EDMONTON CITY COUNCIL TO DECIDE FUTURE OF CURRENT TROLLEYBUS SYSTEM

Now that all the other cities in North America with trolleybus systems have chosen to renew their fleets with accessible trolleys, some on extended routes, it is Edmonton's turn to take decisive action on the future role of its electric bus system and the fate of some 140 km of infrastructure valued at over $89 million. Edmonton City Council will be asked to decide the future of the city's trolleybus system this summer.

This issue was last considered by Council in 2004, in a world quite different from the one we have today. Back then, oil was only $35.00 a barrel, there was much excitement over fuel cells, promises of a future hydrogen economy and biofuels. Now, oil is over $100 a barrel, the fuel cell fervor has fizzled and the limitations of biofuels have become very apparent.

In 2004, the verdict was that the administration should test and evaluate different technologies, including a new low floor trolleybus and hybrid buses. A low floor trolleybus was leased from Vancouver from June 2007 to June 2008 and has been in service on Routes 5 and 135. Six hybrid buses using three different hybrid configurations were bought and have also been in service on various routes. While technical glitches shortened the test period for some of the hybrids, the results of this evaluation are expected later this month.

As well, city administrators have invited back Booz, Allen, Hamilton, the American consulting firm that produced a study for them back in 2004. The 2004 study was highly criticized by the public as

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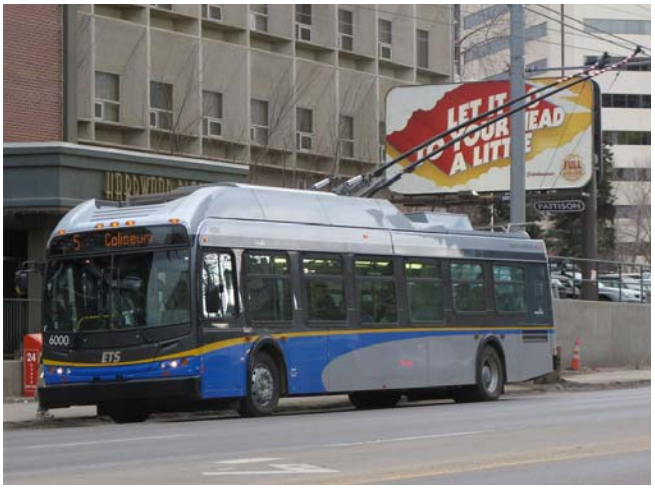

A 21st century low floor trolleybus leased from Vancouver has turned heads and delighted passengers during its year long test period in Edmonton. [Photo: A. Wong]

$300 a Barrel Oil by 2013, say Experts

In early April, oil reached a new record of $113 a barrel. Some might call that expensive. But Energy investment analyst and advisor Matthew Simmons, chairman and founder of the international investment banking firm Simmons & Company, told reporters on February 28th that the current high oil prices of $100 per barrel are "cheap" compared to what we are about to see. "The supply is showing some very troubling signs that production might well have already peaked and started [to slow] down. If it hasn't, then we are very close to it."

"Demand on the other hand shows absolutely no sign of slowing down because we are now at $100

more oil prices, p. 2 . . .

Transit Talk

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etc

Decision Pending on Edmonton's Trolley System
(con't from p. 1)

being fraught with errors and omissions. Their 2008 report is expected to update the 2004 study, although what the parameters of this update are is uncertain.

A public involvement process of sorts has also taken place, where transit riders, drivers and maintenance workers were queried on their opinions, as well as a small number of pre-selected community organizations. Some concerns have already been identified with this process. Brian Tucker, Chair of the Edmonton Trolley Coalition, says that his organization was supposed to be involved in reviewing the questions and the consultation process at the draft stage. "That didn't happen," he says. "We were told there were time constraints, and now that the surveying has taken place, we have identified issues with bias in the way questions were posed." In asking for an evaluation of a new trolleybus, explains Tucker, it is implied that Council also wanted citizens' views of a new, modern low floor trolleybus. Instead, we basically have another evaluation of old trolleys vs. modern diesels and hybrid buses. "We'll see what the results show, though," says Tucker.

The public will have another opportunity to let their views be known at a public hearing, anticipated in June. Interested citizens can verify the date by checking the Edmonton Trolley Coalition's Web site at www.trolleycoalition.org. A simple call to the City Clerk's office (496-8178) is all that is required in order to register to speak.

$300 a Barrel Oil (con't from p. 1)

a barrel, which I still think is a preposterously cheap price. It works out at just $0.15 a cup.

Simmons added he is more concerned about energy shortages than the rising price of oil. "What we will start to run out of is light sweet oil because it is the easiest to get out of the ground. So all we will be left with are massive amounts of oil in places where it is difficult and expensive to extract.

Simmons is a leading expert in his field and author of the book, Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy. In the book Simmons argues Saudi Arabia will, in the coming decades, be unable to maintain its current level of oil production, with huge economic repercussions. Simmons says that the peak oil issue is poorly understood and the world's data on production, demand and inventories is inaccurate.

Simmons is not the only one projecting $300 prices in the not-too-distant future. Energy Investment Strategies editor Jim Kingsdale wrote in December 2007 that if oil continues its hike at its current rate, it will reach $355 by mid-2012, a projection similar to that of Simmons. America's leading energy expert Charles Maxwell told the syndicated radio show "Money Talk" on February 2nd that oil prices are expected to "absolutely soar" by 2015.

High prices, says Maxwell, may ultimately force people to conserve or switch to other alternatives. But can we bring the alternatives online fast enough? Maxwell has his doubts.

Listening to the experts, one conclusion is for certain: the time to start investing in alternatives is now, not five years down the road.

[Sources: Arabian Business, February 28, 2008; Pacifica Riptide, February 2, 2008; Energy Investment Strategies #8, December 4, 2007]

U.S. Data shows Trolleybuses Cheaper to Operate than Diesels

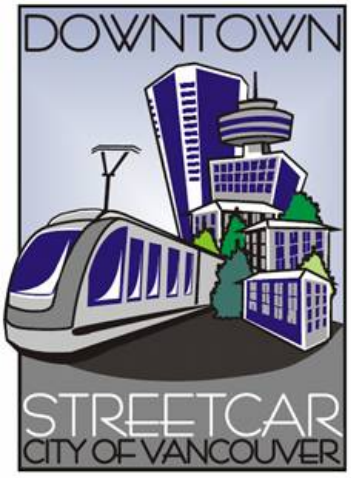
Based on data in the 2007 edition of the APTA *Transit Fact Book*, trolleybus systems in the United States appear to achieve a 5% operating savings over their diesel counterparts. Edson Tennyson, a retired professional engineer and transit consultant based in Vienna, Virginia supplied the following data to *Transit Talk*. Readers should note that the latest *Transit Fact Book* reports 2005 data. More recent increases in diesel fuel prices are expected to have made an even greater difference in favour of the trolleybus. [E. L. Tennyson, P.E.]

	DIESEL BUS (2005)			TROLLEYBUS (2005)		
	Operating & Mtce.	Revenue Hrs.	Cost per Hr.	Operating & Mtce.	Revenue Hrs.	Cost per Hr.
Dayton	$32,289,300	371,200	$86.99	$11,595,700	143,300	$80.92
San Francisco	$185,269,700	1,468,100	$126.20	$120,512,800	1,027,400	$117.30
Seattle	$293,776,800	2,441,700	$120.32	$50,869,400	440,000	$115.61
TOTAL/AVG.	$511,335,800	4,281,000	$119.44	$182,977,900	1,610,700	$113.60

TROLLEYBUS SAVINGS $5.84 per bus hour or 5%

Source: FTA National Transit Database, *APTA Fact Book 2007*

Vancouver embarks on $8.5 million streetcar project



An $8.5 million streetcar proposal won Council approval in Vancouver on March 11th. The project envisions a streetcar demonstration project in time for the 2010 Olympics. The modern streetcar line would operate over a 1.8 km section of track between Granville Island and the New Olympic Village at 2nd and Cambie.

The Downtown Historic Railway presently has a historic interurban operation in this area, but a section of track had to be removed during construction of the Olympic Village. "It makes sense that when the track is rebuilt, that it be ready for a modern streetcar line like in European cities or San Francisco," said Councillor Suzanne Anton who supported the proposal.

Mayor Sam Sullivan says that such a demonstration could build enthusiasm for a much larger system that would serve China-town, the Downtown Eastside, Waterfront Station and Stanley Park. "We're going to have to work hard to have this up and running by 2010, but I believe if there is enough political commitment to it, we can do it."

The project is envisioned as a public-private (P3) partnership. Sullivan sees this as crucial, as it will enable the work to be completed much quicker by enhancing access to capital dollars.

"Streetcars ran along Gastown streets from the late 19th century until shortly after the Second World War", said Dale Laird, the vice-president of the Transit Museum Society, which operates the heritage railway.

"Then everyone had to have their own car, and there wasn't the revenue coming in to repair the tracks that needed repairing. But now we want people out of their cars, and it makes sense to give people living in False Creek a chance to use a new level of public transit", Laird said. [Source: *Globe and Mail,* March 11, 2008; CTV News, www.ctv.ca, March 11, 2008]

March brings fuel shortage to Western Canada

A reduction in production at Imperial Oil's refinery near Edmonton threatened gasoline and diesel supplies at about 500 Esso stations across Western Canada during March, according to CBC News. The manager of one popular Calgary station at Glenmore Circle told reporters on March 7th that supplies would barely last a day.

Imperial Oil spokesperson Gordon Wong said that technical problems at the Strathcona Refinery led to greatly reduced production. Imperial Oil had to resort to rationing supplies, with priority given to more isolated locations.

While the shortage was resolved for the most part by late March, industry observers said that if oil prices stay at current record levels and demand increases with the summer driving season, motorists could soon see $1.40 at the pumps. Industrial, shipping and transportation service providers will see increases as well. [Source: CBC News, March 7, 2008]

Canadian Federal Budget gives Dollars to Transit

The Canadian Urban Transit Association (CUTA) expressed delight at the 2008 Federal Budget's commitment to support investment in public transit infrastructure. "The allocation of $500 million in 2007-08, dedicated to public transit, is a major boost to future access and mobility in Canadian communities", says CUTA President and CEO, Michael Roschlau. "Extending the Gas Tax Fund is an excellent response to the ongoing needs for municipal infrastructure investment. This is a good news budget for transit".

"The budget does not, however, put in place long-term, dedicated funding specifically for public transit", added CUTA Chair Penny Williams. "That will require the implementation of a well coordinated National Transit Strategy."

CUTA's recent survey of Canadian transit systems reported a $40.1 billion need for public transit's capital infrastructure for the period 2008-2012 for the maintenance and upkeep of the current systems, and for transit expansion to accommodate growing ridership. [Source: Canadian Urban Transit Association, February 26, 2008]

Fuel Cell Buses a black hole for Cash, says San Jose, California

Three years ago, the Valley Transportation Authority and SamTrans of San Jose California embarked on a grand project to test three buses powered by hydrogen fuel cells, then touted as futuristic. The vehicles would emit no smog-inducing pollutants and help to keep the valley's air clean.

Now much of the fuel cell fervor has fizzled, and San Jose feels it can no longer keep these 'green vehicles' going. The problem: they cost just too much green.

The VTA's report on the $18 million pilot project showed a whopping $50 per mile cost difference between the hydrogen fuel cell buses and their diesel counterparts: the diesels rang in at $1.61 per mile for fuel and maintenance, whereas the fuel cell buses cost $51.66 per mile. The fuel cell vehicles also break down much more frequently, and replacement parts are next to impossible to get, states the report. The fuel cell coaches needed major repairs about every 1,100 miles, compared with about 6,000 miles on the diesels.

A fuel cell bus costs about $2.5 million to purchase compared with about $400,000 for a diesel coach. A white cloth held to the exhaust of a fuel cell bus would come out clean: no soot, no dirt, no lung-clogging grime. But the issue is whether the $2.5 million bus can withstand the daily pounding of providing transit service on San Jose's streets at a cost that transit can reasonably afford. Warning flags are already up after only 75,000 miles of testing.

"Five years ago, they said the technology was five years away", said General Manager Michael Burns. "Today they are still talking five years, maybe ten." [Source: Mercury News, February 26, 2008]

Pollution alters Brain Function – Researchers

Scientists have long known that fine particles in vehicle exhaust reach the brain when inhaled, but now they know that they actually affect the way we process information.

Researchers sought to replicate the conditions experienced by those who work in garages or near busy roadways. Ten volunteers spent an hour in a room filled either with clean air or diesel exhaust fumes. Each volunteer was wired with an electroencephalograph device that records the electrical signals in the brain.

After about 30 minutes, the brains of those exposed to diesel exhaust displayed a stress response on the EEG, indicating a change in the way information was being processed in the brain's cortex region. This effect continued long after the volunteers left the room.

"We can only speculate what long-term effects chronic exposure would have," said lead researcher Paul Borm. Particles in diesel exhaust have been implicated in many health concerns, including lung problems, cancer, heart disease and genetic defects. This research adds to the findings of previous studies. [Source: BBC News, March 11, 2008]

Edmonton's

EARTH DAY 2008

Sunday April 20th

Hawrelak Park

Interest grows in Hybrid Buses as Diesel Alternative

Major orders in March and April for hybrid buses by the cities of Washington D.C., Philadelphia and Minneapolis/St. Paul will put about 1,700 more GM-Allison powered hybrid transit vehicles on the roads in the U.S., displacing aging diesel buses. GM-Allison driven hybrids account for the majority of hybrid transit buses in service – a total of more than 2,700 vehicles. Hybrids are marketed as a greener alternative to diesel buses because of their reduced emissions and improvements in fuel economy. They also offer improved acceleration.

The U.S. Department of Energy's National Renewable Energy Laboratory (NREL) recently evaluated the performance of New York's second generation of hybrid Orion VII buses that use BAE systems technology. The evaluation showed that the vehicles had improved over the first generation of Orion VII's in the areas of reliability, complexity of maintenance and maintenance costs. BAE Systems spokesman Rich Hopf said that the company is living up to its commitment to improve the technology.

Hybrid technology has been considered a "bridge" between current internal combustion vehicles and vehicles powered by electric motors.

[Sources: Green Car Congress, Jan. 22, 2008; BAE Systems, Feb. 6, 2008; Continental Automotive Systems, www.conti-online.com]

New Trolleybuses begin arriving in Philadelphia

The first production models of an order for 38 low floor trolleybuses for the Southeastern Pennsylvania Transportation Authority began arriving in late February and entered service on three Northside routes operating out of the City's Frankford Depot in April.

The vehicles are similar to those delivered recently to Vancouver, except that they incorporate a small diesel auxiliary power plant for offwire movement, rather than battery-electric auxiliary power. This configuration allows greater off-wire range than the battery-electric version, and is also less expensive to purchase, according to information supplied by SEPTA.

The new trolleys will displace older diesel buses currently in use on these routes that are due to be retired. Public reception to the new trolleys has been very positive.

[Source: International Trolleybus News, J. Marinoff/R.C. DeArmond, Feb./Mar. 2008]

San Francisco to Revamp Transit Service

San Francisco MUNI officials released a "dramatic" plan to revamp transit service in the Golden Gate city on February 27th. The plan will result in the extension of some trolley and diesel services and the rerouting of others. Some lesser used routes will be truncated. The changes are aimed at providing more frequent service, improving reliability and on-time performance, and speeding service. They result from an 18-month long study of ridership trends and traffic patterns. Major focus was placed on MUNI's 15 busiest corridors.

The changes will be rolled out over five to seven years, starting in July of 2009.

[Source: San Francisco Chronicle, Feb. 27, 2008]

Overseas News

Trolleybus Service to continue in Winterthur, Switzerland

In January, Winterthur City Council voted to order 21 new trolleybuses to replace its aging trolley fleet, and to continue using trolleybuses on its main lines. A study by the consulting firm Infras revealed that although diesel technology has improved, these improvements are not so great as to make it a better option environmentally than the trolleybus, despite the latter's higher costs.

The study found that because of their ability to use electricity from different sources—for instance from biomass or hydroelectricity in the case of Switzerland—trolleybuses can be globally much more environmentally friendly than diesels. Moreover, at the local level, they are much quieter and emit no pollutants. While trolleybus costs have risen, so too have the various operational expenditures required for diesel vehicles. While at the present time Winterthur could have saved by converting to an all diesel fleet, the future is less certain.

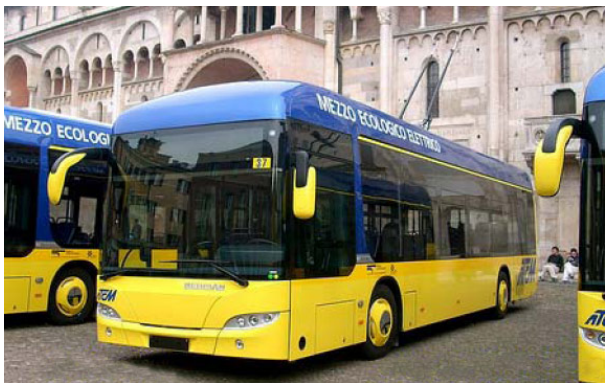
Fuel cell vehicles were discounted by the study as not being yet ready for market. As well, natural gas vehicles were discounted, as any environmental advantage would depend on the use of biogas. Their lower energy efficiency made them poorer contenders.

Three routes will remain trolleybus operated in Winterthur, but one route will be redesigned and converted to diesel operation. [Source: City of Winterthur, www.stadt.winterthur.ch, January 24, 2008]

Trolleybuses may return to Chieti, Italy

Trolleybus service in the Italian city of Chieti, discontinued in 1992, appears poised for a return in May or June of this year. Work has been completed on the upgrading of overhead wires, and the trolley vehicles that had been placed in storage have been rehabilitated. These developments follow a general trend in Italy towards the reintroduction of trolleybuses.

[International Trolleybus News, R. C. DeArmond]



The newest Neoplan low floor trolleybuses to arrive in Modena, Italy, April 2008. [Alefilobus]

We get letters . . .

Fuel Cell Buses nothing more than Flavour of the Year

Irvine Bell, chartered mechanical engineer, the TBus Group

The fuel cell bus is very much the flavour of the year in some quarters as the environmentally friendly replacement for diesel. Unfortunately fuel cell bus promoters seem to lack the knowledge of energy science to realise the great, if not impossible, improvements in energy efficiency that fuel cell buses will have to make to become viable. And that is apart from great and likely unachievable reductions in capital and maintenance costs.

To illustrate the point using figures from an article by Martin Bensley in the July 2006 edition of Buses, the fuel cell Citaro fuel consumption is quoted as 22 kg of hydrogen per 100 km. That hydrogen has an energy value of about 142 MJ (Mega Joules) per kg, which works out at about 31 MJ per km. The efficiency of the electrolysis process used to manufacture the hydrogen from renewable electrical sources is around 30%. So the electrical input required to drive a fuel cell Citaro is about 104 MJ per km.

By way of comparison, a similar electric trolleybus requires around 3 kWh per km or about 11 MJ per km. In other words, the amount of electricity required to drive ONE fuel cell bus will drive around TEN trolleybuses. (When Vancouver evaluated fuel cell buses about half a dozen years ago, it put the figure at about twelve trolleybuses that could be operated for the same primary energy consumption of one fuel cell bus.)

Transmitting electricity to a bus by converting the energy to hydrogen to be converted back to electricity on the vehicle is an exceedingly inefficient way of transmitting energy compared with sending it down a wire. There are absolutely no foreseeable significant improvements in fuel cell technology that will materially change this position.

Running a bus network is invariably done under tight financial constraints. There is thus no way in which bus operators in general could afford substantial hydrogen fleets, even if the hydrogen comes from renewable energy sources. And attempting to do so would be a colossal waste of renewable energy resources, which are not and will probably never be readily available in generous quantities.

If one follows the progress of fuel cell technology—illustrated by Ballard Power Systems recent decision to divest itself of its interests in automotive fuel cells—it is clear that fuel cells for stationary power generation running, for example, on natural gas as part of distributed generation with combined heat and power systems, may have a very big future. Line side fuel cells powering trolleybuses might well make a lot of sense. But fuel cells on vehicles will not prove to be the way forward for buses. Enthusiasm for fuel cell buses is really a form of environmental tokenism. The future for buses is surely going to remain substantially diesel with the only affordable and genuinely environmentally friendlier alternative for urban networks being trolleybuses.

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