma trucker congestion notification system, Washington	200000					
WA	Washington statewide	4500000	✓		✓		
WA	Yakima County adverse weather operations, Washington	475000	✓				
WI	Superior, I-39 corridor, Wisconsin	2500000	✓	✓			
WI	Wisconsin communications network	310000	✓				
WI	Wisconsin statewide	1000000	✓				

APPENDIX U

ITS America's Ten-Year Vision for the National ITS Program: Programmatic Themes

Appendix U – ITS America’s Ten-Year Vision for the National ITS Program: Programmatic Themes

ITS America’s Ten-Year Vision for the National ITS Program: Programmatic Themes

Programmatic Theme #1: An Integrated Network of Transportation Information		
<p>That:</p> <ul style="list-style-type: none"> gathers, analyzes and stores the data and interacts with adjoining external systems 	<p>Will allow for:</p> <ul style="list-style-type: none"> improved traveller information better coordination between agencies a single payment medium for regional and national travel easier data/information-sharing to support safety, security, productivity, mobility and environmental goals 	<p>Will require:</p> <ul style="list-style-type: none"> new partnerships within and between the public and private sectors in the broadest sense, including manufacturers, carriers, service providers and travellers research into traveller behaviour, responsiveness to new information, and the type/quality of data that would be most useful assuring the public safety community of a high level of communication and interface to support emergency and disaster response
Programmatic Theme #2: Advanced Crash Avoidance Technologies		
<p>Will lead to:</p> <ul style="list-style-type: none"> development, integration and deployment of a new in-vehicle electronics to prevent crashes and reduce their severity mechanisms that determine fitness to drive selective automated enforcement 	<p>Will permit deployment of:</p> <ul style="list-style-type: none"> driver assistance products such as curve speed warning, collision warning, adaptive cruise control, stability control, traction control and lane departure warning active safety products such as forward and rear collision avoidance, intersection collision avoidance and lane departure prevention 	<p>Will require:</p> <ul style="list-style-type: none"> addressing manufacturers’ proprietary and competitive concerns research and public-private cooperation to assure that safety systems operate consistently and expectedly and do not distract the driver mounting a public outreach and education campaign on the safety, efficiency and mobility benefits of new ITS products and how to use them properly
Programmatic Theme #3: Automatic Crash & Incident Detection, Notification and Response		
<p>Will lead to:</p> <ul style="list-style-type: none"> faster and more reliable incident detection and notification improved incident response time through more efficient dispatch operations and emergency vehicle movement through traffic 	<p>Will permit:</p> <ul style="list-style-type: none"> getting help to and clearing an accident more swiftly, thus minimizing additional congestion without compromising care for the injured more appropriate response to incidents based on better information regarding the severity, location and nature of the injuries direct links emergency medical services through real-time voice, visual and data communications 	<p>Will require:</p> <ul style="list-style-type: none"> developing programs and funding mechanisms to stimulate cooperation between public and private communications organizations, the widespread deployment of onboard collision notification devices, and better progress toward a nationwide wireless enhanced 911 network

Appendix U – ITS America’s Ten-Year Vision for the National ITS Program: Programmatic Themes

Programmatic Theme #4: Advanced Transportation Management		
<p>Will permit:</p> <ul style="list-style-type: none"> • real-time surveillance and detection of incidents • infrastructure and vehicles to communicate and cooperate more effectively • rapid acquisition and analysis of flow data • real-time operational responses to current and projected flows and conditions • continuous capability during times of crisis or infrastructure destruction • prediction of near-term transportation system conditions 	<p>Will lead to:</p> <ul style="list-style-type: none"> • reduced congestion and more freely flowing traffic • safer work zones and highway-rail intersections • improved management of travel speeds in anticipation of or in reaction to changing weather conditions • clearing incidents more quickly, thereby reducing congestion 	<p>Will require:</p> <ul style="list-style-type: none"> • research of information technologies to create a smarter infrastructure, including better sensors, using vehicles as sources of traffic and road condition information, and opportunities for promoting vehicle-infrastructure cooperation • coordinating and funding the transformation of research results into guidelines, best practices and standards • establishing a mechanism for cooperation among public agencies, private industry and the research community to pursue research on Cooperative Vehicle-Highway Automation Systems • R&D that focuses on automating commercial road maintenance, and public transportation vehicles in dedicated guideways

APPENDIX V

ITS America's Ten-Year Vision for the National ITS Program: Enabling Themes

Appendix V – ITS America’s Ten-Year Vision for the National ITS Program: Enabling Themes

ITS America’s Ten-Year Vision for the National ITS Program: Enabling Themes

Enabling Theme #1: Creating a Culture of Transportation Systems Management and Operations		
<p>Will permit:</p> <ul style="list-style-type: none"> • a multi-disciplinary approach to transportation system management and operations • high levels of cooperation among neighbouring jurisdictions • an expanded focus on performance and customer service • new forms of cooperation between the public and private sector 	<p>Will lead to:</p> <ul style="list-style-type: none"> • a broader set of alliances among product and service suppliers focusing on interoperability issues • management and control facilities coordinated locally, regionally and/or nationally across modes by both private and public service providers • a shift in transportation infrastructure and vehicle-related service providers away from product and facility outputs to performance improvement outcomes 	<p>Will require:</p> <ul style="list-style-type: none"> • focusing research on how the technologies or applications can be coordinated and integrated, as well as on technologies to address specific problems • providing more help to the ITS and planning communities to adjust to an operations orientation, including practical methods of handling ITS capital and operating-resource issues
Enabling Theme #2: New Public Sector Roles, Relationships and Funding		
<p>Will permit:</p> <ul style="list-style-type: none"> • cooperative relations between public and private sector organizations, that promote safety, efficiency and productivity of travel • travelers to benefit from more seamless management of the transportation system 	<p>Will lead to:</p> <ul style="list-style-type: none"> • combining public and private investments to create a mix of technology and operational infrastructure not obtainable through public or private sponsorship alone • alternative pricing strategies to make collecting revenues simpler 	<p>Will require:</p> <ul style="list-style-type: none"> • rethinking methods for procurement and management of private sector services by public agencies • encouraging the creation of regional operating organizations • studying and modernizing the workforce requirements to support emerging organizations and institutions
Enabling Theme #3: New Federal Policies and Initiatives to Achieve Extensive Private Sector Product Deployment		
<p>The private sector will:</p> <ul style="list-style-type: none"> • provide products and services to satisfy government, business and consumer requirements • partner with governments in the development or delivery of transportation services • be innovators in designing new approaches to transportation issues through R&D of new products, systems and services, relationships and business 	<p>Will lead to:</p> <ul style="list-style-type: none"> • revising procurement rules to allow more efficient purchase of ITS products by government agencies • exploring the best methods for delivering accurate and useful real-time information • the sharing of information among all relevant parties while maintaining the privacy of individual drivers 	<p>Will require:</p> <ul style="list-style-type: none"> • enhanced outreach to underscore the value of mobile information and communications systems in providing safer and more efficient travel • greater public access • early adoption to create a lower-risk environment for adoption, generating early sales volume and helping to lower the cost for the general public of adopting ITS technology • possibly introducing creative user incentives to those that purchase ITS products and services • barrier removal
Enabling Theme #4: A Focus on Human Factors		
<p>Will permit:</p> <ul style="list-style-type: none"> • the rollout of safe and usable ITS products and services for all users • reducing the liability 	<p>Will lead to:</p> <ul style="list-style-type: none"> • determining the level of workload associated with secondary tasks • understanding the attention, workload and distraction issues for professional versus 	<p>Will require:</p> <ul style="list-style-type: none"> • making the study of transportation/ITS human factors an issue of national concern and importance • creating a national coalition of public

Appendix V – ITS America’s Ten-Year Vision for the National ITS Program: Enabling Themes

<p>concerns that designers and manufacturers face</p>	<p>private vehicle drivers</p> <ul style="list-style-type: none">• harmonization of external and in-vehicle signs and signals• orchestrating consistency of in-vehicle warnings across all vehicles• presentation of traveler information in a way that maximizes usefulness and minimizes confusion	<p>and private stakeholders to take responsibility for exploring and setting guidelines for ITS-related human factors</p>
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APPENDIX W

Potential ITS Providers by User Service Bundles

Appendix W – ITS User Service Bundles

The following pages contain tables summarizing the current and potential involvement of Atlantic Canada companies in the different ITS User Service Bundles.

The table's columns are defined as:

- '*Years*' refers to the number of years the company has been in existence.
- '*Employees*' refers to the number of people employed by the company.
- '*% out of Region*' refers to the percentage of the company's business that is outside of the Atlantic region.
- '*% out of Canada*' refers to the percentage of the company's business that is outside of Canada.
- '*Applicability to ITS*' refers to how easily applicable the work done by the company is to fields in ITS. A solid circle (●) indicates that the majority of work done by the company is in ITS. A partially filled circle (◐) indicates that a minority of work done by the company is in ITS, and/or that the majority of what is being done is easily transferred to ITS. An empty circle (○) indicates that the company does no ITS work, but that transferring the results to ITS is feasible.
- '*Research/Product Development*' refers to whether or not the company's work relates to research and/or product development.
- '*Manufacturing*' refers to whether or not the company's work relates to manufacturing.
- '*Installation/System Integration*' refers to whether or not the company's work relates to installation and/or system integration.
- '*Consulting*' refers to whether or not the company performs consulting-related services.

Company stability

The first two variables '*Years*', and '*Employees*', are the primary indicators of company stability. The more established a company is (i.e. the more years its been in operation), and the larger the number of employees it has, the less likely it is to dramatically change its output level. In addition to the primary indicators, the percentage of work done outside of the Atlantic region/Canada also influences stability. Generally, the larger the company's market, the less susceptible it is to regional ups and downs in the economy. Finally, company's involved in the manufacturing sector are likely more stable because of the large capital investment that is required.

Extra-regional foothold

The percentage of work performed outside of the Atlantic region and Canada are the two primary factors representing extra-regional foothold. Companies with a significant amount of previous work outside of the region will have an easier time expanding their Canadian and International presence in ITS. In

Appendix W – ITS User Service Bundles

addition to the two factors mentioned, the number of years the company has been in existence can be representative of the company's readiness to enter the Canadian and International markets.

Appendix W – ITS User Service Bundles

User Service Bundle 1: Traveller Information Services

- Consists of user services designed to use advanced systems and technologies to manage information to help drivers decide when to drive and the route to drive, as well as opportunities to reserve rides and other traveller services.

Company	Years	Employees	% out of Region	% out of Canada	Applicability to ITS	Research/ Product Development	Manufacturing	Installation/ System Integration	Consulting
Accesstec Inc	7	27	100	65	●	✓		✓	✓
Delphi Systems Inc.	9	5	60	25	●				✓
Engineering Technologies Canada Ltd.	6	5	0	0	○	✓			✓
Enseignes Imperial Signs	39	400	15	*	○	✓		✓	✓
Geoplan Consultants Inc.	14	15	30	0	○	✓			✓
J. J. MacKay Canada Ltd.	40	150	*	*	●	✓	✓		✓
SGE Group Inc.	30	120	25	12	●	✓		✓	
SVG Consulting Inc.	2	2	60	35	●				✓
xwave	4	2800	50	20	●	✓	✓	✓	✓

User Service Bundle 2: Traffic Management Services

- Consists of user services designed to use advanced systems and technologies to improve the efficiency and operation of the existing surface transportation infrastructure and create safer conditions for travellers.

Company	Years	Employees	% out of Region	% out of Canada	Applicability to ITS	Research/ Product Development	Manufacturing	Installation/ System Integration	Consulting
ADI Group	46	200	15	0	●				✓
Approach Navigation Systems Inc.	6	6	75	60	○	✓		✓	✓
C-CORE	27	57	80	35	○	✓			✓
CARIS	22	150	*	65	●	✓			✓
Consolidated Technologies Ltd.	17	8	90	80	○	✓			✓
Delphi Systems Inc.	9	5	60	25	●				✓
DPL Group	17	80	80	50	●	✓		✓	
Engineering Technologies Canada Ltd.	6	5	0	0	○	✓			✓
Enseignes Imperial Signs	39	400	15	*	○	✓		✓	✓
Geoplan Consultants Inc.	14	15	30	0	○	✓			✓
Intrignia Solutions Inc.	2	3	*	*	○	✓		✓	✓
Jacques Whitford Environment	30	900	60	35	○				✓
Kinek Technologies	2	55	100	100	●	✓		✓	✓
Pinter Consulting Services Inc.	8	1	20	20	○	✓			✓
SGE Group Inc.	30	120	25	12	●	✓		✓	
Seimac Limited	24	55	*	*	●	✓	✓	✓	
Spatial Decision Support Systems Ltd.	8	3	0	0	○	✓			✓
SVG Consulting Inc.	2	2	60	35	●				✓
Trip Data & Safety Management Inc.	23	5	95	40	○	✓			✓

● = majority of work done is in ITS

○ = minority of work done is in ITS, and/or is easily transferred to ITS

○ = company does no ITS work, but transferring the results to ITS is feasible

* = no data available

Appendix W – ITS User Service Bundles

User Service Bundle 3: Public Transport Services

- Relates to public transportation, which includes urban, suburban and rural transit in fixed route, route deviation and demand-responsive modes and operated by bus, heavy rail, light rail, commuter rail and van or carpool or shared ride taxi. All forms of short distance transportation not involving a single occupant automobile should benefit from these services.

Company	Years	Employees	% out of Region	% out of Canada	Applicability to ITS	Research/ Product Development	Manufacturing	Installation/ System Integration	Consulting
ADI Group	46	200	15	0	●				✓
Atlantic Data Group	25	25	70	10	○	✓		✓	✓
Baseline Business Geographics Inc.	8	5	30	15	○	✓		✓	✓
CARIS	22	150	*	65	●	✓			✓
Delphi Systems Inc.	9	5	60	25	●				✓
DPL Group	17	80	80	50	●	✓		✓	
Geoplan Consultants Inc.	14	15	30	0	○	✓			✓
Intrignia Solutions Inc.	2	3	*	*	○	✓		✓	✓
Kinek Technologies	2	55	100	100	●	✓		✓	✓
Pinter Consulting Services Inc.	8	1	20	20	○	✓			✓
Seimac Limited	24	55	*	*	●	✓	✓	✓	
Spatial Decision Support Systems Ltd.	8	3	0	0	○	✓			✓
SVG Consulting Inc.	2	2	60	35	●				✓
Trip Data & Safety Management Inc.	23	5	95	40	○	✓			✓

User Service Bundle: Electronic Payment Services

- Consists of one user service, Electronic Payment Services. This service bundle provides travellers with a common electronic payment medium for all transportation modes and services.

Company	Years	Employees	% out of Region	% out of Canada	Applicability to ITS	Research/ Product Development	Manufacturing	Installation/ System Integration	Consulting
AnyWare Group Inc.	2	25	100	95	○	✓		✓	✓
Delphi Systems Inc.	9	5	60	25	●				✓
J. J. MacKay Canada Ltd.	40	150	*	*	●	✓	✓		✓
SGE Group Inc.	30	120	25	12	●	✓		✓	
SVG Consulting Inc.	2	2	60	35	●				✓

Appendix W – ITS User Service Bundles

User Service Bundle 5: Commercial Vehicle Operations

- Is concerned primarily with freight movement and focuses on services which improve private sector fleet management and freight mobility, and which streamline government/regulatory functions.

Company	Years	Employees	% out of Region	% out of Canada	Applicability to ITS	Research/ Product Development	Manufacturing	Installation/ System Integration	Consulting
Advatek Systems Inc.	15	8	10	10	○	✓	✓	✓	✓
ALT Group Inc.	6	8-10	*	25	○	✓			✓
AMIRIX Systems Inc.	21	50	80	20	●	✓		✓	
Beltek Systems Design Inc.	12	20	100	75	●	✓		✓	✓
Compusult Ltd.	17	32	90	75	●	✓		✓	✓
Delphi Systems Inc.	9	5	60	25	●				✓
DPL Group	17	80	80	50	●	✓		✓	
Geonet Technologies Inc.	8	15	60	20	●	✓			✓
Geoplan Consultants Inc.	14	15	30	0	○	✓			✓
International Communications and Navigation Ltd.	6	23	85	55	○	✓		✓	✓
PEI Innovations Inc.	3	6	95	85	●	✓	✓	✓	
Seimac Limited	24	55	*	*	●	✓	✓	✓	
SVG Consulting Inc.	2	2	60	35	●				✓
Trip Data & Safety Management Inc.	23	5	95	40	○	✓			✓

User Service Bundle 6: Emergency Management Services

- Contains user services that relate directly to the detection, notification and response to emergency and non-emergency incidents which take place on or adjacent to the roadway.

Company	Years	Employees	% out of Region	% out of Canada	Applicability to ITS	Research/ Product Development	Manufacturing	Installation/ System Integration	Consulting
Canpolar East Inc.	20	1	85	85	○	✓			
Delphi Systems Inc.	9	5	60	25	●				✓
Geonet Technologies Inc.	8	15	60	20	●	✓			✓
Geoplan Consultants Inc.	14	15	30	0	○	✓			✓
Spatial Decision Support Systems Ltd.	8	3	0	0	○	✓			✓
SVG Consulting Inc.	2	2	60	35	●				✓
xwave	4	2800	50	20	●	✓	✓	✓	✓

Appendix W – ITS User Service Bundles

User Service Bundle 7: Vehicle Safety and Control Systems

- Relates primarily to the safety goals of ITS by having a direct impact on diminishing both the number and severity of collisions.

Company	Years	Employees	% out of Region	% out of Canada	Applicability to ITS	Research/ Product Development	Manufacturing	Installation/ System Integration	Consulting
Canpolar East Inc.	20	1	85	85	○	✓			
DPL Group	17	80	80	50	●	✓		✓	
Delphi Systems Inc.	9	5	60	25	●				✓
International Communications and Navigation Ltd.	6	23	85	55	○	✓		✓	✓
Intrignia Solutions Inc.	2	3	*	*	○	✓		✓	✓
Measurand Inc.	9	12	100	80	○	✓	✓		
PEI Innovations Inc.	3	6	95	85	●	✓	✓	✓	
SVG Consulting Inc.	2	2	60	35	●				✓

User Service Bundle 8: Information Warehousing Services

- Includes the gathering, fusion, and dissemination of weather and environmental data. It also includes the archiving and sharing of historical transportation data.

Company	Years	Employees	% out of Region	% out of Canada	Applicability to ITS	Research/ Product Development	Manufacturing	Installation/ System Integration	Consulting
Compusult Ltd.	17	32	90	75	●	✓		✓	✓
Consolidated Technologies Ltd.	17	8	90	80	○	✓			✓
Delphi Systems Inc.	9	5	60	25	●				✓
Satlantic Inc.	12	40	95	85	○	✓	✓	✓	
SVG Consulting Inc.	2	2	60	35	●				✓

APPENDIX X

Niche Areas

Appendix X – Niche Areas

Niche Areas

User Sub-Service	Description	Potential Providers	Other Comments
2.4.3 RWIS (Road Weather Information Systems)	Early detection and forecasting of environmental hazards (i.e. icy roads, dense fog, etc.). Based on this, one can more effectively deploy road maintenance resources, issue general traveller advisories, improve emergency management and response, and support location specific warnings to drivers.	<ul style="list-style-type: none"> • Approach Navigation Systems Inc.; • Jacques Whitford Environment; • Seimac Limited 	Identified for internal deployment.
2.5.1 Infrastructure Maintenance Management	Automated management of fleets of maintenance, construction, or special service vehicles (i.e. snowplows, sand/salt trucks, etc.). User Sub-Service also includes the infrastructure-based systems that monitor vehicle location, vehicle status, and the output of sensors (such as environmental or road surface sensors) that are mounted on the vehicles. Also included are the systems within the maintenance vehicles that create this information and send it to the control centre or control system. The infrastructure systems perform vehicle dispatch, routing, and asset management.	<ul style="list-style-type: none"> • Approach Navigation Systems Inc. • CARIS • DPL Group • Geoplan Consultants Inc. • Intrignia Solutions Inc. • Jacques Whitford Environment • Kinek Technologies • Pinter Consulting Services Inc. • Seimac Limited • Spatial Decision Support Systems Ltd. • Trip Data & Safety Management Inc. 	New user service under the U.S. Architecture.
3.11 Transit Vehicle Tracking (also known as Automated Vehicle Location, or AVL)	Track transit vehicle's real-time schedule adherence and updates the transit system's schedule accordingly. Vehicle position may be determined either by the vehicle (i.e. using GPS) or may be determined directly by infrastructure (i.e. beacons, sensors). The Transit Management Subsystem processes this information, updates the transit schedule and makes real-time schedule information available to the Information Service Provider Subsystem via a wireline link. The Transit Management Subsystem processes this information, updates the transit schedule and makes real-time schedule information available to the information Service Provider Subsystem via a wireline link.	<ul style="list-style-type: none"> • CARIS • DPL Group • Geoplan Consultants Inc. 	Driven by American Disability Act which calls for transit investment to improve the accessibility and security of transit systems.
3.1.2 Transit Fixed-Route Operations	Performs automatic driver assignment and monitoring, as well as vehicle routing and scheduling for fixed-route services, replacing conventional manual logging. Transit vehicle data is integrated with that from other modes (e.g. rail, ferry, air) to provide the public with integrated and personalized dynamic schedules.	<ul style="list-style-type: none"> • ADI Group • Baseline Business Geographics Inc. • CARIS • Intrignia Solutions Inc. • Kinek Technologies • Pinter Consulting Services Inc. • Spatial Decision Support Systems Ltd. • Trip Data & Safety Management Inc. 	Driven by American Disability Act which calls for transit investment to improve the accessibility and security of transit systems.
5.5.1 Freight In-Transit	This User Sub-Service covers the ability to track and monitor inter-modal containers and inter-	<ul style="list-style-type: none"> • Advatek Systems Inc. • AMIRIC Systems Inc. 	Driven by increased demand for homeland

Appendix X – Niche Areas

User Sub-Service	Description	Potential Providers	Other Comments
Monitoring	modal freight shipments anywhere in the transportation system and supports the monitoring of the container and its contents during the entire pickup-transport-drop-off period. This information is provided to freight customers, fleet managers, and logistics service providers.	<ul style="list-style-type: none"> • Compusult Ltd. • DPL Group • Geonet Technologies Inc. • International Communications and Navigation Ltd. • PEI Innovations Inc. • Seimac Limited 	security.
5.6.1 Fleet Administration	Tracks the vehicle location, itineraries, and fuel usage at the Fleet and Freight Management Subsystem using a cell based or satellite data link and the pre-existing wireless infrastructure. Vehicles have processors to interface to sensors (e.g. fuel gauge) and to the cellular data link. The Fleet and Freight Management Subsystem can send dispatch instructions, and can process and respond to requests for assistance and general information from the vehicle. The User Sub-Service also provides connectivity to intermodal transportation providers using the existing wireline infrastructure.	<ul style="list-style-type: none"> • ALT Group Inc. • DPL Group • International Communications and Navigation Ltd. • Geoplan Consultants Inc. • Seimac Limited 	
6.4.1 Emergency Response Management	Includes computer-aided dispatch systems, emergency vehicle equipment, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. The Emergency Management Subsystem would include hardware and software for tracking the emergency vehicles. Public safety, traffic management, maintenance management and many other allied agencies may each participate in the co-ordinated response managed by this sub-service.	<ul style="list-style-type: none"> • Geonet Technologies Inc. • Geoplan Consultants Inc. • xwave 	Driven by increased demand for homeland security.