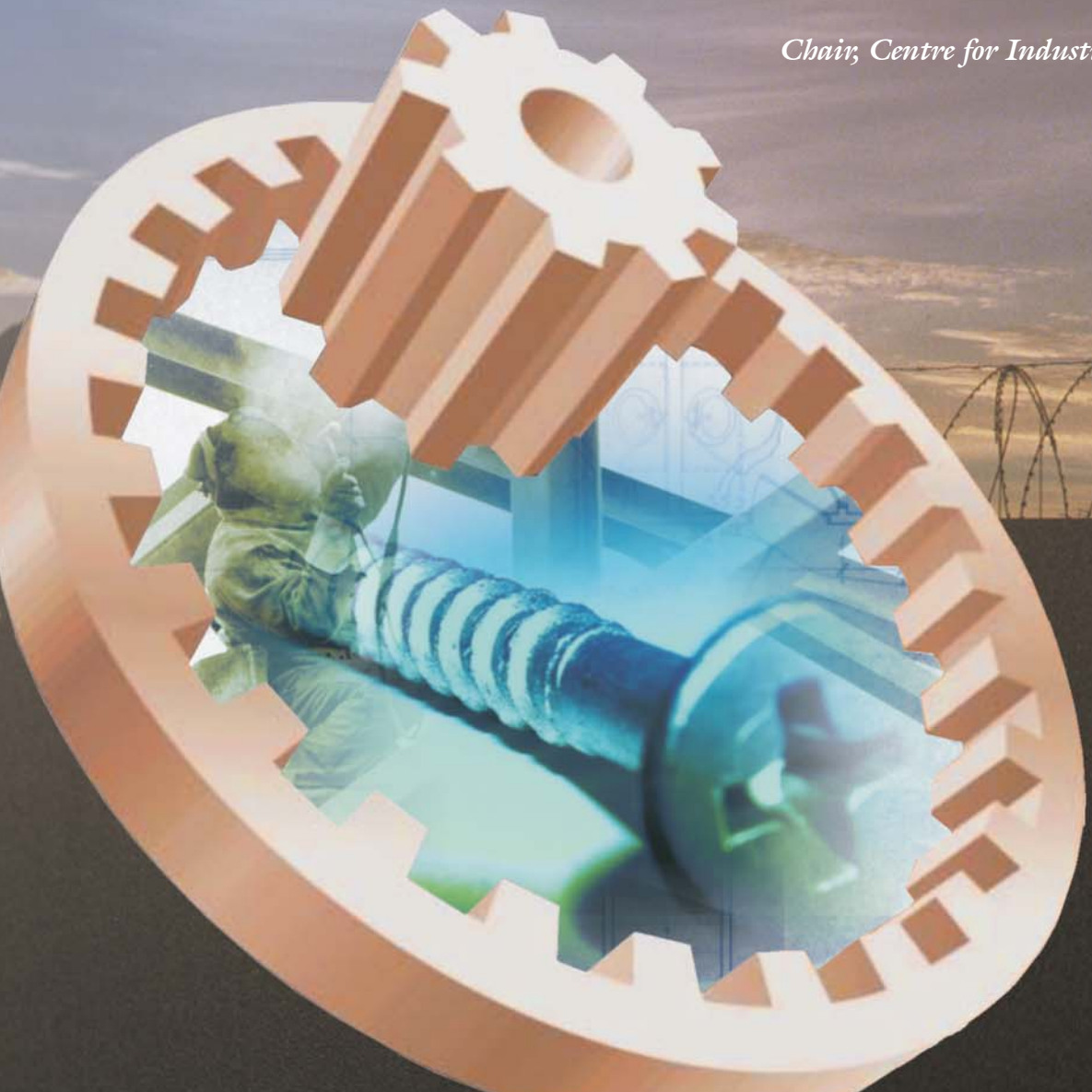
COMPETITIVELY *Working in Tomorrow's* CONSTRUCTION

Ray Pennings
Chair, Centre for Industrial Relations Innovation



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Work Research Foundation
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Introduction

A lesson learned in elementary school comes to mind while thinking about issues of work organization. In order to illustrate the concepts of synergy and momentum, two of my more muscular classmates were invited to estimate how heavy a load they could carry from one side of the room to the other. "Seventy-five pounds," predicted the first. "One-hundred," said the second, with a predictable air of one-upmanship. "But how much could you carry if you worked together?" asked the teacher.

Using bags of grass seed, the brave claims of our classmates were tested. By the end of the lesson, the class not only learned something about hyperbole, over-promising, and the competitive drive to look good in front of others, but also about natural laws which allow the contributions of a team to exceed the sum of the individual parts which make up that team.

The interplay between technical disciplines such as math and science with social disciplines of organizational and individual behaviour are relevant in assessing issues related to the organization of work on industrial construction worksites in a modern Canadian setting.

I began paying attention to industrial construction issues a decade ago. I soon realized that construction labour issues involve a muddy interplay of technical, political, and social issues, which are rarely as black-and-white as the public protagonists in the debate (of which I was one) make them out to be. Given the significant dollars, organizational reputations, and market shares at stake for the various companies, unions, and associations involved in Canadian industrial construction, sorting through spin is an inevitable necessity for any publicly held discussion.

Having stepped out of the fray and into a new role as the chair of a public think-tank dedicated to thinking about innovations that would improve our industrial relations system, one of the priorities I identified was finding a way to facilitate an industry discussion of the important issues that must be confronted. We need to get beyond segments of the industry talking about the merits of their particular arguments with those who agree with them and engage in a broader dialogue. The

objective of this project is to initiate that discussion.

The premise underlying this discussion is straightforward. Construction labour law and work organization practice in Canada have been historically based on a craft model. The infrastructure that supports it—from the apprenticeship and safety organizations to the employer and employee organizations—divide along craft lines. During the past few decades, considerable innovation and experimentation have taken place, and most observers of the industry are familiar with at least a few significant projects in which alternative organizing principles have been used.

The Work Research Foundation's initial intention to engage in a quantitative study measuring the scope or concentration of these innovations was stymied by the lack of publicly accessible, reliable data. So we undertook a qualitative approach, seeking out industry leaders from across the country who collectively are familiar with the range of work organization practices that we could identify.

I do not pretend to have abandoned personal perspectives on the issues; however, I have consciously tried to listen to and reflect arguments from all sides. This study is intended to be a catalyst for a broader dialogue, one based on an honest assessment of the issues confronting the industry. I believe this discussion is both a necessary and important one for the well-being of the construction industry (which, at 13 per cent of GDP, is a significant factor in our overall economic well-being) and those who work within it.

Although the terms craftsmanship pride or maintaining morale are often used as shorthand for recruitment and productivity issues, for the individual worker, they involve a sense of meaning and importance that goes far beyond the problems industry analysts and economists deal with. I am reminded of my father, an immigrant construction labourer, who preferred taking the scenic route to whatever destination the family was travelling. The route included detours past projects he helped build, with a slow-down or stop of the vehicle so we all could notice the uniqueness or beauty he had been privileged to help create.

Yes, the issues around work organization are about addressing the demographic, institutional, and productivity concerns that are necessary if investors are to continue seeing Canada as a place where their capital will yield the necessary returns. They also involve safety, training, and wages to ensure that those who work in this industry can provide for their families and be fairly rewarded for their essential part in

building this country for the future. But most importantly, they are about creating work environments where fathers and sons, mothers and daughters can go home from work and share stories of working together with others, combining their creative gifts with hard work to construct the buildings and roads, towers and bridges, dams and mines that are a vital component of our society.

I'm reminded of the story of the three bricklayers. Unsure of what they were building, a visitor to the construction site asked, "What are you doing?" The first bricklayer replied, "Can't you see? I'm taking one brick at a time, securing it in mortar while callousing my hands, freezing my butt off, and looking forward to the end of my shift when I can get away from a cranky supervisor and unhelpful workmates." The second was much more positive. "We are building a wall that will support various beams that ultimately a building of some sort will rest on." The third stepped back, and, with an air of pride, he waved his hand at the half-built wall and asked almost incredulously, "Can't you see? We are building a cathedral!"

This project is dedicated to all construction workers, with the hope that those who make decisions that shape their workplace do so in ways that allow them to go home at night with a sense of satisfaction and purpose, knowing they have helped build the institutions that address human needs and lift the human spirit.

Methodology

This study is based on a set of qualitative data obtained through a series of interviews with industry leaders, qualified by three conscious limitations in view of complexities identified from the outset.

First, the list of individuals approached for interviews was based on covering the entire spectrum of the process. Interview candidates fell into one of five categories:

1. construction owners who could supply insights based on the factors considered in the lead-up to contract tendering and their experiences and satisfaction with their decisions;
2. general contractors (and their representative organizations) who could provide a broader employer perspective;
3. trade contractors (and their representative organizations) who we expected would be able to cast more specific light on craft identity and jurisdiction issues;
4. labour organizations; and
5. industry organizations whose representatives must deal with the entire range of issues and balance the sometimes competing interests in the operation of their own affairs.

During the process, we combined the trade and general contractors into a single category, based on the similarity of input received, and added a government/industry/analysts/providers category to provide perspective and follow-up on specific issues raised during the course of interviews. A complete list of those interviewed can be found at page xix.

The interview list represents the entire range of categories, but within each category we selected individuals with a range of experience or organizational history. Traditional craft union, alternative work structures, and non-union perspectives were sought in the expectation of receiving partisan responses. Given the significant difference of the construction labour relations system in Quebec from the rest of the country, this study did not seek responses from and does not apply to that province.

Some self-selection is inherent in any interview process. One can only interview those who agree to be interviewed. However, most who received interview requests were cooperative, and only three refused to participate. (Some requested interviews were declined because the respondent did not have the expertise or information expected. In such cases, another candidate was identified, usually from the same or a related organization, and the interview was completed. In one case, a respondent requested not to be identified. We acquiesced and his name is not included in the interview list. However, since it was a labour leader from an alternative model of work organization, and the interview provided some unique information and perspective, the material gleaned from this interview is reflected in the report.)

Second, we promised all interviewees confidentiality regarding their input in the hope they would be as candid as possible, also in identifying the strengths and weaknesses of their organizations. No specific attribution of any comment or document has been made. All material gleaned from the interviews has been treated as opinion for analytical purposes. Only factors that could be independently documented or were supplied by more than one source have been presented as fact in this paper.

Although specific examples provided during the interviews were repeatedly referred to as examples of innovation, we do not include them in this report. The examples cited by interviewees were used as an illustrative shorthand for the trend discussed. To properly understand the developments of a specific project would require an in-depth review of documents and the soliciting of local perspectives. If specific cases were included in this report, they would undoubtedly become the focus of discussion, with local participants feeling compelled to defend their actions, some of which did not work out as intended. In our view, such a discussion would detract from the broader perspective of the trends which the examples point to.

The third factor is to be modest about the claims of this study, which is intended as an informed, descriptive discussion starter for the industry. We are not making unqualified claims that the themes identified are necessarily representative or equally experienced in industrial construction across Canada. But based on the literature reviewed and input received, the trends identified merit industry discussion and further study.

List of Interviewees

Owners/Buyers

Mike Wallace
Construction Coordinator, Engineering Services
Duke Energy Gas Transmission
Vancouver

Ron Genereux/Don Mosseau
Vice President Voyageur 1/Director Construction PMO
Suncor Energy Inc. Major Projects
Calgary

Brad Anderson/John Brogly
Executive Director/Past President
Construction Owners Association of Alberta
Edmonton

Jayson Myers
Chief Economist
Canadian Manufacturers and Exporters
Ottawa

Bob Hutchinson
Director Major Projects
Teckcominco
Vancouver

Industry Associations

Dennis Ryan
Director of Industry Human Resources
Canadian Construction Association
Ottawa

George Gritziotis
Executive Director
Construction Sector Council
Ottawa

Gord Stewart
Training Manager
Independent Contractors and Businesses Association
Burnaby, British Columbia

Rod Schenk
Executive Director
Progressive Contractors Association of Canada
Edmonton

Scott McIvor
Chief Executive Officer
Ontario Construction Secretariat
Etobicoke, Ontario

Labour

Robert Blakely
Director of Canadian Affairs
Building Trades of Canada
Ottawa

John Bettes
Director, Skilled Trades Department
Canadian Auto Workers
Toronto

Neil Roos
Executive Director
Christian Labour Association of Canada
Toronto

Patrick Dillon
Secretary-Treasurer
Building and Construction Trades Council of Ontario
Toronto

Contractors and Associations

Eslin Eling
Director Employment Standards
PCL Contractors Ltd.
Edmonton

Brian Foote
Director of Labour Relations
Toronto Construction Association
Richmond Hill, Ontario

Graham Wozniak
President
Monad Contractors Ltd.
Burnaby, British Columbia

Neil Tidsbury
President
Alberta Construction Labour Relations
Edmonton

Shirley Westeinde
Chair
Westeinde Group
Ottawa

John Schel
President
Boilermaker Contractors Association
Fonthill, Ontario

Steve Lornie
General Manager
Dominion Fairmile Construction Ltd.
Vancouver

Michael Smith
Vice-President
Ellis-Don Construction
London, Ontario

Gerry Reinders/John Reinders
President/General Superintendent
Bridge Electric Corp.
Richmond, British Columbia

Government/Industry/Analysts/Providers

Shirley Dul
Executive Director
Alberta Apprenticeship and Industry Training
Edmonton

Paul Stoll
Senior Research and Partnerships Officer
Human Resources and Development Canada
Hull, Quebec

Mike Dunbar/Charley Maresca
Vice-President
Director of Legal and Regulatory Affairs
Associated Builders and Contractors
Rosslyn, Virginia

Bill Empey
Managing Partner
Prism Economics and Analysis
Toronto

Saskia Funston
Business Development
B.C. Safety Training Systems
Vancouver

Tim Armstrong
Former Chair of Ontario Labour Relations Board, Deputy Minister of Labour and Deputy Minister of Industry
Toronto

Putting Things in Context

This study is based on the premise that the lines of craft distinction, which have formed the basis for the institutions and work organization practices supporting industrial construction, are no longer as distinct as they once were. Considerable innovation and experimentation is taking place in how we divide and assign industrial construction work. This study focuses on two questions that follow from this premise.

1. Are these innovations indicative of systemic changes, and, if so, to what extent, or should they be viewed as a series of exceptions, explainable by local circumstance?

2. If these innovations were to become more widespread, what will their effects be on:
   a. safety, apprenticeship, and training programs?
   b. investment decisions and productivity initiatives?
   c. labour relations parties and structures?

While the nature of the study sounds simple, a number of complexities and risks lurk immediately beneath the surface.

The first involves obtaining objective data. The projects being discussed deal in tens, if not hundreds, of millions of dollars. With such stakes and the realities of competitive interests, providing full disclosure rarely seems in the best interest of owner/clients, contractors, or labour organizations. Not surprisingly, various construction urban myths, based on actual events involving competitor projects, have gained credence among industry participants. Since no publicly accessible, reliable data is available to counter these myths, separating fact from fiction is a challenge.

The second complexity involves determining when changes should be viewed as significant, with potential systemic implications, and when they are simply part of the natural ebb and flow of evolving practices.

The institutions that serve the construction labour market have been established around historic understandings and distinctions. They also have adapted to change over time. It is not surprising to observe a natural impulse of self-preservation promoting a minimalist view of innovation, attempting to accommodate observed changes within existing and known structures.

To illustrate with a fictional metaphor, no one would have been surprised if a horse-carriage association downplayed the significance of the first automobile assembly line. The association would have been motivated to highlight all the obstacles automobile manufacturers would need to overcome before horseless carriages would be anything more than an anomaly. A typical press release might have read, "Carriages are about being transported from point A to point B through the energy provided by third-party propulsion. The introduction of a mechanical means over livery is simply the next step in propulsion evolution, and our association has always been a leader in responding to such changes."

This metaphor is not to suggest that changes currently underway in the construction sector are as significant as the introduction of the automobile was to the transportation sector. We are simply noting that both the livery nostalgics and the innovation enthusiasts are present within the sector. Despite obvious attempts by most respondents to provide honest analysis and input that went beyond self-interest, the impulse to emphasize or minimize changes based on perspective is undeniable.

Both the livery nostalgics and the innovation enthusiasts are present within the industrial construction sector.

A third complication involves the nature of construction itself. Industrial construction projects are not assembly line products. Although certain projects may look similar and naturally invite comparisons from those on the outside, very different timeline, cost, engineering, or geographic variables must be taken into account. Isolating the work organization and labour force factors, which typically constitute between 15 and 40 per cent of the overall cost of a project, is hardly a precise science. Although this might be overcome with a different methodology, that would require both access to data and a budget beyond our present scope.

A fourth complication is the jurisdictional complexity surrounding the construction labour market. Although highly specialized skilled tradespersons in industrial construction are more mobile than most other

occupational groupings, the vastness of Canadian geography remains a complication. Just because the necessary skills are available in Canada does not mean they are available for a specific project. Many projects, by virtue of the significant natural resource and energy components of industrial construction purchasing, occur in remote areas. And, even when the appropriate skilled labour can be identified, variations in provincial skills requirements, labour relations particulars, organizational loyalties, and regulations regarding local hire preferences can conspire to make utilizing the identified tradesperson a difficult proposition.

To summarize, our challenge is to sort through the muddle of innovative work organization trends without access to a global set of reliable data, recognize that almost every possible local comparison must be qualified as comparing apples and oranges, and be aware of the self-interest of those directly involved which colours their input. This complexity does not negate the near unanimous input indicating that changes are occurring within the organization of work in Canadian industrial construction, and the institutions that serve this industry are being challenged in how they respond to these changes.

Year		Canada
1998	**Total Industrial**	**$4,260,752**
	Factory, Plant	$2,629,584
	Mining, Agriculture	$388,945
	Utility, Transportation	$601,803
	Small Projects *	$640,420
1999	**Total Industrial**	**$3,630,384**
	Factory, Plant	$2,085,322
	Mining, Agriculture	$376,140
	Utility, Transportation	$516,796
	Small Projects *	$652,126
2000	**Total Industrial**	**$3,975,654**
	Factory, Plant	$2,361,953
	Mining, Agriculture	$407,217
	Utility, Transportation	$538,552
	Small Projects *	$667,932
2001	**Total Industrial**	**$3,598,025**
	Factory, Plant	$1,954,724
	Mining, Agriculture	$397,736
	Utility, Transportation	$624,515
	Small Projects *	$621,050
2002	**Total Industrial**	**$3,222,724**
	Factory, Plant	$1,603,353
	Mining, Agriculture	$429,526
	Utility, Transportation	$533,562
	Small Projects *	$656,283

* This category represents small industrial projects valued at less than $250,000 each.

Note: a provincial breakdown of this data is available at Appendix 2.

Source: Statistics Canada

Scope of the Study

Before developing the themes outlined above, it is helpful to step back and define the scope and context for our study. Those who will likely read a report such as this will not need convincing regarding the significance of the construction industry to the Canadian economy. Construction accounts for 13 per cent of Canada's gross domestic product, and over 893,000 Canadians (roughly one out of every 16 workers) are employed in the sector.

This study's focus is not the construction sector as a whole but rather that segment of the industry commonly referred to as industrial construction. Although the term has technical definitions for legal and statistical purposes (with slight variations by jurisdiction), such precision is not necessary for our purposes. Statistics Canada measures the value of industrial construction permits in the range of $3 to $4 billion per annum.

The Statistics Canada data does not fully capture the scope of industrial construction work. The Construction Workforce Development Forecasting Committee (CWDFC), established by the Construction Owners Association of Alberta, has compiled a five-year demand and supply forecast for construction workers since the mid-1990s. The supporting documentation identifies 779 major projects with a combined value of over $77 billion ongoing in 2002, up from 574 projects valued at $56 billion for 2000.

The scope of the projects is such that work in this sector is concentrated almost exclusively with larger employers.

CWDFC Project List

	2000 Project List		2001 Project List		2002 Project List	
Sector	**No. of Products**	**Investment Expenditures**	**No. of Products**	**Investment Expenditures**	**No. of Products**	**Investment Expenditures**
Mining	3	$505	1	$8	1	$30
Oil, Gas & Oilsands	44	$31,579	62	$47,080	64	$49,840
Forest Products	8	$1,420	16	$1,720	6	$451
Chemicals	6	$2,806	4	$860	2	$260
Other Manufacturing	32	$1,172	38	$705	37	$680
Pipelines	13	$5,438	16	$3,311	10	$2,710
Other Commercial	252	$8,533	255	$11,445	289	$13,937
Infrastructure & Institutions	216	$4,555	299	$7,480	370	$9,813
Total	574	$56,008	691	$72,608	779	$77,720

Source: The CWDFC

Development of the Craft Model

Construction labour relations is distinct from labour relations in other economic sectors. In most provinces, it is one of the few sectors with customized labour legislation provisions. The peculiarities and legal differences are better dealt with by lawyers, but it is helpful to reflect momentarily on the roots of these unique provisions and other features that distinguish the construction industry from other sectors.

Paul Weiler provides a useful summary of the development of construction labour law in his book *Reconcilable Differences: New Directions in Canadian Labour Law.*[1] As he notes, labour markets are not the initial and independent variable in construction work. Although each construction project is a unique, custom-designed product, work in the construction sector has been made more productive by a division of labour, technological improvements, and economies of scale. The key to this arrangement is the coordination of specialists, each with their own ownership and management structure, into

> a network of contractual relationships negotiated and renegotiated for each new project. [This] is quite unlike the typical experience in other industries, in which the various elements in each operation may be performed by specialists, but by employees who work in distinct departments of a single, large organization under the same top management. Why the difference? Because of the economics of construction. The pattern of construction work is too erratic. When any one project is complete, there is no guarantee that there will be another job for the firm to move on to. Each project takes a great deal of time and resources to bring on stream, and it moves with a momentum of its own. That is accentuated by the seasonality of construction work. . . . Even more important is the business cycle. (182–183)

Because construction workers move between projects and employers, the craft union has historically been understood to fill not only a functional but also an identity vacuum that otherwise would exist in the employment life of a construction tradesperson.

> Each of the important work specialties historically developed its own craft union. Many of these unions have had a century of representation of that skilled trade. There are still nearly twenty international unions: the Carpenters, the Operating Engineers, the Electrical Workers, the Plumbers, and so on. That attachment between the tradesman and his craft union endures throughout his entire life in the construction industry: from his initial point of entry into an apprenticeship program which the trade union either controls or in which it is heavily involved,

[1] Toronto: Carswell Company Ltd., 1980. The summary provided relies on material presented in Chapter 6, "Labour Relations in Building Construction."

> through the distribution of available work by the union's hiring hall, and culminating in the payment of health and welfare insurance and pension benefits. . . . The most salient relationship of a construction worker is with the union representing his trade, not with the contractors for whom he has worked. (183)

Two main functions have characterized how craft unions have exercised their responsibilities: 1) removing wage levels from the competitive bidding process by standardizing wages between employers and 2) controlling the workforce in order to mitigate against the destabilizing impact of the construction cycle on job security. Both objectives have in practice and law become recognized features of organized industrial construction with multi-employer bargaining and hiring halls the norm in most jurisdictions.

While this system of work organization features obvious benefits and strengths, proven over decades of experience, it also suffers from inherent challenges within. The most prominent, undoubtedly, are jurisdictional disputes. Weiler notes:

> Both of these traditional building trade objectives—standardizing area wages and controlling work area—coalesce in one perennial problem area: the jurisdictional dispute. To the outsider these have always appeared to be among the most unedifying, the most futile of collective bargaining disputes. Yet when one penetrates beneath the surface, it is apparent that this conflict is one of substance. Both wage rates and job security are at issue. . . . In the final analysis this kind of inter-union conflict is a natural expression of the general structure of the construction industry and its industrial relations, of operational specialization among firms, and a profound identification of tradesmen with their respective craft unions. As long as there remains that variety of actors in building construction, each jealously trying to guard its own turf, it is inevitable that there will be jurisdictional disputes. (185)

The labour relations structures affecting craft unions as we know them today, characterized by multi-employer accredited bargaining structures, formalized inter-craft union relations through the Building Trades Council. Regional agreements have developed differently with local variation in the 11 Canadian labour relations jurisdictions but have common characteristics.

Jurisdictional disputes are not the only weakness acknowledged within this system. Weiler points out several others. The reliance on majoritarian rule can result in a rigidity and contractual inflexibility that makes little sense in a local situation. The bargaining structure, in which wage costs have been essentially taken out of the competitive arena, has been criticized as contributing to wage and price inflation and having negative overall economic effects. This charge is particularly focused on set-

tlements reached in certain specialty trades, where demand for tradespeople seems inelastic. Also, workers effectively have few choices about their labour relations representatives under this system. Weiler notes that

> in real life it is the employer who decides whether a specific job will be union or non-union, not the employees as conventional representation law would have it. The contractor makes that crucial judgement before there are any employees at all. Indeed it makes that judgement in deciding exactly who will be the employees on the project. From its point of view, the major reason why the union wants the contractor to do that project under a collective agreement is not to gain representation over tradesmen working on the job. Rather the union wants that work available for distribution among its membership, many of whom may be unemployed at that time. In the final analysis it is a myth to assume that collective bargaining relationships get established between contractors and building trade unions in anything like the same fashion [as other industries]. (191)

As in any system where power and control is placed in the hands of a few, says Weiler, the temptation to abuse that power is real, leaving the system looking far less than idealistic to those left without an effective remedy.

While everyone concedes that the craft model has been the predominant model and the organizing premise for construction labour law, apprenticeship systems, the organization of management and industry associations, and established patterns for the assignment of work, it is not the exclusive model. A number of unions involved in industrial construction have not used the same craft organizing principles. The General Workers Union in Nova Scotia, which was the subject of particular labour code provisions in 1970; the Christian Labour Association of Canada, which has operated in various jurisdictions since the 1950s and was the object of a grand-fathering provision when Ontario's province-wide bargaining was established in 1978; and several industrial unions, including the International Woodworkers of America and the Communications, Energy & Paperworkers Union, are but a few examples of unions that have been involved in industrial construction work using a non-craft model.

The options have never only been between the different models of union organization. Some industrial construction work always has been completed by the non-union sector, although the extent of this component varies, with significant variation between jurisdictions, sectors, and trades. Sometimes this presence simply grew out of the absence of the evident advantage of a union presence, and at other times it was part of a conscious strategy to countervail some of the per-

ceptions of union cost and rigidity.

Variations to the craft model have always existed, but how prevalent are they and what impact do they have on the industry?

The American Experience

Many industrial construction contractors and labour organizations are involved on both sides of the 49th parallel, making the differences between practices in the two countries an easy shorthand with which to describe change. While a detailed examination of other jurisdictions goes beyond the scope of this study, a summary overview of the American experience is appropriate, if for no other reason than to interpret the shorthand and jargon that has developed in the Canadian discussion.

Many industrial construction contractors and labour organizations are involved on both sides of the 49th parallel, making the differences between practices in the two countries an easy shorthand with which to describe change.

The evolution of the construction industry for the first 70 years of the twentieth century is typically portrayed as a single continuous process. Usually linked to the industrialization and urbanization trends, a system developed in which the norm was for property owners to hire general contractors to undertake construction projects. These general contractors combined their own workforces with the specialty skills of subcontractor workforces who actually did the bulk of the work.

Union roles evolved to include not only traditional collective bargaining tasks of wage and working condition negotiation and enforcement but also training and apprenticeships as well as job placements. Prior to the Second World War, the industry operated as a single, undifferentiated industry, but, subsequently, residential, commercial/institutional, industrial, and heavy/civil subsectors began to emerge, each characterized by distinct factors and developing subsector practices and identities.

Safford and Locke, in a summary of the literature on the development of the U.S. construction industry, highlight its evolvement since 1970, all of which were referenced directly or indirectly during the interviews.[2]

[2] See especially 5–8, Locke (2001).

The segmentation of the construction industry resulted in tensions regarding the delivery of apprenticeship and training programs. Unions had come to play a leading role, but segmentation resulted in significantly different levels of union organization.

Especially in the residential sector, but also to a lesser degree in the lighter institutional and commercial sectors, it is relatively easy to set up a construction business with little fixed capital required. A significant non-union segment of the construction industry developed, and the perception, disputed by organizations representing the non-organized contractors, is that a significant factor in the gain of market share by the non-union sector is because comparably few resources are spent on apprenticeship and training programs.

The construction sector has also been one in which an underground economy has persisted. Although this did not directly affect the industrial sector, the indirect effects on labour markets and the availability of skilled labour had a ripple effect throughout the industry.

There is little dispute that some of these trends were caused by the response of the unionized sector to the economic challenges facing the industry. In the high inflation era of the early1970s, construction cost increases ran ahead of inflation. Since costs were passed on to construction owners, who had little choice and were not paying as careful attention as they subsequently would, labour and management (whose profits were calculated on a margin basis on the overall costs) both had incentive to agree to significant wage increases.

The owner community began to raise concern; however, the response of the unionized sector was not very accommodating. In the words of Doug McCarron, president of the International Carpenters Union, "Thirty years ago, you asked for our help, and we said no. We thought it wasn't our problem. . . . After all, you were the businessmen, so we turned our back and said, 'You figure it out'."[3] Labour relations throughout this period in the United States, as well as in Canada, can be described as stormy and tumultuous and served as the trigger for structural responses to fix the system.

In the United States, this resulted in the formation of the Business Roundtable, an organization of major national companies for which construction costs were a significant part of their operations. The

[3] McCarron (2002), 5.

Roundtable commissioned a series of studies and reports which resulted in significant changes in the organization of the industry, including the collective bargaining structures, the organization of construction work with professional construction management firms replacing many of the functions previously understood to be general contractor responsibilities, and the introduction of new technologies into construction work processes.

The entire industry and the regions together must compete for investment in an increasingly global marketplace.

Parallel to the Roundtable was the emergence of the Associated Builders and Contractors as a "significant lobbying and education force within the industry with a mission to promote and support non-union or 'open-shop' construction."[4] Union responses to these developments included concessionary bargaining, aggressive organizing programs, increased emphasis on training and safety programs, and economic defences, such as market recovery programs, or legislative and regulatory support, such as fair wage provisions or union preference provisions.

Characterizing these developments is an admittedly delicate task, considering the strong sentiments as to the progress—or regress—they represent. However, several consequences, acknowledged by all segments of the industry, found their way as reference points in many of the interviews we conducted.

First, industry participants must take an increasing responsibility for the industry as a whole. Although contractors and unions properly focus on their market share, and hence have local competitors which they understandably view with normal competitive glasses, it is the entire industry and the regions together that must compete for investment in an increasingly global marketplace. The significant decisions that impact the future of organizations are not so much whether contractor A or contractor B will win a particular tender, but rather the degree to which the investment community will decide between community X and community Y. And while cost is certainly a factor in that decision, it is not the only or even the most significant variable.

Ensuring an adequate supply of skilled labour able to meet the increasingly technological demands and providing a reliability and stability that buyers believe they can depend on are also important considera-

[4] Safford and Locke, 9.

tions. The different players within the sector certainly have widely variant perceptions of what the underlying problems and preferred solutions would look like, but there is—especially when compared to the approach of 30 years ago—much more sophisticated and broader industry awareness.

Second, the nature of contracting has changed. Subcontractors have developed greater specialization, which in turn has caused them to seek contracts in a wider geographic area. Regional, national, and in some cases North American-wide approaches to marketing are being undertaken by firms in the construction industry, which also has its effects on workforce mobility. The result is that issues of standardization of apprenticeship and qualification systems are much more dominant and have an increased importance today.

Third, some of the historic craft distinctions, developed over a long period of time, have blurred. To quote Safford:

> Construction management and technological innovations have also led to the erosion of specialization in certain parts of the industry. In the past, clear boundaries separated the different crafts. The work of carpenters, for example, was distinct from that of steelworkers and the work of pipefitters was distinguishable from that of sheet-metal workers. Today, both in an effort to drive down costs and because of changes in the way buildings are built, these craft boundaries are increasingly blurred. This has exacerbated tensions among the unions, which have found themselves fighting with one another over competing jurisdictions. (9)

Although the examples referenced in our interviews were usually different than those cited by Safford, craft demarcation was very much an issue that dominated the interviews.

The net result of these changes in the United States has been that the organized/unorganized ratio of construction workers has been inverted in the past 30 years from approximately 70:30 to 20:80[5] per cent. These numbers are misleading due to wide local variations in union density levels; however, no one disputes the fact that overall the impact has been significant. The consequences of this are far-reaching in how the sector organizes itself.

But the United States is not Canada. Although these trends have some direct impact, given the close relationship between the two economies

[5] The April 2003 issue of *Construction Executive* notes that U.S. construction union density numbers for 2002 were 17.2 percent.

and the bi-national connections of many of the organizations on both the management and labour side, significant differences need to be taken into account. The overall unionization rate in Canada is close to double that of the United States; the structure and delivery of our labour relations, safety, and apprenticeship systems are very different; and our smaller population spread over a vast geography pose different challenges.

While the U.S. experience provides a valuable reference point and a shorthand by which we can describe some of the changes occurring in Canada, we recognize that we must understand Canadian developments in their own context and understand the implications for the Canadian industrial construction sector.

Innovations

This study originated with an anecdotal awareness of several projects that were not structured according to the norm of craft organization. Alternative union organization and the open-shop sector, which, particularly in Western Canada, has developed a growing niche in industrial construction markets for the better part of two decades, have been a topic of conversation throughout. However, it is now evident that some craft unions were also implementing innovations in work organization. As well, some non-construction unions are doing work that not long ago would have been automatically considered the domain of the building trades.

The absence of Canada-wide third-party data measuring the scope of such innovations has been well established, so it is difficult to back-up any characterization of the extent of these changes. However, the prominence of the actors involved in these innovations, the size and profile of some of the projects on which these changes were being tried, and the potential far-reaching implications of these changes prompted further investigation.

Seven Categories of Innovation

The first step in our study was to establish some definitions in order to help organize discussion of these innovations. In the course of the interviews, we developed seven categories as a framework within which we could try to analyze the scope of innovations. Although a few categories parallel legal frameworks, usually drawn from labour code provisions, most of the innovations are attempts to work around certain legal and established organizational ways of doing things. Consequently, these definitions provide only a general framework, with specific examples often having characteristics that apply to more than one. Assignment of examples into categories is arbitrary at best.

1. *Traditional Craft Organization* – The craft model of organization, based on the historical developments outlined in chapter one, includes several defining features:

- Unions are made up of workers belonging to the occupational group for which they are named (e.g., plumbers belong to the Plumbers union; boilermakers to the Boilermakers union, etc.).
- The work that is predominantly done by this occupational group is that which has historically been understood to be part of that craft. Over time, the assignment of work has been fairly precisely defined and the distinctions between the crafts generally understood.
- There is an alignment between the relevant apprenticeship and training programs and guidelines and the work completed by the trade.
- The work is done under the provisions of a collective agreement specific to the trade that is negotiated on a multi-employer provincial or regional basis.

Few would argue that craft unions have played an historic role in cultivating a sense of craft identity and pride of workmanship associated with their trade. The status that has been achieved and the articulation of standards of craftsmanship are a legacy of this system and remains an important feature today. Many respondents highlighted the positive role craft unions played in recruiting and creating status for their particular trade.

A term such as cluster contractors is a more accurate description of many of the specialty contractors who do work in industrial construction.

2. *Multiple Crafts in One Organization* – It would appear that some craft unions are including members from other craft unions in their membership. This may be a consequence of the reorganization of work on the employer side. Whereas the division between general and trade contractor was once a very clear line, in some niches those distinctions are changing. The projects being taken on by trade contractors often do not fit as neatly within the jurisdictional lines of the dominant trade and often require a limited number of ancillary tradespersons to complete the task. In fact, several of our respondents agreed that a term such as cluster contractors is a more accurate description of many of the specialty contractors who do work in industrial construction.

Many of these contractors began with a single trade and were appropriately certified and became part of the bargaining structures associated with that trade. As they began to require the services of other trades,

usually in a relatively small proportion to their dominant trade, they simply hired employees with the appropriate tickets and employed them without the involvement of the second (or third and fourth) craft union provisions. Instead, all employees are treated under the terms and conditions of the original union to which the firm was certified, and the labour relations complexities that otherwise might come from the involvement of several unions within one firm are avoided. The original craft union benefits by the inclusion of additional members, the contractor avoids the transaction costs associated with multiple agreements, and the employees have work they otherwise might not have, so everyone benefits from this arrangement.

The challenge comes when an increasing number of these arrangements develop over time and craft unions end up with several trades within their membership. The provision of training and craft-specific representation are obviously compromised, and some of the emerging issues do pose challenges for inter-union relationships.

Although the focus has not been entirely within the industrial sector, the decisions by certain locals affiliated with the Labourers and the Carpenters to apply for representation rights for trades other than those they have historically represented are an obvious and public example of this trend. However, anecdotally, there are numerous examples, albeit on a much smaller and less profile scale, which are indicative of this trend.

3. *Expansion of Craft Work Jurisdiction* – Examples were also cited where it was not the inclusion of additional trades but the taking on of work that historically has been associated with different trades that was tried. In one plant shutdown, tenders were arranged in such a way that more work was given to particular trade contractors in a conscious attempt to improve productivity, to the exclusion of other trade contractors that would ordinarily have been involved in some aspect of the project. The development of the Construction Craft Worker apprenticeship in Ontario and multi-skilling initiatives are also examples of innovations cited that are based on workers in specific trades taking on assignments historically assigned to other trades.

4. *Construction Work and Maintenance Agreements* – The line between construction and maintenance work, while definable legally, has long been fuzzy in practice. Many larger industrial owners have an in-house construction crew typically represented by the industrial union that represents their production workers. In many cases, job security language negotiated by these unions ensures that the in-house craft work-

ers have the first opportunity to complete any construction work before a tender for an outside contractor is issued. This is a long-standing practice, and, particularly in given sectors, the understanding that certain work belongs to certain unions is well established, regardless of whether that fits within the niceties of labour relations definitions and conditions for construction.

The feedback regarding this practice was mixed and varied widely by sector and region. Some examples were cited indicating that owners might be relying increasingly on in-house construction crews, particularly as new construction relies increasingly on technical expertise related to specific equipment that is more efficiently accomplished with in-house crews than with outside construction suppliers.

5. *Industrial Unions Doing Construction Work* – There is a well-established history and precedent for industrial unions completing construction projects under existing collective agreements they have with project owners. In recent years, industrial unions have entered the construction sector in new bargaining arrangements, albeit with legal twists that make the arrangements less than straightforward.

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Several respondents mentioned the possibility that unions that do not have a history of construction representation might be interested in entering this area. Some of the examples involved fabrication work, which has not been the exclusive purview of construction unions. There is some evidence that the process of tendering and allocating this work is changing, and more industrial unions are becoming involved in the sector.

The involvement of industrial unions was discussed more in the context of a prospective possibility than present reality. (We might also add that there were very different undertones regarding the desirability or likelihood of this development.) However, its potential significance does merit exploration.

The discussion was prompted by an ongoing case before the Ontario Labour Relations Board involving a local of the Communications, Energy & Paperworkers Union (CEP) doing construction work at Dow Chemical. Historically, the work in dispute was completed under maintenance agreements, but, in 1995, Dow decided it no longer

wanted to do construction work in-house and contracted with MCR Ontario, a private contractor, to carry out the work. Among the conditions of the contract was that a voluntary agreement was to be signed with the CEP and the existing workforce retained.

In a labour board decision in 1996, the Board rejected the claim of the UA craft union that its construction representation rights took precedence, even though the factual foundation might exist for such a declaration, in view of the fact that the work in question was limited to those covered in the pre-existing maintenance arrangements, and this solution was the "most likely to promote harmonious labour relations."[6]

A subsequent sale-of-business type arrangement in 2000 muddied the waters again, and a contractor with a UA agreement formed another company and signed a voluntary with the CEP in order to obtain this work at Dow. This is the subject of ongoing litigation, however, in a decision on preliminary issues issued April 25, 2002,[7] comments were made that point to a potentially significant rethinking of jurisprudence in Ontario. The relevant paragraphs are 37 and 38:

> 37 Although the UA characterized the voluntary recognition agreement and collective agreement as pertaining to the construction industry, it is not obvious to me that they do. As the Board noted in Ontario Hydro at paragraph 65, there is no requirement under the Act that construction employees be represented by construction industry trade unions, nor is there any requirement that collective agreements that cover construction employees fall under the construction industry provisions. The Board concludes, therefore, that there is no obligation that the CEP be a trade union within the meaning of section 126 in order to represent these employees by way of a voluntary recognition agreement. There is, similarly, no need that the collective agreement conform to the Board area and sector requirements because the agreement does not purport to be a voluntary recognition agreement in the ICI sector.
>
> 38 It is also worth noting that the relevant language of the Act has been amended since the Board issued its decision in Ontario Hydro concluding that a bargaining agent had to be a "trade union" within the meaning of section 126 of the Act to bring an application for certification pursuant to the construction industry provisions. One of the significant factors underpinning the analysis was the conclusion, at paragraph 47, that the construction industry provisions of the Act provided a "complete code" for applications for certification in the construction industry. One characteristic of that "complete code" was that certificates were issued pursuant to the construction provisions, in section 160. As the Act now reads, all certificates, including those pertaining to the construction industry, are issued by the Board pursuant to section 10, which is part of the general provisions of the Act. It may be then that the Board's analysis in Pickering Welding and Steel Supply [1987] OLRB Rep April 595, which

[6] M.C.R. Ontario Inc. [1996] OLRD No. 4797, September 16, 1996, 36.
[7] 3189–00–R U.A. 663 v. CEP 672 and Industrial Trades Group, OLRB.

> was distinguished from Ontario Hydro because of the different legislative framework, may be resurrected. However, as I have set out above, since the CEP does not come before the Board in the context of an application for certification, it is not necessary to decide that question.

The import of this is the possibility that the limited field of unions entitled to represent workers in the construction sector in Ontario, which the jurisprudence to date has restricted to the craft unions and the Christian Labour Association of Canada (CLAC) by virtue of a grandfathering exception in Section 158(4), may be opened up to any union making an application. It is interesting to note that when the Nova Scotia Labour Relations Board ruled in 2000 that representation in the construction sector of that province was restricted to only "one (1) or more of fourteen (14) international skilled trade or craft trade unions all with headquarters in Washington, D.C. that cumulatively, had the trade jurisdiction to perform all of the work defined by the phrase 'construction industry'"[8] and denied the CLAC certification in that province on the grounds that "it did not have the requisite history of construction practices" in Nova Scotia, it relied heavily on the Ontario jurisprudence in its reasoning. It also explicitly noted that if it were to certify CLAC,

> some [non-construction] unions also might find the lure of large numbers of new members in a booming construction industry very enticing. For example, as [the lawyer representing the BTC] noted, the Communications, Energy and Paper Workers Union has many tradesmen working in the three pulp and paper plants it has organized in Nova Scotia under Part I of the Act, viz., Kimberly Clark, Stora Forest Industries and Bowater. It would not be a difficult move for it to form construction locals, gain a voluntary recognition agreement, create a CLAC-type "history" in Nova Scotia and then [claim to be a construction union]. . . . The same analysis and result would apply to other industrial trade unions, e.g., the Canadian Auto Workers (CAW) which is a large, influential, relatively wealthy and aggressive union that, in recent years, has expanded its "coverage" of working environments to include Newfoundland fishermen, cannery workers there and in Nova Scotia, and also, of course, the workers represented in the past by the Canadian Brotherhood of Railway Transport and General Workers Union. Another large union with a somewhat comparable industrial "history" is the United Steelworkers of America.[9]

Of course, establishing the legal possibility for the entrance of industrial unions into the construction sector does not mean that they would intend to expand their operations and compete within that sector. In fact, representatives of three industrial unions contacted for this study,

[8] Nova Scotia Labour Relations Board, No. 2087C, paragraph 60.
[9] Ibid., 61.

whose members presently do construction work under maintenance agreements, all insisted that expansion into the construction sector was not on their agenda, even if the legal possibility of doing so opened up. Nonetheless, these legal developments and their possible implications were noted in more than one interview.

6. *Alternative Unions* – The existence of unions operating in the construction sector that market themselves as an alternative to the craft union model, highlighting the benefits of wall-to-wall certification, have been a feature of the construction industry for some time. The impact and extent of these unions vary significantly by jurisdiction and subsector. The presence of alternative unions has not been without controversy; however, particularly in Western Canada, these unions have had an increased presence and impact.

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The legal provisions under which wall-to-wall unions are certified and represent workers in a system that generally assumes craft organization varies by jurisdiction, although the jurisprudence has been well developed, especially in jurisdictions from Ontario westward. CLAC is the most significant of these alternative unions, but there are several others which represent workers in different jurisdictions.

7. *Project Agreements* – Most jurisdictions have provisions by which special agreements can be negotiated outside of the normal multi-employer craft bargaining process for specific projects. The details of these provisions vary by region, but typically they contain more favourable wage and scheduling provisions, a no-strike/no-lockout guarantee for the duration of the project (which often overlaps a provincial negotiating cycle), and provisions by which all workers on a project will be covered by a contract and pay dues while on the project, although firms not certified cannot be certified during their work on the project.

Open Shop

The variations on the craft model described to date all involve unionized workers, and, hence, it is not surprising that these variations are described using labour relations jargon. And, given that the significant

majority of industrial construction work continues to take place within a unionized environment, this is understandable.

However, this survey would not be complete without acknowledging the growing segment of the industry using open-shop non-union labour. The most prominent open-shop associations are Merit Contractors Association of Alberta and the Independent Contractors and Businesses Association of British Columbia. These employer organizations work together to deliver health and benefit programs, retirement benefits, training, and referral services which, in the organized sector, are generally provided through a union.

Our purpose in differentiating these seven categories of innovation on the craft model—each of which derives from specific examples cited to us during our interview process—is not to establish a template that either predicts or prescribes what will unfold in this sector. In fact, while these distinctions make sense in developing a framework for discussion, anyone stepping onto a specific job site will soon realize that the innovations as they are occurring do not neatly fit into these defined categories. A single project may include a combination of innovations.

What is clearly established by these categories is that although we have an industrial construction infrastructure—labour relations presumptions; safety, apprenticeship, and training systems; and labour market institutions, on both the management and labour side—predicated on a craft model of organization, the front-line reality is that industrial construction is actually organized in a manner that often works around the system and its premises.

Taken in isolation, any one of these categories might be viewed as an exception, explainable by local conditions and circumstance. Viewed cumulatively, however, it is our contention that there is reason for this industry to consider how it is organized and to commence a discussion as to whether it needs to systemically adapt to its new realities.

Industry Response

In Chapter 1, we established a framework for understanding the craft model as the predominant form of work organization in industrial construction. In Chapter 2, we surveyed variations to the craft model, which have a place in industrial construction today. In Chapter 3, we try to answer what emerging trends of work organization might mean for the future of the construction industry. We will try to capture the issues raised in order to facilitate and encourage further discussion and research.

Although the specific forms of the questions varied depending on who we were talking to and the flow of the discussion, our interviews focused around three basic questions:

1. What processes do you expect we will rely on to obtain a skilled workforce that can do the job safely in the future?
2. How do you think these trends will affect the decisions of how much to invest in capital construction?
3. What changes does this imply for how we do labour relations in the future?

Translated into more conventional language, we use the subtitles Apprenticeship, Training, and Safety Programs; Investment and Productivity; and Labour Relations.

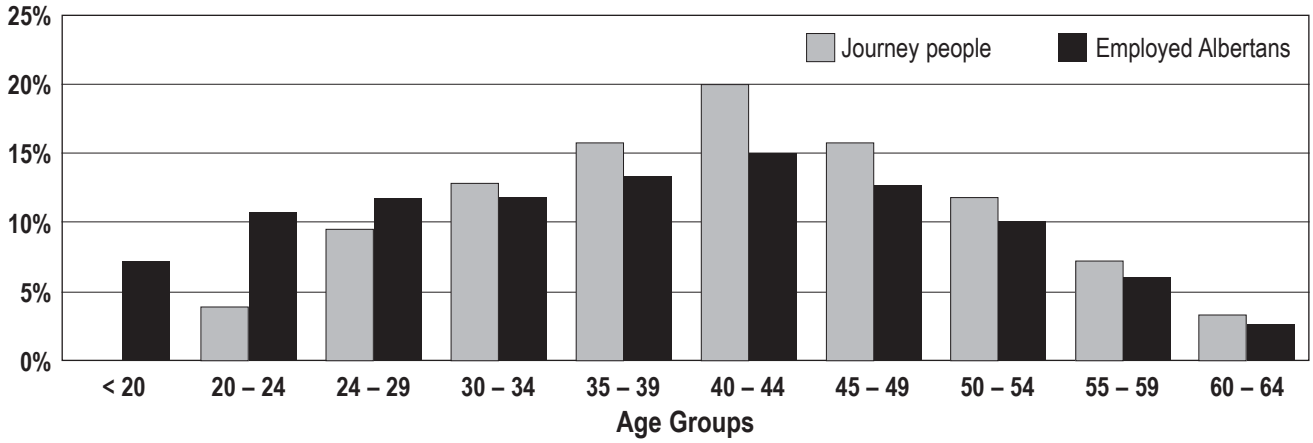
Apprenticeship, Training, and Safety Programs

1. *Recruitment* – For several years, concern about the demographics of the workforce and the challenges in recruiting young people to the skilled trades has been a profile discussion. Significant concern was expressed from the image of the trades among young people and the programs in place to inform and attract young people to a career in construction.

The charts provided to us by the Alberta Apprenticeship Branch highlight trends that anecdotally were confirmed by most participants. The average age of qualified tradespeople combined with current recruitment

patterns will mean a significant shortage of skilled workers in the future.

Figure 1 – Age Distribution of Journey People Versus Total Employment



Journey person age based on last shop registration, 1999–2001, Alberta Learning
Employed Albertans from Statistics Canada, Labour Force Survey, 2001

Courtesy Alberta Apprenticeship and Industry Training

Significant initiatives have been undertaken at various levels to address this concern. Four of the five strategic priorities identified by the Construction Sector Council for 2001–2006 are related to the following themes: "Promoting apprenticeship training and delivery (will work with CAF); advancing career and workforce training; improving the recruitment and retention of youth in the industry; and providing better information and research on the demand for skilled labour and other issues."[10]

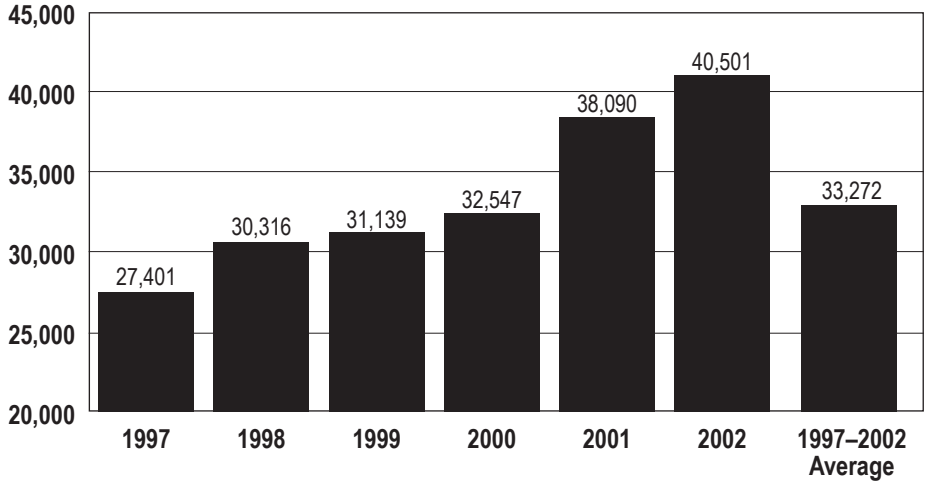
Frequent references were made by the respondents to promote initiatives by the various industry associations to get into the schools and develop worthwhile educational tools. The *Trades Up* CD—a marketing tool that includes movie clips featuring various trades and a game simulating the involvement of various trades in residential construction—was developed in Alberta through a partnership of virtually all the players involved in the industry. The CD was frequently referenced as the sort of initiative that needs to be more broadly undertaken.

Although concern about the looming skilled worker shortage was

[10] "Construction Labour Market Information," presentation by George Gritziotis, Construction Sector Council, and Paul Stoll, HRDC, at Apprenticeship Is the Future Conference, June 3, 2002.

widespread and virtually unanimous among our respondents, some believe the crisis will not be as dramatic as predicted and that initiatives currently underway are having a positive impact. Alberta data suggests that significant changes have occurred during the past decade, with registered apprenticeships up significantly from a decade ago.

Figure 2 – Total Number of Apprenticeships Registered (1997–2002)



Note: The 1997–2002 percentage change is 50 per cent.

Source: Alberta Learning

More significant than the general perspectives about whether the industry is doing enough to attract workers are the perceptions as to why workers are not attracted to the industry. The biases of the education system towards university and white-collar employment were the number one targets. "Construction is seen as employment of last resort," said one respondent. "Parents don't feel any pride in their kids taking up a trade. They still think of it as dirty, hard, and poor paying work."

It was generally recognized that changing a cultural consensus that a career in the construction trades is less desirable than other career choices is a process that takes time. Most suggested that while data to counter popular misconceptions about working in the trades was readily available and the programs to communicate that data are in place, more energy and emphasis will be required if we expect any lasting turn-around of public opinion. Changing cultural attitudes is a process on which progress can hardly be measured in the short-term, and it will be at least the mid-point of this decade before we can expect to realistically measure a shift.

Flowing from the discussion on recruitment came the more specific challenges posed by the cyclical nature of work in industrial construction. Several reasons for this were identified: a natural seasonality to construction work given the realities of Canadian weather and geography (something that affects some trades far more than others); economic cycles contributing to significant variables in demand for tradespeople, even over relatively short periods of time; and the interdependent nature of construction, which requires work to happen in a particular order and, consequently, sometimes leaves workers waiting on the sidelines for projects to reach a stage where the contribution of their craft is required.

None of this is new. Construction work has always been cyclical, and, as outlined in Chapter 1, it is this feature that provided an impetus for the craft model. Construction workers, it has been argued, benefit from the institutional continuity offered by a union to cope with the instability inherent in construction work.

It was somewhat surprising, therefore, to see the cyclical nature of construction work cited in so many interviews as a particular cause for a number of problems. These included recruitment (young people don't want to enter construction because they fear they will get laid off every winter); the structure of apprenticeship programs (apprentices don't want to go to school when things are busy because they fear that the overtime hours on which they rely to make up for down times won't be there when they get back); the overlap between trades (increasingly, workers feel they need Trade Qualifications [TQs] in more than one trade in order to protect themselves against work cycles, but they don't see why they should have to relearn all the stuff they've already learned); and bureaucratic rigidities that accompany working in different regions (to quote one respondent regarding the transfer of a key worker from a different jurisdiction: "First, it was figuring out how to transfer all of the hours from one jurisdiction to another, and then it was getting the permit to transfer between locals. No wonder we have a recruitment problem when good guys enrol in apprenticeships, and the [expletive deleted] system makes it next to impossible for them to finish the minute their present employer doesn't have work for them.").

2. *Trade Demarcation Issues* – Although our study was national and involved jurisdictions with their own examples which were referenced during our interviews, the release of the discussion paper *A New Model for Industry Training in British Columbia* in December 2002 provided a focal point for the most passionate and polarized responses regarding training and trade demarcation issues.

Perhaps the most significant aspect of the discussion, and one from which there was no consensus among respondents, was the issue of craft demarcation. While most acknowledge that current craft line divisions may not be the most appropriate, every alternative solution proposed had significant arguments raised against it.

To start with the broadest consensus, many feel that it makes little sense to have the same TQ curriculum and certificate applicable to industrial and residential construction. Electricians, carpenters, and plumbers do not freely move between the construction subsectors, and the skills that are being sought are sector specific. In practice, there is relatively little cross-over, and tradespeople are likely only to work in the subsector where most of their training and experience has taken place.

The tasks associated with certain trades have evolved over time such that perhaps the historical distinctions no longer make as much sense from a work organization perspective. The examples most commonly cited came from three general groupings: tasks associated with carpentry, formwork, and the erection of buildings; tasks assigned to various pipe trades (plumber, pipe-fitter, steamfitter, sprinkler-fitter, instrumentation mechanic, refrigeration mechanic, and welder); and tasks assigned to the construction of vessels (ironworker, boilermaker, welder, and certain of the pipe trades functions).

The sentiments of most can be summarized by the bottom-line analysis of one respondent:

> If you were organizing a construction process from scratch and wanted to reflect what really occurs on the front lines, you would not draw the lines where they presently are. Given the impact of new technologies—fabrication practices and computerization to name just two—it makes eminent sense to rethink many of the work divisions we currently use. I could probably get most involved to agree on what they eventually should look like. It will never happen, however, because the political hurdles for getting from A to B are insurmountable without some disaster forcing the issue. And nobody wants a disaster.

Although a systematic review of subsectoral distinctions was not undertaken, several comments about the changing pattern of industrial construction expansions bear repeating. The continued increase of technological advances into assembly processes and machinery combined with the reliance on just-in-time supply systems mean that many production processes now require less square footage than they previously did. The result is that capital projects are more likely to integrate new equipment with existing production processes, which places a premium value on local experience and familiarity with the machinery on-site.

The efficiencies gained from working with tradespeople who have a prior knowledge of the equipment utilized in the facility results in an increased reliance on contractors with whom a relationship already exists, rather than on the usual competitive processes. One respondent suggested that on a recent project a factor of $50,000 per instrumentation mechanic was used for calculating the difference between using qualified tradespersons already familiar with the facility on a capital project.

The CAW highlights these developments as justifying their designation of a CAW journeyman, which, in addition to a government TQ certificate of four years (8,000 hours) has the additional requirement of eight years practical and general experience in the trade and recognition of such by the CAW skilled trades department.

The B.C. discussion paper introduces another approach to the issue, namely, the concept of progressive credentialing. The discussion paper outlines the approach using the example of a carpenter.

> To better understand how the new training system will look to employers and employees, consider the example of the carpenter trade. Under the old system, carpentry apprentices were required to have a job before they could gain access to training. Once registered via an apprenticeship agreement, apprentices began a four-year, on-the-job training program that included four ITAC-scheduled sessions of in-school technical training, usually one session per year. They were also required to receive practical training in all facets of the carpentry trade. In order to acquire the skills and knowledge to achieve journeyperson certification, an apprentice employed by a *forming* contractor might be forced to quit their job to find work with a *framing* contractor and then change employers again to gain experience with a *finishing* contractor.
>
> There was no opportunity under the old system for progressive credentials such as forming carpenter, framing carpenter, or finishing carpenter. . . .
>
> Within this [the new proposed] framework, the person who wants to learn skills in the carpentry trade might register as an apprentice with an employer to learn some of the trade skills. Once learned, these skills can be recognized by "incremental" or specialized credentials and these credentials will be recognized as progressive steps to acquire the Interprovincial "Red Seal" credentials. In the example above, learners could get a certificate as a *framing carpenter* or a *level one carpenter* and could eventually gain a Red Seal credential as a carpenter if they want to progress to this level.
>
> Modularization of current trades curriculum and the implementation of theoretical and practical assessments will allow earlier receipt of credentials tied to specific skill sets.[11]

[11] B.C. Ministry of Advanced Education, 2002, 13–15.

Several issues were raised in support of and opposed to this system, and we will return to those relating to the delivery of apprenticeships later. Regarding the effects on trade demarcation issues, advocates of this change suggest that this modularized approach will allow workers to become credentialed for work more quickly which will result in lower drop-out rates and help address short-term labour supply needs. They also argue that training can be customized more specifically to the needs of particular worksites with combinations of credentials acquired to make the worker multi-skilled and able to complete tasks which currently are in the jurisdiction of separate trades. Ultimately, they argue this will result in a more efficient and responsive apprenticeship system.

Critics argue that tradespeople will not acquire the depth and range of skills currently needed. The effects of allowing workers to stop their progression through the system at levels lower than Red-Seal credentials will in the long term contribute to a shortage of tradespersons. Critics charge that the multi-skilled worker promoted by those advocating for these changes will have skill combinations customized to the work practice of particular employers and be less mobile.

However, as it regards the effects of this proposed model on recruitment and trade demarcation issues, there is also strong opinion. Promoters of the credentialing approach suggest that it not only helps address short-term supply needs for particular trades but also lowers the "drop-out rate for apprentices due to the shorter time frames to reach credentialing status" by allowing an electrical worker to stop after what is currently year one of his apprenticeship and perform limited tasks on the construction site without being subject to apprenticeship ratios.

Interestingly, both advocates and critics of the credentialing approach referenced the development of the Metal Building Systems Erector designation in Alberta in support of their position. Advocates of the system noted that rather than the 6,750 hours and 54 months of hands-on experience required for the Ironworker designation, Metal Building Systems Erector certificates could be issued with 3,000 hours. The required schooling was also reduced from 24 weeks in total to 10 weeks.

By shortening the program and focusing on those skills required for building fabrication and not the other elements of the ironworker curriculum, which are not required in metal building erection work, an efficiency has been achieved in the system. Critics pointed to this system and noted that in spite of the considerable cost and efforts that had

gone into its development, the program was not attracting a significant number of apprentices and was not achieving its objectives.

One example in one province neither proves nor disproves the wisdom of the modular approach. Undoubtedly, there are other factors to consider in this example that go beyond the questions of how to appropriately draw the lines between trades.

Factoring into this discussion is the sense that many workers today are acquiring TQ certificates for more than one trade. The reasons provided for this were several: their flexibility provides more job opportunities and offers them a leg up in overcoming the cycles inherent in construction employment; the nature of various common tasks in industrial construction projects are such that it is far more efficient from both a working and cost perspective to have one person with particular combinations of particular trade qualifications; and the broadening of the skill base and qualifications is seen as a helpful career move in broadening one's background and preparing for potential promotion opportunities.

When it comes to trade demarcation issues, three basic positions emerge. Some advocate horizontal changes to crafts, others vertical changes, and others suggest the proposed cures are worse than the disease.

The employment and career motives speak to recruitment and retention issues, but of most significance is the sense, provided by several of our respondents, that the completion of certain common job assignments are greatly enhanced by particular combinations of skills, the acquisition of which requires more than one trade certificate. And although this was accepted as part of the qualification process, several opined that the acquisition of a second or third TQ certificate ought to be expedited so as to reduce overlap and repetition in the learning process.

When it comes to trade demarcation issues, three basic positions emerge. Some advocate horizontal changes to crafts, suggesting that perhaps subsectors such as industrial, commercial, and residential should have some sector-specific designations and curriculum. Others argue for vertical changes to crafts, arguing that the components comprising the curriculum should be modularized and workers allowed to piece together combinations of modules as required for their work. And third, there were those who raised the arguments against both of these innovations and, while recognizing that the current system may have its challenges, suggest that the proposed cures are worse than the disease.

3. *Delivery Systems* – Understanding that the delivery of apprenticeship programs is a matter of provincial jurisdiction, much of the input was applicable in some jurisdictions but not others. Given that the focus of this study is the effect of craft organization, most of the discussion on apprenticeship goes beyond our scope. But a few themes emerged regarding the delivery of apprenticeships that have broader application and deserve mentioning.

The most significant debate was how to properly assess prior learning and the degree to which journeyman recognition should reflect a measurement of outcomes and competencies and the extent to which prescriptive learning processes should be required for the issuance of journeyman status. The issue is clear. Those who advocate greater reliance on competency testing argue that the system simply needs to ensure that journeymen are qualified, regardless of how that qualification was obtained. Whether the learning was acquired in the classroom, through actual on-the-job experience in the trade, or other means, if someone can pass a meaningful test of their knowledge and skills relevant to the trade, they should be accorded journeyman status.

The only way to ensure journeymen have the full range of competencies is through a prescriptive learning program combined with required hours of experience in all aspects of the trade.

The limitations of such testing are pointed out by critics of this approach. No test can adequately capture the full range of important competencies associated with a trade, and the only way to ensure journeymen have that range is through a prescriptive learning program combined with required hours of experience in all aspects of the trade. It is only this range of prerequisite inputs that makes the testing at the end of the process meaningful.

While the particulars vary by province, the general consensus was that apprenticeship delivery systems need to become more flexible in their structure and in providing for a range of delivery options. Distance delivery, mobile delivery, providing classes through alternate formats such as one-day-per-week and evening courses were among the suggestions raised. Some advocated competency based learning, where different learners can work through the material at their own pace, allowing those who are faster to go through it more quickly.

The predominant concern surrounds finding ways to accommodate the schooling portion of the apprenticeship around the employment cycles

of the industry so that fewer apprentices are lost to the system because their employment has ended. Different provinces have different indenturing programs, and, anecdotally, a significant variation in their effectiveness. Generally, respondents were positive about progress made in recent years towards inter-jurisdictional standardization and coordination of apprenticeships, with the work of the Canadian Apprenticeship Forum mentioned appreciatively.

A few of the respondents with significant cross-jurisdictional experience commented on how different indenturing processes in place in different provinces affect the process. Considerable anecdotal opinion was expressed about the effect of sponsorship on apprenticeship completion, with some respondents suggesting that certain programs "trained all of the apprentices with [the other models of work organization] stealing journeymen without doing their fair share of training." Other respondents said the issue of sponsorship really made no difference, and it was market forces that determined completion rates.

The only study on the matter we found was a 1999 York University study, "Union Membership and Apprenticeship Completion," which found variable results by trade and region. But, overall, "the main effect of union membership was found to be non-significant."[12]

The other area of difference that emerged in the input regarded apprenticeship to journeyman ratios required by legislation. The issue of ratios is a complex one for it not only involves ensuring that the work is completed without any compromise to its competence or safety, but it also has significant effects on labour market supply, project costs, and the price paid for labour. In areas of work where apprentices are qualified to safely perform, those who pay the bills have economic incentive in seeing as much work done by apprentices as possible. Those responsible for negotiating protections for the wages and jobs of journeymen have an obvious incentive to negotiate lower ratios. Not only do low ratios increase the available work for journeymen, they limit the supply of journeymen in the longer term which creates upward pressure on wages.

Although we accept at face value the claims from all sides that the debate and concerns regarding appropriate ratios are about ensuring adequate and safe training (a complete chart of the ratios by trade and jurisdiction is included at Appendix 1), there are no easy answers.

[12] Sweet and Lin (1999), 7.

Strong opinions can be found on both sides of the issue. A 2002 pilot study conducted by the University of Alberta for the Construction Owners Association of Alberta[13] notes positive results regarding the productivity and work integration of electricians and pipefitters on the Athabasca Oil Sands project, however, sample sizes limit meaningful conclusions. Further data work will be the only effective way of sorting through this debate.

4. *Soft Skills* – Somewhat surprising were the concerns regarding soft skills that emerged through the discussions on apprenticeship and training. While literacy and numeracy inadequacies were lamented, most conceded that workers did have the requisite skills to complete their tasks, albeit with a perceived lower proficiency than a decade or two ago. Stronger sentiments were expressed about the communication, analytic, and people skills possessed by today's workforce.

Somewhat surprising were the concerns regarding soft skills. Stronger sentiments were expressed about the communication, analytic, and people skills possessed by today's workforce.

While comments were general in nature, most pointed to concerns identifying suitable leadership skills for foremen, supervisory, and union leadership roles. The ability to problem-solve, effectively communicate concerns to third-parties, adapt to new technologies, and organize group activities and roles was repeatedly raised. Various programs, provided both on an industry- and company-specific basis, were cited, but concern was generally higher about the adequacy of these soft skills than about the technical skills.

5. *Safety* – Although our questions highlighted apprenticeship, training, and safety systems as equal areas for conversation, comparatively little feedback was provided on safety issues. The consensus was that safety was not as affected by innovations to the craft model of organization. Most suggested that standards for safety were set by the owners and contractors, and that there were no differences between job sites that were organized on a craft, alternative union, or open-shop basis. Throughout the past decade, the industry has worked together, to use the words of one respondent, "on a more holistic approach to safety where we all actually cared more about safety results than our organizational self-interests."

[13] Robinson Fayek, 2002.

There are many safety programs and initiatives throughout the industry, and most contractors large enough to be significantly involved in the industrial sector of construction participate in these programs in a similar manner. Safety pilot groups such as those organized under Ontario's Workplace Safety and Insurance Board; the requirement to participate in programs such as the Construction Safety Training System (CSTS); the prevailing practice of pre-job safety meetings, toolbox meetings, extensive written procedures, and policies regarding safety issues as well as company newsletters, meetings, and courses were all highlighted as evidence of an industry safety consciousness. As well, the numerous safety courses offered by unions, provincial safety associations, and employer organizations were highlighted, noting "that when it comes to safety, you can never say you are doing enough." Safety seems to have moved up as a priority today and is taken seriously by most in the industry.

This is not to say recommendations for improvement were not noted. Several respondents suggested that workplace safety correlates closely with the calibre of on-site management and supervision. The area of greatest concern remains with younger workers, who retain a sense of youthful invincibility which, when combined with their less experience and less candour in speaking up when dangerous situations arise, results in greater risk. Intimations were also made that certain segments of the industry were less conscientious about safety than others, but none of our respondents suggested that the models of work organization were a definite factor in any differences regarding safety in industrial workplaces.

Investment and Productivity

Most respondents were cautious about closely linking decisions regarding investment and productivity issues to the organization of work. Many other factors are at least equal and, cumulatively, more significant in affecting the cost of construction projects. Particularly in view of certain high-profile projects whose budget overruns have been in the public spotlight, most respondents went out of their way to emphasize that it is a gross oversimplification to suggest that issues of work organization are either the sole cause or cure of productivity issues.

Still, the cost of construction and the confidence placed in the construction sector's reliability of completing projects on schedule and within budget are factors considered in the boardrooms where investment

decisions are made. In a management issues survey conducted by the Canadian Manufacturers and Exporters, occupancy costs, which include more than just initial construction costs, rank sixth on the list of factors that influence the decision regarding where to locate new facilities—well down the list but still more significant than corporate tax rates, government relocation incentives, or the location of competitors.[14]

Several respondents who were buyers said work organization issues were more explicitly discussed in the procurement process today than a decade ago. Some noted that tendering practices were being changed, dividing mega-projects into a series of smaller projects so as to broaden the field of available contractors and allow for the involvement of open-shop or alternative union bidding for work that previously would have been automatically limited to the craft union market.

Appendix 4 (see page 64) provides a comprehensive perspective of the variables that need to be considered in dealing with productivity measurement and performance. Many of the items included under Engineering, Construction Planning, and Owners were mentioned in the course of our interviews, and many interrelate with labour market issues. For example, the challenge for the industry is to supply stable work levels that allow the workforce to retain some equilibrium while providing an opportunity for apprentices to continue in the trade. This needs to be done in a way that does not overburden the demand side such that expensive overtime rates are incurred and budgets skewed.

Many respondents appreciatively mentioned the Construction Owners Association of Alberta for creating the Construction Workforce Development Forecasting Committee (CWDFC) and its annual five-year Demand and Supply Forecast. This initiative has involved virtually all industry players and was repeatedly cited throughout the interviews as an example of industry planning and coordination that needs to take place, also on a broader level that extends beyond a single province or concentrated industry sector.

Notwithstanding the input received regarding technology, engineering, and broader sectoral issues, our focus was the impact work organization models had on investment and productivity. Respondents were careful to point out the nuances of their response, usually qualifying their examples by adding that not everyone in the traditional craft/alternative union/open-shop camps were of similar opinion.

[14] CME Management Issues Survey 2002, 13.

It was clear from the responses that the emergence of particularly the open-shop and alternative union models in Western Canada has prompted wider discussion of the alternatives. Changes within the practices of traditional building trade unions during the past decades were attributed to an emerging competitive environment which was not present a decade or two ago.

The issue of jurisdictional disputes seems to have achieved metaphorical importance symbolizing the problems inherent in the craft system.

The issue of jurisdictional disputes was usually the first raised, and it seems to have achieved metaphorical importance symbolizing the problems inherent in the craft system. Although several described the "ludicrous" problem of an assignment dispute shutting down an entire job, few recent first-hand examples were provided.

Jurisdictional disputes continue to exist, but in most jurisdictions, the legal processes for resolving them tend to work efficiently. Some specific examples were provided of processes that could only be described as unproductive and inefficient; however, reasons could usually be attributed for these examples, such as the lack of structural disincentives to resolving problems locally (in one case, the usual cost risks associated with losing a jurisdictional dispute were not incorporated into the system) or the particular political climate in the local union where the motives related to doing something in the face of membership dissatisfaction rather than addressing a prima facie jurisdictional dispute. Overall, respondents suggested that work disruptions as a result of jurisdictional disputes are far less of an issue today than they were even a decade ago.

The efficient resolution of disputes doesn't get at the heart of the issue. Respondents tended to use the term jurisdictional dispute as shorthand for talking about issues related to work assignment, multi-skilling, and efficiency. Open-shop advocates have argued that jurisdictional divides between unions "remain a prime source of diminished productivity" and that "field supervisors are often hamstrung by jurisdictional rules in setting up crews, assigning them tasks, and moving them to different areas and activities."[15]

Measuring the extent of these variables is a difficult and imprecise science. Advocates of the different work organization models rightly

[15] Thompson, Joel. "The Productivity Gap" (*Open Mind*, Spring 2003), 48.

pointed to certain aspects of their system that are preferable to the alternatives. No two construction projects are identical, and isolating the method of work organization as the variable in any modelling exercise is virtually impossible. However, whenever the subject arose, we did ask the following hypothetical question: "Suppose that two crews were paid identically, with the only variable on the project being that on one, work assignments needed to follow union jurisdictional lines while on the other, work could be freely assigned to any tradesperson who had the appropriate qualifications to do the work safely and legally. What sort of savings might be realized?"

Answers ranged from five to 15 per cent savings. The most common reasons given for these savings included the ability to keep crews together and on-site for longer periods, lessening the orientation and familiarization time that occurs on each job; the better utilization of variously priced skills on the workplace so as to better leverage the expertise of more highly priced crafts; and the synergy and morale that comes with a focus on doing what needs to be done to complete the job.

Craft model defenders acknowledged some of these factors but generally argued that their effects were over-emphasized and were off-set by increased specialist expertise. "What makes the situation appear worse than it really is," said one, "has as much to do with the skill of the on-site supervisors as it does with the work organization. The efficiencies [claimed by open-shop advocates] are so job-dependent that the blanket numbers used are really meaningless."

Still, the efforts by some even within the craft system to move towards more flexible lines between crafts in the assignment of work do suggest that many believe there are inherent inefficiencies in the craft system. One project involved a negotiated build-up process to put together a composite crew from tradespersons who had previous work experience on this sort of job. The intention was that, once on-site, all trades would work together without regard for jurisdictional claims, and the project would run on a wall-to-wall basis with different unions involved.

The experiment was compromised by legal difficulties in executing the agreement to suspend the ordinary jurisdictional rules. One respondent, commenting on this and other similar attempts to overcome what he called "jurisdictional protectionism," noted:

> The problem with any attempts to overcome this within the craft system is that

all 18 crafts have a veto. Since the efficiencies and work assignment issues apply differently to different crafts, with some seeing themselves "giving" and others "getting" much more, there is no way of getting the requisite all-party agreement under our current system.

The other prominent productivity issue most frequently addressed regarded absenteeism, morale, and attitude. The language varied depending on the background of the respondent. Those inside the craft union model referred most often to "the two per cent problem." Critics of the craft system used language that made it sound more like a 20 per cent problem.

Those inside the craft union model referred most often to "the two per cent problem." Critics of the craft system used language that made it sound more like a 20 per cent problem.

It is easy to describe the productivity problem with sweeping language that would make it appear workers in one model are less productive than those in another. Not only would such generalizations be unfair, they would not honestly reflect the feedback received.

Whatever their actual extent, productivity issues are a significant driver of the changes we are discussing. The buyers we interviewed expressed strong sentiments that productivity improvement was a precondition to future investment decisions, and they were actively considering ways and means to accomplish those improvements. Most viewed productivity issues as the primary drivers of the work innovations described in this paper.

There are, of course, two sides to the productivity measurement coin. While the debate of two or 20 per cent refers to worker output, input was also given that any productivity advantage realized by those outside of the craft model were being achieved "on the backs of workers and lower wages." "Consider the differences paid in wages. Do an apples-to-apples comparison of benefits and account for the reinvestment in the industry through training and safety programs, etc.," summarized one respondent. "I have no doubt that any objective measurement will show at least as great a gap on the input side as on the output side."

Measuring either input or output gaps are beyond our scope, but the prevalence of productivity concerns throughout our interviews is undeniable.

The concerns expressed by construction industry buyers were similar to that described by Tim Armstrong in his recent report *ICI Construction in Ontario: A Review of Competitive Disadvantage and its Measurement*:

> One unionized employer, in an articulate presentation, expressed concern that worker motivation and pride in work had declined over the last two to three decades. He described a malaise that he attributed in part to the absence of a sense of shared commitment to the success of the enterprise and a reluctance on the part of some unionized workers and their union to enter into an open and candid dialogue concerning ways in which productivity performance could be enhanced by various collaborative measures, including the relaxation of restrictive work practices. This critique, it should be said, was not an anti-union diatribe, but an appeal for a less polarized and confrontational approach to workplace issues and greater innovation and flexibility in tailoring collective bargaining to the new realities of the competitive environment.[16]

Some union leaders have directly addressed the productivity issue. We were provided copies of union newsletters and correspondence that indicate how productivity concerns are being dealt with, such as the following open letter to Boilermakers Lodge 146 members from international vice-president Richard Albright:

> First of all it is important to remember that it is a privilege to be a member of the Boilermaker Union not an inherent right. With that privilege comes a responsibility. If we are to be successful we must all commit to and strive to maintain the *Boilermaker Advantage* which is to get the job done right the first time, safely, on or ahead of schedule, without any trouble and to the complete satisfaction of the Customer. Today, the *Boilermaker Advantage* is an illusion in the eyes of several major Owners in Alberta.

The letter, circulated in 2001, alludes to the fact that during that year, complaints regarding productivity were received from six major oil companies. Albright continues: "I have been a member of Lodge 146 for (34) years and without a doubt, the current level of lack of Owner confidence in Lodge 146 Boilermakers is lower than it's ever been. Do not make the mistake of taking this matter lightly."

Interview respondents with any first-hand involvement with the craft unions took pains to balance negative illustrations relating to productivity with examples of proactive leadership on the part of union executives to deal with problems as they arose; copies of correspondence on the letterhead of buyers noting when jobs were finished "ahead of schedule, on budget, and more importantly, safely. . . . In addition, some unplanned work was also completed within the same timeframe.

[16] Armstrong (2002), 33.

It is apparent that all involved in the shutdown showed a great deal of enthusiasm and pride in their work." And, while less profile, examples of budget overruns, unsatisfactory work, and schedule delays were also provided regarding alternative union and open-shop job sites.

Summarizing the feedback on this political hot potato into a single theme is impossible. Every model of work organization has its successes and failures, its heroes and villains, and we were directed to look at them all. Construction buyers are voting with their feet and looking to stretch their construction dollars further.

The other major issue regarding productivity that emerged from the interviews dealt with the quality of supervision, leadership, and other soft-skill related issues. Several respondents noted that the pool of skilled on-site supervisors is inadequate, despite increased efforts in recent years by all industry sectors to address leadership needs through training programs. One respondent suggested that the reason for this was the lack of experience of those being trained. "Training may be able to accelerate the benefit of experience, but it cannot replace experience," he noted.

The problem confronting the industry is finding people with the appropriate leadership skills and experience who are willing to enrol in courses and assume positions of leadership. Some suggest that the rewards provided for on-site leadership simply do not outweigh the pain and aggravation associated with the positions. The "good people would rather just continue on as tradesmen where they can enjoy doing what they are good at and leave the political crap to others."

Some suggest that the rewards provided for on-site leadership simply do not outweigh the pain and aggravation associated with the positions.

Some feedback regarding soft skills has already been summarized in the previous section relating to apprenticeship and skills upgrading, but one point needs to be highlighted. Several respondents noted concerns regarding the ability of the workforce to deal with new technologies, increasing the cost of integrating those technologies. Although it was difficult to obtain specific examples from respondents, different construction technologies are being experimented with in other countries (Japan was the most frequently mentioned).

While Canadian firms want to import new technologies, they are hindered in implementation by a significant learning curve based not just

on the complexity of the technology but on a technical skills shortage. The issues, although ill-defined, do suggest further study regarding not only literacy and numeracy levels but also communication, analytic, and problem-solving abilities in comparison to those in other jurisdictions.

Labour Relations

Respondents were appropriately cautious in blue-skying about what labour relations in the industrial construction sector would look like a decade from now. For those with any history of labour relations involvement, this hesitation is understandable. Productivity and investment can be made to sound like relatively sterile and abstract concepts (although, as our previous discussions demonstrate, that is hardly the case on the front lines). Yet, there is hardly any way of expressing labour relations opinions without venturing into a political and legal minefield.

In addition to the labour relations impacts of the issues already identified under our discussions of apprenticeship and training, as well as under productivity and investment, the input received can be summarized by four themes. Given the diverse organizations represented, a broad range of input was expected. Surprisingly, there was a remarkable degree of consensus. This by no means suggests total agreement, but the different perspectives provided do not fit neatly along expected lines of traditional craft, alternative union, and non-union perspectives. There is also as much diverse opinion within the various camps as there is between them.

Pointing out a broad consensus supporting four themes does not mean we are suggesting that all antipathy between the organizations competing for the loyalty and support of construction workers has disappeared. Quotations could be taken from most of the interviews, which, particularly if viewed in isolation, would spark the ire of other industry representatives. However, if the input is viewed as an entire package and if it is indeed representative of the entire sector, we can be hopeful of a growing opportunity for civil dialogue within the industry, something that would not have been possible even a few years ago.

1. *Labour relations practitioners throughout industrial construction are increasingly taking into account a broader industry perspective and are willing to look beyond short-term self interests.* A growing sense of partnership

was referenced by all parties, usually in contrast to the attitudes of the 1980s through mid-1990s. Work disruptions, both through strikes and lock-outs as well as through wobbles, were viewed as much less prevalent today, and most portrayed the leadership of the industry as having higher levels of competence and a more progressive attitude than that which dominated even a decade ago.

Several examples were pointed to as evidence of a new-found willingness on the part of previous labour relations adversaries to take a broader view. Agreements to resolve bargaining disputes through a mediation-arbitration process rather than resorting to strikes/lock-outs shows an awareness of the negative impact labour disruptions were having on the sector as a whole. References were made to joint workshops regarding mutual interest bargaining and the role of joint data collection initiatives, such as the Ontario Construction Secretariat.

2. *Rather than simply focusing on defensive positions to protect current market share against all competition, the labour relations parties would benefit by developing industry solutions to unfair competition.* The definitions of unfair competition certainly varied depending on the respondent; however, rather than focusing narrowly on protecting their current market, the parties would gain more by demonstrating and documenting the value their particular model of work organization provides. An emphasis on training and safety programs, skills initiatives, and other innovations that provide value to the worker and the contractor require a greater priority than protective measures used in the past. In the words of one respondent:

> Some seem to think that by negotiating air-tight clauses the building trades will keep their monopoly control of the industry. It won't work. The genie is out of the bottle, and while some jurisdictions are still behind, it's only a matter of time before there is no monopoly control of the labour pool left. However, I expect that the building trades will continue to dominate because they have such a head start in accessing the work pool and providing the training programs we need. If they would only focus their energy on adding more value rather than fighting yesterday's battles about job control, they would win the race hands-down. The only question I have is whether they will realize this in time.

The only qualification to this sentiment came in regard to competition that did not meet regulatory requirements. Although the underground economy is not as dominant a problem in the industrial sector as it is in others, it was raised by some as an issue of concern. More often came the allegation that the open-shop or alternative union models of organization were not investing as much in apprenticeship and training programs and consequently had an unfair competitive advantage that

they could pass on to employers.

Respondents from the open-shop and alternative union camps vigorously denied this, insisting they were doing more than their proportionate share of investing in the skills base for the industry and highlighting programs initiated. They suggest a greater challenge is presented by some competitive practices, with market recovery programs the example most frequently cited, which threaten to erode confidence in the integrity of the bidding process.

Interestingly, respondents from both sides of the discussion found common ground in suggesting that the players need to 1) recognize each other as legitimate competition, rather than undercutting each other; 2) focus on selling the benefits of their own programs and the value they provide while maintaining a broader industry perspective; and 3) ensure that regulations are consistently enforced and lived up to by all industry participants. By following these three guidelines, many of the labour relations issues would be resolved by the marketplace, and everyone would find their appropriate niche.

3. *The competitive economics of the industry will result in more flexibility and localized approaches to problem solving.* No one suggests that the multi-employer registration system models of bargaining will disappear. Multi-employer consistency is essential for the delivery of programs in an industry such as industrial construction, regardless if the work is organized by craft or not. Alternative unions such as CLAC have established protocols which employers in the sector work with on a consistent basis, and, in certain subsectors, some joint bargaining also takes place.

Open-shop groups such as Merit Contractors and the Independent Contractors and Businesses Association require multi-employer consistency to deliver their benefit and job referral programs. While by no means having the same force as the collective bargaining agreements negotiated by the building trades or CLAC, they also share wage information between employers and so contribute to an informal benchmarking of wage standards. All of these initiatives were cited as examples of the essential multi-employer cooperation required for this industry to function.

However, it was generally felt that provincial bargaining would become more and more a framework for bargaining, with an increasing number of issues left to the local parties to sort out. Programs such as market recovery, enabling clauses, and other less formal means of dealing with situations, where the costs of the general agreement are recog-

nized to be uncompetitive, effectively means that consistent wage packages are not implemented anyway. Between project agreements, legislative changes, and local agreements, an increasing percentage of the workforce is being name-hired, and, in practice, many business agents flexibly enforce the provisions of standardized agreements in order to make it work at the local level.

That is not to say that cost is not a factor in the discussions. Spokespersons for all work organization models insist that the take-home pay for workers in their system is as good as those in competitive models. And, given that within certain market tolerances, this must be the case if qualified workers are to be found willing to work under each model. While no independent numbers document how much transferability exists between labour pools, a substantial number of workers work under different labour models and move freely between them based on the availability of work.

No doubt cost factors are used in marketing alternative approaches. "While current wage rates and take home pay are approximately equivalent for a tradesperson working on either a union or non-union site, gross wage costs are not," argued a recent article citing the productivity advantages of the open-shop model. "Union collective agreements contain numerous costly provisions that do not put more money into the pockets of workers but may add several dollars an hour to gross wage packages."[17] In the Armstrong report, a contractor certified by the building trades is cited referring to

> an ICI labour-burden calculation comprised of three elements – (i) wages (basic rates, vacation pay and statutory holidays); (ii) payroll burden (essentially payroll taxes plus miscellaneous employer expenses, expendable small tools, insurance, labour financing costs, occupational safety programs); and (iii) union and association funds (benefit packages, union dues, association operating costs). This was then compared to the average per/person costs for working crews with the non-union contractor, with variables shown for straight time and overtime hours and apprentice/journeyperson ratios. In the example given—and on the assumption the non-union workweek is 44 hours at straight time and the apprentice/journeyperson ratio in the unionized sector is 1 to 10 versus 1 to 3 in the non-union sector—the average hourly cost per person is at least $10 (or roughly 25%) higher in the unionized sector. Despite this dramatic disparity in costs, however, the particular contractor providing these comparison figures is highly successful in the largely commercial sector in which it has established its reputation for competence, efficiency and quality. Whatever else this example illustrates, it adumbrates the problem of limiting the test of "competitive disadvantage" to price comparisons alone.[18]

[17] Thompson, 48.
[18] Armstrong, 55.

Our interviews netted a range of feedback with conflicting opinions about whether contractors working under one model or another had a competitive advantage. Those outside the building trades argued that market recovery funds, enabling clauses, and other protective work practices placed open-shop contractors at a bidding disadvantage. What is striking is the consensus that all sides of this industry would benefit from making value arguments rather than cost arguments.

4. *The result of these pressures will see changes in the configuration of organizations in the sector.* Some respondents mentioned that the make-up of institutions involved in the sector is likely to significantly change over the years. It is already occurring in the contracting sector. Rather than neatly dividing into general and trade contractors, the development of specialty cluster contractors was observed. Millwrights and ironworkers, sheet metal and pipe fitters, heating, ventilation, air conditioning, and electrical workers are among the combinations that were cited as emerging. This muddying of craft distinctions within contractors will result in pressures to see labour and management groups align themselves more closely and, eventually, may even lead to reorganizations.

Some note that these institutional changes, while most likely to be noticed on the part of organizations affiliated with craft structures, may also have its affect on the alternative labour organization side. Citing events complicating the Carpenters and the Labourers affiliations with the building trades during the past years, one respondent noted that it might not be surprising to see alternative organizations also emerge on the open-shop side. He continued:

> I expect to see a basic reconfiguration of this industry. The new organizations will be more national than provincial in focus, they will interact with the owner community, and they will work together far more cooperatively than the institutions we see today. Like companies have learned that working with competitors through industry associations is vital for competing in a global economy, this industry will also have to learn to work together.

No other respondent was anywhere near as bold in his predictions, yet the theme of reconfiguration ran consistently through the input received, although most expect that political realities and instincts of protecting the institutional status quo would, to use the term suggested by one, "glacierize the process of change."

What becomes clear as we evaluate the broad themes that emerge from the interviews is that the changes in work organization present in the sector have initiated a process of which the full impacts are not yet evident. How far or fast this process unfolds remains to be seen.

Analysis and Trends

We began this study with the premise that changes are occurring in the way industrial construction work is organized. Two research questions were identified flowing from this premise.

1. Are these innovations indicative of systemic changes, and, if so, to what extent, or should they be viewed as a series of exceptions, explainable by local circumstance?

2. If these innovations were to become more widespread, what will their impact be on:
    a. safety, apprenticeship, and training programs?
    b. investment decisions and productivity initiatives?
    c. labour relations parties and structures?

In Chapter 1, we summarized the context within which these changes are occurring. Chapter 2 presented an analytical framework within which to understand these changes. In Chapter 3, we summarized the leading themes identified by industry leaders regarding these changes and their implications. While a range of opinion exists on each of these questions, making definite conclusions difficult, it is possible to identify themes around which future discussion can be organized and follow-up research conducted.

The innovations described in this paper are more than a series of localized exceptions. They mark the beginning of significant changes. Whereas industrial construction was previously organized around a single dominant model, with exceptions operating on the fringes, the future will include a plurality of models operating side-by-side. The lines between these models are blurry at best. While traditional craft organizations on both the labour and management sides adapt to competitive realities, other organizations that compete with the craft model will have to similarly adapt. The result is a continuum of organizational models, with the pure craft model on one side and a pure multi-craft, wall-to-wall model on the other.

In reality, few work sites will operate exclusively with one particular model and instead will operate along the continuum. While the seman-

tics describing these changes depend on organizational perspective—those with a longer history in the sector are more apt to characterize this as "natural evolution" while those with an interest in emphasizing their differences are more likely to use "new models" language—the front-line reality is that industrial construction work is organized very differently today. No one expects that the clock will be turned back.

The changing character of work will make wall-to-wall—or at least multi-trade—bargaining inevitable.

Turning to the second question—the likely impact of these changes—a variety of opinion exists. In order to advance the discussion, we offer a few propositions which seem reasonable based on the data collected. We recognize these conclusions are debatable; in fact, we posit them in order to stimulate debate. As noted in the methodology, the process of this study was not one that provided definitive answers, however, we do believe the following issues need to be understood and debated if we want to honestly address the way we organize work in the industrial construction sector for the benefit of all involved.

- *The skill combinations required of many industrial construction workers will be different than those contained within single crafts today.* How this challenge will be answered is an open question. It may come as a result of modularized, just-in-time apprenticeship delivery programs, where current craft designations are carved into their constituent parts and then reassembled to fit the job. It may also come as a result of a more horizontal reorganization, where accommodations are found to lessen the stress of employees who currently need to be multi-ticketed to complete all their tasks. Both have been labelled multi-skilling, but they will produce very different types of workforces.

- *The changing character of work will make wall-to-wall—or at least multi-trade—bargaining inevitable*. The emergence of cluster contractors in the place of single trade contractors, an increased focus on local or project agreements, and the evolving skill combinations required of trades all challenge a pure single-contract-per-craft model of bargaining. As multi-craft agreements become the norm, the primary competitive advantage utilized by alternative union and open shop to enter the industrial construction market will no longer be uniquely theirs.

- *New players will enter into the industrial construction marketplace during this period of transition*. In a sense, it is already happening as

more work is being completed by non-construction unions under the maintenance or fabrication labels. Previously, much of this work would have been considered as belonging to construction unions. One would expect that new organizations, also on the employer and non-union side, will form as particular niche approaches within the continuum face emerging issues.

- *The parallel between the organization of work and collective bargaining structures will diminish.* Relatively few organizations on either the management or labour side will be able to survive simply focusing on the role of a single trade in the industrial construction process. It is impossible to predict how various organizations will respond to the consequent overlap of concerns and pressures for consolidation. Sorting through these challenges will occupy a significant amount of energy and political capital within and between these organizations, with inevitable side effects in other areas of their operations.

- *The provincial focus of safety, training, and labour relations initiatives will be replaced by more standardized national processes.* Labour market shortages and worker mobility as well as the broader scope of contractors and construction owners will place pressure to minimize provincial differences and reduce the transaction costs associated with working in different jurisdictions. Although this will cause some internal challenges between the local and national branches of various organizations, the result will be a stronger emphasis on national approaches.

- *A variety of delivery options for apprenticeship programs will be broadly available.* While the method and vehicles for delivery undoubtedly will be broad, there will be a national core of standards and definitions. More emphasis will be placed on training workers with communication, problem-solving, and interpersonal skills. More investment will be made in upgrading the front-line leadership skills of both labour and management representatives. There will be an increasingly local emphasis on problem-solving with a greater tolerance for variable solutions as suits local circumstance.

Debate will continue about the relationship between productivity, different models of organizing work, and worker satisfaction.

- *Debate will continue about the relationship between productivity, different models of organizing work, and worker satisfaction.* Ideally, the

industry would be served by a credible study that provides some measurement of the relationship between the three. In the absence of such a study, advocates for the various approaches will be left to sell the perceived benefits of their approach—the open shop claiming a productivity advantage, the craft unions claiming worker satisfaction advantages, and the alternative union claiming work organization advantages—without any real way to sort through the competing claims and counter-claims. The downside of this debate for the industry is that it can have an unintended polarizing effect and result in either/or choices rather than achieving the benefits of both/and choices.

- *Legislative change reflecting the changed realities of industrial construction will follow and not lead the change*. The related issues are clearly political hot potatoes, and it is a rare government that will have the political courage to address the issues until they absolutely have to. The 1990s present instructive examples from both sides of the political spectrum. The Progressive Conservative government in Ontario introduced labour law changes with the intention of weakening the craft model. The NDP government in B.C. introduced labour law changes with the intention of strengthening the craft model. Both governments backed off from their initial proposals, and the net effects were minimal in either province. In recognition of this reality, the industry must take the lead in facilitating a broad discussion of the change it is experiencing or risk an ossification of current structures and eventually face a crisis of outdated structures unable to respond to competitive challenges.

This is an industry in transition, and, not surprisingly, diverse opinions are held on how that transition will materialize. Few argue that the change is real and dramatic, as much as some would prefer to wish it away.

Some minimize this as part of a natural historical cycle. As one respondent suggested: "I've been in this business 30 years and seen half a dozen 'premise-altering' changes, and yet we're still doing business much the same way we did before. What comes around goes around." Others are trying to ignite the sparks of change into a fire, hoping to burn away obstacles that prevent their innovation from gaining an advantage over their competition.

Progress on this road of change will be unsteady. Politics, economics, and stubborn human nature will interfere and cause unforeseen curves in the road. Yet, we are convinced that those positioned to advance or

hinder this change would do well to keep in mind ordinary construction workers, such as my father was.

Honest, straightforward, talented craftpersons find much of the debates that occupy these pages interfering, unnecessarily complicated, and unduly partisan in character. What they want from their leadership is a working environment in which they can work with pride. They look to labour, management, and industry leaders to help them achieve satisfaction in their work, a sense of camaraderie and joint accomplishment, and the opportunity to go home to their families and tell stories of their contribution towards building a healthy and prosperous society.

Conference Summary

A summary of the study findings was presented to 45 industry leaders at a conference held at the International Hotel in Calgary on May 1, 2003. Afterwards, three panels convened to discuss the implications of work organization on apprenticeship, safety, and training; investment and productivity; and labour relations. Following is a summary of the panel presentations and discussions.

Apprenticeship, Safety, and Training

Panellists: Patrick Dillon, Ontario Building Trades and Construction Council; Gord Stewart, Independent Contractor and Businesses Association; Cliff Williams, Apprenticeship and Industrial Training, Alberta Learning

The panel presentations and subsequent discussion focused on the provinces of Alberta, British Columbia, and Ontario. Apprenticeship training in Alberta was presented as working well, responsive to industry needs, and capable of accommodating change. Alberta trains 20 per cent of Canada's apprentices, even though only 10 per cent of the country's population resides in the province. There are 40,000 apprentices in Alberta, 16,000 in B.C., and 55,000 in Ontario. In Alberta, completion rates are 75 per cent after the first year as compared to 50 per cent in B.C. Industry differences are acknowledged and resolved at the Board level.

Apprenticeship training in British Columbia was presented as being misaligned with industry needs and heavily bureaucratic—everything had to run through the government. On April 30, new legislation was introduced to overhaul the system. Highlights of the changes were discussed, including:

- apprentices and employers can sign two-party agreements;

- apprentices can schedule their own school dates and pay tuition;
- a small board with corporate and fiduciary responsibilities to the province;
- flexibility for training and delivery systems;
- government to act as a watchdog.

In Ontario, attracting people into apprenticeship programs was presented as not being an issue for the BTC unions. Training is effective, particularly in comparison to the U.S. where it is much more specialized. Cross training among the trades means that labour costs are significantly less than on comparable projects in the U.S.

Besides the work of the provincial apprenticeship training boards, the pan-Canadian nature of apprenticeship training support was noted. In particular, the Canadian Apprenticeship Forum's work in facilitating the exchange of information between jurisdictions was mentioned.

The historic leadership role that the BTC unions played in developing apprenticeship, safety, and training programs, which were started long before safety associations and government legislation came about, was also discussed. Some felt that innovations taking place are going a long way to address the skills shortage.

The question of how long-term career needs can be promoted with short-term apprenticeship training programs was also discussed. Some felt that while it is the industry's responsibility to promote careers in construction, apprenticeship needs to be seen within the context of a career path. Once people are working in the industry, they are far more likely to stay in it. Apprenticeships can meet industry needs, but there has to be commitment from all parties—industry, labour, and government. It was mentioned that one way to promote apprenticeship training is for the government to provide tax incentives for employers to hire apprentices.

Investment and Productivity

Panellists: Doug Brown, Flint Infrastructure Services; Roger Ellenberger, Petro Canada; Lyle Johnson, Nova Chemicals

An extensive list of competing local, national, and international variables that affect investment decisions and productivity measures was presented, including:

- joint venture opportunities;
- degree of government support (taxes, utilities, supportive legislation);
- local area site (competitive cost structures, local economic conditions, proximity to markets and suppliers); and
- construction labour (work agreements, labour flexibility, provincial/national bargaining, labour legislation, competition for skilled labour, jurisdictional boundaries).

One of the concerns raised was that the construction industry does not have a single point in government to respond to issues. Some felt that on the owner side, restrictive and inefficient work practices need to be minimized, and owners must be prepared to reduce workforce pressures. Owners and engineers need to keep productivity issues in mind during the design process.

It was suggested that while productivity relates to the skill sets of individual workers (in some cases, specific technical skills are in short supply, such as with using 3D CAD tools), the creation of an environment where workers can reach their potential is also important. Doing so involves addressing a number of variables, including safety, quality, costs, schedules, environment, planning and estimating, performance management, risk management, relationship management, and communication. Attention needs to be paid to management structures, focusing on what's best for the owner, systematic execution, benchmarking, and continuous improvement.

Measuring work organization effects on productivity is difficult. Construction industry leaders need to get together so that benchmarking can take place to properly compare different jurisdictions, different models, and determine productivity measures.

Some felt that labour mobility is also a huge issue the industry needs to address if it wants to increase productivity. Ways must be found to allow workers to move among the provinces because of the sometimes limited skilled labour pool.

It was also generally felt that the particular model of industrial construction work organization was not the most important factor in investment decisions. All models are viable, and a competitive mix is preferable to one dominant model. Industrial construction projects need to be safe, done right—meaning no surprises—cost effective, and environmentally responsible.

Labour Relations

Panellists: Robert Blakely, Building and Construction Trades Council of Canada; Eslin Eling, PCL Construction; Joe Keyes, Construction Labour Relations Association of Ontario; Neil Roos, Christian Labour Association of Canada

As might be expected, the presentations and discussions regarding labour relations were the most wide-ranging. A number of themes, however, did emerge.

First, it was presented that the degree of complexity due to the number of employer associations, labour organizations, and legislative provisions makes change hard to effect. Most often, changes have been based on survival. No one responds to continuous change; change always comes from pressure. For instance, in the 1980s, adversarial relations between the craft unions and their employer counterparts were diminishing their market share and left the door open for other groups to flourish. During the 1990s, the labour relations climate changed. If negotiations failed, arbitration instead of strikes/lockouts became the option.

Second, it was presented that owners need to become more involved in labour relations, tell contractors what they want, say here's what we're looking for. The opportunity for involvement, for mutual problem solving is there today, whereas in the past, it wasn't possible.

Third, it was presented that a more cooperative approach to industrial construction labour relations is needed. The emphasis should be on the establishment of work community not just wages, which is particularly difficult to do in construction because the work is not conducive to the establishment of work communities.

Fourth, some felt that the traditional craft model is no longer able to meet the needs of owners and must change. The Hibernia project—with 2,500 jurisdictional disputes—was cited as an example of the problems inherent in the craft system. Historically, the BTC has been adept at change management, and some felt that it will continue to adapt to new circumstances based on pragmatic common sense.

Fifth, some argued that construction is by nature a craft industry; the work lends itself to craft distinctions. Even alternative union and open-shop models divide along craft lines and need to deal with jurisdictional issues. But craft jurisdictions are blurring, and this process is ongo-

ing. At one point, there were 24 trades; now there are 15. Some see the craft unions falling into four categories: mechanical, electrical, civil, and painting.

Other comments made during the discussion include:

- in the open-shop model, jurisdictional issues are not a factor and workers are very satisfied;
- there are too many employer associations;
- ninety per cent of residential construction in Western Canada is done by open shop;
- a lot of innovation is coming out of Alberta;
- industry is best served when workers are part of the process—workers will make their own choices;
- competition and offering workers a choice is good;
- the establishment of fair wages—one set of rates—would put the players on a level playing field and eliminate wages as a variable;
- productivity is not related to the organizational structure of work but to the organization of work;
- change is inevitable but hopefully will not be bloody—we need to learn from each other;
- construction workers deserve a decent future, and this is what the focus should be.

Red Seal Trades	NF	NS	PEI	NB	QC	ON	MB	SK	AB	NWT	BC	YT	NU
Boilermaker		1:1		1:1	5:1	1:1-3:1	1:1-2:1	1:1-5:1	1:1-3:1		1:1		
Bricklayer	1:1	1:1	1:1	1:1	5:1	1:1-5:1	1:1-3:1	1:1	1:1		1:1	1:1	
Carpenter	1:1	1:1	1:1	1:1	5:1	1:1-5:1	1:1-2:1	1:1	1:1	1:1	1:1	1:1	
Concrete Finisher (Cement Finisher)					5:1		1:2	1:2	1:1		1:1		
Crane & Hoist. Equip. - Mobile Crane Operator				V		1:1							
Electrical Motor Systems Technician				1:1			1:1-2:1		1:1	1:1	1:1	1:1	
Construction Electrician	1:1	1:1	1:1-3:1	1:1	2:1	1:1-3:1	1:1-2:1	1:1	1:1	1:1	1:1	1:1	
Industrial Electrician	1:1	1:1	1:1	1:1	V *	1:1-2:1	1:1					1:1	
Floorcovering Installer					2:1		1:1	1:2	1:1	1:1	1:1		
Glazier					3:1	1:1-4:1	1:1	1:3	1:1	1:1	1:1	1:1	
Heavy Equipment Technician (Mechanic)	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	
Instrument Technician (Industrial Instrument Mechanic)	1:1	1:1		1:1			1:1	1:1	1:1	1:1	1:1	1:1	
Insulator (Heat and Frost)				1:1	5:1			1:1-2:1	1:1-2:1	1:1	1:1	1:1	
Ironworker (Generalist)		4:1		1:1	5:1	1:1-7:1		1:1	1:1-3:1		1:1		
Millwright (Industrial Mechanic)	1:1	1:1	1:1	1:1	5:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	
Oil Burner Mechanic	1:2	1:1	1:1	1:1						1:1	1:1	1:1	
Plumber	1:1	1:1	1:1	1:1	2:1	1:1-3:1	1:1-3:1	1:1	1:1	1:1	1:1	1:1	
Power Lineman (Powerline Technician)	1:1	1:1	1:1	1:1		1:1		1:3	1:1	1:1	1:1	1:1	
Refrigeration & Air Conditioning Mechanic	1:1	1:1	1:1	1:1	2:1	1:1-3:1	1:1	1:1	1:1	1:1	1:1	1:1	
Roofer				1:1	4:1		1:1	1:3	1:1	1:1	1:1	1:1	
Sheet Metal Worker	1:1	1:1	1:1	1:1	2:1	1:1-4:1	1:1	1:1	1:1	1:1	1:1	1:1	
Sprinkler Systems Installer	1:1	1:1		1:1	1:1	1:1-2:1	1:1-2:1	1:1	1:1	1:1	1:1	1:1	
Steamfitter - Pipefitter	1:1	1:1-3:1		1:1	2:1	1:1-3:1	1:1-3:1	1:1-3:1		1:1	1:1	1:1	
Structural Steel & Plate Fitter (Steel Fabricator/Fitter)	1:1	1:1		1:1	1:2	1:1	1:1-2:1	1:1	1:1		1:1		
Welder	1:1	1:1	1:1	1:1			1:1	1:3	1:1	1:1	1:1	1:1	

Source: HRDC - Ellis Chart
* V=ratio variable
Please note that the information reflects 1999 data.

Appendix 2: Compulsory or Voluntary Red Seal Trades by Province and Territory

TRADE	NF	NS	PEI	NB	QC	ON	MB	SK	AB	NWT	BC	YT	NU
Boilermaker													
Bricklayer	V	C	V	C	C	V	V	V	V		V	V	
Cabinetmaker	V	V	V	V	V		V		V	V	V	V	
Carpenter	V	V	V	V	C	V	V	V	V	V	V	V	
Concrete Finisher (Cement Finisher)	V	V	V	V	C		V	V	V		V		
Crane & Hoist. Equip. - Mobile Crane Operator				V		C							
Electrical Motor Systems Technician	V	V	V	V			V		V	V	V	V	
Construction Electrician	C	C	C	C	C	C	V	C	C	C	C	C	
Industrial Electrician	V	V	C	V	C	V	V					C	
Floorcovering Installer		V	V	V	V	C		V	V	V	V	V	
Glazier	V	V	V	V	C	V	V	V	V	V	V	V	
Instrument Technician (Industrial Instrument Mechanic)	V	V	V	V			V	V	V	V	V	V	
Insulator (Heat and Frost)	V	V	V	V	C			V	V	V	V	V	
Ironworker (Generalist)	V	V	V	V	C	V		V	C		V		
Millwright (Industrial Mechanic)	V	V	V	V	C	V	V	V	V	V	V	V	
Painter and Decorator	V	V	V	V	C	V	V	V	V	V	V	V	
Plumber	V	C	C	C	C	C	V	C	C	V	C	V	
Power Lineman (Powerline Technician)	V	V	C	V		V		V	V	V	C	V	
Refrigeration & Air Conditioning Mechanic	V	C	V	C	C	C	C	C	C	V	C	V	
Roofer	V	V	V	V	C		V	V	V	V	C	V	
Sheet Metal Worker	V	V	V	V	C	C	V	C	C	V	C	V	
Sprinkler Systems Installer	V	V	V	V	C	V	V	V	V	V	C	V	
Steamfitter - Pipefitter	V	V	V	V	C	C	V	V	C	V	C	V	
Structural Steel & Plate Fitter (Steel Fabricator/Fitter)	V	V	V	V	V	V	V	V	V		V		
Welder	V	V	V	V			V	V	C	V	V	V	

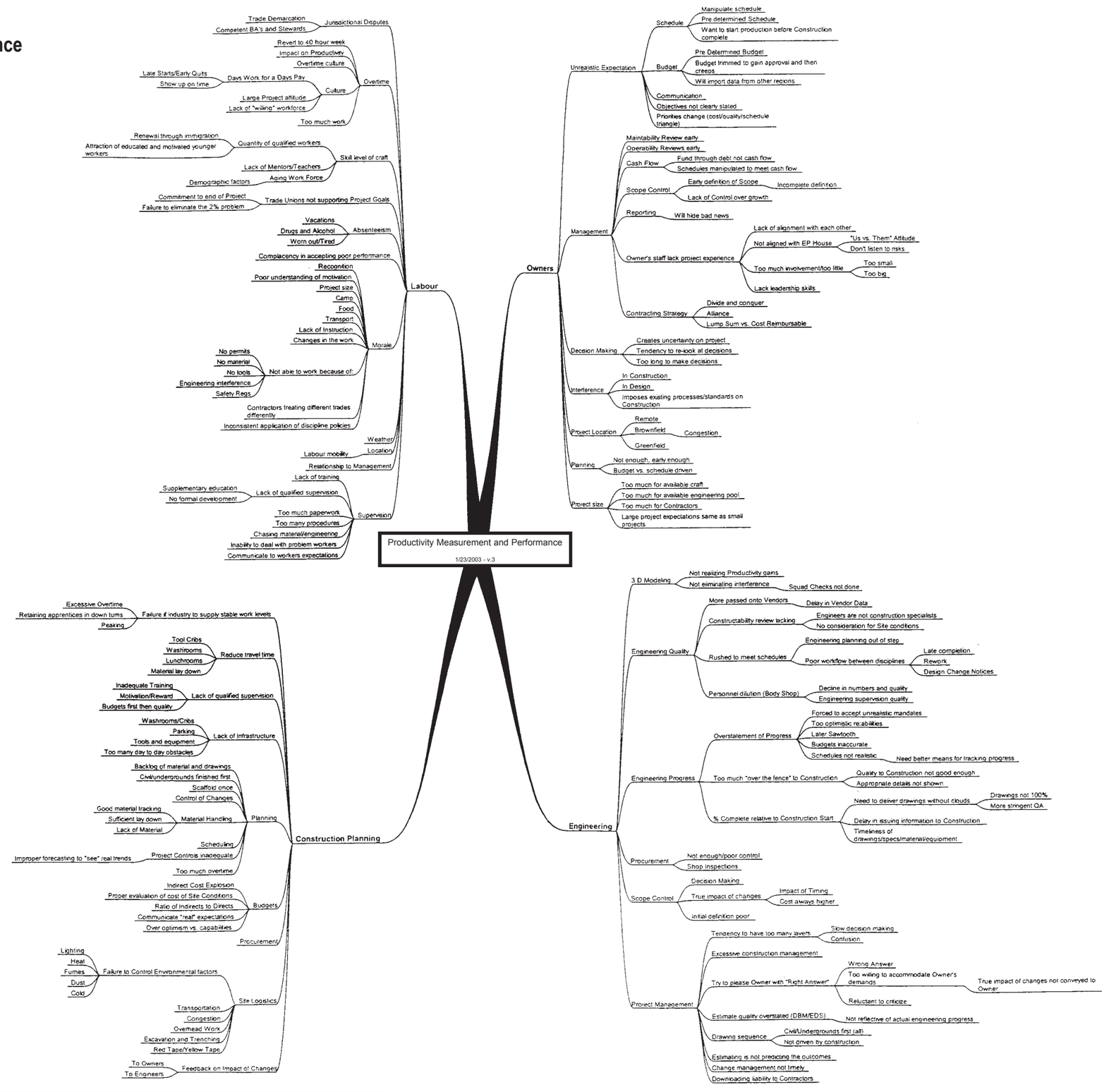
Source: HRDC - Ellis Chart

Appendix 3: The Value of Industrial Permits Annually from 1998 to 2002 for Canada, Provinces, and Territories, in $(000)

Year		Canada	Nfld.-Lab.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta	B.C.	Yukon	N.W.T.	Nunavut
1998	**Total Industrial**	**$4,260,752**	**$13,109**	**$11,943**	**$55,904**	**$42,861**	**$1,130,178**	**$1,580,534**	**$236,908**	**$86,859**	**$824,317**	**$273,279**	**$3,504**	**$1,356**	**$0**
	Factory, Plant	$2,629,584	$5,865	$5,812	$31,850	$16,500	$825,214	$980,629	$134,223	$44,269	$484,844	$99,292	$0	$1,086	$0
	Mining, Agriculture	$388,945	$500	$2,760	$3,900	$3,985	$48,970	$114,558	$65,627	$10,575	$84,363	$53,457	$250	$0	$0
	Utility, Transportation	$601,803	$2,225	$400	$6,437	$16,109	$97,222	$195,665	$13,246	$15,837	$196,201	$55,483	$2,728	$250	$0
	Small Projects*	$640,420	$4,519	$2,971	$13,717	$6,267	$158,772	$289,682	$23,812	$16,178	$58,909	$65,047	$526	$20	$0
1999	**Total Industrial**	**$3,630,384**	**$26,313**	**$18,559**	**$60,152**	**$58,292**	**$950,126**	**$1,547,366**	**$107,843**	**$82,603**	**$453,762**	**$319,145**	**$570**	**$4,620**	**$1,033**
	Factory, Plant	$2,085,322	$17,250	$6,450	$15,777	$28,898	$638,446	$893,187	$42,144	$58,190	$239,669	$144,303	$0	$0	$1,008
	Mining, Agriculture	$376,140	$4,746	$5,320	$17,697	$5,218	$48,452	$137,725	$23,498	$9,660	$58,725	$65,099	$0	$0	$0
	Utility, Transportation	$516,796	$1,710	$1,810	$13,267	$16,337	$83,927	$222,868	$21,889	$1,965	$112,589	$35,814	$0	$4,620	$0
	Small Projects*	$652,126	$2,607	$4,979	$13,411	$7,839	$179,301	$293,586	$20,312	$12,788	$42,779	$73,929	$570	$0	$25
2000	**Total Industrial**	**$3,975,654**	**$7,416**	**$12,822**	**$54,042**	**$43,726**	**$932,834**	**$1,864,827**	**$127,279**	**$50,906**	**$584,361**	**$295,525**	**$659**	**$972**	**$285**
	Factory, Plant	$2,361,953	$500	$2,150	$26,503	$19,723	$601,059	$1,303,394	$43,113	$27,398	$204,277	$133,836	$0	$0	$0
	Mining, Agriculture	$407,217	$0	$2,288	$5,783	$4,775	$69,476	$142,217	$36,446	$4,248	$82,014	$59,970	$0	$0	$0
	Utility, Transportation	$538,552	$5,320	$3,932	$8,713	$9,650	$94,401	$125,057	$18,420	$1,698	$240,198	$30,713	$0	$450	$0
	Small Projects*	$667,932	$1,596	$4,452	$13,043	$9,578	$167,898	$294,159	$29,300	$17,562	$57,872	$71,006	$659	$522	$285
2001	**Total Industrial**	**$3,598,025**	**$7,148**	**$29,119**	**$33,643**	**$43,533**	**$859,757**	**$1,485,669**	**$118,175**	**$98,383**	**$693,975**	**$221,353**	**$856**	**$4,904**	**$1,510**
	Factory, Plant	$1,954,724	$1,216	$5,785	$12,808	$20,392	$569,230	$970,755	$20,282	$24,174	$256,141	$70,893	$0	$2,520	$528
	Mining, Agriculture	$397,736	$350	$400	$4,908	$13,750	$62,953	$156,532	$51,108	$14,789	$44,722	$47,724	$0	$500	$0
	Utility, Transportation	$624,515	$4,255	$18,700	$3,160	$600	$79,282	$72,796	$23,238	$48,250	$336,858	$35,270	$300	$824	$982
	Small Projects*	$621,050	$1,327	$4,234	$12,767	$8,791	$148,292	$285,586	$23,547	$11,170	$56,254	$67,466	$556	$1,060	$0
2002	**Total Industrial**	**$3,222,724**	**$18,224**	**$7,477**	**$54,140**	**$61,265**	**$720,509**	**$1,508,684**	**$125,605**	**$88,852**	**$400,851**	**$230,119**	**$1,405**	**$4,409**	**$1,184**
	Factory, Plant	$1,603,353	$3,692	$1,920	$20,806	$22,767	$399,218	$830,528	$35,537	$68,957	$147,567	$68,817	$0	$3,544	$0
	Mining, Agriculture	$429,526	$0	$780	$4,655	$900	$73,860	$251,287	$53,494	$3,933	$9,098	$31,519	$0	$0	$0
	Utility, Transportation	$533,562	$12,008	$1,359	$18,227	$28,014	$81,764	$138,376	$13,969	$5,498	$176,802	$56,575	$270	$0	$700
	Small Projects*	$656,283	$2,524	$3,418	$10,452	$9,584	$165,667	$288,493	$22,605	$10,464	$67,384	$73,208	$1,135	$865	$484

* This category represents small industrial projects valued at less than $250,000 each.

Appendix 4:
Productivity Measurement and Performance



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About the WRF

Overview

The Work Research Foundation (WRF) was incorporated and registered as a charitable organization in 1974. Its purpose is to do research in industrial relations and economics from a worldview perspective.

The WRF's objectives involve understanding issues surrounding the organization of work, the movement of trade, and leadership in the economic sphere. Different research projects examine issues at an academic level, at a macro-economic and public policy level, and at a front-line workplace level. Together, these approaches help inform each other and assist in mapping the significant changes—and their implications—that will characterize the contribution of work to our social and economic prosperity in the decades to come.

The WRF couples its innovative research agenda with an educative influence agenda. Its research is organized through three policy centres. The WRF has formed a partnership as the research arm of the DePree Leadership Center in California, which was established as a resource to leaders to promote values-based leadership nurturing effective organizational community.

In addition to ongoing research and publication projects, the WRF also conducts leadership retreats where, in collaboration with the DePree Center, leadership training and peer learning opportunities are provided. WRF's biennial survey of public attitudes towards unions, conducted since 1997, is becoming a valuable resource of longitudinal data for industrial relations researchers. WRF also publishes a quarterly journal entitled *Comment*.

The WRF receives its funding by soliciting donations from individuals, foundations, and organizations who support its mission or programs. The largest single contribution to the WRF during 2002 represented 17.9 per cent of its revenues. Some of its revenues are also derived from conferences, the sale of publications, or project-specific donations. This project was funded from general revenues.

Worldview

The WRF operates with a distinctive point of view, a worldview or framework that helps us understand all of reality. Following are some of our significant emphases:

Patterns – The basic patterns that shape economic life are neither random nor subject to change over time—there is an enduring design to economic life. Wisdom in economic life consists of tracing these basic patterns and working along (rather than against) the grain of reality these patterns uncover.

The Economic Sphere – Businesses, trade unions, and other economic institutions need room to grow and flourish in society—their own distinct sphere of economic life. The economic prosperity of a society requires that the economic sphere enjoys the respect of other spheres and, in particular, that government clears the way for economic innovation and the maturing of leadership in economic life. The general well-being of a society requires, at the same time, that the economic sphere does not extend beyond its proper reach by commercializing other spheres of life.

Dignity and Respect – People thrive and contribute effectively when their work puts food on the table and inspires commitment—when they enjoy dignity and their work receives respect.

Social Partnerships – Flourishing markets require a rich weave of mutually gainful social relationships. In particular, government, business, and labour should function as social partners in economic life.

WRF Community

The community the WRF aims to serve includes all leaders in economic life: business leaders (corporate boards, CEOs, and professionals), labour leaders (trade union boards and executive staff), government leaders (federal and provincial members of parliament, city councils, and senior civil servants), and intellectual leaders (journalists, think-tank scholars, consultants, and college and university professors). The work of the WRF is enriched by careful attention to the diverse and sometimes conflicting worldview frameworks that influence economic life in North America.

About the Author

Ray Pennings was appointed chair of the WRF Centre for Industrial Relations Innovation in September 2001. He completed his undergraduate education at McMaster University in 1990. Ray has extensive professional experience in the industrial relations and public policy fields. From 1991–2001, he served as the public affairs director for the Christian Labour Association of Canada, a 27,000-member union operating across Canada. His insights on emerging trends in labour relations and economic life are frequently sought through invitations to participate in conferences as a panellist or speaker. In addition to two books, Ray has had hundreds of articles published in newspapers, magazines, and journals. He is active in his community serving on local boards and committees and was a candidate in the 2000 federal election, winning 35 per cent of the popular vote. Ray lives in the Hamilton area with his wife and son.

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