



GAS TAX AGREEMENT

Outcomes Report 2009-2012

ACKNOWLEDGEMENTS

The Outcomes Report for the period January 1st, 2009 to December 31st, 2012 is made pursuant to the Canada – British Columbia – UBCM Agreement on the Transfer of Federal Gas Tax Revenue (Gas Tax Agreement).

Photo credits: Central Okanagan Regional District, City of Armstrong, City of Chilliwack, City of Penticton, City of Prince George, City of Victoria, Cowichan Valley Regional District, District of Lake Country, District of West Kelowna, Regional District of Nanaimo, Town of Golden, Town of Smithers, TransLink, Village of Queen Charlotte.

Graphic Designer: Laframboise Classique Designs

Published by the Union of British Columbia Municipalities
525 Government St.
Victoria, B.C. V8V 0A8

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EXECUTIVE SUMMARY

The Union of BC Municipalities (UBCM) Gas Tax Outcomes report for the period of 2009-2012 reports on the achievement of environmental sustainability outcomes of cleaner water, cleaner air, and reduced greenhouse gas (GHG) emissions as a result of federal Gas Tax funds invested in local government environmentally sustainable infrastructure projects across British Columbia.

During this period, over \$407 million in Gas Tax funding has been invested in \$764 million worth of completed infrastructure projects in communities throughout BC in the areas of active transportation, local roads and bridges, public transit, community energy systems, solid waste management, wastewater, and water.

Some of the highlights of this Outcomes Report show that Gas Tax funding from 2009-2012 has resulted in:

- Over 56,000 tonnes of reduced greenhouse gas (GHG) emissions;
- Over 51,000 cubic meters of water conservation;
- Over 79,000,000 kilowatt hours of clean energy generation per year;
- 188.5 tonnes of reduced criteria air contaminant (CAC) emissions;
- 379 km of new or improved paths and trails;
- 96 km of new or improved road and bridge construction;
- 550 transit vehicle purchases;
- 50 community energy retrofits to public buildings;
- 78 km of new or improved water and wastewater pipes;
- 4,900 water meter installations; and
- 9 boil water advisories lifted.

The second part of this report provides the results of an assessment of BC's local governments on meeting their commitment to undertake Integrated Community Sustainability Planning, as well as document the types of ICSP processes that have occurred over the term of the GTA. An ICSP is any plan or planning activity that is consistent with four elements: long term thinking, broad in scope, integration and collaboration.



The results shows that since 2005, BC's local governments have taken a number of approaches to achieving ICSP and confirms BC's local governments continued commitment to strong planning practices.

Background

The Agreement on the Transfer of Federal Gas Tax Revenues (GTA) is a tri-partied agreement amongst the federal and provincial governments and UBCM. Signed in 2005, the GTA has committed more than \$1.63 billion in federal funding for environmentally sustainable infrastructure and capacity building projects that benefit BC's local governments.

The GTA provides communities in BC with a source of stable, predictable, and long-term funding towards environmentally sustainable municipal infrastructure to help address infrastructure needs in the areas of active transportation, local roads and bridges, public transit, community energy systems, solid waste management, wastewater, and water. Sustainable infrastructure projects must also result in one of the key environmental sustainability outcomes of cleaner water, cleaner air, or reduced greenhouse gas emissions. Gas Tax funding can also be used to support local government capacity building and ICSP projects.

In BC, the GTA is delivered to local governments and eligible recipients through a number of programs including the Community Works Fund, the Innovations Fund, the General Strategic Priorities Fund, the Regionally Significant Projects Fund, and the Tier 3 Strategic Priorities Fund.

Since 2005, more than 2,000 projects have benefited from Gas Tax funding in communities across BC.



METHODOLOGY

This report provides outcomes and output data for 315 federally Gas Tax funded infrastructure projects completed between January 1, 2009 and December 31, 2012. This report continues from the first UBCM Outcomes Report (2005-2008) and is guided by the indicators established through the Gas Tax National Performance Measure Framework (PMF). The PMF was designed to identify causal links between outputs and outcomes and provide a rationale that sustainable infrastructure project outputs demonstrate progress towards the achievement of a sustainability outcome.

Project data was collected through an online submission form sent to eligible recipients between December 2013 and January 2014. The form requested information on every project completed between 2009 and 2012 with over \$100,000 in Gas Tax funds invested. This threshold of \$100,000 was implemented to focus the report on larger infrastructure investments, while still accounting for over 95% of total Gas Tax investments by eligible recipients during this period.

The online submission form requested a range of outcome and output data for each identified project and was tailored to each project investment category. Of the 323 submission distributed, 315, or 97.5%, were completed and returned. Once collected, data measuring the environmentally sustainability outcomes and outputs was analyzed and reported for each project category. The submission form also requested information on additional qualitative benefits including economic, environmental, health, and social.

The outcomes and outputs detailed in this report are based on data that has been submitted by eligible recipients. In several instances, eligible recipients provided data regarding project outputs but were unable to provide data relating to the outcomes of cleaner water, cleaner air, and reduced GHG emissions. In instances where project outcomes were not provided, calculation methodologies using project outputs were used to determine additional outcomes. As a result, the outcomes achieved by these projects may be greater than listed in this report.

For projects that did not report GHG emissions reductions, calculation methodologies from the Ministry of Community, Sport and Cultural Development were applied to determine emissions reductions. The methodologies used for these calculations can be found in Appendix A while a breakdown of the outcomes and outputs captured in the submissions forms is listed in Table 1. A list of the number projects completed by each local government is attached in Appendix B.

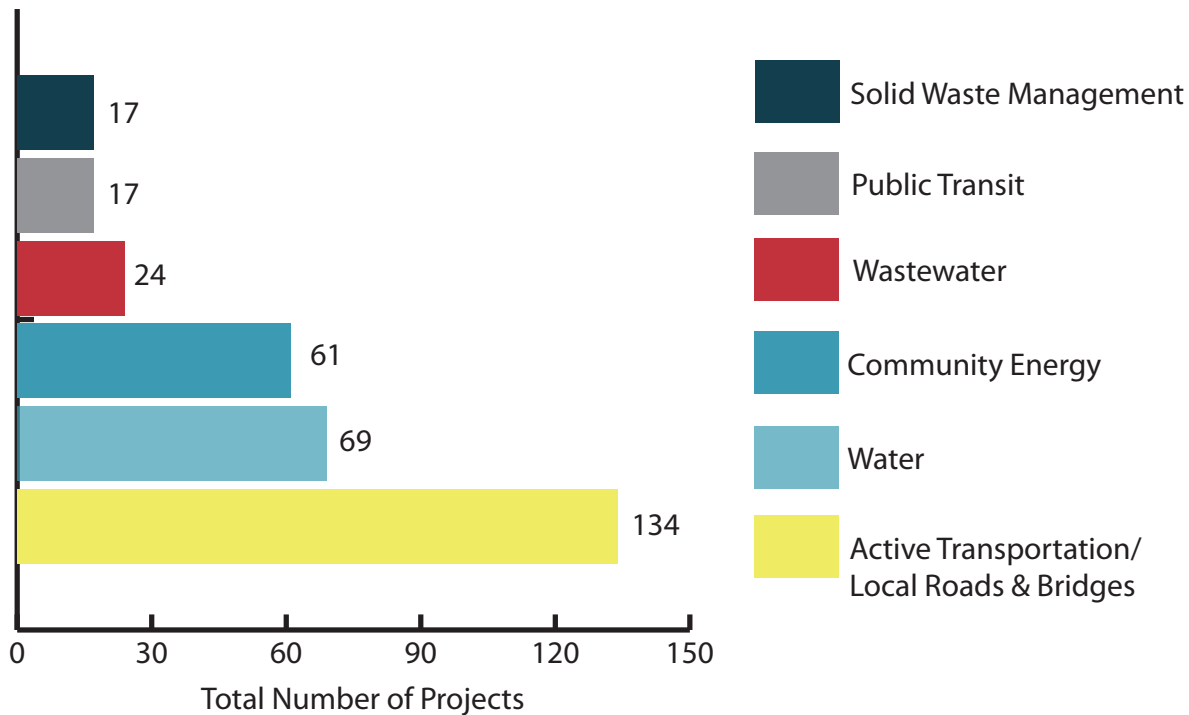
Table 1: Outcomes/Outputs Measured in Online Submission Forms by Project Category

Project Category	Outcomes/Outputs Measured
Active Transportation/Local Roads and Bridges	<ul style="list-style-type: none"> • GHG emissions reduction • Length of new or improved infrastructure • Vehicle use reduction
Public Transit	<ul style="list-style-type: none"> • GHG emissions reduction • CAC emissions reduction • Energy use reduction • Number of replaced or improved vehicles • Increase in capacity • Number of new or improved facilities • Number of kms of new or improved transit lines/lanes
Community Energy	<ul style="list-style-type: none"> • GHG emissions reduction • Energy use reduction • Clean energy generation • Fleet vehicles litres of fuel reduced through fleet vehicle replacement
Solid Waste Management	<ul style="list-style-type: none"> • GHG emissions reduction • Energy use reduction • Waste diversion • Increased number of users • Travel distance reduction • New landfill or expansion of existing landfill
Wastewater	<ul style="list-style-type: none"> • GHG emissions reduction • Energy use reduction • Increase in treatment capacity • Length of new or replaced pipe • Number of new connections
Water	<ul style="list-style-type: none"> • GHG emissions reduction • Energy use reduction • Increase in storage capacity • Increase in treatment capacity • Number of users/users receiving improved service • Length of new or replaced pipe • Number of new water meters • Number of new connections

OVERVIEW OF PROJECT OUTCOMES/OUTPUTS

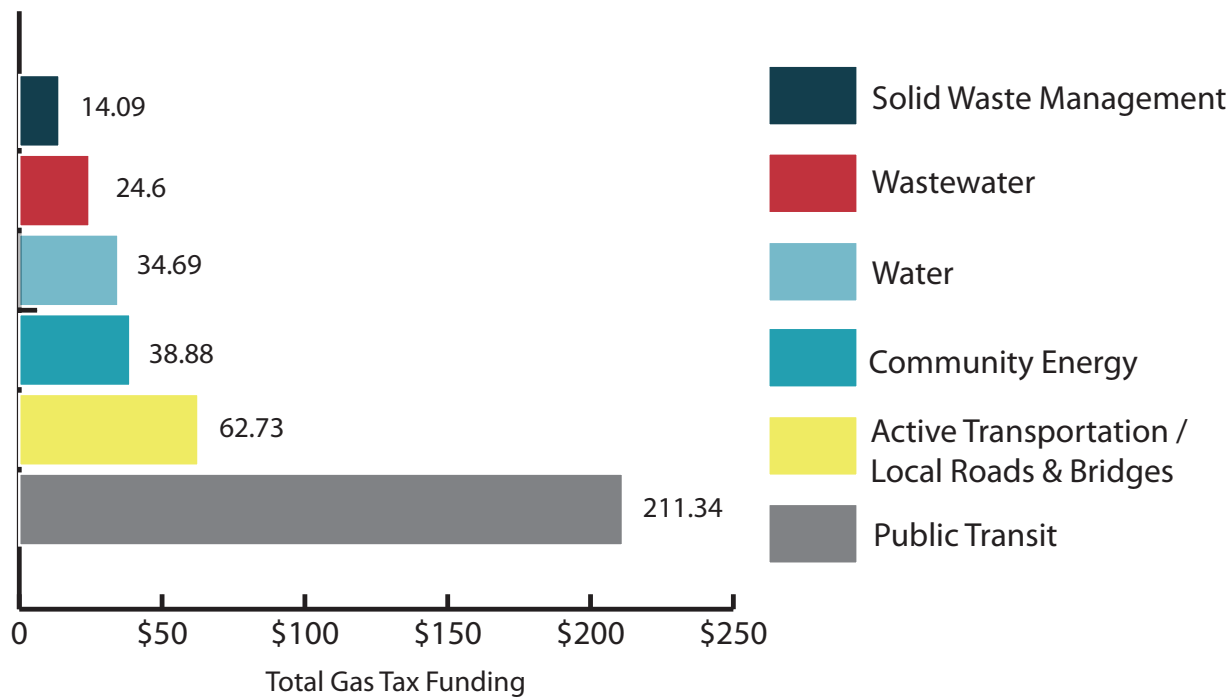
Between 2009 and 2012, federal Gas Tax funds were invested in 323 local infrastructure projects that received more than \$100,000 in funding. Figure 1 below provides a breakdown of projects completed during this period that received more than \$100,000 in Gas Tax funding by project category.

Figure 1: Completed Projects Recieving over \$100,000 in Gas Tax Funding by Category: 2009-2012



In total, these projects have received over \$386 million in reported Gas Tax funding. Public transit projects received the majority of reported Gas Tax funding with TransLink projects accounting for over \$202 million in reported Gas Tax spending. Figure 2 provides a breakdown of reported Gas Tax spending on completed projects during this period that received more than \$100,000 in Gas Tax funding.

Figure 2: Total Gas Tax Funding for Projects over \$100,000 by Project Category: 2009-2012



Cleaner Water

In total, 87 submissions reported cleaner water as a project outcome. Cleaner water was achieved through improved water collection and treatment methods, improved wastewater treatment methods, improved ditching, and improved solid waste management practices that reduced contamination of nearby water sources.

Of those submissions reporting cleaner water, 58 reported improvements in the quality of drinking water and 9 boil water advisories were reported as lifted, some of which had been in place for up to 15 years. Water projects also increased the capacity of communities throughout BC to provide quality water to local residents. In total, 469 new connections were installed.

Additionally, projects receiving Gas Tax funding have undertaken measures to reduce water consumption to ensure the sustainability of this resource. In total, these projects have resulted in reduced water usage of over 51,000 cubic meters.

Cleaner Air

Gas Tax funds have also been used to contribute to the environmental sustainability objective of cleaner air. Cleaner air outcomes were achieved primarily through reductions in the use of fossil fuels that contributed to criteria air contaminant (CAC) emissions. CAC emissions reductions were primarily achieved through replacements of public transit infrastructure with more fuel efficient models. Table 2 below outlines CAC emissions that have been achieved as a result of projects receiving Gas Tax funding.



Table 2: Reported CAC Emissions Reductions: 2009-2012

Air Contaminant	Emissions Reductions (tonnes/year)
Hydrocarbons	6.16
Carbon Monoxide	19.15
Sulphur Oxides	146.56
Particulate Matter	16.63

Reduced GHG Emissions

In addition to cleaner water and cleaner air, Gas Tax funds were used to invest in environmentally sustainable infrastructure that allowed local governments to reduce their GHG emissions. Eligible recipients have reported that Gas Tax funded projects have contributed to GHG emissions reductions of more than over 56,000 tonnes of CO₂ per year.

GHG emissions reductions have been achieved through investments in alternatives to vehicle use such as public transit, bike lanes, and sidewalks that have resulted in decreased vehicle dependency. GHG emissions have also been reduced through green energy retrofits that have resulted in decreased energy use in buildings across BC. Table 3 below outlines energy use reductions that have occurred as a result of these projects.

Table 3: Annual Energy Use Reductions and Clean Energy Production: 2009-2012

Energy Type	Data
Energy Reduction	
Diesel (Litres/year)	2,187,691.22
Electrical (kilowatt hours/year)	1,828,550
Natural Gas (GJ/year)	17,882
Propane (Litres/year)	96,099.95
Clean Energy Production (kilowatt hours/year)	89,350,627

Another source of GHG emissions reductions is from the production of clean energy such as biomass, geothermal, hydroelectricity, and solar. Clean energy projects reduce dependency and use of fossil fuels and as a result GHG emissions are avoided. Clean energy production projects have produced the equivalent of 89,350,627 kilowatt hours (kWh) per year.

Additional Outcomes

In addition to the environmental sustainability objectives of cleaner water, cleaner air, and reduced GHG emissions, submissions for projects receiving Gas Tax funding have reported additional economic, environmental, health, and social benefits. Local governments have reported a variety of additional benefits such as increased environmental awareness, increased health and safety, improved traffic flow, and reduced noise pollution. These benefits have directly contributed to improvements in quality of life in communities across BC.



Photo Credit: Cowichan Valley Regional District: Lambourn Estates Water and Sewer Upgrades

OUTCOMES/OUTPUTS BY INVESTMENT CATEGORY

Active Transportation/Local Roads and Bridges

This project category had the largest number of projects completed between January 2009 and December 2012. Active transportation projects included the installation of bike lanes, sidewalks, and trails that provided communities with healthy alternatives to vehicle use. Local road and bridge projects included improvements to road infrastructure that, in many instances, reduced travel distances and thus vehicle use.

Projects in this category were designed to contribute to the achievement of environmental sustainability objectives of cleaner water, cleaner air, and reduced GHG emissions through improvements to ditching, road surfaces, and the provision of alternative transportation to reduced vehicle dependency. In total, 134 projects were completed in this category resulting in reported reduced CO₂ emissions of 1,948 tonnes being reported.

Active Transportation/Local Roads and Bridges		
Completed Projects	134	
Total Gas Tax Funds (\$)	62,730,104	
Total Project Costs (\$)	157,549,270	
Outcomes/Outputs	Data	
GHG Reductions (tonnes of CO ₂ /year)	1,948	
Travel Reduced/Avoided (kilometers/year)	5,734,443	
Diesel Use Reduction (Litres/year)	3001	
Projects Reporting Cleaner Water	11	
Infrastructure Construction	Data	Completed Projects
Active Transportation (kilometers)	379.649	123
<i>Bike Lanes (kilometers)</i>	141.098	53
<i>Multi-Use Paths/Trails (kilometers)</i>	156.972	38
<i>Pedestrian Bridges (kilometers)</i>	1.136	10
<i>Sidewalks (kilometers)</i>	80.443	37
Road Construction (kilometers)	96.316	69
<i>Bridges (kilometers)</i>	.818	8
<i>Existing Road Improvements (kilometers)</i>	65.339	43
<i>Gravel Roads Paving (kilometers)</i>	3.487	3
<i>New Road Construction (kilometers)</i>	25.882	11
<i>Roundabouts (kilometers)</i>	.79	4
Improved Ditching (kilometers)	26.112	23

Many of the projects in this category reported additional benefits other than those listed above. Projects such as bike paths, sidewalks, and trails commonly reported benefits such as increased health and safety. Road construction projects such as bridges and the paving of gravel roads commonly reported benefits such as improved air quality from reductions in road dust and reduced travel distances.

Additional Benefits	
Type of Indicator	Projects Reporting Benefit
Economic	127
Environmental	131
Health	121
Social	44

Project Profile: Prince George Cameron Street Bridge

In 2009, the replacement of the Cameron Street Bridge in Prince George was completed. In addition to replacing the bridge, the project improvements to the intersection at River Road and the intersection of North Nechake/PG Pulpmill Road where a roundabout was put in place allowing for the free flow of traffic and reduction in traffic signals.

The project resulted in annual greenhouse gas emissions of approximately 1,425 tonnes of carbon dioxide due to a 3,140,100 kilometer reduction in vehicle use. These figures were obtained through a traffic count performed prior to the bridge closing in 2005.

Additional benefits of this project included increased safety as commercial vehicles were provided with a route through town that does not go through residential neighbourhoods. The bridge connects trail systems between residential and commercial areas to encourage residents to commute to work without using their vehicle.



Photo Credit: City of Prince George: Cameron Street Bridge Replacement

Public Transit

Investments in public transit projects accounted for approximately 55% of Gas Tax spending between 2009 and 2012 with TransLink accounting for more than \$202 million for funding in the Greater Vancouver Regional District. Investments in public transit infrastructure have resulted in cleaner air and reduced GHG emissions by encouraging people to seek alternatives to vehicle use.

Funding in this category went to a variety of projects including the construction of bus stops and transit facilities. However, investments in buses and transit services continue to be the primary focus of public transit investment. Buses and other vehicles were purchased to increase transit system capacities across BC by 19,891 spaces. Capacity increases allowed transit systems to offer new routes and more frequent service to existing routes that make it more convenient for users and provides an improved alternative to vehicle use.

Public Transit	
Completed Projects	17
Total Gas Tax Funds (\$)	211,339,224
Total Project Costs (\$)	394,828,062
Outcomes/Output	Data
GHG Emissions Reductions (tonnes of CO ₂ /year)	5,708
Reduction in CAC Emissions (tonnes/year)	188.53
<i>HC (tonnes/year)</i>	<i>6.19</i>
<i>CO (tonnes/year)</i>	<i>19.15</i>
<i>NOx (tonnes/year)</i>	<i>146.56</i>
<i>PM (tonnes/year)</i>	<i>16.63</i>
Estimated Reduction in Fuel Use (Litres/year)	2,185,142
Vehicle Purchases	564
<i>Buses</i>	<i>547</i>
<i>Seabus</i>	<i>1</i>
<i>Skytrain Cars</i>	<i>14</i>
<i>Trolley</i>	<i>2</i>
System Capacity Increase (number of spaces)	19,891
Transit Facility Construction	
<i>Bus Stops</i>	<i>34</i>
<i>Transit Exchanges</i>	<i>2</i>

Each project submission in this category reported additional benefits such as increased accessibility for individuals with disabilities, improved traffic flow, and reductions in noise pollution. Transit systems in Greater Vancouver Regional District and Capital Regional District were able to purchase additional vehicles that allowed for the expansion of transit services in these areas and improved services for local residents. Additionally, transit stations were built in Kamloops and Kelowna that allowed for improved transit services and the accommodation of future service expansion.

Additional Benefits	
Type of Indicator	Projects Reporting Benefit
Economic	17
Environmental	17
Health	17
Social	17

Project Profile: TransLink

Between 2009 and 2012, TransLink has invested over \$202 million in Gas Tax Funds for a range of transit projects designed to increase system capacity and/or replace older vehicles with more fuel efficient models to reduce emissions of GHG and air contaminants.

Since 2005, Gas Tax funding has significantly advanced the technology of the region’s vehicle fleet, replacing the existing fleet with new, lower emission buses, and substantially expanded the fleet available to increase transit service levels. New customized vehicles provide commuters with an accessible transit alternative to vehicle use. Not only are these investments successfully reducing travel times and increasing transit ridership, but they are also contributing to the economic environmental, and social wellbeing of Metro Vancouver region.



Photo Credit: TransLink: Conventional Bus – Fleet Expansion

Highlights of TransLink Projects Include:

- Increased ridership of 50 million annual transit trips between 2009 and 2012;
- Improved fuel efficiency as a 26% increase in ridership resulted in only a 5% increase in energy use;
- The addition of SkyTrain vehicles to the network replaces diesel buses with virtually zero-emission vehicles and is the principal reason why the portion of energy use from renewable sources grew to 26 per cent from 19 per cent¹;
- Approximately 11,000 tonnes of fleet GHG emissions have been cut;
- GHG emissions have dropped from a high of 66.9 grams per passenger kilometer to 57.5 grams per passenger kilometer, a 14 per cent improvement;
- Reductions in harmful criteria air contaminant emissions that negatively impact air quality; and
- Improved fuel efficiency from new transit vehicles have resulted in reduced diesel fuel consumption by 1.6 million litres, saving roughly \$2 million, and reduced GHG emissions².



¹2012 has not been calculated. Data will be provided in 2013 Annual Report (being released in March-April 2014)

²http://www.translink.ca/~media/documents/about_translink/corporate_overview/sustainability/translink_2012_sustainability_report.ashx

Community Energy

In this category 61 projects were completed between 2009 and 2012. Community energy projects include facilities that generate clean energy such as solar, hydroelectricity, or geothermal, and retrofits to existing buildings to reduce electricity, natural gas, and propane usage. As a result, community energy projects have directly contributed to cleaner air and reduced GHG emissions objectives.

The majority of projects completed in this category were retrofits to existing buildings. Energy consumption is reduced through measures such as improved insulation and replacing older heating and cooling systems with more efficient models. In total 50 retrofits were completed, of which seven also involved the installation of geothermal units or solar panels that enabled the building to further reduce its electrical, natural gas, and propane usage.

Community Energy Projects by Type

Type	Completed Projects
Biomass	3
Geothermal	10
Hydro	1
Retrofit	50
Solar	4

Community Energy

Completed Projects	61	
Total Gas Tax Funds (\$)	38,880,776	
Total Project Costs (\$)	81,517,610	
Outcomes/Output	Data	Completed Projects
GHG Emissions Reductions (tonnes of CO ₂ /yr)	18,650	61
Natural Gas Energy Use Reduction (GJ/yr)	28,437	21
Electrical Energy Use Reduction (kilowatt hours/year)	2,758,986	29
Propane Use Reduction (Litres/year)	98,728	3
Water Use Reduction (Litres/year)	2,800,000	2
Clean Energy Production (kilowatt hours/year)	89,350,627	18

Many of these projects have produced additional benefits as well. Each project in this category reported that environmental benefits such as reduced dependency on fossil fuels and improved environmental practices. Retrofit projects reduced fossil fuel use through the installation of appliances (primarily heating and cooling) and insulation that resulted in greater efficiency. Economic benefits from community energy projects included reduced electricity and fuel costs.

Additional Benefits	
Type of Indicator	Projects Reporting Benefit
Economic	59
Environmental	61
Health	35
Social	38

Project Profile: Lake Country Hydroelectric Generating Station

In 2009, construction of the Lake Country Hydroelectric Generating Station was completed. The generating station utilizes the municipality's existing water supply infrastructure to generate renewable energy. The Micro-hydroelectric generating station provides clean, emission-free, renewable energy through the existing waterworks equivalent to meet the electricity needs of 400 homes. The generating capacity of the hydroelectric project is 1,100 kilowatts and the average annual energy production is expected to be 3,871,000 kilowatt hours (kWh).

The production of this renewable energy displaced the need for consumption of energy through gas and coal combustion. At the expected average annual production of 3,871,000 kWh, a reduction of 1,936 tonnes of CO₂ per year will be achieved. With the assumption that this generating plant will be in operation for at least 35 years (although hydroelectric plants generally last longer than this), this amounts to a total CO₂ reduction of approximately 67,760 tonnes over the life of this project.



Photo Credit: District of Lake Country: Hydroelectric Generating Station

There were 17 solid waste management projects completed between 2009 and 2012. These projects enhanced solid waste practices through landfill improvements, waste collection improvements, and the implementation of community solid waste and recycling programs. In total, 47,572 households were provided with new or improved solid waste management services such as curbside recycling pickup, solid waste disposal, and upgrades to transfer stations and recycling facilities.

Gas Tax funds were used by municipalities to reduce their CO₂ emissions by 29,533 tonnes per year. The majority of these reductions were from reduced vehicle use resulting from improved waste collection methods. Additionally, 34.76 tonnes of methane (the equivalent of 730 tonnes of CO₂) was captured through improvements to gas collection methods at landfills.

Solid Waste Management	
Completed Projects	17
Total Gas Tax Funds (\$)	14,086,692.42
Total Project Costs (\$)	19,186,246.16
Outcomes/Output	Data
GHG Emissions Reductions (tonnes of CO ₂ /year)	29,533
Methane Capture (tonnes of CO ₂ equivalent)	730
Waste Diversion (tonnes/year)	9,200
Diesel Use Reduction (liters/year)	2,549
Travel Reduced (kilometers/year)	5,800
Infrastructure Improvements	
<i>Garbage /Recycling Trucks</i>	<i>21</i>
<i>Trickling Filter</i>	<i>1</i>
<i>Vertical Landfill Gas Wells</i>	<i>8</i>
<i>Weigh Scale</i>	<i>1</i>

In addition to these outcomes and outputs, many of the projects derived additional economic, environmental, health, and social benefits. All projects in this category reported environmental benefits such as reduced littering due to increased solid waste collection bins, reduction in air pollutants, cleaner water due to improved filtration methods, better waste management practices, and increased environmental awareness. Additional reported benefits included reduced maintenance costs from the replacement of solid waste disposal vehicles, reduced health risks associated with the emergency mass disposal of animals, and improved life expectancy for landfills.

Additional Benefits	
Type of Indicator	Projects Reporting Benefit
Economic	10
Environmental	17
Health	16
Social	9

Project Profile: Regional District of Nanaimo - Solid Waste Transfer Station Upgrade

The Regional District of Nanaimo is improving its practices for managing solid waste by upgrading the Church Road solid waste transfer station. Upgrades to the transfer station were completed in 2010 to handle increasing volumes of solid waste and recyclables. Additionally, the facility was retrofitted and expanded according to LEED Gold certification standards.

Upgrades to the facility included the construction of an additional building to accommodate commercial vehicles bringing garbage and food. The building was designed to reduce the draw on potable water supply through the planting of vegetative roofs and drought resistant landscaping, along with installing rain water harvest tanks, low flow toilets, and on site treatment of floor washing water including grey water from sinks and showers.

Highlights of this project included:

- GHG emissions reduction of 2,000 tonnes of CO₂ per year from organic diversion;
- Additional GHG emission reductions resulting from reduced trips to the regional landfill;
- Waste diversion of 3,500 tonnes per year;
- Expansion of the curbside waste collection program to include residential food waste collection from 24,190 homes;
- Requiring that the curbside collection fleet be outfitted with split body (two-stream) collection trucks; and
- Improved public safety through separation of commercial and self-haul customer traffic, and safety features designed to protect the public from falls into recycling bins.



Photo Credit: Regional District of Nanaimo: Solid Waste Transfer Station Upgrade

Wastewater

Local governments have invested Gas Tax funds to upgrade plants, improve treatment methods, minimize the potential for contamination, and increase treatment and collection capacities. As a result, almost 25 kilometers of pipe has been installed or improved and 469 new connections have been installed.

The benefits of cleaner water extend to the local environment. Large wet weather related events, such as flooding, have the potential to overwhelm local government infrastructure that is designed to minimize contamination. Investments in wastewater infrastructure allow local governments to increase their capacity to respond to these events. These projects have also reduced the number of wastewater overflows that pollute fresh water sources.

Wastewater	
Completed Projects	24
Total Gas Tax Funds (\$)	24,603,804.76
Total Project Costs (\$)	29,905,192.25
Outcomes/Outputs	Data
Projects Reporting Cleaner Water	18
GHG Emissions Reduction (tonnes of CO ₂ /year)	23.33
Reduction in Energy Use (kWh/year)	192,000
Length of New or Improved Pipe (meters)	24,967.5
Number of New Connections	469
Increase in Treatment Capacity (m3/day)	16,180

Many of the projects in this category reported additional benefits. Each project reported environmental benefits such as reduced sewage leakage through the replacement of pipes and improved effluent quality due to improved treatment methods. Other benefits such as reduced odour and increased property values were also reported.

Additional Benefits	
Type of Indicator	Projects Reporting Benefit
Economic	17
Environmental	24
Health	21
Social	17

Project Profile: Penticton Advanced Wastewater Treatment Plant Upgrade and Lee Avenue Force Main

Completed in 2011, upgrades to the Penticton Advanced Wastewater Treatment Plant have allowed more properties in the region to be added to the wastewater collection system. The state-of-the-art facility includes innovative technology that converts greenhouse gas emissions into electricity and recover heat for reuse in the facility.

The project includes several features to reduce greenhouse gas emissions and energy consumption, such as the installation of a micro-turbine, heat recovery technology, and a centrifuge sludge-handling unit. Additional improvements to the Lee Avenue lift station and force main will also allow reclaimed water to be used for irrigation throughout the south part of the City, reducing demand for treated domestic water.

Highlights from this project include:

- 50% increase in treatment capacity (27 ml/day);
- 33% reduction in landfill waste (220 loads/year);
- 83% reduction in chlorine use (23,800 kg/year);
- 100% reduction in sulphur dioxide consumption (8,000 kg/year); and
- 25% reduction in energy use (135,000 kWh/year).



Water

A secure water supply is one of the most important services for any community. Gas Tax funds are used by local governments to support a range of projects that improve and/or extend drinking water systems.

Infrastructure investments in this category have directly resulted in cleaner water for BC communities. New and rehabilitated water pipes and water meters have resulted in improved treatment processes, distribution systems, and improved water quality. Improved water infrastructure has also provided other environmental benefits such as reduced leakage and water loss, increased conservation, less soil erosion, and improved conditions for plant, fish, and animal habitats.

Water	
Completed Projects	69
Total Gas Tax Funds (\$)	34,685,459
Total Project Costs (\$)	81,426,789
Outcomes/Outputs	Data
Projects Reporting Cleaner Water	58
Permanent Boil Water Advisories Lifted	9
GHG Emissions Reductions (tonnes of CO ₂ /year)	9.13
Reduction in Water Use (Litres/year)	51,849,600
Reduction in Energy Use (kilowatt hours/year)	302,180
Increased Storage Capacity (m3/day)	687,766
Increased Treatment Capacity (m3/day)	279,086
Length of New or Replaced Pipes (meters)	53,062
New Water Meters	4,924
New Connections	469
Residents Receiving Improved Treatment	101,516

Many of the projects in this category reported additional benefits such as improved fire protection, reduced chlorine use, and improvements to fish habitats. Other benefits include improved consistency and water quality through treatment method enhancements such as the addition of ultraviolet filtration. These benefits have resulted in increased confidence in local water facilities for citizens across in communities across BC.



Additional Benefits	
Type of Indicator	Projects Reporting Benefit
Economic	38
Environmental	50
Health	59
Social	59

Project Profile: Cowichan Valley Lambourn Estates Water and Sewer Upgrades

Upgrades to the Cowichan Valley Lambourn Estates water and sewer systems were completed by 2011 to improve water treatment and sewer systems to bring the existing systems into regulatory compliance.

Upgrades to the water system included the addition of Greensand filtration, UV disinfection, water treatment plant, dedicated supply line from the water treatment plant to the reservoir, and the addition of a new well. The sewer system was improved through the addition of a new membrane sewage treatment plant, a standby generator, electrical service upgrades, UV disinfection, pre-screening and electronic controls, and increased monitoring.

With the completion of the upgrades, the water and sewer systems accommodated the 137 existing single family residents plus an additional 50 lots through a capacity increase of 9.3 litres per second in potable water to the system. Additionally, the sewage treatment capacity was increased by 63 cubic meters per day. As a result of these upgrades, an overall increase in effluent quality from Class C to Class A occurred.



Photo Credit: Cowichan Valley Regional District: Lambourn Estates Water and Sewer Upgrades

INTEGRATED COMMUNITY SUSTAINABILITY PLANNING

In addition to sustainable infrastructure projects, Gas Tax funding has also been invested into planning processes in British Columbia that have strengthened local governments ability to develop and implement integrated community sustainability planning (ICSP).

Since 2005, there have been over 382 capacity building projects totaling over \$41 million funded by federal Gas Tax funds. These planning activities range in scope from the development of a stand alone ICSP, to other documents or processes such as Official Community Plans (OCP) and Regional Growth Strategies (RGS).

The purpose of ICSP is to advance the environmental, economic, social, and cultural sustainability of British Columbia's communities. Essentially, ICSP is any plan or planning activity that is consistent with the following key sustainability elements:

- Long-term thinking (local governments consider extending the planning horizon beyond the normal 3-5 year planning timeframe);
- Broad in scope (local governments consider the communities' environmental, economic, social and/or cultural sustainability);
- Integration (local governments better co-ordinate their approach to community sustainability through linkages between different types of plans); and
- Collaboration (local governments engage in the public and other partners in planning processes to support community sustainability).³

Under the GTA, all local governments that receive Gas Tax funding have committed to undertake an ICSP, either individually or as part of a regional strategy. In order to fulfill this requirement, a local government must demonstrate over the term of the GTA that plan updates or new plans undertaken consider the sustainability elements.

³Canada-British Columbia-Union of British Columbia Municipalities, "Capacity Building and Integrated Community Sustainability Program Guide," 2005.

To determine if local governments had met their ICSP commitments set out in the GTA, as well as document the types of ICSP processes undertaken in BC, UBCM contracted the services of Fraser Basin Council to conduct a study on the status of BC local governments ICSP practices.

Research results were compiled from each of the local governments that had received federal Gas Tax funding from UBCM (174 of the 189 BC local governments), as to whether an ICSP or similar process had been completed, was underway or being considered. For completed processes, the type of plan or process in which the results had been captured was documented. For those local governments without an ICSP underway, a timeline was indicated where the process was being considered was documented.

Results

In the years since the GTA was signed, there has been a great deal of activity among BC local governments in applying ICSP principles. Local governments have taken a number of approaches to achieving ICSP, from relatively simple statements in more traditional land use planning documents, to comprehensive analyses and accompanying strategies. To date all BC local governments (municipalities and regional districts) have met or have a clear timeline for meeting their ICSP requirement. Local governments have met this commitment through a variety of approaches which take into consideration the size of their community and their capacity to undertake such planning activities.

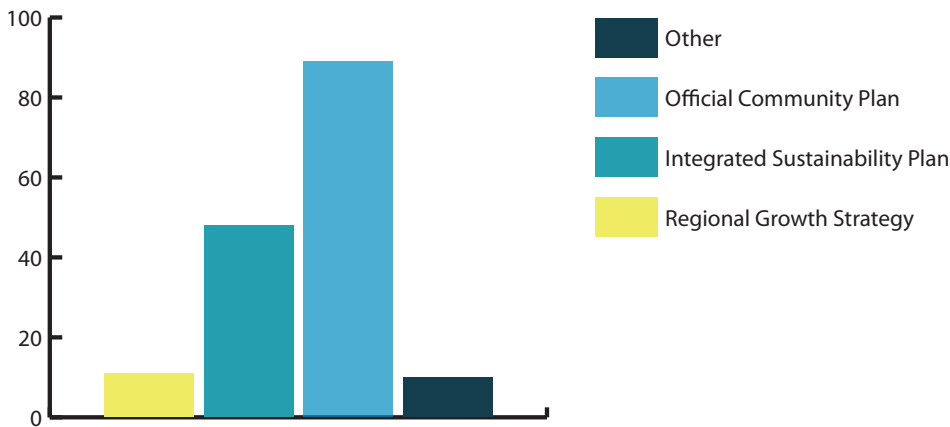
In reviewing the types of planning processes BC local governments have developed ICS planning were through Official Community Plans (OCP), Regional Growth Strategies (RGS), Integrated Sustainability Plans (ICSP) and other planning documents that have considered sustainability principles.

Municipalities have met their ICSP commitment using a range of approaches. More than one-third (35%) have a stand-alone sustainability plan or strategy; slightly more than two-thirds (60%) have used an OCP to apply sustainability principles; and 5% have used other plans or policy documents. Those with a stand-alone sustainability plan also have an OCP based on the strategy and/or reflecting the direction provided therein.

For regional districts, RGSs are the most common means (37%) by which sustainability planning principles are applied, followed by rural OCP's (33%), and checklists, policy statements, and other specific plans (18%). Another 11% have stand-alone regional sustainability strategies.

Figure 3 provides a breakdown of the planning processes by type that BC local governments have developed using the ICSP principles.

Figure 3: Types of Planning Processes Developed by Local Governments



Community Profile: Town of Smithers

The Town of Smithers Sustainable Resiliency Plan focuses on integrating existing plans and strategies to build community resiliency and sustainability. The integration of these seven plans and strategies is intended to demonstrate the commonalities, support the synergies and discuss any conflicts within the community. The plan consists of an introduction to explain the concept of sustainable resilient communities, defines sustainability and resiliency, summarizes the seven plans and strategies, provides 10 recommendations and a conclusion.

Recommendations found in the Smithers Sustainable Resiliency Plan include:

- Further investigate the renewable energy opportunities within the forest industry;
- Provide information to the community and promote regional mining, forestry and tourism opportunities, including training; and
- Establish a climate action reserve fund to finance. recommendations in the corporate and community energy emissions plans such as reducing GHG emissions through investments in environmentally sustainable infrastructure projects.
- Promote building energy retrofits in all sectors, including residential, commercial, industrial and institutional.

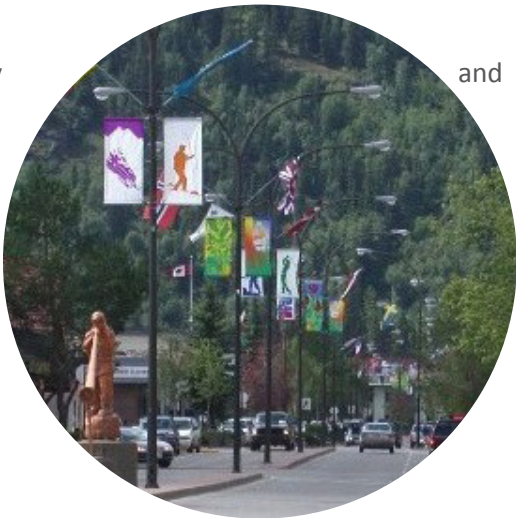


Photo Credit: Town of Smithers: Downtown Smithers

CONCLUSION

The Gas Tax outcomes results point to the success of the GTA at not only meeting the environmental sustainability objectives outlined in the agreement, but also at improving the lives of British Columbians by investing in services that they use on a daily basis. The GTA has contributed to cleaner water, cleaner air, and reduced GHG emissions in communities across the province through investments of over \$407 million in infrastructure improvements for active transportation, local roads and bridges, public transit, community energy, solid waste management, wastewater, and water systems projects in communities throughout BC between 2009 and 2012.

Beyond the quantitative achievements of investments in environmentally sustainable infrastructure projects, the GTA contributed to economic, environmental, health, and social improvements in BC communities. The GTA has also ensured that local governments develop integrated community sustainability plans to advance their long-term sustainability.

Project Category	Calculation Methodology ¹
Active Transportation/ Local Roads and Bridges	<ul style="list-style-type: none"> Non-Recreation Bike Paths and Bike Lanes: GHG emissions are calculated by estimating the number of commuters who will use the bike facility instead of driving, and then calculating the resulting emissions avoided. Roads and Bridges: GHG emissions are calculated by estimating the number of kilometers of vehicle use avoided and then calculating the resulting emissions avoided. In instances where only the number of users was known, GHG emissions reductions were calculated using benchmark data from the GHG EA Guide
Public Transit	<ul style="list-style-type: none"> Vehicle Replacement: GHG emissions reductions are calculated by comparing the fuel efficiency of the new vehicle to that of the original.
Community Energy	<ul style="list-style-type: none"> Renewable Energy System: GHG emission reductions will depend on the amount of conventional energy avoided as a result of using a renewable energy system. The GHG emissions factor depends on the kind of heating system that is already in place, or that would have been used if the renewable heating system was not installed (i.e. electric, natural gas, or propane). Building Retrofit: In most cases, energy savings are determined through a feasibility study. However, if not available, savings estimates can be calculated using existing consumption and percentage savings. Most retrofit projects will save between 10-30% of a building's energy.
Solid Waste Management	<ul style="list-style-type: none"> GHG reductions are calculated based on the estimated reduction in methane production at landfills, reduced vehicle use, and reduced fuel use from the replacement of waste disposal vehicles with more fuel efficient models.
Wastewater	<ul style="list-style-type: none"> GHG reductions are calculated based on the estimated reduction in wastewater flow and the resulting reductions in energy use.
Water	<ul style="list-style-type: none"> GHG reductions are calculated based on the estimated reduction in water flow and the resulting reductions in energy use.

¹BC Ministry of Community Development, Greenhouse Gas Emission Assessment Guide: For British Columbia Local Governments, 2008.

Appendix B: Completed Infrastructure Projects between 2009 and 2012 by Local Government

Community	Completed Projects	Gas Tax Funding (\$)
100 Mile House, District of	1	252,933
Abbotsford, City of	9	3,698,389
Armstrong, City of	1	1,956,887
Ashcroft, Village of	2	289,044
Barriere, District of	1	102,681
BC Transit	1	5,663,028
Bulkley-Nechako Regional District	3	370,558
Burns Lake, Village of	2	666,686
Campbell River, City of	2	1,210,857
Capital Regional District	3	2,666,322
Cariboo Regional District	8	2,303,752
Central Kootenay Regional District	2	275,000
Central Okanagan Regional District	4	1,442,216
Central Saanich, District of	1	569,880
Chetwynd, District of	2	340,351
Chilliwack, City of	3	2,551,805
Coldstream, District of	3	824,674
Columbia-Shuswap Regional District	3	2,744,814
Colwood, City of	1	460,000
Comox Valley Regional District	3	1,599,013
Courtenay, City of	3	789,254
Cowichan Valley Regional District	10	2,980,768
Cranbrook, City of	3	1,257,040
Dawson Creek, City of	3	714,091
Duncan, City of	1	104,333
East Kootenay Regional District	1	500,000
Esquimalt, Township of	2	5,645,815
Fernie, City of	2	654,758
Fort St. James, District of	2	404,622
Fort St. John, City of	2	645,947
Fraser Lake, Village of	1	346,813
Fraser Valley Regional District	6	1,106,672
Fraser-Fort George Regional District	4	908,977
Fruitvale, Village of	2	452,505
Gibsons, Town of	3	577,624
Golden, Town of	4	1,104,494
Harrison Hot Springs, Village of	1	140,864
Hazelton, Village of	1	365,473
Highlands, District of	1	130,000
Houston, District of	1	395,000
Invermere, District of	1	616,374
Kamloops, City of	8	12,102,045

Community	Completed Projects	Gas Tax Funding (\$)
Kaslo, Village of	1	111,648
Kelowna, City of	12	7,109,713
Kent, District of	1	150,000
Keremeos, Village of	1	116,840
Kimberley, City of	4	603,699
Kitimat, District of	1	411,550
Kitimat-Stikine Regional District	5	1,925,000
Ladysmith, Town of	4	939,156
Lake Country, District of	2	3,492,323
Lantzville, District of	1	254,017
Lillooet, District of	1	563,202
Logan Lake, District of	1	198,030
McBride, Village of	2	448,579
Metchosin, District of	1	300,000
Montrose, Village of	1	203,733
Nakusp, Village of	1	885,000
Nanaimo Regional District	4	8,499,005
Nanaimo, City of	2	527,375
Nelson, City of	2	607,808
New Denver, Village of	1	226,470
New Hazelton, District of	1	221,000
North Cowichan, District of	16	2,853,175
North Okanagan Regional District	3	10,804,149
North Saanich, District of	2	676,234
Northern Rockies Regional Municipality	1	897,305
Okanagan-Similkameen Regional District	2	330,000
Oliver, Town of	4	789,888
Osoyoos, Town of	3	611,526
Peace River Regional District	2	589,652
Pemberton, Village of	2	382,643
Penticton, City of	2	13,876,923
Port Alberni, City of	5	1,520,633
Port Alice, Village of	1	259,631
Port Clements, Village of	1	219,535
Port Edward, District of	1	258,753
Port Hardy, District of	1	172,850
Port McNeill, Town of	1	790,812
Powell River Regional District	1	155,620
Prince George, City of	11	9,763,851
Queen Charlotte Village	1	120,958
Quesnel, City of	2	587,565
Radium Hot Springs, Village of	1	108,000

Community	Completed Projects	Gas Tax Funding (\$)
Revelstoke, City of	2	294,662
Richmond, City of	1	2,037,400
Saanich, District of	6	4,900,460
Salmo, Village of	1	161,144
Salmon Arm, City of	2	979,447
Sechelt, District of	2	469,119
Sicamous, District of	1	270,000
Silverton, Village of	1	114,454
Skeena-Queen Charlotte Regional District	1	231,696
Smithers, Town of	2	389,707
Spallumcheen, Township of	2	332,539
Sparwood, District of	1	122,190
Squamish, District of	1	750,000
Squamish-Lillooet Regional District	1	223,144
Sunshine Coast Regional District	8	2,909,772
Tahsis, Village of	1	115,475
Taylor, District of	4	1,448,034
Telkwa, Village of	1	115,305
Terrace, City of	9	1,334,485
Thompson-Nicola Regional District	6	926,045
Trail, City of	1	1,533,645
TransLink	9	202,382,025
Valemount, Village of	2	290,059
Vancouver, City of	1	9,470,000
Vanderhoof, District of	2	325,426
Vernon, City of	7	2,133,585
Victoria, City of	4	4,044,990
View Royal, Town of	4	8,730,430
Wells, District of	1	502,114
West Kelowna, District of	6	1,491,993
Whistler, Resort Municipality of	1	918,365
Williams Lake, City of	3	882,143

