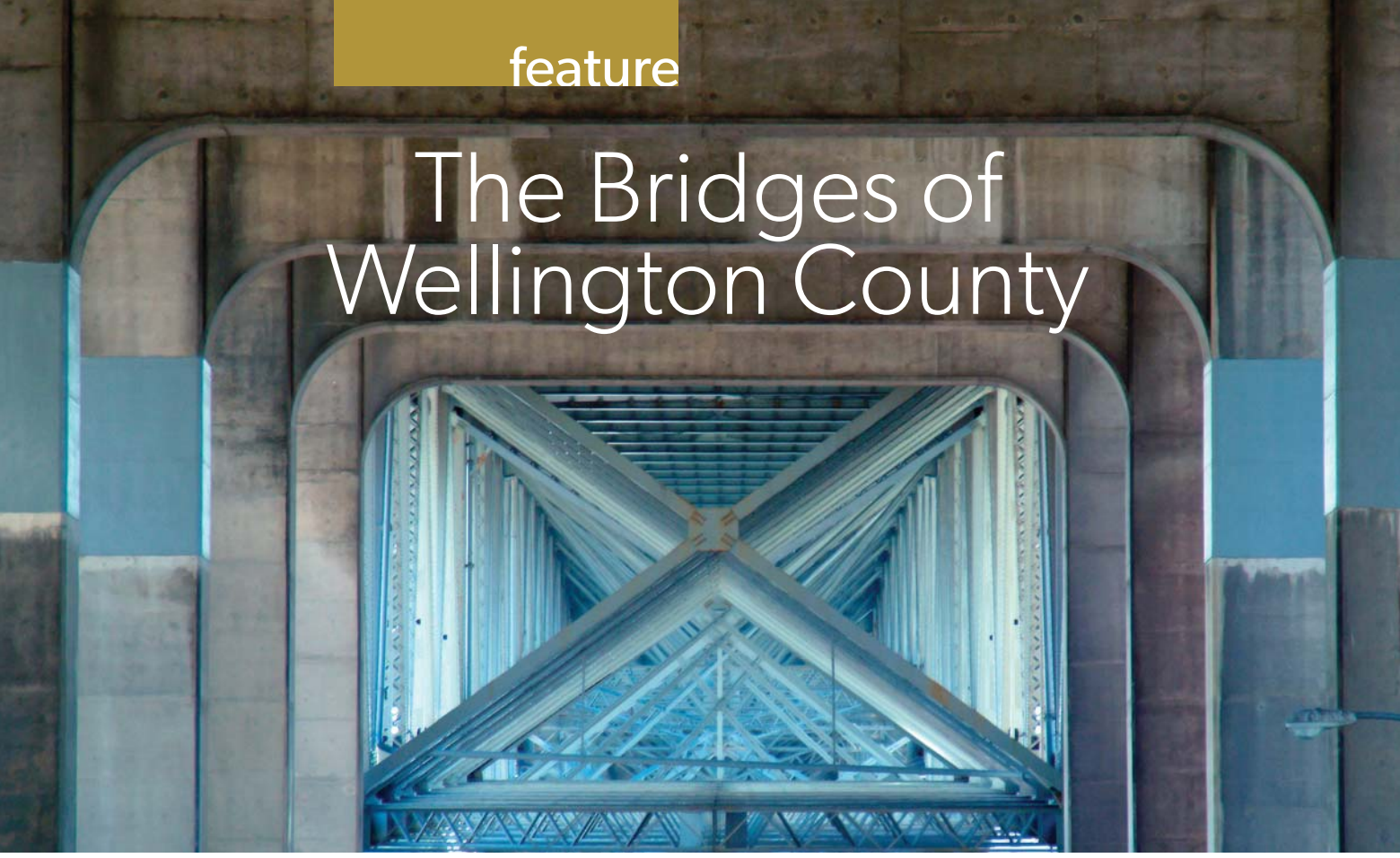
# The Bridges of Wellington County



The Ontario Good Roads Association (OGRA) partnered with the Residential & Civil Construction Alliance of Ontario (RCCAO) and the Ministry of Transportation to undertake the Wellington County Bridges Study. This pilot studied the bridge infrastructure needs of the County of Wellington and its lower tier municipalities to assess the potential application of alternative delivery methods. The following article is extracted from the report, which can be found in its entirety on the OGRA website.

**Just as the City of Ottawa** and the communities in the Greater Toronto and Hamilton Area have grappled with the task of rehabilitating and expanding their mass transit systems, Ontario's smaller municipalities have faced with an equally vexing problem — how to rehabilitate and reconstruct bridges and culverts. These key components of the province's road network are every bit as important to smaller communities as the Yonge-University-Spadina subway line is to Toronto. And just like the debate between subway or LRT, the decisions that govern the stewardship of bridges and culverts are also technically and politically fraught.

Many of Ontario's bridges are over 50 years old and as such as approaching a point in their lifecycles where they will require major rehabilitation and reconstruction. This is expensive work. Given that municipalities have limited financial resources to address these critical infrastructure needs, new approaches to improve asset management and address this backlog for bridge rehabilitation are essential. Project bundling/delivery and Alternative Financing and Procurement (AFP) have been identified by the Province of Ontario as approaches that the municipal sector should explore.

In August 2012, the Ministry of Infrastructure released Building Together: Guide for Municipal Asset Management Plans to provide a framework to address these municipal infrastructure challenges. This framework includes making asset management planning and public reporting universal, making optimal use of the full range of budgeting and financing tools, and addressing the infrastructure challenges that are confronting small municipalities. Provincial infrastructure funding grants would be conditional on published municipal asset management plans. Building Together also encourages municipalities to utilize the AFP model where the private sector would have a role in design and construction as well as life-cycle maintenance of certain assets under long-term contracts. The Guide endorses AFP delivery methods and the bundling of municipal work.

To determine whether it is feasible or worthwhile for municipalities to adopt AFP and bundling models, an alliance of non-governmental organizations led by OGRA and the Residential and Civil Construction Alliance of Ontario (RCCAO) were commissioned to measure the magnitude of bridge work for a typical Ontario county and its constituent municipalities. Wellington County and its constituent municipalities were identified as being a representative candidate for this study.

Within the County of Wellington study area, there are 635 structures with spans of 3.0 metres or longer.[1] Approximately one-third of the structures (194 structures) are owned and managed by the County of Wellington and the remainder (441 structures) are owned and managed by seven constituent municipalities including the Town of Erin, Township of Mapleton, Township of Centre Wellington, Township of Wellington North, Township of Guelph/ Eramosa, Township of Puslinch, and Town of Minto. Also beneficial to the researchers was the fact that the County of Wellington had generally available and reliable data sets that documented original year of construction, type of structure, and size.[2]

Given the large number of assets, it was hardly surprising that researchers concluded that an immense amount of capital was needed to manage these assets moving forward. Based on the projections of the study, addressing the bridge infrastructure needs in the County and constituent municipalities will require approximately $132 million (2011 dollars) over the next seven years or $19 million annually (2011 dollars). Over the longer term from 2020 to 2050, once the initial backlog is dealt with, the average annual expenditure required to address the needs posed by these assets will be reduced to approximately $10-$11 million (in 2011 dollars — not adjusted for inflation) per year. These costs will have to fit into a framework that also recognizes the competing infrastructure priorities that these municipalities will have over this period. With the scale of the challenge defined, researchers needed to determine how well AFP might apply to the County's on the ground reality.

1 This excluded MTO highway structures and structures in the City of Guelph.

2 Unfortunately, the study includes only 60% of the lower-tier municipal inventory due to missing data that was required for the needs assessment. Despite the missing data, a sufficient sample size was available for the study, and the results were extrapolated to reflect the total infrastructure inventory.

## Defining AFP

There are a wide range of AFP options that municipalities can consider in order to gain efficiencies and reduce overall bridge renewal costs. This range includes municipal managed Design-Build contracts, multi-year contract bundling and AFP delivery. Since there is no "one-size-fits-all" approach, a municipality must consider the technical and financial risks and determine whether there is Value for Money (VfM) in delivering through an AFP model, or choosing a Design-Build or other model. When considering any multi-year bridge renewal program, municipalities must also consider long-term allocation of capital and operating budgets and their financial means.

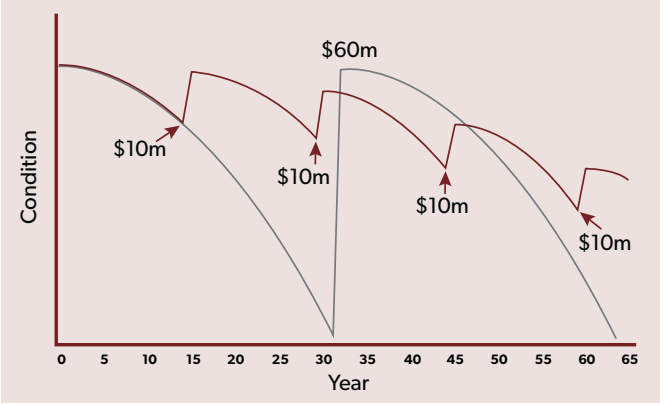
Applying AFP or public-private partnerships (P3) contract procurement methods to address the structural infrastructure needs has potential benefits for municipalities. The AFP model brings together private and public-sector expertise in a unique structure that reduces the risk of project cost increases and improves project delivery schedule when compared with traditional project delivery methods.

AFP or P3 project delivery can be accomplished by one of several approaches, including Design-Build (DB), Design-Build-Finance (DBF) and Design-Build-Finance-Operate-Maintain (DBFOM). AFP delivery approaches have been implemented by the province on large health, education, and transportation projects to deliver hospitals, schools, highways, and other critical infrastructure. While the AFP model best suits large complex projects, bundling smaller projects together can achieve similar benefits. Moreover, the Ministry of Infrastructure has identified AFP as an opportunity for municipalities to reduce costs and risk of both capital investments and long-term maintenance commitments.

An earlier study undertaken for Infrastructure Ontario in 2011 identified that AFP-procured projects can achieve significant costs savings (overall in the range of 30%). The savings come from reduced owner costs (10% to 15%), bidder innovation and value engineering (10% to 20%), avoidance of change orders and scope creep (10% +), an accelerated schedule (5% to 10%), and economies of scale. This study conservatively estimates that applying AFP delivery methods can achieve savings in the order of 13% to 20%, in addition to the benefits of accelerated construction.

The preliminary results of this study favour an AFP Design-Build contract that includes bundling County and Township structures over a multi-year period. This type of contract would require the County and its lower tier municipalities to make long-term budgetary commitments while at the same time recognizing that there are affordability considerations.

Small but Timely Renewal Investments Save Money




Poor Asset Management ($60m total): Let asset deteriorate, then replace.

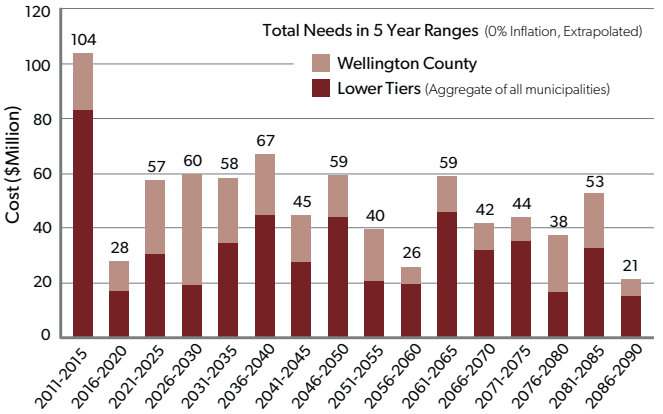
Smart Asset Management ($40m total): Make timely investments throughout.

## Benefits of AFP Delivery

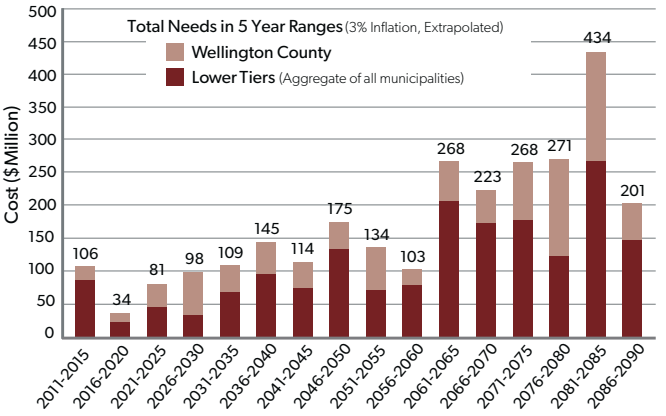
This study considers how the benefits of a DB contract can be applied to high-value municipal bridge work, which is distributed over a wide geographic area and covers several municipal jurisdictions. Since few municipalities have a volume of work that would provide 'value for money' for a single AFP contract, the study endorses the idea of having adjoining municipalities with similar structural needs combine resources to prepare a single AFP contract that includes the rehabilitation of many structures over several years. Combining many individual structure projects into one large AFP contract provides the opportunity to achieve the savings that are inherent with AFP contracts.

Although taking this step may be daunting for municipalities that may not have the technical resources or expertise to manage a DB AFP, there has been significant positive AFP/P3 experience in Ontario. A 2011 study for Infrastructure Ontario consulted a number of major Canadian transportation construction companies with respect to their views on the delivery of AFP/P3 projects. A key consideration was that a Design-Build contract needs to be of sufficient size, at least $50 million to $100 million, to be viable with the assumption of risk and to justify the investment in the bid process. This may not be a problem on large transportation projects such as Highway 407, the Herb Gray Parkway in Windsor, or an urban light rail transit project. However, to apply the benefits of AFP procurement to bridge contracts, it would be necessary to bundle bridge work geographically into contracts worth over $50 million.

Total Structural Needs in the County of Wellington and Constituent Townships (2011 dollars)




Total Structural Needs in the County of Wellington and Constituent Townships with 3% Inflation




For the vast majority of municipalities in Ontario, it would be virtually impossible to bundle $50 million of bridge work. Although the aim of this study is to consider opportunities to pool bridge projects over a number of adjoining municipalities, the reality is that each of the participating municipalities would have unique or varying infrastructure priorities, fiscal capacities, and technical resources. Nonetheless the researchers concluded that the potential benefits are worth the effort.

There is limited municipal experience in North America with bridge AFP/P3 contracts. One good municipal example is the Disraeli Bridge in Winnipeg which was procured as a DBFM project. Although this was a single structure, the contract was worth $195 million. The bridge was opened on time and on budget in the fall of 2012 and resulted in multi-million-dollar cost savings in comparison to a traditional delivery approach. The results from the final value-for-money report, completed by Deloitte & Touche LLP, assessed the value of savings at approximately $47.7 million, or 17.1%. On a larger scale, the State of Missouri launched an ambitious program in September 2008 with a goal to have 802 of the state's bridges completed by the end of 2014 (250 bridge rehabilitations and 554 bridge replacements). Due to underestimated state of infrastructure (repair cost) and the financial market troubles at the time, the original project launch was cancelled. After repackaging the program, a Design-Build contractor was selected in May 2009 for the $685 million Safe & Sound Bridge Improvement Program. On November 8, 2012, the program drew to a close, with all 802 bridges completed in just slightly more than 3.5 years. The project was expected to take more than five years to complete, so this was a truly successful program.

Closer to home, MTO has considerable experience with bundling bridge rehabilitation projects. MTO has bundled rehabilitation design and delivery, using DB and traditional design-bid-build approaches. Bundling projects is intended to reduce overall costs, save time, and introduce opportunities for innovative construction approaches. It also permits a contractor to plan work to manage the traffic impacts of construction. There are many Ontario-based contractors that are involved in such major projects and have the necessary construction management and coordination experience.

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Bundling several bridge projects requires an understanding of how to set up the AFP procurement process, prepare the performance-based specifications, set up the payment mechanisms, and prepare the project agreement (contract). Infrastructure Ontario and a select number of engineering consulting firms, have expertise in this area. Significant experience has been gained from AFP projects, such as hospital and transportation projects, to help municipalities with this step. They have built up considerable experience delivering institutional projects (hospitals, courts) and will be able to use this experience to help municipalities with civil infrastructure projects using AFP and bundling methods.

## Application of AFP to Bridge Works

AFP models provide an opportunity to advance bridge work and reduce overall costs. Based on MMM's AFP experience and studies undertaken for IO, it was determined that significant costs savings (overall in the range of 30%) can be achieved from AFP-procured projects. The savings can be realized through:

- Reduced owner costs (10% to 15%) as a result of reduced effort in design, pre-engineering services and construction management.
- Bidder innovation and value engineering (10% to 20%) that result from performance-based specifications.
- Avoidance of change orders and scope creep (10% +) as the contractor assumes most construction risks.
- Accelerated schedule (5% to 10%) which can reduce financing costs and make the infrastructure available sooner.
- Economies of scale (also present in a traditional procured project of the same size).

It is worth noting that although an AFP project will lower the overall project costs for the owner, the contractor cost will be higher due to the additional responsibility for the design, construction management, and risk. Contractor soft costs generally increase to about 40% of the hard construction cost as compared to 30% on a traditional bid-build project. The savings to the owner are reflected in overall project cost savings achieved as a result of contractor innovation as well as reduced owner's soft cost (design and construction administration), change orders, claims, and owner's risks.

In order to implement an AFP procurement contract, the County and Townships would have to agree to participate in such a venture. The costs of the work would be allocated to each municipality based on estimated costs to do the work in their jurisdiction. The estimates would be used to apportion the final bid cost on a percentage basis of the total. Any scope changes or deviations that may arise after the contract is established would be negotiated separately with the respective municipality that has jurisdiction over the structure subject to the change. IO can be called upon for advice and assistance with respect to the procurement methods and contract documents. IO has actively participated with a number of urban municipalities in the procurement of recent major municipal AFP contracts.

The prospect of completing critical infrastructure work in a fashion that saves money and reduces risk for municipalities is enticing. There are still key questions that must be answered in order to clarify the issues pertaining to structural needs and financial implications. In the absence of this clarity, only time will tell if financial necessity, political expediency, the merits of the AFP approach or some combination of these factors will see Ontario's municipalities adopting these types of arrangements.