City of Richmond

Report to Council

To:	Richmond City Council	**Date:**	July 17th, 2002
From:	Councillor Lyn Greenhill Chair, Public Works & Transportation Committee	**File:**	0780-01
Re:	**HYBRID ELECTRIC VEHICLES**		

The Public Works & Transportation Committee, at its meeting held on July 17th, 2002, considered the attached report, and recommends as follows:

Committee Recommendation

That the proposed Pilot Program for Hybrid Electric Vehicles (as outlined in the report dated July 5th, 2002, from the Acting Director, Public Works), be endorsed.

Councillor Lyn Greenhill, Chair
Public Works & Transportation Committee

Attach.

VARIANCE

Please note that staff recommended the following:

That the report (dated July 5th, 2002, from the Acting Director, Public Works), regarding the Pilot Program for Hybrid Electric Vehicles, be received for information.

STAFF REPORT

Origin

At the June 19, 2002 Public Works Transportation Committee staff were requested to provide information on Hybrid Electric vehicles. This report provides information and also outlines staff's steps to utilize this technology.

Background

Over the past eight years the City of Richmond has taken an active role in reducing emissions and the effect they have on the environment. Initially, our vehicles were operated on propane, then gasoline and compressed natural gas (CNG), also known as Bi-fuel.
Over the past two months staff have been reviewing hybrid electric vehicles to support our vision for the City of Richmond to be the most appealing, liveable and well-managed community in Canada.

While vehicles operating on Bi-fuel proved to reduce greenhouse gases, technology has advanced to include Hybrid Electric Vehicles (HEV's) that have demonstrated to date to be even more effective in reducing numerous air borne pollutants, which are the major contributors to climatic changes and health concerns.

Analysis

Hybrid Technology
The technology being developed to decrease vehicle emissions and increase fuel efficiency includes: natural gas, electric vehicles, fuel cells, and gasoline-electric hybrids. The hybrid is the most practical option because it uses the fuel delivery infrastructure that is already widely available (unlike natural gas), generating on-board electricity with an extended range (unlike electric vehicles), and is commercially available (unlike the fuel cell) which is under development and is not commercially available in vehicles of this class at this time.

Comparison to Internal Combustion Engines Using Alternative Fuel Sources

	Internal Combustion Engines	Electric	Hydrogen Fuel Cell	Natural Gas	Gasoline Electric Hybrid
Reduced air emissions		✓	✓	✓	✓
High fuel mileage			✓		✓
300 km range	✓		✓		✓
Widespread fuel infrastructure	✓				✓
Quick and easy refuelling	✓			✓	✓
Reasonable acceleration	✓			✓	✓
Commercial availability	✓			✓	
Fuel consumption (mpg)	40	N/A	80	30	60

The two hybrid electric vehicles that are currently on the market that meet Richmond's requirements are the Toyota Prius and Honda Civic. For the purpose of this report staff have compared the Cavalier, which is currently being used by the City, and the two HEV's mentioned (Toyota Prius and Honda Civic). These vehicles have similar interior, trunk configuration, access and egress, all around visibility and handling characteristics. The two HEV vehicles are a hybrid designed to reduce vehicle emissions in urban driving. They use a highly efficient gasoline engine combined with an advanced electric motor.

Options

1) Lease (Recommended)

Leasing gives us the flexibility to assess this new technology without making a permanent commitment, allowing us to confirm the assumptions made by manufacturers and prepare a long-term strategy around the use of HEV's. Leasing for three years will allow us to conduct an evaluation and make a sound determination as to the long-term impacts and benefits to the City. If we develop a problem during this pilot time frame, we can simply return the HEV's and cancel the lease. If new technology is introduced over the next three years that could prove to be better, we could take advantage of said technology.

These leases will be applied to replacing four vehicles planned in 2002. These replacement funds will be deferred to the year 2005 at which time would be used to buyout the leases. Existing monthly vehicle expense accounts will be used to support lease expenses. It should be noted that leasing would have a minor impact on the reserve, as no funds will be contributed to the reserve during the leasing period.

Leasing two vehicles from each manufacturer will provide more input for future comparative analysis, ensuring we make the best choice to meet operational needs.

2) Purchase/Ownership

Ownership of HEV's is a viable alternative as a long term strategy once this new technology is proven. The overall financial impact reflects a comparable Net Present Value for vehicles of similar configuration. In addition, a higher projected residual trade-in value makes the Prius/Civic more cost effective than the Cavalier. Lower estimated fuel consumption and maintenance costs are the result of this new hybrid technology.

	Cavalier	Toyota	Honda
Summary of Costs			
O&M Cost	$15,846	$ 7,341	$ 7,341
Less Trade Value	$ 7,423	$13,598	$12,888
Net Cash Flow	$ 8,423	$ (6,257)	$ (5,546)
Capital Cost	$17,243	$31,589	$29,939
Net Present Value	$25,666	$25,332	$24,393

Partnerships

Staff approached both manufacturers to secure a partnership and were instructed to approach our local dealers. Both dealers are very interested in working with the City to ensure this new technology is accepted and are prepared to support their product well beyond the lease period. Narrow profit margins limit the discounts to nominal amounts, however both are willing to waive any security deposits associated with leases. Toyota is prepared to reduce monthly lease rate by $20 to $ 684 per month, while Honda will reduce monthly rate by $ 76 to $505 per month.

Conclusion

Staff is planning to implement this "Pilot Program" by leasing two Toyota Prius and two Honda Civic vehicles for a three-year period starting in 2002 and will monitor overall impacts to be compared with similar types of vehicles currently being operated. Details of our findings will be available at the end of 2003.

Ken Fryer
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