Qualifications-Based Selection (QBS): Best Practice for Architecture, Engineering and Construction Management/General Contractor Procurement in Canada

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While the term AEC generally refers to architecture, engineering, and construction, this paper will use the term AEC to specifically refer to architecture, engineering and construction management/general contracting.

Although this paper will discuss both design-build and design-bid-build, it is effectively neutral towards any delivery system.
Both will be discussed to demonstrate that QBS is the best practice in various environments.

This paper represents a comprehensive literature review of QBS research as of August 2018, with a focus on Canadian research.

Abstract

Qualifications-Based Selection (QBS) is a procurement process that has seen widespread use throughout the United States and is gaining traction in Canada. QBS has a considerable number of advantages over other competitive procurement methods that involve price for the selection of architecture, engineering, or construction management/general contractor services (AEC) (details can be found under QBS Metrics at a Glance). This paper will examine the advantages of QBS over other competitive procurement methods (low bid and best value procurement (BVP)), clarify common misconceptions about QBS, examine current procurement processes in Canada, and propose possible steps towards the expansion of QBS throughout the country.

Data presented in section 2 of this paper is presented based on literature review. Metrics analyzed for architecture and engineering (A/E) include: cost-growth, schedule-growth, unit cost ($/S.F.), project intensity ($/S.F./Month), construction speed, perceived risk in projects, project complexity, level of excessive bureaucratic systems, level of overall project quality, administrative waste, proposal writing costs, and level of innovation. Metrics analyzed in this paper for construction management (section 2.2) will focus on: difficulty of developing upfront construction pricing for best value and low bid procurement methods, the ability for QBS to select contractors solely on their experience and innovation, the risk of original price estimates holding little weight due to insufficient information and change order risk.

This paper will demonstrate in section 3.1 how low bid and best value procurement methods have put the public at risk, cost taxpayers more money, and have failed in regard to contracting the most qualified AEC professionals. Progress towards selection based on qualifications is being made, however, and section 3.2 will outline said changes, both through legislative acts and "evidence-based decision making."[1] Guided by the trend towards QBS in Canada, buyers of AEC, and other professional services can decide if they would like to adopt a system that is more efficient for them, the contractor, and the Canadian public.

[1] "A QBS Success in Ontario." http://yes2qbs.com/profiles/a-qbs-success-in-ontario/.

QBS Metrics at a Glance

- For design-build projects, QBS has a project cost growth of 0.92%, which is one-tenth of that of the 9.82% cost growth of low-bid, and almost one-third of the 2.47% cost growth of BVP.
- For design-build projects, the unit cost of projects procured with QBS is comparable to low-bid and is 44% lower than BVP.
- QBS has a faster construction speed than either BVP (by 23%) or low-bid (by 6%) for design-build projects.
- QBS has the highest intensity of any competitively procured design-build projects.
- QBS projects put a large emphasis on long-term facility flexibility during the design process.
- QBS projects are not prone to experience excessive bureaucratic procedures, even when said procedures are federally regulated.
- There is an extremely high level of quality associated with QBS projects.
- Both the designers and owners of completed QBS procured projects report that the projects had high levels of success.
- QBS is not subject to complex pricing analysis, which reduces both administrative and proposal writing costs.
- QBS is better able to focus on the innovation an architect, engineer, or general contractor can generate than BVP or low bid procurement methods.
- QBS is not as susceptible to change order risk as other procurement methods.

1.1 Introduction

Canada has long trailed the United States in regard to the use of Qualifications-Based Selection when procuring architectural, engineering, and construction management/general contracting (AEC) services. It is only in February 2018, that the government of Canada has announced they will launch a pilot program for Qualifications-Based Selection (QBS),[2] a procurement process that has been mandated in the USA by the Brooks Act since 1972.[3] The Brooks Act, or the Selection of Architects and Engineers Statute, made it illegal to use price as an evaluated criterion when deciding the winner of a contract for architectural and engineering (A/E) services.[4] QBS has seen expansion in other levels of U.S. government, where "47 states currently have some form of QBS law or regulation in place."[5]

QBS is most accurately considered an ideology with many methodologies that support it. In its most basic form, procurement using QBS is much the same as the process of hiring someone for a job. In both cases, a buyer seeks to hire certain expertise, and capability - intangible attributes that are difficult to directly measure and evaluate.

Let's compare the hiring of a staff architect to a contractor architect. When hiring a staff architect, a general description, as well as salary range, is posted, where candidates will then respond with a brief two or three-page qualifications document (a resume). The two or three most qualified candidates are then interviewed, and salary negotiations are only done with the most qualified candidate, directly prior to hiring. If salary negotiations are unsuccessful, the hirer is free to move on to the next most qualified candidate.

With QBS, the buyer of contracted architecture services advertises a Request for Qualifications (RFQ), that invites qualified and interested architects to provide specific and pertinent information about their qualifications, such as expertise, consistency of methodology, and past achievements. The client's budget is often disclosed to allow potential suppliers to opt in or out based on the reasonableness of the budget (which can also be provided as a range). Proponents will respond to the RFQ with a short document including qualifications (their

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[2] Beyond Referrals. "Canadian Government to Pilot QBS" 7 Feb. 2018, http://beyondreferrals.com/canadian-government-to-pilot-qbs/.

[3] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.1

[4] *Ibid*

[5] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.14

proposal). Proposal documents are scored, and a shortlist including usually three to five,[6] of the most qualified firms is created with interviews to "stress-test" the claims in their proposal document (just like the job interview described above). Once selected using a transparent and relevant scoring rubric, the most qualified firm can then negotiate the final scope and fees in a collaborative manner with the client. If no scope and fee agreement can be reached, the next most qualified firm will begin the negotiation process - thus guaranteeing that the most qualified firm is always incented to provide the fairest price for their services.[7] If organizations are already using a QBS-like process to make multi-million dollar hiring decisions for staff, why aren't they using the same process for contractors?

The three most common procurement methods of AEC services in Canada are low bid procurement, best value procurement (BVP), and QBS.

Low bid is a procedure with a long history in the public sector,[8] where contracts are awarded "to the bidder with the lowest price" as this is mistakenly thought to provide the best value and is the most easily defended to unsophisticated voters by bureaucrats and politicians. A low bid procurement is initialized with a request for tenders (RFT), a formal invitation for the submission of bids to supply goods or services.

BVP is a specific-sounding name, but a generic process in which contracts are awarded on the basis of cost, balanced with other factors including qualifications.[9] While the term "best value" may imply that BVP brings about the highest quality at the lowest cost, this paper will demonstrate that neither low-price nor high quality is achieved when BVP is used. A BVP is initialized with a request for proposal (RFP), a document which solicits proposals that include technical expertise and price, in the case of a best value RFP.

Finally, QBS is a procedure where contractors are selected based on qualifications alone, where price is not a factor in the selection process although the price is a collaboratively

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[6] Cushman, Robert F., and Michael C. Loulakis. *Design-build contracting handbook*. Aspen Law & Business, 2001. p.244

[7] Harrison, Cal. *Buying Professional Services: Replacing the Price-Based Request for Proposal with Qualifications Based Selection*. 2016.

[8] Molenaar, Keith R., and Nathaniel Sobin. "Sustainable, high performance projects and project delivery methods." *ResearchGate*, 1 Sept. 2009, www.researchgate.net/profile/Keith_Molenaar/publication/237234014_Sustainable_High_Performance_Projects_and_Project_Delivery_Methods/links/5494591d0cf22af91122253d.pdf. p.4

[9] Molenaar, Keith R., and Nathaniel Sobin. "Sustainable, high performance projects and project delivery methods." *ResearchGate*, 1 Sept. 2009, www.researchgate.net/profile/Keith_Molenaar/publication/237234014_Sustainable_High_Performance_Projects_and_Project_Delivery_Methods/links/5494591d0cf22af91122253d.pdf. p.5

negotiated element along with the final scope.[10] The advantages of QBS over BVP and low bid procurement, and the development of QBS in Canada will be the focal points of this paper. A QBS procurement is initialized with a request for qualifications (RFQ), as discussed above.

1.2 Misconceptions about QBS

QBS Is a License for Vendors to Charge as Much as They Like

A common complaint in regard to QBS is the possibility to overpay for architectural, engineering and construction (AEC) services, as it is perceived that competitive pricing is not necessary to win a competition at a reasonable price. In reality, the adversarial nature of low bid selection encourages AEC firms to ignore any hidden variables that may increase costs and submit change-orders after winning the contract.

For bid-build projects, a 2004 study found that QBS has the lowest cost growth among competitive procurement methods, and has a significantly (>40%) lower unit cost (measured in dollars per square foot) than BVP methods.[11] Another study of A/E firms found that when QBS is used in the design phase, the construction cost growth averages 3%, while the industry average is ~10%.[12] The high cost growth of best value and low bid procurement methods thus largely negates any initial cost savings found by using price-based-proposals.

It Is Impossible to Differentiate Firms Without Using Price to Do so

A question often asked about QBS is: "if I release my budget for a project, won't every AEC firm offer their services at the same price as the advertised budget?" Although this may sound like a negative experience for a client, in reality, this hypothetical situation ensures that the client can focus on identifying the most qualified AEC firm at a fair and reasonable price point. Price should not be the factor that differentiates firms from one another when expertise and other qualifications are the greatest influences of the success of a project.

A Two-Envelope System is the Same As QBS

A commonly used method to procure AEC services is a two-envelope system, where qualifications pertinent to a project are submitted in one envelope, and financial proposals are submitted in a separate sealed envelope. While a two-envelope system is commonly mistaken

[10] *Ibid*
[11] El Wardani, Marwa A. "Comparing Procurement Methods for Design-Build Projects." *The Pennsylvania State University*, May 2004, www.aiacc.org/wp-content/uploads/2016/03/U-of-Penn-DB-study-in-2004.pdf. p.59
[12] *Ibid*

to be the same as QBS, the downfall of a two-envelope system is that the bidding price is often an evaluated criterion that decides the winner of a contract, provided certain qualifications criteria are met.

If a buyer of AEC services wishes to use a two-envelope procurement system, a budget for the services purchased should be posted, where qualifications are evaluated, and bids must be compliant with the posted budget, but not evaluated. However, it should be noted that the excessive costs associated with having every proponent provide detailed pricing remain in place when this type of two-envelope system is used. Costs that are always, 100% passed along to the clients in the long run.

QBS Proposals Take Longer to Evaluate Than Other Procurement Methods

It is often mistaken that because price is seemingly more straightforward to evaluate than qualifications, QBS may take longer than other, price-based procurement methods. On the contrary, government QBS projects are not subject to an excessive number of bureaucratic processes[13] and have found to take less time than best-value procurement methods due to the detailed programs that need to be created to evaluate price proposals.[14]

I Am Not an AEC Firm, so I need a Price-Based RFP to Determine my Budget

It is the responsibility of the client to complete price discovery for their budget via discussions with credible consultants, prior to requesting proposals for a project. If a buyer of AEC does not know what their budget is prior to releasing an RFP, it is possible the price that will be "discovered" will be out of their budget range. It is unethical to compel AEC firms to write expensive proposals for a project that may not even come to fruition.

[13] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.29

[14] "Selecting Architects and Engineers for Public Building Projects: an Analysis and Comparison of the Maryland and Florida Systems." *ACECND*, The American Institute of Architects, www.acecnd.org/image/cache/QBS_MD-FL_Study.pdf. p.3

2.1 QBS Research

Since its introduction via the Brooks Act, QBS has been found to have resounding success in the A/E industries. Although QBS is used most often in the USA, it is also widely used in Asia, Canada, and Europe.[15] It is advocated by many international financial institutions, most notably by The World Bank and the Asian Development Bank.[16] QBS is also endorsed by the International Federation of Consulting Engineers, the Australian Council of Building Engineers, and by The Association of Consulting Engineers Australia.[17] In Canada, QBS is the preferred method of procurement by the Association of Consulting Engineering Companies,[18] the Federation of Canadian Municipalities,[19] the Canadian Construction Association,[20] the Canadian Association of Management Consultants,[21] the Royal Architectural Institute of Canada,[22] the Ontario Association of Architects,[23] and many more. A list of organizations currently advocating for QBS in Canada can be found in the appendix as well as on QBSCanada.ca.

> "Internationally, QBS is identified as the global best practice for purchasing architecture and engineering services (and is easily applied to other services as well) identified by the National Institute of Governmental Purchasing and the Chartered Institute of Purchasing and Supply in the U.S., U.K., Australia, South Africa, Middle East and China."[24]

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[15] "Qualification Based Selection For The Procurement of Engineering and Management Services." *Australasian Legal Information Institute*, www.austlii.edu.au/au/journals/AUConstrLawNlr/1998/26.pdf. p.12

[16] *Ibid*

[17] *Ibid*

[18] "The Best Practice for Selecting a Consultant." *ACEC*, www.acec.ca/advocacy/procurement/selecting_consultant/index.html.

[19] "National Guide to Sustainable Municipal Infrastructure." *FCM*, June 2006, fcm.ca/Documents/reports/Infraguide/Selecting_a_Professional_Consultant_EN.pdf. p.2

[20] Gilbert, Richard. "Canadian Construction Association Targets Poor-quality Plans." *ConstructConnect*, 16 June 2010, canada.constructconnect.com/dcn/news/Associations/2010/6/Canadian-Construction-Association-targets-poor-quality-plans-DCN039306W.

[21] "The Effective Use of Price as a Criterion in Proposal Assessment for Management Consulting Services." *CMC*, higherlogicdownload.s3.amazonaws.com/CMCCANADA/6ae61369-ed65-4d46-87b4-976096e78fa2/UploadedImages/PDFs/Procurement%20Position%20Paper.pdf. p.2

[22] "Qualifications-based Selection (QBS)." *Royal Architectural Institute of Canada*, www.raic.org/raic/qualifications-based-selection-qbs.

[23] Dreessen, Toon. "OAA Pre-budget Submission." *Ontario Association of Architects*, 21 Jan. 2016, www.oaa.on.ca/oaamedia/bloaags/text/2016_01_21_-_oaa_pre-budget_submission.pdf.

[24] Harrison, Cal. "Canada Behind the Times in Tendering Practices." *Winnipeg Free Press*, 4 May 2016, www.winnipegfreepress.com/opinion/analysis/canada-behind-the-times-in-tendering-practices-378063211.html.

An analysis of 70 design-build projects in the United States, *Comparing Procurement Methods for Design-Build Projects*, compared sole source, low-bid, best value, and QBS procurement methods.[25] The study found that the cost growth of a project is 9% more for low-bid procurement, and 1.6% more for BVP than QBS (percentages measured by absolute difference).[26] The low cost growth of QBS is one of the factors that explains why QBS has a comparable unit cost to low bid ($/S.F.), and has a 44% lower unit cost than BVP.[27] Furthermore, project intensity ($/S.F./Month) for low bid and BVP was measured to be 31% and 47% slower than QBS, respectively for these projects.[28] QBS had the highest construction speed of all procurement methods, where BVP was 23% slower than QBS, and low bid was 6% slower than QBS.[29] While it was noted that BVP projects underperformed in the areas of unit cost and construction speed due to a limited sample size,[30] the lack of scope and cost change orders in QBS projects would aid in QBS' high construction speed and low unit cost.[31] [32]

A report written by Paul S. Chinowsky and Gordon A. Kingsley, *An Analysis of Issues Pertaining to Qualifications-Based Selection,* analyzed 41 predominantly public design-bid-build projects in 23 states throughout the United States.[33] Relevant demographics of the 41 projects studied are shown in the figure below.

[25] El Wardani, Marwa A. "Comparing Procurement Methods for Design-Build Projects." *The Pennsylvania State University*, May 2004, www.aiacc.org/wp-content/uploads/2016/03/U-of-Penn-DB-study-in-2004.pdf.
[26] El Wardani, Marwa A. "Comparing Procurement Methods for Design-Build Projects." *The Pennsylvania State University*, May 2004, www.aiacc.org/wp-content/uploads/2016/03/U-of-Penn-DB-study-in-2004.pdf. p.59
[27] *Ibid*
[28] *Ibid*
[29] *Ibid*
[30] El Wardani, Marwa A. "Comparing Procurement Methods for Design-Build Projects." *The Pennsylvania State University*, May 2004, www.aiacc.org/wp-content/uploads/2016/03/U-of-Penn-DB-study-in-2004.pdf. p.61
[31] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.21
[32] Stewart, Brian. "University of Alberta." *PBSRG*, pbsrg.com/resources/university-of-alberta/.
[33] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf.

Owner Type:	Public 95% Private 5%
Project Type:	Transportation 44% Water 39% Commercial 15% Industrial 2% Land Development 0%
Delivery System:	Design-Bid-Build 90% Design-Build 5% Other 5%
Design Procurement Process:	QBS 78% Best Value 10% Low-Bid 5% Sole Source 7%
Construction Procurement Process:	QBS 12% Best Value 17% Low Bid 59% Sole Source 2% Other 10%
Design Fee:	Minimum $2,500 Maximum $9,000,000 Median $441,500
Construction Cost:	Minimum $25,000 Maximum $900,000,000 Median $4,500,000

Source: Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.20

The study found that of the sample projects, cost growth due to change orders as a percentage of the final construction cost was 3% for QBS, where the industry average is accepted to be 10% (based on data current as of the reports publishing).[34] Note that low cost growth may be due to higher accuracy of initial pricing because of the collaborative nature of the scoping and costs discussions between client and vendor, as opposed to the often deceptive and adversarial costing approach incentivized by the low bid and BVP procurement processes. However, this is not always the case, as seen in the above study comparing design-build projects, where unit cost ($/S.F.) for QBS procured projects was lower than for projects procured using BVP.[35]

Complimentary to cost growth is construction schedule growth, where the industry average is ~10% for any given project.[36] The study found that QBS procured projects had a construction schedule growth of 8.7%, with 60% of those projects having a construction

[34] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.20, 21
[35] El Wardani, Marwa A. "Comparing Procurement Methods for Design-Build Projects." *The Pennsylvania State University*, May 2004, www.aiacc.org/wp-content/uploads/2016/03/U-of-Penn-DB-study-in-2004.pdf. p.59
[36] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.21

schedule growth of <3%.[37] Using QBS to procure the most experienced (and not the lowest bidding) A/E contractors lowers cost and schedule growth, preventing cost change orders and delays.[38]

The Chinowsky/Kingsley paper also measured perceived project risk areas for QBS procured projects. The risk categories were construction cost and schedule, social risk, political risk, and owner relationship risk; construction cost and schedule was found to be the highest risk area (with 27% of respondents stating the risk was high or very high).[39] It is possible that projects with high schedule and costs risks are thus more likely to use QBS due to its capacity in reducing cost and schedule growth, but the paper notes further research is necessary to confirm this hypothesis.[40]

The study found that QBS projects were predominantly complex, with 56% of respondents indicating a high to very high level of technical complexity of their projects.[41] As QBS projects receive "consistently high scores"[42] in trust from design teams, it is possible that the team relationship formed using QBS, a relationship absent from adversarial relationships often present in price-based selection methods leads to QBS performing better with complex projects.[43] Furthermore, as "cost and schedule growth factors are directly related to the quality of the design solution,"[44] the issue of complexity is addressed in the design phase to reduce risk and complex design elements.[45]

QBS procured projects were found to put a large emphasis on long-term facility flexibility during the design phase.[46] This demonstrates that design firms are interested in

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[37] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.21
[38] *Ibid*
[39] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.22
[40] *Ibid*
[41] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.23
[42] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.28
[43] "National Guide to Sustainable Municipal Infrastructure." *FCM*, June 2006, fcm.ca/Documents/reports/Infraguide/Selecting_a_Professional_Consultant_EN.pdf. p.18
[44] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.24
[45] *Ibid*
[46] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.25

creating a positive long-term perception of their firm, not simply in a hasty completion of the project.[47]

While QBS is federally mandated in the United States, there didn't seem to be excessive bureaucratic procedures that slowed the selection of contractors; the average selection time was found to be comparable with experience found in private contracting.[48] Although "respondents [did not experience] a significant amount of excess bureaucratic procedure or red tape in their working relationships,"[49] it is possible that any time wasted due to this "red tape" could have been made up for by QBS' inherent efficiencies in the procurement process. Since QBS presents no need to review complex pricing analysis, QBS is both less costly and time consuming for both the writing and reviewing of proposals than other methods.[50]

Finally, and perhaps most importantly, QBS was found to have an extremely high level of quality after the completion of a project: "100% of the respondents indicated that the project had a high or very high level of quality when completed."[51] When the design team was surveyed, 94% of respondents indicated a high or very high level of success with the project.[52] 93% of owners indicated a high or very high level of success with the project.[53]

A cross-section of design and contract managers were interviewed for inquiries about the selection process for QBS projects. Overwhelmingly, due to a firm's ability to openly participate and be evaluated, "QBS provides an open competition for all interested parties."[54] Furthermore, QBS ensures that an owners project criteria are to be met, while addressing cost and schedule constraints, as shown in the data above; QBS has below average cost and schedule growth, all completed QBS projects had a high to very high level of quality, and there was a high level of owner and designer satisfaction with the results of the project. The evidence

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[47] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.25

[48] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.29

[49] *Ibid*

[50] "Selecting Architects and Engineers for Public Building Projects: an Analysis and Comparison of the Maryland and Florida Systems." *ACECND*, The American Institute of Architects, www.acecnd.org/image/cache/QBS_MD-FL_Study.pdf.

[51] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.30

[52] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.31

[53] *Ibid*

[54] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.33

very clearly demonstrates that QBS ensures a competitive process that meets the owner's criteria, while also factoring in their budget and schedule constraints.[55]

QBS, as demonstrated above, clearly offers quantitative advantages over other competitive procurement methods. However, a study directly comparing the experiences of two otherwise similar A/E selection procedures, where the only difference is the introduction of price into one of the processes can be beneficial to show the pitfalls of BVP. A study done by the AIA compared Maryland's Department of General Services, which is governed by law to require price and qualifications in the A/E selection process, with Florida's Department of General Services and State University System, where price is only negotiated after the selection process is complete.[56] A/E firms bidding on projects in Maryland were required to submit elaborate technical proposals and fixed prices, which increase proposal writing costs extraordinarily.[57] For the selection of proposals, the number of administrative staff, the budget, and selection process length were also much larger in Maryland than Florida,[58] as a result of the "necessity of preparing detailed programs on which A/Es can base price proposal results."[59]

In spite of the fact that A/E fees are lower in Maryland than in Florida, the added costs associated with the process in Maryland significantly outweigh any savings on fees: the average cost of A/E relative to the estimated construction cost in Florida's departments was between 6.7%-7.3%, whereas Maryland's department was almost double that at 13%.[60] Maryland's system was also found to be nearly one and a half times slower than Florida's when measuring the time between the approval of funding for a project and the commencement of construction.[61] All of these factors make Maryland state projects unattractive to many A/E

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[55] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.33

[56] "Selecting Architects and Engineers for Public Building Projects: an Analysis and Comparison of the Maryland and Florida Systems." *ACECND*, The American Institute of Architects, www.acecnd.org/image/cache/QBS_MD-FL_Study.pdf.

[57] "Selecting Architects and Engineers for Public Building Projects: an Analysis and Comparison of the Maryland and Florida Systems." *ACECND*, The American Institute of Architects, www.acecnd.org/image/cache/QBS_MD-FL_Study.pdf. p.2

[58] "Selecting Architects and Engineers for Public Building Projects: an Analysis and Comparison of the Maryland and Florida Systems." *ACECND*, The American Institute of Architects, www.acecnd.org/image/cache/QBS_MD-FL_Study.pdf. p.3

[59] *Ibid*

[60] "Selecting Architects and Engineers for Public Building Projects: an Analysis and Comparison of the Maryland and Florida Systems." *ACECND*, The American Institute of Architects, www.acecnd.org/image/cache/QBS_MD-FL_Study.pdf. p.5

[61] "Selecting Architects and Engineers for Public Building Projects: an Analysis and Comparison of the Maryland and Florida Systems." *ACECND*, The American Institute of Architects, www.acecnd.org/image/cache/QBS_MD-FL_Study.pdf. p.6

firms, who view them as "work of last resort."[62] Florida's procurement system is not only able to use QBS to hire the most qualified professionals, but is also able to save on both administrative costs for the buyer and proposal writing costs for competing firms - all of which are ultimately passed on to the end user.

Although Maryland's Department of General Services procurement system was shown to create inefficiencies in proposal writing and reviewing that don't exist when QBS is used, proposal writing and the complex analyses that may accompany it can cost significantly more than the example shown in Maryland. On highly competitive tenders, it may be necessary to complete costly competitive analyses to have a reasonable chance at winning a contract;[63] these analyses can range from $20,000-$300,000.[64] Furthermore, price-based RFPs can often require elaborate technical proposals, which significantly increase the cost of writing a proposal. Considering design fees can often be less than $500,000, as seen with the average design fee in the QBS study done by the ACEC of $441,500,[65] if multiple firms participating in a tender, complete complex analyses and elaborate technical proposals, it is possible the cost of all proposal writing by all participating firms may surpass the value of the contract itself.

In an example given to QBS Canada from 2014, a Canadian architecture firm responded to an RFP that planned to award approximately $50,000 in fees.[66] The firm tracked the time it took to write a proposal and respond to the RFP. Primarily due to the RFPs requirement of detailed pricing analysis, the proposal cost this firm $20,000 to write and submit, or 40% of the fees they were competing to be awarded.[67] Assuming it also cost ~$20,000 for all of the other 37 firms that submitted a proposal for that RFP, the architecture community spent $760,000 to compete for $50,000 in fees (over 15 times the contract amount).[68] The $760,000 spent to compete for the RFP also doesn't factor in the increased administrative expenses that RFPs with required prices generate, as discussed in the previous study comparing the procurement

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[62] "Selecting Architects and Engineers for Public Building Projects: an Analysis and Comparison of the Maryland and Florida Systems." *ACECND*, The American Institute of Architects, www.acecnd.org/image/cache/QBS_MD-FL_Study.pdf. p.6

[63] Thacker, Nigel. "What Does It / Should It Cost to Prepare a Proposal?" *OCI*, 23 Nov. 2015, www.ociwins.com/resources/blog/what-does-it-should-it-cost-to-prepare-a-proposal/.

[64] *Ibid*

[65] Chinowsky, Paul S., and Gordon A. Kingsley. "An Analysis of Issues Pertaining to Qualifications-Based Selection." *ACEC*, www.acec.ca/assets/pdf/advocacy_pdf/QBS_Study_APWA_Final.pdf. p.20

[66] Harrison, Cal. "Cal Harrison on RFP Reform." *Vimeo*, Beyond Referrals, 7 Oct. 2014, vimeo.com/108227256.

[67] *Ibid*

[68] *Ibid*

systems in Maryland in Florida.[69] The economic waste generated in this example is not atypical of other projects in the architecture, engineering, and construction industries. Although this cost is generated by AEC firms, it is caused by the BVP and low bid procurement processes and these proposal writing costs are always built into the fees that the firms charge, which means the end-user is ultimately on the hook for the increased fees:

> "The Maryland A/E selections system, because of its requirement that competing firms submit elaborate technical proposals accompanied by fixed prices, also results in extraordinary cost to the A/E firms that compete but are not awarded contracts. Although not direct costs to the state, as operating expenses of the firms, those costs are eventually passed on to consumers of A/E services."[70]

So how does QBS reduce these excessive proposal writing costs? First, when winning on low price is not an option, the lesser-qualified firms will not submit proposals as they realize they cannot win on qualifications. Let's assume in the example above that self-selection would reduce the number of proposals from 38 to 8. Second, let's assume that the proposal writing cost - once the need for a very expensive pricing exercise is removed - goes from $20,000 per firm down to $2,000 per firm. This is a reasonable assumption as qualification-based proposals are fairly standard documents that can be submitted with little need for customization (similar to a resume). Price-based documents, on the other hand, are highly customized, usually legally binding, and require a lot of time to create. So instead of having 38 firms submit $20,000 proposals at a cost of $760,000, we have 8 firms submitting $2,000 proposals at a cost of $16,000 - a reduction of $744,000 in proposal writing costs. And this is before factoring in the cost of evaluating the proposals (in this scenario 8 brief proposals instead of 38 complex proposals).

Considering how this one small $50,000 fee RFP appears to have created almost one million dollars in proposal writing waste, it is not hard to imagine that the total amount wasted each year in Canada could easily be in the billions of dollars.

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[69] "Selecting Architects and Engineers for Public Building Projects: an Analysis and Comparison of the Maryland and Florida Systems." *ACECND*, The American Institute of Architects, www.acecnd.org/image/cache/QBS_MD-FL_Study.pdf. p.3

[70] "Selecting Architects and Engineers for Public Building Projects: an Analysis and Comparison of the Maryland and Florida Systems." *ACECND*, The American Institute of Architects, www.acecnd.org/image/cache/QBS_MD-FL_Study.pdf. p.3

Innovation is often limited by the increased treatment of consulting services as a commodity by large municipalities.[71] A survey of municipal and consulting engineers across Canada found that 80% of consulting engineers report that "terms of reference typically do not specifically require the investigation of innovative and/or alternative solutions."[72] When interviewed, respondents noted that municipalities are often overly prescriptive: "a too-well-defined scope of service and limit innovation and creativity."[73] Considering price-based relationships frequently lead to an adversarial relationship between the consultant and the client,[74] QBS can promote innovation by its ability to develop a team relationship not focused on price, allowing for a joint scope development.[75]

[71] "National Guide to Sustainable Municipal Infrastructure." *FCM*, June 2006, fcm.ca/Documents/reports/Infraguide/Selecting_a_Professional_Consultant_EN.pdf. p.18
[72] *Ibid*
[73] "National Guide to Sustainable Municipal Infrastructure." *FCM*, June 2006, fcm.ca/Documents/reports/Infraguide/Selecting_a_Professional_Consultant_EN.pdf. p.18
[74] *Ibid*
[75] *Ibid*

2.2 QBS for General Contractors

Although QBS is most often discussed in the areas of A/E, QBS has been found to have very positive results in the procurement of general contractors (GC). In a study published in 2016 by Douglas Alleman, Arthur Antoine, Douglas D. Gransberg, Ph.D. and Keith R. Molenaar, Ph.D. at the University of Colorado, QBS was found to be favourable over BVP for GC, although BVP is more commonly utilized.[76] Considering that "the majority of construction owners over-emphasize the acceptance of the lowest price,"[77] one of the major benefits to QBS is the "ability to select solely based on contractor ability and qualifications."[78] The main benefit to procuring a construction manager/general contractor is the contractor's experience and innovation, so QBS allows these benefits to be the focal point of awarding contracts, rather than a focus on lowest price.[79]

QBS is also beneficial over RFPs with requested prices due to the difficulty in developing construction pricing during early project design.[80] Due to so many unknowns early on in the project design phase, "representatives stated that the jobs often changed so significantly from CM/GC selection to [construction contract price phase][81] that the pricing component held very little weight."[82] Furthermore, it is entirely possible that the GC could give a winning low bid while knowing that these changes to pricing would require renegotiation.[83] In the case of a 2014 investigation by the RCMP of the Winnipeg police headquarters contractor, this sort of behaviour was suspected: "[A former employee] alleged that the firm 'coached the sub-trades on how to fill out the bids to quote low and then they would submit change orders.' "[84]

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[76] Alleman, Douglas, et al. "A Comparison of Qualifications Based-Selection and Best Value Procurement for Construction Manager/General Contractor Highway Construction." *Iowa State University Digital Repository*, 1 Aug. 2016, lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1104&context=ccee_pubs. p.14

[77] Sawyer, Jeff T. "Qualifications Based Selection of Construction Services: Evaluation Criteria that Best Differentiate Contractor Qualifications." *ASU Digital Repository*, Dec. 2014, repository.asu.edu/attachments/140834/content/Sawyer_asu_0010N_14365.pdf. p.3

[78] Alleman, Douglas, et al. "A Comparison of Qualifications Based-Selection and Best Value Procurement for Construction Manager/General Contractor Highway Construction." *Iowa State University Digital Repository*, 1 Aug. 2016, lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1104&context=ccee_pubs. p.11

[79] *Ibid*

[80] *Ibid*

[81] Alleman, Douglas, et al. "A Comparison of Qualifications Based-Selection and Best Value Procurement for Construction Manager/General Contractor Highway Construction." *Iowa State University Digital Repository*, 1 Aug. 2016, lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1104&context=ccee_pubs. p.3

[82] Alleman, Douglas, et al. "A Comparison of Qualifications Based-Selection and Best Value Procurement for Construction Manager/General Contractor Highway Construction." *Iowa State University Digital Repository*, 1 Aug. 2016, lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1104&context=ccee_pubs. p.11

[83] *Ibid*

[84] Kives, Bartley. "2014 Search Warrant Alleges Fraud by Police HQ Contractor Caspian." *Winnipeg Free Press*, 29 Feb. 2016, www.winnipegfreepress.com/local/2014-search-warrant-alleges-fraud-by-police-hq-contractor-caspian-370540201.html.

While one of the two major benefits to procuring a CM/GC is the contractor's innovation,[85] pricing discussions detract focus from CM/GC innovation, along with other important discussions of scope and risks.[86] QBS removes any discussion of price during the selection process of a CM/GC, allowing innovations and experience be the focal points of discussion.

The University of Colorado study found the benefits of BVP primarily related to upfront pricing, and its ability to keep contractors in check for costs, as well as to act as a differentiator.[87] All of these benefits are negated when a budget is posted to all interested bidders, in order to ensure prices are competitive and agreeable between both the contractor and the client. If the most qualified firm's bid matches a client's proposed budget, the client should be satisfied having procured the most qualified contractor at a reasonable price, and the CM/GC should be satisfied having secured the contract.

A common pitfall of selection based partially or completely on the lowest bid, applicable to both A/E but also general contracting, is the risk that firms may submit change orders after being awarded a contract. Contractors tend to underbid, especially in situations where they may have knowledge about a problem unforeseen by the client,[88] which will result in large cost growth not seen in QBS projects.[89] The difference in cost growth can reasonably be, at least partially, attributed to low price procurement systems that (i) incent vendors to be minimally compliant so that they can have the lowest price possible and (ii) typically prevents or punishes vendors from pointing out flaws in designs or drawings that they know will cost the owner at a later date. So instead of fixing these flaws early with a pencil, they are fixed later with a hammer. In the case of the originally approved $135-million purchase and renovation for the

[85] Alleman, Douglas, et al. "A Comparison of Qualifications Based-Selection and Best Value Procurement for Construction Manager/General Contractor Highway Construction." *Iowa State University Digital Repository*, 1 Aug. 2016, lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1104&context=ccee_pubs. p.11

[86] Alleman, Douglas, et al. "A Comparison of Qualifications Based-Selection and Best Value Procurement for Construction Manager/General Contractor Highway Construction." *Iowa State University Digital Repository*, 1 Aug. 2016, lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1104&context=ccee_pubs. p.11,12

[87] Alleman, Douglas, et al. "A Comparison of Qualifications Based-Selection and Best Value Procurement for Construction Manager/General Contractor Highway Construction." *Iowa State University Digital Repository*, 1 Aug. 2016, lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1104&context=ccee_pubs. p.10

[88] Riecke, Valerie R. "Public Construction Contracting: Choosing the Right Project-Delivery Method." 2004, sogpubs.unc.edu/electronicversions/pg/pgfal04/article3.pdf. p.27

[89] El Wardani, Marwa A. "Comparing Procurement Methods for Design-Build Projects." *The Pennsylvania State University*, May 2004, www.aiacc.org/wp-content/uploads/2016/03/U-of-Penn-DB-study-in-2004.pdf. p.59

Winnipeg police headquarters, "the total project cost now stands at $214 million, due to a series of design changes and cost overruns."[90]

The data that displayed QBS as the most effective competitive procurement method for design-build projects, found in *Comparing Procurement Methods for Design-Build Projects*, is relevant to the procurement of general contractors unquestionably in two of five structural variations: owner and constructor-led design-builder, and owner and integrated design-builder.[91] This is because in these two cases, the general contractor is being directly procured using QBS. Although it would be hypothetically possible in three of the five other structural variations for the general contractor for a QBS project to be procured using other means, it has been previously identified that a contractors' competencies are a "critical success factor that should be considered by owners when procuring a team for a design-build project. The contractors' competencies include technical and financial capabilities; effective implementation of project planning; design and construction within a design-build environment; and past experience."[92] Thus, it is a reasonable assumption that because QBS is the favourable procurement method for GC,[93] the overwhelmingly positive results of the design-build study (including low cost growth, high construction speed, baseline unit cost, and high intensity as discussed in previous sections) apply to general contractors; in order to be sure that the most qualified GC is hired in either the case of design-build or design-bid-build, QBS should be used.

[90] Kives, Bartley. "2014 Search Warrant Alleges Fraud by Police HQ Contractor Caspian." *Winnipeg Free Press*, 29 Feb. 2016, www.winnipegfreepress.com/local/2014-search-warrant-alleges-fraud-by-police-hq-contractor-caspian-370540201.html.

[91] El Wardani, Marwa A. "Comparing Procurement Methods for Design-Build Projects." *The Pennsylvania State University*, May 2004, www.aiacc.org/wp-content/uploads/2016/03/U-of-Penn-DB-study-in-2004.pdf. p.33-35

[92] El Wardani, Marwa A. "Comparing Procurement Methods for Design-Build Projects." *The Pennsylvania State University*, May 2004, www.aiacc.org/wp-content/uploads/2016/03/U-of-Penn-DB-study-in-2004.pdf. p.19

[93] Alleman, Douglas, et al. "A Comparison of Qualifications Based-Selection and Best Value Procurement for Construction Manager/General Contractor Highway Construction." *Iowa State University Digital Repository*, 1 Aug. 2016, lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1104&context=ccee_pubs. p.14

3.1 Procurement in Canada

A survey of municipal engineers working in firms of all sizes across Canada found that RFPs with prices and sole sourcing methods are the most commonly used procurement methods.[94] The survey found that price represents, on average, 22% of the evaluation criteria.[95]

Although QBS has been demonstrated in previous sections to be the best practice for the procurement of AEC, BVP and low bid procurement is widespread across Canada.[96] This has created serious problems with the quality, cost growth and schedule growth of projects, as will be demonstrated in the examples below. Moreover, the price-based RFPs used throughout Canada seldom apply life-cycle costing,[97] causing faster than expected deterioration of completed projects.[98] [99]

In Quebec, an interesting paradox has arisen with the legislated use of QBS for provincial procurement of A/E, contrasted to the commitment to low bid procurement in other jurisdictions within the province. The Montreal Gazette analyzed professional services contracts that had been approved by Montreal's city executive committee since January 2014.[100] Of the 135 contracts approved, almost 90% were awarded to the lowest bidding firm, and nearly half of the contracts with multiple bids went to firms that had the lowest/near-lowest quality score.[101] The foundation for a system that allows low-quality bidders to win contracts lies in the Quebec Cities and Towns Act, which takes bidders qualifications score (provided that they reach a minimum of 70% for technical criteria), adds 50 to it, multiplies it by 10,000 and then divides it by the bidders' price. The bidder with the higher final score wins the contract.[102] Although Montreal uses a two-envelope tendering system, a bidder's technical score can be manipulated by an artificially low bid to result in a final score higher than more qualified firms. It is thus not

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[94] "National Guide to Sustainable Municipal Infrastructure." *FCM*, June 2006, fcm.ca/Documents/reports/Infraguide/Selecting_a_Professional_Consultant_EN.pdf. p.18

[95] *Ibid*

[96] *Ibid*

[97] *Ibid*

[98] CNGRP. "The Case for Quality Based Selection: Does the Lowest Price Provide the Best Value for Architectural and Design Services? | Ontario Construction Report." *Ontario Construction Report*, 28 June 2013, ontarioconstructionreport.com/the-case-for-quality-based-selection-does-the-lowest-price-provide-the-best-value-for-architectural-and-design-services/.

[99] Snyder, Jesse. "Delays in Approving New Champlain Bridge Cost Taxpayers $500M, AG Finds." *Montreal Gazette*, 29 May 2018, montrealgazette.com/news/economy/delays-in-approving-new-champlain-bridge-cost-taxpayers-500-million-auditor-general-finds/wcm/05b4dcd5-663c-41c4-9501-35a637a331a0.

[100] Gyulai, Linda. "Municipal Contracts: Quebec Sacrifices Quality for Cost." *Montreal Gazette*, 24 Mar. 2015, montrealgazette.com/news/local-news/quebec-sacrifices-quality-for-cost.

[101] *Ibid*

[102] "Cities and Towns Act 573.1.0.1.1." *Légis Québec*, 1 June 2018, legisquebec.gouv.qc.ca/en/ShowDoc/cs/C-19.

unreasonable that of contracts with multiple bidders, only 40 went to firms that had the highest quality score.[103] What's more, 31 of the 40 contracts were also the lowest bidder, meaning only nine of the most qualified firms won a contract due to having the highest quality.[104]

In her special report in April 2015, Bonnie Lysyk, the Auditor General of Ontario, discussed how the quality of winter highway maintenance has "declined from the level that Ontarians have historically been used to."[105] The contractors responsible for maintenance, being given full autonomy in how they would achieve their outcomes, became incentivized to minimize costs in order to underbid their competition. The Ministry of Transportation's decision to hold the lowest bid as the "overriding criterion"[106] to award contracts has resulted in contractors decreasing necessary expenditures at the expense of quality.[107] "For instance, in one contract area, the amount of anti-icing liquid used went from 3.2 million litres in a winter under the previous contracts to only 9,500 litres"[108] under the new system. Contractors' choice to salt and plow infrequently, or not at all (even in instances where they were requested to by the Ontario Provincial Police) put "the safety of the public and of providers of emergency services … at risk."[109] The inability to meet contract requirements had serious consequences: In the winter of 2013, there was "an increase in the number of deaths on Ontario highways … where snow, slush or ice was a factor."[110]

Using a low-bid procurement process was also found to ultimately cost more; in one instance, the second-lowest-bidder lost a contract by only $700,000 but had proposed the use of 22 more pieces of equipment than the winning contractor. The Ministry ended up having to purchase 13 additional pieces of equipment to improve service levels in that area, which incurred an annual cost of $1.7 million, more than two times the original contract price increase from the second-lowest-bidder.[111] Much like in the example shown above in Quebec municipalities, as long as contractors were able to score a minimum of 70% on criteria created

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[103] Gyulai, Linda. "Municipal Contracts: Quebec Sacrifices Quality for Cost." *Montreal Gazette*, 24 Mar. 2015, montrealgazette.com/news/local-news/quebec-sacrifices-quality-for-cost.
[104] *Ibid*
[105] Lysyk, Bonnie. "Winter Highway Maintenance Special Report." *Office of the Auditor General of Ontario*, Apr. 2015, www.auditor.on.ca/en/content/specialreports/specialreports/winterhighway_en.pdf. p.1
[106] *Ibid*
[107] *Ibid*
[108] Lysyk, Bonnie. "Winter Highway Maintenance Special Report." *Office of the Auditor General of Ontario*, Apr. 2015, www.auditor.on.ca/en/content/specialreports/specialreports/winterhighway_en.pdf. p.1, 2
[109] Lysyk, Bonnie. "Winter Highway Maintenance Special Report." *Office of the Auditor General of Ontario*, Apr. 2015, www.auditor.on.ca/en/content/specialreports/specialreports/winterhighway_en.pdf. p.12
[110] Lysyk, Bonnie. "Winter Highway Maintenance Special Report." *Office of the Auditor General of Ontario*, Apr. 2015, www.auditor.on.ca/en/content/specialreports/specialreports/winterhighway_en.pdf. p.3, 12
[111] Lysyk, Bonnie. "Winter Highway Maintenance Special Report." *Office of the Auditor General of Ontario*, Apr. 2015, www.auditor.on.ca/en/content/specialreports/specialreports/winterhighway_en.pdf. p.12

by the Ministry, they would be passed on to the second stage, where low-bid procurement methods alone decided who the winning contractor was.[112] It is clear that without low-bid methods, fewer corners would have been cut with highway winter maintenance in Ontario, ultimately making the roads safer for the public. Although the special report may advocate for a best-value approach,[113] the acknowledgement that qualifications are critical when deciding a contract winner represents a step in the right direction towards QBS.

The Ontario Association of Architects (OAA) Bill Birdsell, summarizes how provinces mostly price-based procurement model is a "race to the bottom."[114] The lack of reasonable compensation for designers, he says, can result in shortcuts and under qualified staff, unable to create the most effective and durable results, causing higher construction and building lifecycle costs.[115]

[112] Lysyk, Bonnie. "Winter Highway Maintenance Special Report." *Office of the Auditor General of Ontario*, Apr. 2015, www.auditor.on.ca/en/content/specialreports/specialreports/winterhighway_en.pdf. p.12
[113] Lysyk, Bonnie. "Winter Highway Maintenance Special Report." *Office of the Auditor General of Ontario*, Apr. 2015, www.auditor.on.ca/en/content/specialreports/specialreports/winterhighway_en.pdf. p.29
[114] CNGRP. "The Case for Quality Based Selection: Does the Lowest Price Provide the Best Value for Architectural and Design Services? | Ontario Construction Report." *Ontario Construction Report*, 28 June 2013, ontarioconstructionreport.com/the-case-for-quality-based-selection-does-the-lowest-price-provide-the-best-value-for-architectural-and-design-services/.
[115] *Ibid*

3.2 QBS in Canada

While RFPs with requested prices and sole source methods are those most experienced by Canadian A/E firms,[116] QBS has seen rapid growth in its use in the past two decades. This section will explore the geographical distribution of QBS in Canada, including any legislation in place to carry it out.

QBS was first introduced at a provincial level in Quebec through a regulation that requires provincial agencies to use QBS to procure consulting A/E services.[117] This regulation marked the first time QBS has been mandated by law by a provincial government, which came as a result of decades of lobbying in the province.[118] Quebec's progression to use QBS provides a stark contrast to the outdated and inefficient system used by the municipalities within it, as discussed in the last section.

Large Canadian associations have had significant influence in the promotion of QBS in Canada, both through lobbying as seen in Quebec by the Association of Consulting Engineers of Quebec and Association of Architects in Private Practice of Quebec (AAPPQ),[119] and through recognition of the successful use of QBS.[120] The OAA and ACEC have been also been integral in the promotion and education of QBS through Canada.[121] [122] In 2018, the City of Coquitlam received the ACEC-BC Client of the Year Award in part due to its "procurement and delivery methodology that leads to clear scope."[123] The city successfully incorporated the use of QBS for procuring engineering services, in order to focus on experience and technical ability rather than on a price based evaluation process. This process allowed for collaborative design between owners and engineers, which provided a clear scope definition for every project. "In an industry that is more and more price driven, and where engineering services are often viewed as a

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116 "National Guide to Sustainable Municipal Infrastructure." *FCM*, June 2006, fcm.ca/Documents/reports/Infraguide/Selecting_a_Professional_Consultant_EN.pdf. p.18

117 Williams, Patricia. "Quebec Mandates Qualifications-based Selection Procedures for Provincial Agencies." *ConstructConnect*, 25 July 2008, canada.constructconnect.com/dcn/news/others/2008/7/Quebec-mandates-qualifications-based-selection-procedures-for-provincial-agencies-DCN029340W.

118 Williams, Patricia. "Quebec Mandates Qualifications-based Selection Procedures for Provincial Agencies." *ConstructConnect*, 25 July 2008, canada.constructconnect.com/dcn/news/others/2008/7/Quebec-mandates-qualifications-based-selection-procedures-for-provincial-agencies-DCN029340W.

119 *Ibid*

120 "Client of the Year Award." *ACEC-BC*, www.acec-bc.ca/awards/client-of-the-year-award/.

121 "National Guide to Sustainable Municipal Infrastructure." *FCM*, June 2006, fcm.ca/Documents/reports/Infraguide/Selecting_a_Professional_Consultant_EN.pdf. p.18

122 CNGRP. "The Case for Quality Based Selection: Does the Lowest Price Provide the Best Value for Architectural and Design Services? | Ontario Construction Report." *Ontario Construction Report*, 28 June 2013, ontarioconstructionreport.com/the-case-for-quality-based-selection-does-the-lowest-price-provide-the-best-value-for-architectural-and-design-services/.

123 "Client of the Year Award." *ACEC-BC*, www.acec-bc.ca/awards/client-of-the-year-award/.

commodity, the City of Coquitlam is setting an excellent example of valuing the professional services that we provide via qualification-based selection."[124]

The City of Calgary, the City of Nanaimo and the BC Ministry of Transportation and Infrastructure all also commonly use QBS, as they share the City of Coquitlam's belief that QBS has significant benefits in project outcomes, innovation, cost control and overall satisfaction.[125]

A 2016 decision in Winnipeg, which changed the tendering practices for waste-collection services from a low bid to a price and qualifications based system, demonstrates a step in the right direction towards QBS.[126] Although, as shown in section 1 of this report, BVP has its own pitfalls that often result in awarding contracts to an underqualified lowest bidder, this move shows Winnipeg's recognition in the importance of requiring qualifications during the tendering process.[127]

Progress towards the selection of AEC based on qualifications has also been made as projects procured with BVP increasingly focus on qualitative metrics to select firms. This progress is demonstrated no better than with the Best Value Approach (BVA) developed by the Performance Based Studies Research Group (PBSRG); the BVA approach focuses on a firm's verifiable performance metrics demonstrating expertise, and the ability to identify and mitigate risk.[128] The firm should also be able to propose alterations to the scope of the project that could increase value for the owner.[129] Although price is one of the five selection criteria (the last criteria being an interview) for projects procured using a BVA,[130] the earlier mentioned criteria are similar to what would be found in a project procured with QBS. The BVA has had much success throughout the USA and Canada, including at the University of Alberta in the areas of services, construction and design & engineering, where schedule and cost were greatly reduced and change orders were completely absent.[131] As buyers of AEC services see the success stories of projects procured by requiring verifiable examples of expertise, price will become less relevant in the selection process. The BVA creates a bridge between traditional BVP and QBS, which demonstrates a promising future for the movement towards QBS in Canada.

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[124] "Client of the Year Award." *ACEC-BC*, www.acec-bc.ca/awards/client-of-the-year-award/.

[125] "User Guide to Implementing Qualifications Based Selection." *ACEC-BC*, June 2016, www.acec-bc.ca/media/43176/acec-bc-user-guide-to-implementing-qbs.pdf.

[126] Harrison, Cal. "Canada Behind the Times in Tendering Practices." *Winnipeg Free Press*, 4 May 2016, www.winnipegfreepress.com/opinion/analysis/canada-behind-the-times-in-tendering-practices-378063211.html.

[127] *Ibid*

[128] "Best Value Approach." *PBSRG*, pbsrg.com/best-value-approach/.

[129] *Ibid*

[130] *Ibid*

[131] Stewart, Brian. "University of Alberta." *PBSRG*, pbsrg.com/resources/university-of-alberta/.

In Alberta, "background and prep work on the legislation [for QBS] [began in 2014]."[132] This came as a result of years of education to stakeholders about QBS by the Consulting Engineers of Alberta (CEA) and the engineering industry. In advance of any legislative changes, the industry has begun to shift towards QBS with government departments and municipalities cooperation, in order to guarantee a seamless transition.[133] The City of Calgary, having used QBS for approximately 30 years, is seen by the CEA as a model of a major city; QBS was tested by the City of Calgary and remains in place today.[134] It is not difficult to imagine that the success QBS has achieved in Calgary may help with the introduction of legislation in the province of Alberta.

The University of Alberta is also currently undergoing a significant two-year study regarding how QBS performs when compared to fee-based selection. The study will include an evaluation of sample projects based on several metrics including price, schedule and risk. A quantitative review of procurement in Calgary, where QBS is used, and Edmonton, where BVP is used, will then be done, and factors such as innovation and project life cycle will be compared between the two methods. A review and evaluation of a QBS pilot project proposed by Alberta Transportation will occur in the final stage of the study. This study will serve as a document to provide quantitative evidence in Canada about QBS' performance for the procurement of professional services.

Although QBS was introduced and is still largely carried out as a result of regulation, the introduction of legislative policy is not necessary for QBS to be used in Canada. In 2014, as a result of a meeting with Jennifer Enns, the Manager of Engineering and Energy Services for the City of Calgary, and RFP documentation provided by the city, Metrolinx, Ontario's regional transit agency trialed QBS by using it to procure two engineering services.[135] Metrolinx, being a "self-declared proponent of evidence-based decision making,"[136] went forward with the project not as a result of legislation in Ontario, but due to being provided with evidence that QBS is the best practice for procuring professional services in Canada. They noted, "with positive results, there will be more [QBS] projects to come."[137]

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[132] Hixson, Russell. "Alberta Engineers Push for Qualification-based Procurement." *ConstructConnect*, 30 Sept. 2014, canada.constructconnect.com/joc/news/Associations/2014/9/Alberta-engineers-push-for-qualification-based-procurement-1002385W.

[133] *Ibid*

[134] *Ibid*

[135] Lee, Diane. "A QBS Success in Ontario." *Yes2QBS*, 4 Dec. 2015, yes2qbs.com/profiles/a-qbs-success-in-ontario/.

[136] *Ibid*

[137] *Ibid*

As QBS' use in Canada continues to increase, legislation will soon follow: "Johanne Desrochers, president and CEO of the Quebec consulting engineers' association, said her organization's lobbying efforts [in legislating QBS in Quebec] were aided by the fact QBS already was being utilized in some circles, namely at the transportation ministry."[138] The ability to compare the results of QBS to other procurement methods makes the decision to create legislation much easier and understandable.[139]

Cal Harrison, President of QBS Canada, says Canada's shift to QBS doesn't require new money, legislation, studies, or government departments,[140] but requires direction by Canada's public sector instead:

> "Moving to value instead of low-price just requires a commitment and direction by Canadian politicians to catch up with the rest of the world and bring a tried, tested and true process to government procurement. In the process, Canada will save billions of dollars of taxpayer money each year, while at the same time improving the quality of infrastructure and services."[141]

In February of 2018, a consultation commenced in preparation for a trial of QBS for the procurement of A/E by Public Services and Procurement Canada (PSPC).[142] This pilot of QBS seeks to "evaluate its effectiveness in achieving better outcomes, more innovation and life-cycle savings."[143] PSPC's openness of adopting and piloting of QBS is a major breakthrough,[144] and with QBS' track record in the USA and municipalities across Canada, this program could result in the introduction of QBS at a national level.

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[138] Williams, Patricia. "Quebec Mandates Qualifications-based Selection Procedures for Provincial Agencies." *ConstructConnect*, 25 July 2008, canada.constructconnect.com/dcn/news/others/2008/7/Quebec-mandates-qualifications-based-selection-procedures-for-provincial-agencies-DCN029340W.

[139] *Ibid*

[140] Harrison, Cal. "Canada Behind the Times in Tendering Practices." *Winnipeg Free Press*, 4 May 2016, www.winnipegfreepress.com/opinion/analysis/canada-behind-the-times-in-tendering-practices-378063211.html.

[141] *Ibid*

[142] Beyond Referrals. "Canadian Government to Pilot QBS" 7 Feb. 2018, http://beyondreferrals.com/canadian-government-to-pilot-qbs/.

[143] *Ibid*

[144] *Ibid*

4.1 Conclusion

In the areas of AEC, Qualifications-Based Selection (QBS) has favourable metrics over best value and low bid procurement methods, most notably in the areas of cost-growth, schedule-growth, construction speed, unit cost, administrative and proposal writing costs, change order risk, and innovation. In any project where the budget and/or schedule is critical, QBS should be used, as it results in the lowest cost and schedule growth of any competitive procurement method. In any project where innovation is of great importance, QBS should be used as its nature of promoting joint scope development is valuable in fostering an environment where innovation can occur. This relationship is why QBS is not susceptible to the same risk of change orders as is common with price-based procurement methods. Moreover, QBS results in lower construction costs per square foot than other competitive procurement methods for design-build projects and is considered cost-effective for design-bid-build projects; competing for a contract with low bids thus doesn't have a significant impact on cost savings.

For the Canadian taxpayer, QBS is beneficial in saving proposal writing costs for AEC firms and administrative costs for the government, as these additional expenses are ultimately passed on to the taxpayer. Sadly, RFPs that request prices and sole sourcing methods are the two most common forms of procurement in Canada for engineers and other professionals, so not only are there a vast number of needless inefficiencies for the proponents and buyers, but also for taxpayers and clients. With QBS, the public receives safer infrastructure designed and built by the most qualified contractors at a fair price.

As QBS continues to be tested and proven at a municipal, provincial, and federal level, the evidence will continue to speak for QBS as the best practice for the procurement of architecture, engineering, and construction management professionals. With Canada's federal government launching a pilot program of QBS, the possibility of the introduction of a more efficient procurement system that would end up saving the taxpayer, buyer, and seller of professional services money would mark a good day for all Canadians. Education and increased awareness about QBS, and a firm commitment by politicians and buyers of professional services to not require competition based on price from AEC firms are important next steps for the success of QBS, and to improve the quality, safety, and cost-effective construction of the built environment in Canada.

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4.3 Appendix

The following is a list of some of the organizations currently advocating for the use of QBS processes in Canada:

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