

# The Canadian Construction Innovation Council

The construction industry is large and vital to the success of the nation. It has a major influence on the economic wealth, the societal well-being, and sustainability of the urban environment. It is an industry facing many challenges, most of which require a “whole industry” approach for their effective solution.

Business and technologies are changing rapidly and innovation is required for the Canadian construction industry to maintain a competitive advantage. Unfortunately insufficient activity is occurring to promote and coordinate innovation in the construction industry in Canada while other countries have taken steps to manage it in a more strategic manner.

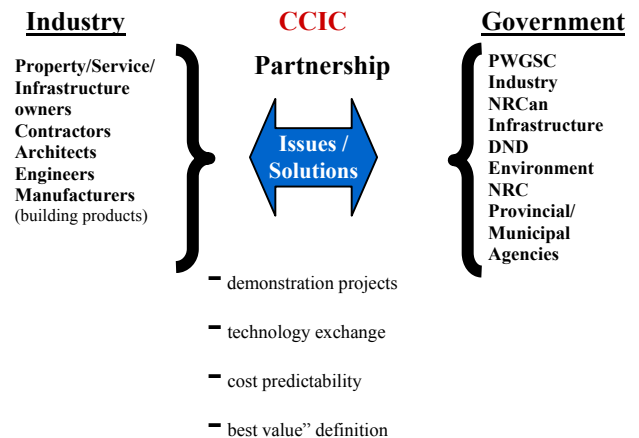
At the same time the industry is facing some significant challenges and opportunities:

- Clients are demanding greater quality and more value;
- E-business and information technologies provide significant opportunities for productivity improvements;
- Governments, clients and industry are looking for greater environmental sustainability;
- New business arrangements are proliferating; and
- Globalization offers both an opportunity for business expansion and a threat

In addition the governments in Canada need help to meet their objectives. There is a unique opportunity for the industry and government to work together to change the way that the construction industry adopts innovation that will help both parties meet their objectives. As a result the Canadian public will receive greater value for their money.

Leading members of the Canadian construction industry through the National Steering Committee for Innovation in Construction (NSCIC) recognized the need for industry to take the lead in addressing these issues. With the support of the Canadian Construction Association they have created a new permanent body to co-ordinate an innovation strategy for the Canadian construction industry:

## Canadian Construction Innovation Council (CCIC)



### CCIC Mandate:

The Canadian Construction Innovation Council (CCIC), in collaboration with all partners involved in the construction process, will provide leadership in promoting and coordinating research and innovation in and for the Canadian construction industry. The CCIC will identify needs and opportunities for industry related research and innovation, develop national innovation priorities, set targets for assessing industry performance, promote technology transfer and champion innovation issues affecting the institutional, commercial, industrial and heavy construction sections.

### CCIC Vision

Canada will be a world class model for the construction industry

### CCIC Mission

CCIC will be the recognized leader in promoting industry-wide collaboration to enhance innovation, productivity, quality and value in construction resulting in a Canadian construction industry that provides world-class products and services.

CCIC will be the voice of institutional, commercial, industrial and heavy construction innovation in Canada.

## The Canadian Construction Industry Today

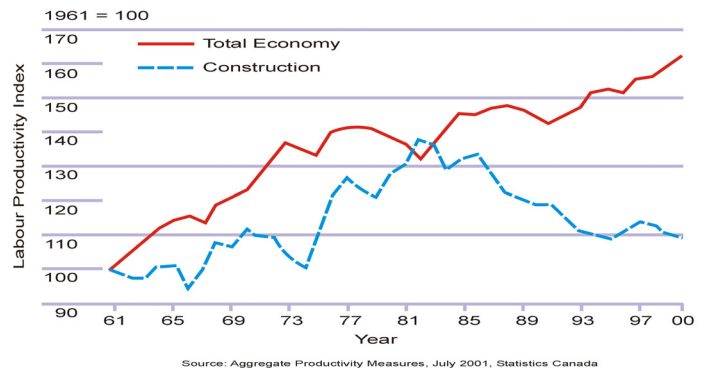
The construction industry, and its dedicated supply chain, represents over 11% of GDP - much larger than defined by traditional "construction" statistics, which are limited to value-added site activities of general contractors and specialty trades. The industry includes the design of buildings and infrastructure, the manufacture of building products and of machinery and equipment for construction, operation and maintenance, and disposal of facilities.

The Canadian construction industry, at its best, is excellent. Its capability to deliver the most difficult projects, under the harshest of conditions, is as good as that of any nation in the world. However, the productivity growth in the construction industry has lagged behind that of the total economy by over 50% since 1960, with most of the lag occurring in the past two decades. The industry is capable of a much higher achievement, if it could unleash its full innovative potential.

Basic facts about the construction industry:

- Over 200,000 enterprises
- Almost 1.2 million employees
- Maintains/repairs > \$5 trillion of assets
- Consumes over 1/3 of national energy
- Produces 1/4 of Canada's solid waste
- Consumes 1/2 of the primary resources.

**The Canadian construction industry is three times the size of the Canadian automotive industry.**



## International Activities

Recent surveys and studies reveal that the Canadian construction industry faces remarkably similar issues to that of its international competitors. Several other nations are developing, or have already developed, national strategies and have implemented comprehensive national action plans to deal with them. A common feature is the partnership between industry and the government.

Currently, no such plan exists in Canada.

In the United Kingdom, the industry has moved its agenda to the stage of conducting demonstration projects to assess the benefits. A report by the Movement for Innovation (M4I) called *"Accelerating Change"* compares (for 2001) the performance of the companies who had adopted the principles and practices of M4I with the industry as a whole.

- Profitability - the median profit margin expressed in percentage - shows that M4I companies achieved a 7.6% profit margin compared with "non M4Is" at 5.6% - meaning an improvement of 2 percentage points or an increase of 65% of actual profit.
- Productivity - the added value per employee - increased from 28,000 pounds to 34,000 pounds - an increase of 21% in added value
- Cost - compares change in average cost of a 'standard' project' during 2001 - non M4I companies increased cost by 2% while M4I companies reduced costs by 2% (a 4% cost improvement for M4I projects)

Similar activities are underway in Australia, Denmark, Finland, Hong Kong, Singapore, Sweden and the United States.

**Canada risks being left behind in this world-wide effort to improve the productivity of the construction industry.**

## ***Threats/Opportunities/Challenges***

The construction industry will shortly need to meet the developing challenges and opportunities of globalization, sustainability, information technologies, new business arrangements and demographic changes. The industry has historically suffered from inconsistent profitability, invested too little in capital and, mainly due to its fragmented structure, it has invested too little in human resources and R&D. Real R&D expenditures have actually fallen over the past two decades and, to a large extent, the industry continues to rely on 1970's technologies. Many of the industry's clients are not satisfied with the overall value of its products and the quality of its services.

Innovation in the construction industry is a complex activity. While, a single firm can champion an innovation, broader adoption usually requires the involvement of many external parties and stakeholders. Single firms are very limited in their ability to innovate without the co-operation and alignment of the 'construction community'. Typically, an innovation will only receive wide acceptance and dissemination if it is acceptable to a variety of stakeholders including regulatory, standards, legal, contractual, labour, safety, and environmental authorities. This is in addition to dealing with the basic business case issues. It is important that this 'innovation system' should work smoothly and not produce inadvertent barriers to innovation. In order to make progress, an industry-wide approach is needed.

The Canadian construction industry, as a whole, faces several fundamental and interrelated chronic problems:

- The industry is deeply fragmented and geographically dispersed. Governance arrangements are poorly integrated. There is no effective platform at which the private/public sectors can meet to discuss and resolve systemic industry-wide issues.

- The procurement system is driven by low initial cost versus quality and life-cycle value;
- The cyclical nature of the industry leads to survival strategies that do not support a long-term innovation culture.
- An unusual supply/demand/price behaviour; minimal price variations regardless of demand makes it difficult for companies to gain from investing in innovation and consistently low and unpredictable profit margins leave little capacity for funding innovation;
- Driven by the pressures of time, cost and schedule rather than quality and value in the delivery of its products and services.
- Risk allocation does not support innovation. High risk/low reward for designers; low risk/high reward for end client;
- Many procurers and tenants are technically unsophisticated and are thus unable to recognize improved value that can flow from innovative practices. There is a heavy reliance on low-bid contracting systems.
- Skilled labour shortage is a worsening crisis.
- Industry's image affects its ability to attract the best employees.
- Innovation occurs incrementally with a spread rate that is slow compared to other industries. Closer to the 'trailing edge' than the leading or bleeding edges of innovation.
- At less than 0.1% of revenue, R&D investments are very low compared with virtually any other industry.
- Construction is virtually invisible to Canadian governments; there are few coherent government policies for the industry. The construction industry has not been a federal government priority.

Many in the industry acknowledge these problems and a national discussion on how to ameliorate the situation is developing.

**The CCIC will co-ordinate this discussion.**

## **National Priorities**

Governments have a number of priorities that are interrelated and the construction industry is key to helping the governments deal with these priorities.

Urban renewal - design and build the urban infrastructure. If the construction industry can provide the infrastructure more efficiently, governments can do more with the available money.

Climate change –the construction industry' is a major consumer of energy and resource and a generator of solid waste. Any improvement in these areas in the construction industry will have a significant impact on government targets

Commercialization – the construction industry had always been at the forefront of innovation. With industry-wide coordination the industry can

be a partner in helping government be an early adopter of innovations and in moving innovations to a broader industry use. This is crucial for commercialization of these innovations.

Government renewal involves looking at the way business is done in a different light. The construction industry is keenly interested in working with government to find different ways to do business - procurement, contracting, best-value definition etc.

These priorities are all driven by various government departments with no central agency responsible for the construction industry. A primary issue is the need to co-ordinate research and innovation in the construction industry.

**CCIC will co-ordinate research and innovation in the construction industry.**

## **Industry Performance Targets**

The CCIC is committed to creating an innovative construction industry that provides the best socioeconomic value for Canada.

While ambitious, the CCIC believes that the following performance improvements are achievable in five years for the Canadian construction industry.

|   |                         |
|---|-------------------------|
| Optimum project cost                                | Improved by 25%         |
| Project design, construction and commissioning time | reduced by 25%          |
| Predictability of construction cost                 | increased by 50%        |
| Defects in design and construction                  | decreased by 50%        |
| Accidents   | decreased by 50%        |
| Productivity of design and construction             | increased by 25%        |
| Profitability of design and construction            | increased by 25%        |
| Research & innovation investment                    | increased by 100%       |
| Projects with 'sustainability' criteria             | for 25% of all projects |
| Project decisions based on life-cycle cost          | for 25% of all projects |

Even if only 50% of the change is actually achieved, with total Canadian expenditures on construction in excess of \$100 billion per year, this would result in savings of over \$10 billion per year for the Canadian economy.

**Clearly the opportunities are large.**

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