

BIM Insights: How BIM and e-permitting can transform municipal operations

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Permitting refers to a wide range of planning and building application permit reviews involving provincial and municipal rules and regulations as well as a broad range of departments and agencies. Increased emphasis on improving productivity in the AEC industries in recent years has drawn attention toward expediting and streamlining the largely manual and labour-intensive permitting processes. Many jurisdictions around the globe have adopted and implemented a range of strategies to improve their review processes for construction permits. These generally include implementation of information and document management systems that aim to replace the paper-based permitting system with digital submission and review of drawings (aka e-permitting systems).

In this column, the different categories of e-permitting systems and their differentiators from traditional permitting practices are reviewed. The result is a roadmap for advancing from a traditional, paper-based permitting process to an integrated, Building Information Modelling (BIM)-enabled e-permitting platform.

Why E-Permitting?

Growing populations in major cities have increased demand for new housing and supporting infrastructure. The construction industry and regulators need to improve and streamline the approvals process: this challenge has placed tremendous pressure on municipalities and their capacity to keep pace with these demands and changes to their communities.

The benefits of e-permitting systems exceed well beyond the environmental and cost savings from removing vast amounts of paper and include:

- improved transparency, significant process optimization;
- increased efficiency;
- accuracy and consistency; and
- (perhaps most importantly) the opportunity to enable integrated, multi-agency review processes through BIM, Geographic Information Systems (GIS) and automated code checking algorithms.

What Level of E-Permitting is Right for Your City?

Over the last decade, e-permitting practices have been introduced in many municipal jurisdictions. Researchers at the University of Toronto's BIRC investigated these recent international developments, including those in the United States, Canada, Europe and Asia. In BIRC's findings, three distinct levels of e-permitting were defined based on varying levels of automation and integration. These levels are illustrated below.

BIM Implementation is Key

The inertia and resistance to the adoption of new technologies in the construction sector has been acknowledged and well documented. However, for successful implementation of a model-based e-permitting system in which BIM/GIS implementation is a key component, the change needs to go further. Some countries around the world that have been more successful than others in adopting new technologies and innovative processes, particularly in relation to the implementation of BIM/GIS practices. Singapore and the U.K. are two examples of successful reforms. They both adopted a top-down approach in which the use of BIM/GIS for design and later for e-permitting was mandated across all projects nationally.

Canada, on the other hand, has a middle-out approach to BIM implementation, which means that large organizations adopt BIM and then push for regulatory bodies and their supply chain to follow. This creates a substantial gap between the municipalities often using traditional paper-based and manual permitting and review processes on one hand, and the construction industry slowly but surely adopting BIM for design and internal code compliance checking on the other

hand. This gap creates significant inefficiencies in the review and construction permitting process and frustration on the part of industry leaders who have adopted BIM practices but are unable to capitalize fully on their investment due to the lack of government support.

The benefit of Canada's middle-out approach is that once the municipalities and the other levels of government start mandating BIM for new projects and for e-permitting processes, the learning curve of the industry will be much smaller than those experienced by other countries, and the costs involved in training the local industry will be substantially lower.

Taking these factors into consideration, while Canada has been slow in joining other world leaders in adopting BIM practices broadly, mandating BIM in the near future is inevitable.

