



DOING THE MATH

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EXECUTIVE SUMMARY

The Alberta Government is proposing a major Public Private Partnership (P3) project to build schools in Calgary and Edmonton.

P3s are advocated as a public infrastructure financing model on four grounds: that they enable the government to invest in infrastructure without incurring debt; that they provide access to private capital that would otherwise not be available; that they are a low-cost and effective vehicle for indirect public borrowing; and that they reduce project costs to governments by transferring financial risk to project proponents.

None of these claims is valid. Financial markets are not fooled when a government chooses to borrow indirectly, by committing to a flow of future payments to a P3 project, rather than directly. If it looks like debt and makes calls on the future fiscal capacity of the province like debt, it's debt.

The claim that risk transfer justifies the higher financing costs associated with P3 projects simply does not hold up. It is more cost effective for the public sector to bear the risks associated with infrastructure projects than it is to pay a private developer to take on that risk.

It is evident from even a cursory look at bond interest rates that government borrowing costs are lower than those of even the best-rated corporate borrowers. In addition, borrowing rates are generally substantially higher for P3 projects than would be the case for typical large corporate borrowers. The higher rates are attributable to the fact that the lender generally has recourse only to the assets of the project corporation created for the purpose of de-

veloping and operating the individual P3. Thus, P3 borrowing rates are more closely aligned to mortgage rates or asset-based lending rates than to general corporate bond rates.

This study compares conventional financing and P3 (private financing) costs based on the information available about the costs of schools needed in Calgary and Edmonton made public by the School Boards. The Alberta government's proposal to use a standardized design will result in some cost savings, but these savings would accrue to both conventional financing and P3 models. The additional costs of private financing will remain the burden of Alberta taxpayers — and these costs will be significant.

Using conservative (generous to the P3 model) assumptions about financing fees, borrowing costs and equity returns for P3 projects and government borrowing rates and financing fees for the publicly financed alternative, the study models the financing cash flows for the schools approved as P3 projects for the four Edmonton and Calgary school systems assuming P3 financing and assuming traditional public sector financing over the expected life of the projects. The analysis assumes that the financing flow will be similar to that of a mortgage, with equal payments spread out over the life of the projects. It then compares the present value of the two sets of cash flows, to measure the cost difference between the two financing methods.

On the conservative assumptions used in this analysis, for every two schools financed using the P3 model, an additional school could be built if they were all financed using conventional public sector financing.

Taking the four boards together, the Provincial Government's take-it-or-leave-it P3 scheme would result in 18 schools with board-estimated total costs of \$201.9 million being built at a cost, in present value terms, of \$305 million. If the provincial government were in fact to make \$305 million available to the school boards, rather than to P3 providers, the boards could build ten additional elementary schools; or eight additional K-9 or junior high schools; or as many as six additional high schools

INTRODUCTION

P3 financing of schools in Edmonton and Calgary will be far more expensive than traditional public financing. A close and detailed look at the financial side of P3 schools shows that for every two schools financed through P3s in Alberta, an additional school could be built for the same cost, if all were built using traditional public sector contracting models.

One of the consequences of the burgeoning economic growth of Alberta in general and of the cities of Edmonton and Calgary in particular is that the school system is literally bursting at the seams. Students and their families cope with temporary classrooms or long-distance bus rides.

New school construction is falling far behind the needs of Alberta's rapidly-growing urban population.

Economic logic says this shouldn't be a problem. Because along with Alberta's rapidly-growing economy and burgeoning urban population, the provincial government is living in a fiscal world that would leave every other provincial government in Canada gasping with envy. Alberta has no net debt. It has net financial assets of \$19.7 billion. Collectively, Canadian provinces and territories have net financial liabilities of \$259 billion, or 18% of GDP. Alberta has net financial assets of 8.3% of GDP. Alberta ran a fiscal surplus of \$8.6 billion in 2006-7 – more than 25% of its total expenditures. The budgetary surplus is more than 3% of GDP.

Despite the province's fiscal bonanza, the government has announced its intention to rely on a P3 model to finance the construction of a list of new schools in Calgary and Edmonton.

The announcement has generated considerable controversy. First, the government decided not to fund all of the schools planned by the boards, and to fund from different priority lists than the boards' priority lists. In short, Edmonton and Calgary will be getting the schools the province wants, not the schools the local boards want.

Second, the province intends to build schools to standardized designs as a way to save money, raising questions about the imposition of “cookie-cutter” buildings on communities with varying needs and circumstances.

Third, the government has announced that it intends to finance both construction and major maintenance of these new schools through P3s, rather than conventionally through the provincial fiscal system.

The decision to build from the province's school list rather than the local boards' lists clearly reflects a political calculation by the government, for which it will have to bear the consequences.

With respect to the decision to build to standardized designs, there are undoubtedly savings at the design and construction stage to be realized by working to standardized school designs. However, those savings are unlikely to be substantial, especially given the compressed timeline for all of the projects. Furthermore, any savings would have to be weighed against inefficiencies arising from the use of identical buildings in communities with potentially different requirements as well as any concerns about aesthetic issues arising from the commitment to standardization.

The third key feature of this plan — to finance these new schools through P3s — is most difficult to comprehend.

Given the province's fiscal wealth, the fact that the province is even considering indirect financing through P3s is odd, to say the least. But even if the province were not in a position to make the investments needed without borrowing, the evidence is clear that relying on P3s to finance public infrastructure makes no economic sense.

Although details of the financing approach have not been made available, government officials have indicated that the plan is to contract for a fixed payment over a pre-determined number of years, after which full responsibility for the buildings would shift to the school boards. In an unusual twist, the Minister of Education has indicated that the projects will distinguish between routine maintenance, which will be the responsibility of the school boards, and major maintenance such as roof and/or boiler replacement, which will continue to be the responsibility of the P3 for the duration of the contract.¹

The key to the scheme is the financing. There is nothing particularly novel about fixed-price design and construction contracts or extended warranties on major components of facilities such as the roofs and boilers mentioned by the Minister in his statement. Either of these features could be included in conventionally financed and operated school projects, if the economics made sense, and in many cases already are.

But if P3s are just one step beyond the current model in which private builders are contracted for the actual construction of school buildings, as has been suggested, it is a very large and very expensive step.²

Even on the surface, it doesn't appear to make much sense for a sovereign borrower like Alberta, with an unequalled credit rating, to be relying on a private entity for project financing. And when you get below the surface, it makes even less sense.

P3s are advocated as a public infrastructure financing model on four grounds: that they enable the government to invest in infrastructure without incurring debt; that they provide access to private capital that would

1 "Proposed P3 schools getting lots of attention; Alberta Education receiving calls from here, abroad" Calgary Herald , June 16, 2007, p B3

2 "Our schools are already being built by private contractors. This would be taking things one step further", CBE Wards 12 and 14 candidate Carol Bazinet, quoted in "P3 schools split trustee hopefuls: Role of private sector seen as blessing, curse", Sarah McGinnis, Calgary Herald, 30 September 2007, B3

otherwise not be available; that they are a low-cost and effective vehicle for indirect public borrowing; and that they reduce project costs to governments by transferring financial risk to project proponents.

None of these claims is valid. Financial markets are not fooled when a government chooses to borrow indirectly, by committing to a flow of future payments to a P3 project, rather than directly. If it looks like debt and makes calls on the future fiscal capacity of the province like debt, it's debt.³ There is no evidence that any government in Canada — least of which the Province of Alberta — is currently experiencing difficulty borrowing on bond markets. Quite the contrary, there is such a shortage of borrowers in the Canadian fixed income market that large American financial institutions have begun to borrow on Canadian markets in Canadian dollars through the issuance of so-called “Maple” bonds.

Far from being low-cost and effective, the cost of capital raised via a P3 project is typically 30% to 50% higher (depending on the duration of the project and the specific financing terms) than the cost of capital raised through conventional public borrowing.

And the claim that risk transfer justifies the higher financing costs associated with P3 projects simply does not hold up. Indeed, it is evident from

³ Accounting rules are beginning to close in on the supposed advantages of P3 financing from a debt perspective. The International Monetary Fund has noted pointedly that the present value of payments required under P3 financing in the United Kingdom should be considered as equivalent to debt in evaluating that country's debt position. [See: International Monetary Fund, “Public-Private Partnerships”, Fiscal Affairs Department, IMF (In consultation with other departments, the World Bank, and the Inter-American Development Bank), Approved by Teresa Ter-Minassian March 12, 2004.] More recently and closer to home, the public accounts in British Columbia now include a footnote detailing the future financing commitments embedded in that province's extensive network of P3 projects. [Province of British Columbia, Public Accounts 2006-2007, notes to financial statements, note 25(d).] Embarrassingly for the BC government, the note shows contingent liabilities for future payments of \$55 billion in addition to the official figures of \$29 billion in taxpayer supported debt and \$8 billion in so-called self-supported debt.

even a cursory analysis that it is more cost effective for the public sector to bear the risks associated with infrastructure projects than it is to pay a private developer to take on that risk. More detailed studies of the issue of risk transfer in Great Britain, where P3s became the dominant form of infrastructure finance under Prime Minister Tony Blair, show that risk transfers tend to increase, rather than reduce, project costs.

Specifically related to the proposed P3 schemes for Calgary and Edmonton schools, a comparison of a typical P3 structure with public sector financing costs indicates that financing costs would be 51% higher through a P3 structure than they would be if the projects were developed by the public sector and financed conventionally.

For the Edmonton public board, the financing costs required to pay for all 18 new schools in its capital plan using conventional public financing vehicles would pay for only 13 of those schools using a P3 vehicle.

For the Edmonton Catholic board, for the cost of all six of the new schools in its capital plan, P3 financing would allow for just four.

For the Calgary public board, the financing costs required to pay for all 18 schools in its capital plan under public development and using conventional public financing vehicles would pay for only 13 of those schools using a P3 vehicle.

For the Calgary Catholic board, the funding required to provide all 11 of the schools in its current capital plan using conventional public sector development and finance would cover the costs of only 7 schools using a P3 model.

On the conservative assumptions used in this analysis, for every two schools financed using the P3 model, an additional school could be built if they were all financed using conventional public sector financing.

These kinds of numbers shouldn't be a surprise for Albertans. When the Provincial Government put its \$300 million proposed new courthouse

out for tender as a P3, the “winning” bid came back at the whopping total of \$500 million. The Government balked, and decided instead to finance the building itself – for a cost of \$300 million. The P3 model would have wasted \$200 million.

Albertans might well ask why it was a problem for the provincial government to waste money using a P3 to finance its courthouse, but it is not a problem for the provincial government to force school boards to waste money using P3s to finance badly needed new schools.

EDMONTON AND CALGARY SCHOOL REQUIREMENTS

Both the Edmonton and Calgary public and Catholic school boards have articulated formal medium-term plans for new school building to accommodate their cities’ rapid population growth.

EDMONTON PUBLIC SCHOOL BOARD

The Edmonton Board of Education’s Three-Year Capital Plan 2008-2011 calls for the construction of 18 new schools and one major school preservation project over the next three years with an estimated total capital cost of \$199.9 million, listed as follows by priority number. The plan also calls for the investment of \$63 million in major renovation and renewal projects.

The provincial government is proposing to fund six schools: Palisades K-9; The Meadows K-9; Terwillegar Heights K-9; Lake District K-9; Heritage Valleys K-9; and Pilot Sound K-9, with a board-estimated capital cost of \$76 million.

TABLE 1
Edmonton Public School Board

PRIORITY	SCHOOL	\$ MILLION
New Schools		
1	Palisades K-9	12.67
2	The Meadows K-9	12.67
3	Terwillegar Heights K-9	12.67
4	Lake District K-9	12.67
5	Heritage Valleys K-9	12.67
6	Pilot Sound K-9	12.67
7	The Grange K-9	12.67
8	Griesbach K-9	8.47
9	Ellerslie K-9	12.67
10	Lewis Farms K-9	7.44
11	Terwillegar Heights K-9	12.67
12	Heritage Valleys K-6	7.44
13	Windermere K-6	7.44
14	Palisades K-6	7.44
15	Big Lake K-6	7.44
16	The Meadows K-9	12.67
17	Heritage Valleys 7-9	13.74
18	Windermere 7-9	13.74
TOTAL		199.85
Major Renovations		
	Strathcona	16.18
	Eastglen	8.76
	Prince Charles	5.03
	Forest Heights	7.56
	L.Y. Cairns	16.31
	Avalon	9.18
TOTAL		63.02

EDMONTON CATHOLIC SCHOOL BOARD

The Edmonton Catholic Board's 2007-2010 plan calls for a total of \$209 million in new schools and major renovations of existing facilities, \$64 million of which is for six new schools, one high school, one junior high and four K-9 schools.

The major projects in the plan, with their board priority designations, are listed below.

The provincial government is proposing to fund three K-9 schools – Windermere, Lewis Farms and Heritage Valley, with a board-estimated total cost of \$28.5 million.

TABLE 2
Edmonton Catholic School Board

PRIORITY	SCHOOL	\$ MILLION
Construction of New Schools		
1	Elementary / junior high school in Windermere	9.51
2	High school in Terwillegar	17.24
3	Elementary/junior high school in Lewis Farms	9.51
4	Elementary school in Heritage Valleys	8.16
5	Elementary/junior high school in Pilot Sound	9.51
6	Junior high school in Castle Downs Extension	10.47
TOTAL		64.40
Major Renovations		
	Archbishop MacDonald High School - Major Modernization/Cafeteria	11.52
	Archbishop O'Leary High School - Major Modernization	21.83
	Louis St. Laurent - Expansion/Major Modernization for Fine Arts Program	10.83
	St. Edmund Elementary/Junior High School - Major Modernization	7.34
	J.H. Picard - Major Modernization	13.77
	H.E. Beriault Junior High School - Major Modernization	9.87
	St. Alphonsus Elementary/Junior High School - Major Modernization	13.08
	St. Angela Elementary School - Major Modernization	8.54
	Grandin Elementary School - Major Modernization	8.14
	St. Matthew Elementary School - Major Modernization	10.42
	Our Lady of Victories Elementary School - Major Modernization	4.60
	St. Pius X Elementary School - Major Modernization	8.17
	St. Hilda Junior High School - Major Modernization	6.66
	Our Lady of Peace Elementary School - Major Modernization	4.63
	St. Paul Elementary School - Major Modernization	5.34
TOTAL		144.75

CALGARY BOARD OF EDUCATION

The Calgary Board of Education's current capital plan calls for the construction of 18 new schools between 2007 and 2010, listed as follows by priority number.

The provincial government is proposing to fund six schools: Saddle Ridge; Evergreen; Cranston; Royal Oak; West Springs; and Bridlewood. According to the Calgary Board's estimates, these schools would cost an estimated \$58.3 million.

TABLE 3
Calgary Board of Education

PRIORITY	SCHOOL	\$ MILLION
New Schools		
1	Northwest Senior High	42.00
2	Coventry Hills Middle	17.60
3	Saddle Ridge Elementary	9.60
4	Tuscany Middle	19.00
5	Evergreen Elementary	9.60
6	Piitoayis Family School	13.80
7	Bridlewood Elementary	10.30
8	Taradale/Coral Springs Middle	17.60
9	Cranston Elementary	9.60
10	Royal Oak Elementary	9.60
11	Panorama Hills Middle	17.60
12	West Springs Elementary	9.60
13	Rocky Ridge/Royal Oak Middle	17.60
14	Northeast High School	38.10
15	Copperfield Elementary	8.92
16	McKenzie Towne Middle	16.20
17	Evergreen Middle	17.60
18	West Springs/Cougar Ridge Middle	16.20
TOTAL		300.52
Preservation / modernization		
	Western Canada High School	38.7
	Bowness High School	19.25
	Sherwood Community School	9.3
TOTAL		67.25

CALGARY CATHOLIC DISTRICT SCHOOL BOARD

The Calgary Catholic District School Boards plans for 2007-8, 2008-9 and 2009-10 are summarized in table 4.

The plans call for an investment of \$135.9 million in 11 new schools and a further \$71.9 million in modernization and preservation projects in 14 schools.

The provincial government has announced P3 funding for three schools: K-9 schools in Cranston and Saddle Ridge; and a K-6 school in Evergreen. Based on the Calgary Catholic Board's estimates, these facilities would cost approximately \$39 million.

The board-estimated costs for the schools approved for construction under the province's P3 scheme are summarized in table 5.

TABLE 4
Calgary Catholic

PRIORITY	SCHOOL	\$ MILLION
New Schools 2007-8 to 2009-10		
1	Evergreen Elementary	10.9
2	Cranston Elementary / Jr. High	14.1
3	Hanson Ranch / Panorama Hills Jr. High	14.1
4	Saddle Ridge Elementary / Jr. High	14.1
5	Rocky Ridge / Royal Oak Elementary	10.9
6	Copperfield Elementary	10.9
7	Montreaux Elementary	10.9
8	Cochrane Elementary	10.9
9	Airdrie Jr. High	14.1
10	Evanston Elementary	10.9
11	Chestermere Elementary / Jr. High	14.1
		135.9
Preservation / Modernization		
1	St. Martin de Porres	6.7
2	Notre Dame High School	14.6
3	St. Gabriel the Archangel	8.5
4	Bishop O'Byrne	9.8
5	Bishop Carroll	5.9
6	St Vincent de Paul	1.8
7	St. Matthew	2.0
8	St. Margaret	4.0
9	Holy Redeemer	1.7
10	Holy Cross	3.3
11	St. Andrew	0.8
12	St Francis	11.0
13	St. Luke	0.9
14	St. William	0.9
TOTAL		71.9

TABLE 5

Summary of provincially approved plans (\$ million based on Board estimates)

BOARD	\$ MILLION
Edmonton Public	76.0
Edmonton Catholic	28.5
Calgary Public	58.3
Calgary Catholic	39.1
TOTAL	201.9

The Boards' capital plans are summarized in table 6

TABLE 6

Summary of capital plans (\$ million)

BOARD	NEW	PRESERVATION	TOTAL
Edmonton Public	200	63	263
Edmonton Catholic	64	145	209
Calgary Public	301	67	368
Calgary Catholic	136	72	208
TOTAL	701	347	1048

THE PUBLIC SECTOR AND P3 FINANCIAL MODELS

PUBLIC SECTOR FINANCIAL MODEL

The public sector financial model assumes 100% of the capital cost of the project will be financed through securities backed by the Government of Alberta. Interest is assumed to be the current yield on long-term Government of Alberta securities. Costs associated with financing are conservatively estimated at 5 basis points, or 0.05% of the amount borrowed. The borrowing

is assumed to be for a 30-year period. It is assumed that financing costs are incurred beginning with the completion of construction and that construction financing costs are capitalized into the estimated cost of the project.

P3 FINANCIAL MODEL ⁴

Typically, the financing of P3 projects is made up of a combination debt financing and equity contributed by the project developer. Varying amounts of leverage are used in the financing of these projects, with the extent of leverage depending on the reliability of the cash flows. In the case of school and hospital projects, with their highly reliable cash flows, the financial structure tends to be highly leveraged. For example, the P3 hospital project in Brampton, Ontario, was financed with debt at 85% of project cost and equity at 15%.

⁴ There is little routinely published information on the details of the financing of P3 infrastructure projects. Such details are typically made public only as a result of disclosure in the course of legal actions. While such disclosure is obviously not comprehensive, the fact that these arrangements arise from competitive bidding in a world-wide market suggests that those details that are made available reasonably reflect the market as a whole. These agreements are typically highly leveraged, with financing consisting of debt in the range of 80-90% of project costs and direct equity investment making up the remainder. In the case of the Ostler Health Centre in Brampton, the Financial Model provided for an interest rate on the debt portion of the investment of 6.35% at a time when the Government of Ontario 10-year bond yield was less than 4.25%. An analysis of the Ostler financial model revealed a projected equity return of 17.5%, for a blended total return of just over 8%. Similar figures were disclosed in court actions related to tolls levied on Ontario's P3 expressway, Highway 407. These figures are consistent with but on the low side of publicly available information about returns on such projects. With respect to total return, the former CEO of the Ontario Municipal Employees Retirement System (OMERS) Paul Haggis indicated in a 2004 interview ("OMERS chief mulls new investment model", James Daw, Toronto Star, 12 June 2004) that OMERS total return expectation for infrastructure investments was in excess of 10%. Leading global infrastructure investment fund manager boasts of "an annual average compound return of 19.4% across its infrastructure funds over an 11-year period" ("Why McQuarrie manages infrastructure funds", March 2006 http://www.macquarie.com.au/au/about_macquarie/media_centre/20060303a.htm)

With a given return-on-equity objective for the project proponent, total project costs will be higher, the lower the percentage of the project financed through the issuance of debt. The base case analysis assumes an 85/15 debt/equity ratio.

In infrastructure finance, interest on debt covered by project costs is typically calculated in one of two ways: either as a premium over the government borrowing rate; or as a premium over the London Interbank Offered Rate (LIBOR). Typical premiums would be 200 basis points (2%) above each respective rate. With Government of Alberta long term yields at approximately 4.5% (Canada plus 15 basis points) and the current one-year LIBOR at approximately 5%, a typical range for debt costs would be 6.5% to 7.0%. The base case analysis assumes debt costs at the low end of the range.

It is worth noting that borrowing rates are typically higher for P3 projects than would be the case for large corporate borrowers. The higher rates are attributable to the fact that the lender generally has recourse only to the assets of the project corporation created for the purpose of developing and operating the individual P3. Thus, P3 borrowing rates are more closely aligned to mortgage rates or asset-based lending rates than to general corporate bond rates.

It is assumed that the form of P3 financing employed is similar to a mortgage, with payments spread out evenly over time, rather than to a bond, with coupon interest-only payments and a balloon payment at the end. Because the average amount incurring interest costs is lower with mortgage-type financing than with bond-type financing, bond-type financing carries a higher cash cost over the life of the investment.

Equity returns built into P3 financing models are generally in the 15-20% range. The base-case analysis assumes equity returns at the low end of the range.

Transaction-related legal, accounting and financial analysis costs for P3 projects typically run at approximately 4% of the project capital cost for the

project proponent and are built into the project financial model.⁵ Each party to a P3 agreement would be expected to have similar transaction-related costs. Thus, in a two-party deal, these costs would be expected to be approximately 8% of capital costs and in a more complex arrangement (for example, if both the school board and the Government of Alberta were parties to the agreement), these costs would be expected to be approximately 12% of capital costs. Here, we have assumed transaction costs for a two-party deal.

Because the scale of the school projects contemplated by the government's P3 model for Calgary and Edmonton schools is smaller than that of the typical P3 project and because the projects would involve 18 separate facilities, one would expect other things equal, that transaction costs would be higher as a percentage of capital costs than for a larger less complex project.

Project financial commitments are assumed to commence with the completion of construction and run for a 30-year period.

Sensitivity analyses using different debt/equity ratios, return assumptions and transactions costs are presented in an appendix.

METHOD OF ANALYSIS

Costs for the public sector and P3 models are compared by calculating the present value of financing costs over the 30-year financing period for each method. Present values are calculated assuming that payments are made once

⁵ For example, in the Financial Model for the Ostler Health Centre, transaction and administrative costs associated with the agreement, for one of the three parties, amounted to \$19,185,000 on a project valued at \$255 million and a total cost (including interest) of \$447,505,000. Information disclosed recently with respect to the North Bay Regional Health Centre in Ontario (Value for Money Assessment, North Bay Regional Health Centre, Infrastructure Ontario, March 2007) revealed transactions costs of \$18 million on a project valued at \$404 million (including interest costs).

a year, at the end of the year, and are discounted to the inception year at the Government of Alberta long-term borrowing rate of 4.5%.

For the purpose of the analysis, it is assumed that the projects will be financed through equal regular payments over the agreement period. Consequently, it is assumed that debt financing in the P3 is assumed to take the form of a 30-year mortgage with constant blended payments, rather than of a bond issue to be repaid at the end of the period.

RESULTS

The methodology described above was applied to the provincially-approved school projects for the two Edmonton boards and the two Calgary boards, using the projected costs in the boards' capital plans as best estimates of the actual costs of providing the schools.

EDMONTON PUBLIC SCHOOL BOARD

Including transactions costs, the present value cost of financing the six schools through P3s would be \$114.9 million, or approximately \$39 million more than the cost of the schools using conventional public sector financing methods. P3s increase the costs by approximately 51%.

To put it slightly differently, for the cost of building six schools under the P3 program, the public sector financing model would support the construction of nine K-9 schools.

Looking at the Edmonton Public Board's entire 3-year capital plan, the 18 schools in the plan are estimated by the board to cost roughly \$200 million, with another \$63 million for major renovations. Financed through P3s, the new schools would cost more than \$302 million. The difference of over \$100 million would be more than enough to pay for the major renovations planned.

TABLE 7

Public and P3 Cost Comparison, Edmonton Public School Board

MORTGAGE BASIS

Estimated cost	76.0	\$ million
Transaction costs Govt.	0.05%	
Transaction costs P3	4.0%	
Number of parties	2	
Leverage	85%	
Borrowing	64.6	\$ million
Equity	11.4	\$ million
Target equity return (%)	15%	
Target annual equity cash flow	1.74	\$ million
10-year gov bond rate	4.5%	
P3 borrowing rate	6.5%	
Term	30	years
	PUBLIC	P3
	\$ million	\$ million
Net Present Value, financing	76.0	108.9
Transaction costs	0.0	6.1
TOTAL COST	76.0	114.9
P3 cost disadvantage (\$)	38.9	
P3 cost disadvantage (%)	51%	
Public borrowing room at P3 cost	114.9	

EDMONTON CATHOLIC SCHOOL BOARD

The Edmonton Catholic Board received approval for three new K-9 schools with a board-estimated total cost of \$27.2 million.

Using the board-estimated construction costs as a base, those three schools would cost \$41.1 million to build using a P3 financing model. The difference -- \$14 million -- would be enough to finance 1½ additional schools.

The Board's full three-year new school construction and major renovation plan is valued at \$209 million. P3 financing of that construction value would cost a total of \$316 million -- a loss of over \$100 million. The results are presented in table 8.

TABLE 8

Public and P3 Cost Comparison, Edmonton Catholic School Board

MORTGAGE BASIS

Estimated cost	27.2	\$ million
Transaction costs Govt.	0.05%	
Transaction costs P3	4.0%	
Number of parties	2	
Leverage	85%	
Borrowing	23.1	\$ million
Equity	4.1	\$ million
Target equity return (%)	15%	
Target annual equity cash flow	0.62	\$ million
10-year gov bond rate	4.5%	
P3 borrowing rate	6.5%	
Term	30	years
	PUBLIC	P3
	<hr/>	<hr/>
	\$ million	\$ million
Net Present Value, financing	27.2	39.0
Transaction costs	0.0	2.2
TOTAL COST	27.2	41.1
P3 cost disadvantage (\$)	31.9	
P3 cost disadvantage (%)	51%	
Public borrowing room at P3 cost	41.1	

CALGARY BOARD OF EDUCATION

The results of the analysis for the Calgary Public Board's \$58 million provincially approved P3 capital program are presented in table 9.

Including transactions costs, the present value cost of financing the 6 schools approved by the Provincial Government for P3 financing would be \$87.7 million. The additional cost of \$29.7 million would permit the construction of three additional junior schools; two additional middle schools or $\frac{3}{4}$ of the cost of building a high school.

The 18 schools in the public board's original capital plan would cost \$311 million using traditional public sector financing methods. The cost of financing the same project capital cost through P3s would be an estimated \$461 million, including transactions costs.

P3 financing would increase capital costs by \$159 million, or 51%.

For the \$310.5 million cost of financing all 18 schools in the plan using conventional public financing vehicles, the Public Board would be able to provide at most the top 13 on its 18-school priority list of planned schools. Those 13 schools would cost \$205 million if financed publicly.

TABLE 9

Public and P3 Cost Comparison, Calgary Board of Education

MORTGAGE BASIS

Estimated cost	58.0	\$ million
Transaction costs Govt.	0.05%	
Transaction costs P3	4.0%	
Number of parties	2	
Leverage	85%	
Borrowing	49.3	\$ million
Equity	8.7	\$ million
Target equity return (%)	15%	
Target annual equity cash flow	1.33	\$ million
10-year gov bond rate	4.5%	
P3 borrowing rate	6.5%	
Term	30	years
	PUBLIC	P3
	<hr/>	<hr/>
	\$ million	\$ million
Net Present Value, financing	58.0	83.1
Transaction costs	0.0	4.6
TOTAL COST	58.0	87.7
P3 cost disadvantage (\$)	29.7	
P3 cost disadvantage (%)	51%	
Public borrowing room at P3 cost	87.7	

CALGARY CATHOLIC DISTRICT SCHOOL BOARD

The results of the analysis for the Calgary Catholic District School Board's \$39 million capital program approved for provincial P3 financing are presented in table 10.

Including transactions costs, the present value cost of financing the three schools through P3s would be \$39.1 million, or approximately \$20 million more than the cost of the schools using conventional public sector financing methods. P3s increase the costs by approximately 51%.

To put it slightly differently, for the cost of building three schools under the P3 program, the Catholic board could build another 1.5 K-9 schools; another 2 K-6 schools; or about half the cost of a high school.

Looking at the Catholic board's entire school capital plan, including transactions costs, the present value cost of financing 11 schools using traditional public sector financing methods would be \$135.9 million. The cost of financing the same project capital cost through a P3 would be an estimated \$205.5 million, including transactions costs.

For the \$135.9 million cost of financing all 11 schools in the plan using conventional public financing vehicles, P3 financing would support the provision of only 7 of the planned schools. Those 7 schools could be financed publicly at a cost of \$85.9 million.

Taking the four boards together, the Provincial Government's take-it-or-leave-it P3 scheme would result in 18 schools with board-estimated total costs of \$201.9 million being built at a cost, in present value terms, of \$305 million. If the provincial government were in fact to make \$305 million available to the school boards, rather than to P3 providers, the boards could build ten additional elementary schools; or eight additional K-9 or junior high schools; or as many as six additional high schools.

TABLE 10

Public and P3 Cost Comparison, Calgary Catholic District School Board

MORTGAGE BASIS

Estimated cost	39.1	\$ million
Transaction costs Govt.	0.05%	
Transaction costs P3	4.0%	
Number of parties	2	
Leverage	85%	
Borrowing	33.2	\$ million
Equity	5.9	\$ million
Target equity return (%)	15%	
Target annual equity cash flow	0.89	\$ million
10-year gov bond rate	4.5%	
P3 borrowing rate	6.5%	
Term	30	years
	PUBLIC	P3
	<hr/>	<hr/>
	\$ million	\$ million
Net Present Value, financing	39.1	56.0
Transaction costs	0.0	3.1
TOTAL COST	39.1	59.1
P3 cost disadvantage (\$)	20.0	
P3 cost disadvantage (%)	51%	
Public borrowing room at P3 cost	59.1	

The boards' combined capital plans call for the construction of a total of 53 new schools at a total board-estimated cost of \$701 million. P3 financing of that amount would cost more than \$1 billion (\$1,060 million) in today's dollars. For the public sector model cost of \$701 million, P3s would finance only 37 of the 53 schools, leaving 15 schools unbuilt. Coincidentally, the money wasted by requiring P3 financing of the new schools in the plans would be more than enough to fund the \$347 million cost of the four boards' school preservation priorities.

Or to put it another way, the additional cost of P3 financing would cost Calgarians and Edmontonians roughly \$500 per household.

RISK TRANSFER

The argument over financing costs having been lost decisively based on analyses such as the one presented above, P3 advocates have attempted to shift the terms of the debate by introducing the concept of risk transfer from the public sector to the private project operator as P3 advantage.

The argument is that the assumption by the P3 operator of the risk of cost overruns more than offsets the cost disadvantage of P3 financing, resulting in a net gain from P3 development. On the face of it, the argument appears questionable since, presumably, the P3 operator is inevitably going to build the value of the overrun risk assumed into its financial model, and the government will therefore be paying the P3 operator indirectly for assuming the overrun risk just as it will be paying the P3 operator indirectly for the P3 model's higher financing costs.

For this to hold water as an argument, the difference between the value of the transferred risk to the public sector (in this case, the school board) and the cost of assuming that risk built into the P3 project financial model would have to exceed the substantial financing cost disadvantage in the P3 model. With the analysis above as a reference point, this differential would have to

exceed 51% of the public sector model's capital costs. Even without further analysis and reflection, this would appear to be a tall order indeed.

But that is not the end of the problems associated with the use of risk transfer as a justification for adopting the P3 model for public infrastructure finance.

First, the risk transfer argument depends on the value to the government of the risks transferred exceeding by a substantial margin the value attached to those risks by the project proponent, to whom the risk is being transferred. Without such a differential, no gain would be generated to offset against higher financing costs. The most basic kind of risk analysis would demonstrate that in fact the direct opposite is true. In general, one would expect the value attached to any given risk by the government to be less than the value that would be attached to it by an individual project proponent.

Why? Because the government is responsible for the administration of literally hundreds of projects, it is able to pool the risk associated with any one project over those hundreds of projects. The larger the number of projects over which a given risk can be spread, the lower the value of the risk and the lower the cost of insuring against that risk. For the P3 operator, the situation is reversed. Because P3 projects are generally owned by stand-alone entities – usually limited partnerships – established for the sole purpose of building and operating the project, all of the risk associated with that project must be absorbed within the financial model of that single project. The smaller the number of projects, the higher the value of any given risk and the higher the cost of insuring against that risk, with the highest cost associated with stand-alone projects.

The economics of risk management for public projects are analogous to the economics of risk management in the operation of a dental or drug insurance plan. Just as insurance rates are lower, the larger the group covered, the cost of risk management in public projects is lower, the larger the number of projects among which the risks are shared.

The risk transfer model assumes that the risk value built into the project proponent's price will be lower than the value of that risk to the government. In fact, the value to the government will be substantially less.⁶

This is exactly the conclusion reached by the British Association of Chartered Certified Accountants in a study of road and hospital P3s in Great Britain, published in 2004.⁷ This study delves extensively into the use of risk transfer as a justification for P3 schemes. Reviewing other studies of hospital financing in Britain, the study observes:

Several studies have examined the business cases supporting the use of private finance for new hospital builds, and questioned the ability of the methodology to measure VFM in an unbiased way, the degree to which the business cases demonstrate VFM and the higher cost of PFI over conventional procurement (Gaffney and Pollock 1999; Price et al. 1999; Pollock et al. 2000; Froud and Shaoul 2001; Shaoul 2005). Their evidence shows that the VFM case rests upon risk transfer. The credit ratings agency, Standard and Poor's, in its report for the capital markets (Standard and Poor's 2003), states that the PFI companies carry little effective risk. Other work shows that the high costs of PFI projects lead to affordability problems, an issue that the emphasis on VFM downplays, and lead to hospital downsizing in order to bridge the affordability gap (Hodges and Mellett 1999; Gaffney and Pollock 1999; 1999b; Gaffney et al. 1999a; 1999b; 1999c; Pollock et al. 1999 p.7).

⁶ In general, measured risk varies with the square root of the number of cases over which the risk is spread. So, for example, the value of a given risk spread over 36 projects will be one-sixth of the value of that same risk absorbed by a single, stand-alone project.

⁷ Pam Edwards, Jean Shaoul, Anne Stafford and Lorna Arblaster, "Evaluating the operation of PFI in roads and hospitals", Research Report No. 84, Association of Chartered Certified Accountants, Certified Accountants Educational Trust, 2004

And summarizing its own conclusions with respect to risk transfer, the study concludes:

The net result of all this is that although risk transfer is the central element in justifying VFM and thus PFI, our analysis shows that *risk does not appear to have been transferred to the party best able to manage it*. Furthermore, rather than transferring risk to the private sector, PFI has, first, created additional risks to the public agency and the public sector as a whole that must increase costs to the taxpayer and/or reduce service provision, a travesty of risk transfer. [emphasis added] (p. 222).[VFM = Value for Money; PFI = Public Finance Initiative (the British Government's terminology for P3s.)]

Second, it is assumed implicitly that there is no alternative to a P3 available to the government to transfer project risk. That is also not true. As noted above, it is quite common for capital projects to be built on a fixed-price guaranteed basis, with the risk of cost over-runs borne by the contractor. Governments are in a position to choose whether to transfer construction cost risk to a contractor – at a price – or to self-insure against cost overruns by retaining responsibility for cost management.

Third, it is doubtful, in the specific situations in which P3s are contemplated, that risk is ever really fully transferred from the government to the project proponent. Why? Because the consequences of default on the agreement are not evenly balanced between the government and the project proponent. In the case of the project proponent, the consequences of default are limited by the fact that the project is legally a stand-alone entity. A proponent's liability on default is generally limited to any equity invested in the project that has not been drawn out in the form of profit. There is no recourse to the financial resources of the entities financing or providing services to the P3. For the government, there is no walk-away option. If the proponent defaults, the government's payments under the P3 agreement stop, but it still has to provide the educational services. It still has to run the school. In

the end, the risk falls back on the government, leaving open the question of why the government would pay someone to absorb a risk that, in the event of default, it will have to absorb in any case.

BACK TO BASICS – WHY THE ECONOMICS OF P3S RELATIVE TO DIRECT PUBLIC PROVISION DON'T MAKE SENSE

Basic economic analysis will tell you that the public sector enjoys two fundamental advantages over the private sector in financing public infrastructure. The public sector can borrow at a substantially more favourable rate than a private sector operator of a stand-alone project. And because it is able to pool risk over a large number of projects, the public sector can manage risks associated with project costs more cost-effectively than a private operator of a stand-alone project.

In other words, the very factors that are touted as P3 advantages are in reality the core factors that lead inevitably to the conclusion that, properly compared, P3s cannot compete with direct public sector provision.

A decision to bear the higher costs and proceed with P3 financing will inevitably result in one or both of higher costs for taxpayers and less public infrastructure being provided. Either way, the citizens of Calgary, Edmonton and of Alberta will be the losers.

P3 financing would increase capital costs by \$172 million, or 56%.

For the cost of financing all 18 schools in the plan using conventional public financing vehicles, the Public Board would be able to provide at most the top 13 on its 18-school priority list of planned schools.

Taking the two boards' capital plans together, the P3 financing cost disadvantage would result in 8 of 28 schools that would be affordable using conventional public financing not being built.

APPENDIX II
DETAILS OF THE CASH FLOW MODEL – MORTGAGE BASIS CALGARY
PUBLIC BOARD

TABLE 13
P3 and public cost comparison, Calgary Public

MORTGAGE BASIS		
Estimated cost	58.0	\$ million
Transaction costs Govt.	0.05%	
Transaction costs P3	4.0%	
Number of parties	2	
Leverage	85%	
Borrowing	49.3	\$ million
Equity	8.7	\$ million
Target equity return (%)	15%	
Target annual equity cash flow	1.33	\$ million
10-year gov bond rate	4.5%	
P3 borrowing rate	6.5%	
Term	30	years
	PUBLIC	P3
	\$ million	\$ million
Net Present Value, financing	58.0	83.1
Transaction costs	0.0	4.6
TOTAL COST	58.0	87.7
P3 cost disadvantage (\$)	29.7	
P3 cost disadvantage (%)	51%	
Public borrowing room at P3 cost	87.7	

TABLE 13 (CONT'D)

CASH FLOW MODEL	GOVT.	P3 MORTGAGE	P3 EQUITY	TOTAL P3
Initial capital	-58	-49.3	-8.7	-58
Year				
1	2.61	3.78	1.33	5.10
2	2.61	3.78	1.33	5.10
3	2.61	3.78	1.33	5.10
4	2.61	3.78	1.33	5.10
5	2.61	3.78	1.33	5.10
6	2.61	3.78	1.33	5.10
7	2.61	3.78	1.33	5.10
8	2.61	3.78	1.33	5.10
9	2.61	3.78	1.33	5.10
10	2.61	3.78	1.33	5.10
11	2.61	3.78	1.33	5.10
12	2.61	3.78	1.33	5.10
13	2.61	3.78	1.33	5.10
14	2.61	3.78	1.33	5.10
15	2.61	3.78	1.33	5.10
16	2.61	3.78	1.33	5.10
17	2.61	3.78	1.33	5.10
18	2.61	3.78	1.33	5.10
19	2.61	3.78	1.33	5.10
20	2.61	3.78	1.33	5.10
21	2.61	3.78	1.33	5.10
22	2.61	3.78	1.33	5.10
23	2.61	3.78	1.33	5.10
24	2.61	3.78	1.33	5.10
25	2.61	3.78	1.33	5.10
26	2.61	3.78	1.33	5.10
27	2.61	3.78	1.33	5.10
28	2.61	3.78	1.33	5.10
29	2.61	3.78	1.33	5.10
30	60.61	3.78	1.33	5.10
Present value	58.00	61.49	21.58	83.08
Internal rate of return	4.50%	6.50%	15.00%	7.89%
Additional cost % (excl. trans. costs)	43.2%			

APPENDIX III
SENSITIVITY ANALYSIS – MORTGAGE BASIS

Using the base model assumptions, excluding transactions costs from the analysis reduces the estimated disadvantage for P3 provision from 56% to 48%.

Table 7 shows the percentage disadvantage for P3 financing at various leverage percentages and various equity rates of return when debt interest rates are 1%, 1.5/5, 2% and 2.5% (LIBOR + 2%) above the Government of Alberta long-term borrowing rate of 4.5%. Percentage impacts are calculated not including the impact of transactions costs, which are uniform across all scenarios.

TABLE 14

Private sector borrowing at 2.5% more than public
P3 Cost disadvantage as % of public sector cost

LEVERAGE	EQUITY RETURN				
	10.0%	12.5%	15.0%	17.5%	20.0%
56.7%					
90%	43%	47%	51%	55%	59%
85%	45%	51%	57%	63%	69%
80%	47%	55%	63%	70%	78%
75%	50%	59%	68%	78%	88%

Private sector borrowing at 2.5% more than public
P3 Cost disadvantage as % of public sector cost

LEVERAGE	EQUITY RETURN				
	10.0%	12.5%	15.0%	17.5%	20.0%
56.7%					
90%	43%	47%	51%	55%	59%
85%	45%	51%	57%	63%	69%
80%	47%	55%	63%	70%	78%
75%	50%	59%	68%	78%	88%

Private sector borrowing at 1% more than public
P3 Cost disadvantage as % of public sector cost

TABLE 14 (CONT'D)

LEVERAGE	EQUITY RETURN				
	10.0%	12.5%	15.0%	17.5%	20.0%
40.4%					
90%	26%	30%	34%	38%	42%
85%	29%	35%	40%	46%	52%
80%	32%	40%	47%	55%	63%
75%	35%	44%	54%	64%	74%

Private sector borrowing at 1.5% more than public
P3 Cost disadvantage as % of public sector cost

LEVERAGE	EQUITY RETURN				
	10.0%	12.5%	15.0%	17.5%	20.0%
45.7%					
90%	32%	35%	39%	43%	47%
85%	34%	40%	46%	52%	58%
80%	37%	45%	52%	60%	68%
75%	40%	49%	59%	69%	78%

This analysis demonstrates that the lower the leverage rate and the higher the equity return, the greater the P3 percentage disadvantage. With respect to equity returns, 12.5% is likely at the low end of going-in equity return expectations for infrastructure projects and would typically be associated with lower-leverage financial models. 17.5% would be a typical going-in equity return expectation in high-leverage models. For example, 17.5% was the going-in equity return expectation in the 85% levered Brampton hospital project (the Ostler Health Centre) in Ontario.

The higher the differential between P3 debt carrying costs and government long-term borrowing rates, the greater the P3 percentage disadvantage. Given the nature of the lender recourse offered in typical P3 financings, the 2.5% differential implicit in a LIBOR plus 2% borrowing rate is a more likely scenario than the 2% differential in the base case.

