"Ride the Wind!" - A Success Story

Introduction

Calgary Transit operates an extensive integrated transit network consisting of light rail transit (referred to as the C-Train), and regular bus and community shuttle service.

The existing transit system encompasses 32 kilometres of C-Train track, 33 C-Train Stations, more than 11,000 park and ride stalls and a fleet 100 light rail vehicles and 760 buses which carry approximately 75 million revenue passengers annually.

Project Summary

The City of Calgary's Ride the Wind! Project that was launched September, 2001, made Calgary's C-Train the first wind-powered public transit system in North America.

The first Light Rail Transit system to operate on wind-generated electricity since the days of sail, the initiative project reduces carbon dioxide emissions by 26,000 tonnes a year - the amount that would be produced by creating electricity through the burning of coal or natural gas. The system is 100 per cent emissions free.

This exciting innovative venture is a public/private partnership with ENMAX Energy Corporation and Vision Quest Windelectric Inc. as the other participating principles.

More than 187,000 people ride the Calgary C-Train every weekday and do so proudly knowing the City of Calgary has taken this major initiative to dramatically reducing the impact of urban transportation on our environment.

Calgary Transit planners are confident and hopeful that other cities around the globe will eventually follow Calgary's lead to explore cleaner energy options.
**Background**

In 1994, Calgary officially recognized that global climate change is a serious concern by signing the Canadian Declaration on Climate Change and the Urban Environment.

The declaration calls for stabilizing carbon monoxide emissions at 1990 levels by 2000. To support this initial step, the city joined the Partners for Climate Protection Program—a joint initiative of the Federation of Canadian Municipalities and the International Council for Local Environmental Initiatives.

The city also became a participant in the Voluntary Challenge and Registry, a non-profit partnership between industry and governments across Canada that promotes a voluntary approach to addressing climate change.

Calgary City Council in February, 1996, approved stabilizing its carbon dioxide emissions at 1990 levels, and between 1996 and 2000 undertook a two-phase study, which culminated in the Carbon Dioxide Emissions Abatement Action Plan. Phase 1 of the study, completed in 1998, included a detailed audit of the corporation’s emissions and evaluated how these emissions could be curtailed. Phase 2 produced the abatement plan that was approved by City Council in June 2000.

The corporation pledged to reduce its greenhouse gas emissions to six per cent below 1990 levels by 2012. That equates to a carbon dioxide emissions reduction of 160,000 tonnes per year from levels taken in 1997—the year the city conducted its baseline inventory. The reduction would decrease the total annual CO2 emissions to 740,000 tonnes.

To meet this new lofty objective, the city set specific reduction targets for all its major greenhouse gas producers, including the sewer division, streetlights, waterworks and Calgary Transit. Transit’s target reduction was set at 10,800 tonnes per year.

Calgary’s 100-car C-Train system consumes approximately 21,000 megawatt hours of electricity annually. Despite the fact the C-Train produces no local carbon dioxide emissions, its power supply originates from coal or natural gas powered generation facilities that do produce significant greenhouse gas emissions.

**Project Development**

In 1999, a consortium of companies approached Calgary Transit with an innovative pitch to power the C-Train with zero-emission wind energy. The group included Vision Quest Windelectric Inc., an Alberta wind-generated electricity producer, ENMAX, the city’s electrical distribution system and the Pembina Institute for Appropriate Development, one of the country’s leading environmental organizations.

The consortium proposed a two-phase study to demonstrate the advantages of purchasing wind-generated electricity. The first phase focused on team building and developing public and political support for the Ride the Wind! Project. Phase 2 made formal a business relationship among Vision Quest, ENMAX and Calgary Transit to buy wind-generated power. It also focused on community education about climate change, including how citizens could take action for the environment and encouraged citizens to take pride in Calgary’s Transit system.
The 21,000 megawatt hours of electricity that the C-Train consumes yearly represents about 50 per cent of Calgary Transit's total electricity requirements. The generation of that power produces about 26,000 tonnes of carbon dioxide from coal-fired or natural gas electricity production—considerably more than Calgary Transit's 10,800-tonne emissions-reduction target. Eliminating 26,000 tonnes of carbon dioxide equates to the elimination of 7.5 million private vehicle trips per year.

C-Train power consumption is projected to increase to 26,000 MWh annually over the next five years as new LRT extensions are completed and additional light rail vehicles are introduced into service.

By powering C-Train operations with wind-generated electricity, C02 emissions will be reduced by 26,000 tonnes annually or 260,000 tonnes over the ten-year term of the contract.

**Power Industry Deregulated**

Alberta has deregulated its electrical power industry. Power companies contribute the power they produce to a pool and the price for electricity fluctuates based on demand.

By mid-2000, strong economic growth in Alberta had led to a dramatic increase in demand for electricity. Meanwhile, the power supply remained constant which caused prices for electricity to soar. For example, in 2000, the average price for electricity was $133 per megawatt hour, but prices spiked to $183 between June and December later that year.

With the rise in electricity prices expected to continue in future years, Calgary Transit officials sat down with Vision Quest Windelectric and ENMAX and forged ahead with plans to strike a 10-year deal. Not only would this deal to buy wind-generated power benefit the environment, it would also provide budget stability to fluctuating power prices. While details of the city’s pricing contract with Vision Quest and Enmax are subject to a confidentiality agreement, its substance is simple. When Alberta power pool prices dip below wind power prices, Vision Quest will charge Calgary a premium. When power pool prices are high, Calgary will get a rebate.

Calgary Transit realized when it signed the contract with Enmax and Vision Quest that it ran the risk of seeing power pool prices decline once the inevitable new power producers come on line in a few years time. However, it was calculated even under the worse case scenario, the most the city could lose is about $2.5 million (a premium of one-half cent per passenger) over the course of the 10-year contract.

"We saw this as a great opportunity to help our environment while gaining budget stability during a time of volatile power prices in the Province of Alberta," said Calgary Transit General Manager John Hubbell. "Our passengers are confident and proud that using the C-Train is the most environmentally clean way to commute year-round."

**Project Implementation**

In February, 2001, Calgary City Council approved the 10-year contractual arrangement among the city, ENMAX, - a wholly-owned subsidiary of the city - and Vision Quest to supply Calgary Transit with enough power to operate its C-Train.
City Council approved the "Ride the Wind!" Project by a 13-2 margin. The strong political support indicates municipal politicians are ready to develop specific goals and action plans to reduce greenhouse gas emissions.

Vision Quest constructed 12 new wind turbines at its wind farm in Southern Alberta in order to provide the C-Train with the necessary power. The partners made provisions in the contract to extend it following the initial 10-year term.

**What Has Occurred Since**

The September, 2001 launch of North America's first wind-driven Light Rail Transit System, was attended by representatives of all three levels of government, all of whom expressed pride and congratulations.

Calgarians, who ride the train (187,000 every workday) have also embraced the initiative.

Although they feel no physical difference while on the train, customers have commented on many occasions, they feel good about riding a transit system that has taken this major step to reducing the impact of urban transportation on the environment.

Numerous municipalities around the globe are closely watching the Calgary "Ride the Wind!" project experience with a view to establishing their own wind-driven transit operations.

In May, 2001, Calgary Transit won a Federation of Canadian Municipalities CH2M HILL Sustainable Community Award for its leadership in renewable energy with the "Ride the Wind!" project.

Most recently, Calgary Transit won the Canadian Council of Ministers of the Environment 2001 Pollution Prevention Award for the Ride The Wind! project.

While providing and efficient, safe, courteous service to its customers, Calgary Transit remains committed to continue to do its part to reduce the environmental impact of urban transportation.

**A History of the City of Calgary and Calgary Transit**

Calgary is a city of about 860,000 people located at the base of the Rocky Mountain Foothills in southern Alberta. The city's economy has been built on a diverse economic base of agriculture, energy, tourism and its favorable location as a distribution centre for manufactured goods produced in western Canada.

Since the 1960s, Calgary's history has been one of sustained growth, with the population more than doubling from 400,000 in 1971 to present.

Calgary Transit operates an integrated bus and Light Rail Transit System within the city.

Calgary Transit began service in 1909 with a 12-car streetcar system operating along 10 miles of track servicing a population of 30,000. By 1918, service had extended to outlying communities. Modern buses were introduced to Calgarians in 1932 and streetcars were slowly phased out of the system's operations throughout the 1940s, replaced by both diesel and electric trolley buses.
By the early 1970s, trolley buses had been completely phased out at about the same time Calgary's population began to boom.

From 1970 to present the city's population has doubled, from 400,000 to more than 850,000. Spurred by an Alberta oil boom and the City of Calgary having been awarded the 1988 Olympic Winter Games, construction of Calgary’s Light Rail Transit System called the "C-Train," began in 1978.

On May 25, 1981 the C-Train first provided service on its 11-kilometre leg from Anderson Road north to 7th Avenue S.W. through the downtown core. Four years later, the second leg opened from 7th Avenue east across the Bow River to the northeast Whitehorn Station. In 1987, the third leg was completed west to the University of Calgary and then extended to Brentwood in 1990.

In 2001, a further 3.6 kilometre rail line extension south from Anderson Station to Fish Creek-Lacombe was opened to service burgeoning population growth in the city's deep south.

Calgary's C-Train dramatic rise in ridership in recent years demonstrates its success and popularity among Calgarians. Since its inception, May 25, 1981, more than 500 million riders have hopped on the C-Train. About 187,000 customers currently ride the C-Train every work day.

Calgary Transit's bus/C-Train ridership has soared by 33 per cent over the past five years at the same time the city's population rose by 15 per cent. C-Train ridership alone shot up by 73 per cent during the same time period. Calgary Transit added 15 new C-Train cars to its system in 2001 and an additional 17 new cars will be on the rails next year. Most impressively, surveys show a staggering 42 per cent of the city's downtown workforce use Calgary Transit, both bus and rail every workday.

Further extensions of the rail lines will occur in 2003 and 2006 to meet the growing demand of commuters. Calgary Transit now moves about 75 million passengers on an average annual basis.
Conclusion

The innovative and environmentally friendly Ride the Wind! Project provides a 100 per cent emissions-free C-Train system and makes a significant contribution towards the achievement of Corporate emission reduction targets.

The program has established a strong leadership image for Calgary as being proactive and contributing to the development of innovative solutions for a global problem.

We are hopeful merits of the project will be recognized and rewarded by the Transportation Association of Canada.

Contacts:

Dave Colquhoun
Manager of Transit Planning
City of Calgary
P.O. Box 2100 Station M
Calgary, Alberta T2P 2M5
Tel.: (403) 537 7794
Fax: (403) 537-7737
dave.colquhoun@calgarycalgarycity.ca

Ron Collins
Communications Coordinator
Calgary Transit
P.O. Box 2100, Station M
Calgary, Alberta T2P 2M5
ron.b.collins@gov.calgary.ab.ca