

Discussion Paper

People &

Performance

Building Alberta's Future Construction Workforce



The Skilled Trades Ad^vantage.

Contents

Highlights	4
Key Recommendations	5
Introduction	7
Background	7
Better people systems	9
Workforce solutions	10
I. Skills Development	12
Low-skills path	12
High-skills path	13
Strengthening skills training	14
Maximizing return-on-investment from training	15
Actions to improve skills development.	17
II. Project Management	18
Improving project relationships	18
Trust	18
Communication	19
Lean construction	20
Technology and learning.	21
Actions to improve project management	23
III. Human Resource Management	24
Team effectiveness	24
Thinking strategically about people	26
Safety culture.	27
Reducing recruitment costs.	27
Actions to improve human resource management	30
Conclusion	31
Endnotes	32

People & Performance: Building Alberta's Future Construction Workforce

Discussion Paper

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Disclaimer

The views expressed in this discussion paper are those of the author and do not reflect official policy of the Building Trades of Alberta or its member unions.

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Highlights

This report presents ideas from a review of global construction industry research about how to better link people and performance. The purpose is to identify leading thinking and promising practices in the areas of skill development, work organization, and human resource management in the construction industry. A key finding is that **lasting solutions to labour shortages in Alberta's construction industry require creative ways of linking people and performance.**

This report was commissioned by the Building Trades of Alberta (BTA). Alberta's building trades unions play a vital role in the supply of skilled labour. Looking into the future, innovative approaches to workforce development are more likely to be successful if unions support, and in some cases initiate, these changes.

There is a wide range of workforce development options presented in this report. The path forward involves paying attention to all pieces of the workforce puzzle, including new ways to retain workers, better ongoing development and use of their capabilities, more effective project management, and the use of specific practices that help to create a more productive and high-quality work environment.

The report takes a close look at "high performance", and shows that the global construction industry is improving performance through the better organization, development, use, and leadership of people.

The common goal in Alberta's construction sector should be: **Working smarter together.** Achieving this goal will improve the existing knowledge and skills in the workforce, as well as contributing to improvements in quality, cost reduction, and efficiency. A key conclusion is that the future of construction depends on having systems in place that focus on people and not on the technical systems. Without the former, the latter will never perform at optimal levels.

Construction industry employers seem to lag behind other industries in how they conduct their people practices. This gap must be closed, otherwise recruitment and retention of employees will remain chronic problems, and performance will not improve.

The report identifies a number of practical workforce planning and development suggestions for building trades unions, employers, and other industry stakeholders. The recommendations are intended to stimulate a discussion within BTA, its member unions, and their major partners – especially contractors, clients and government – with the goal of finding solutions to the workforce issues they face.

Key Recommendations

Recommendations for skills development

ACTIONS UNIONS CAN TAKE

- Educate members and stakeholders about the advantages of high-skills paths to workforce development.
- Coordinate training initiatives by BTA member unions to more efficiently and effectively meet changing skill needs.
- Create a short survey for assessing members' future skill development and training needs, and the quality of their current formal and informal training. This information can be used by unions, employers, and training institutions to plan future improvements in training and apprenticeship programs.

ACTIONS CONTRACTORS CAN TAKE

- Adopt proven training evaluation methods and integrate them into existing training programs to calculate return-on-investment and learning outcomes.
- Review new initiatives, such as mentoring and leadership development, using best-practice training evaluation techniques.

ACTIONS ALL INDUSTRY STAKEHOLDERS CAN TAKE

- Develop a common framework that describes a "high performance workforce" and the actions required to achieve this goal, focusing on the factors that influence both the development and the use of skills.
- Develop rigorous evaluation criteria and measurement tools for assessing the impact of any changes to apprenticeships. The effects of these changes on workers, employers, and the construction labour market should be measured.

The future of construction depends on having systems in place that focus on people and not on the technical systems.

Without the former, the latter will never perform at optimal levels.

Recommendations for project management

ACTIONS UNIONS CAN TAKE

- Initiate multi-stakeholder discussions of the role of trust in project success. Building high-trust relationships needs to be a priority for major contractors, clients, and construction trades unions. This can only be achieved if all parties are committed to fostering trust.
- Use the information in this report as a basis for identifying 3 or 4 ways that unions can add value to the project management process. By doing this, unions will contribute to better communication, integration, and coordination at all phases of projects in which their members are involved.

ACTIONS CONTRACTORS CAN TAKE

- Ensure that communication and trust-building is part of project management training.
- Partner with university researchers to document the costs and benefits of lean construction applications in Alberta, including human resource implications.

ACTIONS ALL INDUSTRY STAKEHOLDERS CAN TAKE

- Identify and distribute the best practices of construction project management within Alberta.

Recommendations for human resource management

ACTIONS UNIONS CAN TAKE

- Identify ways to include teamwork competencies in training programs for members.
- Document how unions contribute to reducing contractors' hiring and turnover costs.

ACTIONS CONTRACTORS CAN TAKE

- Incorporate team leadership and mentoring competencies in training programs for supervisors.
- Document through case studies examples of unionized contractors who use best-practice human resource management, and communicate the practical lessons throughout the construction sector.

ACTIONS ALL INDUSTRY STAKEHOLDERS CAN TAKE

- Define the teamwork abilities that are required to create motivated, committed, and productive teams that take pride in their work.
- Develop a worksite "safety culture" model that can be widely applied in the sector and that supports positive and productive people practices. Use case studies of successful safety cultures that reflect this model.

Introduction

This report presents ideas from global construction industry research about how to better link people and performance. Long-lasting solutions to labour shortages require creative ways of linking people and performance. This means finding new common ground for union-management cooperation, a growing necessity in Alberta's labour market. Above all, the report invites industry partners to have frank discussions about which future directions for Alberta's construction sector will be of greatest mutual benefit.

The stakes are indeed high. Alberta's oil sands projects have made the province "the centre of gravity for Canadian construction workers."¹ **Considering that \$80 billion additional oil sands investments are planned, the performance of industrial construction projects will be a critical factor in the Alberta's — and Canada's — future economic prosperity.** According to the Construction Sector Council's 2007 projections, construction activity in Alberta will create an additional 50,000 jobs by 2011. Across Canada, non-residential construction in 2008 is expected to involve 12,000 major projects with a total value of \$21.5 billion.² This is a global problem that will see Alberta contractors compete against employers from around the world for skilled labour.

Background

This report is based on a review of hundreds of articles from academic and professional journals, books, and reports. The purpose of this review is to identify the most important people practices in the areas of skill development, work organization, and human resource management in the construction industry. Three questions were used to assess this material:

1. What are the practical implications of this research for building trades unions?
2. What are the practical implications of this research for employers and other construction industry stakeholders?
3. Where is there common ground where unions, their members, employers and clients can take mutually beneficial actions?

"On a construction site, it is possible to have a shortage of skills without having a shortage of workers."

— Construction Sector Council,
Measuring Skills in Construction, 2005, p. iii.

This report was commissioned by the Building Trades of Alberta (BTA). Alberta's building trades unions recruit people into skilled trades, support apprenticeships, provide skills upgrading, and supply skilled workers to job sites. Without these contributions, some projects would not get done. In fact, the Construction Owners Association of Alberta's mission statement — "***a construction industry that has access to a workforce with the right skills, in the right mix, at the right time, in the right numbers***" — identifies the common goals of unions, contractors and clients.³ Looking into the future, innovative approaches to workforce development are more likely to be successful if unions support, and in some cases initiate, these changes.

Initially, this report set out to identify successful approaches to workforce planning and human resource management in other industries that could help Alberta's construction sector find solutions to its labour crunch. As it turned out, leading construction experts have been adapting the people practices used in other sectors. So the literature reviewed for this report comes mostly from within construction. The challenge is to find ways to close the gap between what construction industry experts recommend as effective people practices and what actually happens in projects and on worksites.

Time is scarce in Alberta's fast-paced construction environment. As a result, not all relevant solutions to the labour shortage get considered. **With a small investment of time, and goodwill, the construction sector can navigate its way out of crisis management mode, creating a wider range of workforce development options.**

More attention needs to be paid to the other pieces of the workforce puzzle. These pieces involve finding new ways to retain, develop, and use people's capabilities. In addition, there needs to be more effective project management as well as using people practices that result in a more productive and high-quality work environment.

WORKING BETTER

"Improved productivity and enhanced project management capacity are critical to the industry. With a tight labour supply one of the solutions necessary is to *work better*."

— Alberta Employment, Industry and Immigration.
A Workforce Strategy for Alberta's Construction Industry.
Building and Educating Tomorrow's Workforce.
Alberta's 10 Year Strategy. October 2007, p. 7.

Better people systems

The common goal in Alberta's construction sector should be: *Working smarter together*. The result will be improved use of existing knowledge and skills in the workforce, as well as improvements in quality, cost reduction, and efficiency. Surely, this is what contractors and customers want. Even if the most optimistic recruitment plans for apprentices and journeypersons succeed, they will not meet future needs. Finding ways to work together better and manage people better are urgent priorities.

The *Workforce Strategy for Alberta's Construction Industry* calls for a "high-performance workforce" and "high performance workplaces." While the *Workforce Strategy* does not provide details, it can be seen as a call for further discussion of what "high performance" means for the construction sector and what industry stakeholders must do to achieve higher performance. We will take a closer look at "high performance," showing that the global construction industry is improving performance through the better organization, development, use, and leadership of people.

The future of construction depends on better people systems, not better technical systems. Without the former, the latter will never perform at optimal levels. The need for a strategic connection (i.e., linked to business goals) between people at all stages and levels of a construction project and the ultimate success of that project — on time, on budget, excellent quality, and satisfied clients — is a prominent theme in discussions about the future of construction in other countries.⁴

People practices in construction seem to lag behind other industries.⁵ Yet, it is important to recognize that some major contractors and clients are using cutting-edge human resource practices. For example, PCL is on the *Fortune* magazine's 2008 list of 100 Best Companies to Work for in America, and Trico Homes, based in Calgary, is on the 2008 list of 50 Best Workplaces in Canada, published in the *Globe and Mail* (both lists were created by Great Place to Work® Institute). EllisDon was ranked #1 on the *Report on Business* magazine's 2008 list of 50 Best Employers (created by Hewitt Associates). And the original oil sands producers — Syncrude and Suncor — are widely recognized for their emphasis on employee development and a strategic approach to human resource practices.

Closing the people practices gap between employers in the construction industry and leading employers in other industries must be given priority in a workforce development strategy. The objective is to raise the bar for the entire construction sector.

Workforce solutions

The report identifies potential workforce solutions relevant for all stakeholders, focusing on three related areas (see **Figure 1**):

1. **Skills development:** taking a high-skills approach that builds on existing crafts, strengthening apprenticeships, and the business case for investing in training.
2. **Project management:** trust and communication, lessons from lean construction, and the implications of information and communication technology.
3. **Human resource management:** improving team effectiveness, advantages of a “strategic” approach to people, and reducing hiring and turnover costs.

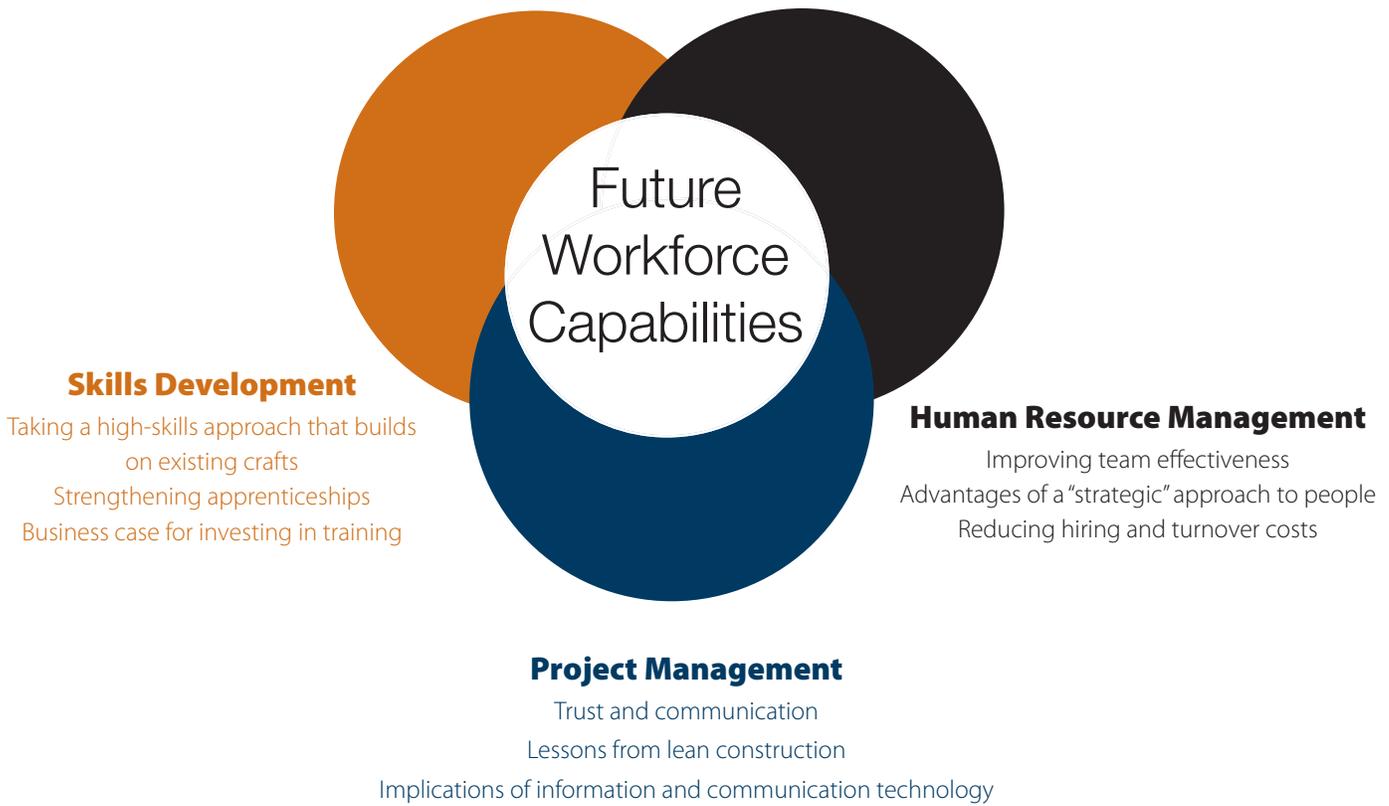
The report summarizes the current and emerging practices that seem promising in each of the three areas. It is up to stakeholders to determine what will work best for them. The challenge is to identify opportunities in all three areas that have the greatest potential to build a skilled and motivated workforce able to deliver excellent results. BTA’s specific challenge will be to find common ground for union-management cooperation on workforce issues, a growing necessity in Alberta’s competitive labour market.⁶ Above all, industry partners need to have frank discussions about which future directions for Alberta’s construction sector will be of greatest mutual benefit.

PRESSURES OF A GLOBAL ECONOMY

“In today’s global economy where labour is mobile, increasing the capacity of people to meet labour market demand can no longer be achieved simply by increasing the amount of hours worked or by driving people to ‘work harder’.”

— Alberta Employment, Industry and Immigration.
Building and Educating Tomorrow’s Workforce.
Alberta’s 10 Year Strategy. July 2006, p. 10.

Figure 1: Linking People & Performance



I. Skills Development

Discussions about how to create the future construction workforce follow two distinct pathways: a low-skills path or a high-skills path.

- The **low-skills path** creates narrowly specialized construction jobs that can be done by unskilled or semi-skilled workers. This path assumes that project success depends on more flexible use of workers and less costly labour.
- The **high-skills path** expands the construction skill base by strengthening the apprenticeship system, ongoing training and learning, and better use of workers' capabilities. This path assumes that successful projects require an increasingly skilled, knowledgeable, and capable workforce.

Low-skills path

The National Apprenticeship Specialization Project (NASP) could be heading down a lower-skills path.⁷ **This involves carving out from established construction trades specific occupations with narrower skill sets — essentially fragmenting and de-skilling a craft.** Stakeholders are being consulted on the pros and cons of what the NASP calls “specialization.” The main thrust of the project is to find ways to create new trades based on smaller skill sets, with their own training and licensing, although some specialized certificates being considered could be acquired by journeypersons.

An example of how construction employers make use of a narrow skill set is the Residential Framing Technician, which creates a mini-trade out of one task: framing a house. This type of mini-trade may be suitable in mass-production construction, for example a large residential subdivision or multi-unit facilities. There is no evidence that it could be effective on large commercial or industrial projects, given the range of skilled trades required. Furthermore, journeypersons can be used more extensively across jobs because of their broader skills.⁸ This improves workforce flexibility and job security.

In sum, **there is no research evidence that low-skills specialization is the best pathway for building the future construction workforce.** According to a number of studies, construction will require workers to have a broader skill base with higher level skills, not to be less skilled. This is due in part to the increasing complexity of building processes, technologies, materials, and systems. Labour market pressures also make it a priority to tap more deeply into the talents of existing workers — in other words, *working smarter*.

High-skills path

The high-skills path involves broadening and deepening workers' skills. To understand the differences between the low-skills and high-skills paths, we need to be clear about terminology. For example, advocates of the low-skills path use the term “specialization” when describing craft fragmentation. This can be misleading, by implying that more skills are being acquired when in fact the opposite is happening. It therefore is useful to keep in mind a surgeon as the model of specialization. Surgeons have acquired in-depth, specialized training beyond a medical degree in one area of medicine. When you have your knee or hip replaced, you want a surgeon who has done the procedure hundreds or thousands of times, but who also has a broad foundation of medical expertise.

In future, successful businesses increasingly will be knowledge-based and require higher levels of education and training — not less — from workers. As a result, there will be more specialization along the lines of the surgeon example, with journeypersons acquiring additional training and certification in specific competencies.

Following a high-skills path to workforce development could involve workers acquiring multiple skill sets. However, using the term “multi-skilling” to describe this process is contentious for two reasons. First, multi-skilling can raise jurisdictional issues for craft unions by blurring the boundaries between different types of crafts. Second, just like the term specialization, multi-skilling has low-skilled applications which are presented as future workforce solutions. Used this way, the term multi-skilling refers to a flexible, semi-skilled workforce that can perform pieces of several crafts.

Research evidence generally shows that a broader skill base — in other words, multiple skills developed to a high level — has benefits. For example, construction trades in Germany and the Netherlands are based on broad skill sets, compared with other countries, contributing to a more flexible use of craft workers, resulting in productivity advantages.⁹ Research on US employers that have used multi-skilled craft workers to address labour shortages on industrial projects found some benefits for both workers and employers.¹⁰ According to this research, multi-skilling provided craft workers higher wages, learning opportunities, more continuous employment, and higher job satisfaction. For employers, the benefits of having multi-skilled journeypersons included workforce flexibility, better worker morale, lower turnover, and a more efficient construction process. In contrast to these high-skills applications of multi-skilling, other research examines lower skilled multi-skilling, such as in building pre-fabrication, which provides few productivity benefits.¹¹

The above studies are used to illustrate the advantages of a high-skills path, not to advocate for multi-skilling. In fact, the same studies make it clear that **multi-skilling is not a replacement for traditional craft training methods.** Like any workforce development strategy, applications are limited.¹² For example, maintenance projects are more suited to a multi-skilled workforce. Single craft journeypersons will continue to be required on projects with more than 200 workers. And **multi-skilling is less suited to a labour market where there is full employment in the trades.**

Perhaps most important, **the effective use of multiple skill sets depends on the ability of site supervisors to know the talents of each individual worker and to put together the right crews based on this knowledge.** Supervisors thus may require additional skills and training to fully deploy highly skilled craft workers. A high-skills path depends, in part, on ensuring that workers with the right combinations of skills and experience are available when and where needed. Unions can contribute to this goal, because it requires up-to-date information on the full range of skills that workers possess. Unions are in a better position than contractors to keep a skills database for their members and play a more direct role in crew planning and composition.

Strengthening skills training

The above discussion of high-skills and low-skills strategies raises important questions about skills training in Alberta. Specifically, answers to three questions could help stakeholders further strengthen Alberta's apprenticeship system:

1. Why are employers considering, or adopting, specialization and multi-skilling?
2. Why would workers be interested in either of these training options?
3. How can unions build on the strengths of the existing apprenticeship system?

To better understand employers' motivations for choosing either a high-skills or low-skills path, we need to know if these preferences are a response to dissatisfaction with the existing apprenticeship system. A survey of contractors, apprentices, journeypersons, training providers, and other stakeholders would be the best way to assess training needs and to evaluate options for improving the apprenticeship delivery system. An industry survey also could identify future competencies that contractors will require in 5 to 10 years — information that is critical to preparing for the changing workforce.¹³

To better understand why workers may be interested in these training options, information is required on the training needs and goals of apprentices and journeypersons. For example, there are proposals in the US to combine construction craft training with college degree courses to make construction a more appealing career.¹⁴ US research suggests that some journeypersons want to obtain credentials in related crafts. This option may appeal to apprentices too, but we need to know more about workers' interests and needs.¹⁵ Again, this sort of information can be obtained through surveys.

Unions' future role in training must build on their past success providing craft workers to meet industry's skill needs.¹⁶ For example, unions could help to document how investments in apprenticeship training contribute to goals that matter most for employers, such as recruitment and retention.¹⁷ Other ways that unions can contribute to future workforce solutions include:

- Better meeting contractors' training needs in regional labour markets.
- Coordinating training activities among locals in the same union.
- Coordinating training activities of separate unions on building trades councils.

Maximizing return-on-investment from training

We noted above that there is no research evidence to show that by decreasing the skill requirements for construction jobs, employers will make recruitment and retention easier. Actually, this approach can put the company's (and the industry's) long-term viability at risk. That's because investing in training pays off for employers, even in the short term, but especially in the longer term. **The research evidence strongly supports this point: training investments contribute to future business success.**¹⁸ Here are some examples of the return-on-investment (ROI) for training:

- A 12-year study in the UK found that a 5 percentage point increase in worker training within an industry is associated with a 4 percentage point increase in productivity and a 1.6 percentage point increase in wages.
- A national training evaluation study in Australia found that businesses had a positive return on training investments of 30% or more. The study concluded that a company's commitment to the skills and training of its employees is a powerful predictor of improved productivity and profitability.
- A three-year study of 575 companies in the US, by the American Society for Training and Development, found that companies investing more in training per employee had better total shareholder return and financial performance.

The same is true in construction. A Canadian study found that for every dollar employers invested in apprenticeship training, they benefited by \$1.38.¹⁹ The study looked at companies that employ craft workers in 15 trades (including bricklayers, carpenters, construction electricians, heavy duty equipment technicians, millwrights, mobile crane operators, sheet metal workers, and tool and die makers). Net economic benefits (revenue generated by apprentices) were found by the end of the first or second year of apprenticeship training. The journeypersons involved in training the apprentices also benefited by enhancing their own skills and knowledge.

Studies like this one emphasize the importance of removing barriers to using apprentices on job sites. A study of apprentice utilization in Alberta debunked a number of myths that have prevented employers from using more apprentices on industrial projects.²⁰ This study found that apprentices can be as productive and cost-effective as journeypersons as long as they receive good training and quality supervision, and are safety conscious. This conclusion is supported by research in Germany, which found that the productivity of apprentices can be increased by including more learning opportunities in productive work processes starting early in the program.²¹

Alberta's long-term construction workforce strategy needs to include methods for evaluating the benefits and costs of training. This approach has been recommended by the US Business Roundtable's Construction Committee, based on growing evidence that training is a strategic factor in the long-term success of the industry.²² Good tools are available for measuring training ROI:

- The Australian National Training Authority has developed a training ROI method that employers can use.
- A project supported by the Irish government developed a method by which companies can evaluate training effectiveness, including ROI, learning on the job, and training participants' satisfaction.²³

In Alberta, a thorough evaluation of training ROI would have to compare the quality of apprenticeship programs and other training sponsored by unions (and union contractors) against training offered in the non-union sector. A US study suggests that union-sponsored training has better results.²⁴ Union contractor-sponsored apprenticeship completion rates in 30 US states were higher than in the open-shop sector, with higher enrolments, greater participation of women and ethnic minorities, lower attrition and better completion rates than non-union programs.²⁵ These findings are consistent with the open shop's preference for semi-skilled workers and more flexible, shorter-term and less formal training methods. The study concludes that: "...apprenticeship training activities of the open shop sector hardly seem adequate to mitigate the skill crisis."²⁶

There are three other issues that unions, contractors, and training providers need to address in order to ensure that the right training investments are being made:

- Mentoring of apprentices is a growing practice in Alberta. Additional costs for training mentors and freeing them up from their usual job duties to provide mentoring imposes new costs on employers. It would be helpful to know the real costs and benefits.
- Joint union-management trust-fund training programs are expanding. Evaluation of these programs would help to ensure that the training is providing the expected benefits for industry as well as for training recipients.
- It is also important to consider other benefits such as improved worker commitment and motivation. Contrary to what some employers believe, training workers can improve retention, because workers receiving training view this as a sign that the company is interested in their development.

LINKING TRAINING TO BUSINESS GOALS

DPR Construction has been recognized as a *Training Top 100* firm in the US. It is a commercial building contractor based in Redwood, California. Among its projects is the Pixar Animation Studios. DPR monitors and manages its business around six goals or critical success factors: safety, scheduling, preconstruction excellence, closeout, change management, and zero defects. All training is linked to these six success factors.

— *Training*,
March 2003, p. 66.

Actions to improve skills development

The research on skill development has a number of important implications for Alberta's construction industry stakeholders. This section suggests how major stakeholders can play a role in further developing the skills of the construction workforce in the province:

ACTIONS UNIONS CAN TAKE

- Educate members and stakeholders about the advantages of high-skills paths to workforce development.
- Coordinate training initiatives by BTA member unions to more efficiently and effectively meet changing skill needs.
- Create a short survey that will assess members' future skill development and training needs, and the quality of existing formal and informal training they have received. Unions, employers, and training institutions can then use this information to improve future training and apprenticeship programs.

ACTIONS CONTRACTORS CAN TAKE

- Adopt proven training evaluation methods and integrate them into existing training programs to calculate return on investment and learning outcomes.
- Evaluate new initiatives, such as mentoring and leadership development, using best-practice training evaluation methodologies.

ACTIONS ALL INDUSTRY STAKEHOLDERS CAN TAKE

- Develop a common framework that describes a "high performance workforce" and the actions required to achieve this goal, with the focus on the role of skill development. This framework must combine factors that influence both the development and the use of skills.
- Develop rigorous evaluation criteria and measurement tools for assessing the impact of any changes to apprenticeships. The effect of these changes on workers, employers, and the construction labour market should be measured.

II. Project Management

Improving project relationships

Construction is a project-based industry, so improving how projects are managed has the potential to increase productivity at all project stages. Project management research highlights the importance of building stronger relationships between all the groups involved in a project. Two issues stand out:

- Better ways of managing the construction process requires higher levels of trust among the project participants.
- Better project management depends on improvements in how people communicate and cooperate.

Rarely are unions mentioned in discussions of solutions to project management. But a closer look at research on project management identifies ways that unions can contribute to better project performance, especially in the areas of trust and communication.

Trust

A construction project involves a series of short-term relationships involving different contributors who have diverse skills. In other words, the success of a project depends on the strength and quality of these relationships. One of the key ingredients of successful partnerships is mutual trust. **In high-trust relationships, individuals know that the other party will take their interests into account when making decisions. They can be confident that the relationship will have more upsides than downsides. Conflicts will be easier to resolve because each party understands the other, and they have too much invested in the relationship to put it at risk.**

THINKING BIG ABOUT PROJECT MANAGEMENT

“Instead of spending so much time chasing after the ideal of that perfect ‘project manager,’ it may be more profitable for construction companies to create a culture that fosters perfect ‘project management.’” *A conclusion of the 2006 Project Management Survey by FMI Management Consulting.*

— EC&M.

In search of the perfect project manager. 2006, p. 12.

According to project management experts: "... a cooperative approach between construction organizations would bring about trust and commitment-induced efficiency, and better resource allocation and utilization which leads to increased industry performance."²⁷ This is achieved when all project participants are committed to meeting the objectives. The words frequently used to describe how to develop a client-focus include cooperation, coordination, communication, and integration. Developing these qualities must be a priority for construction project stakeholders.

Current descriptions of the relationships found in construction use words such as fragmented, divisive, adversarial and low trust. For example:

- An article in *Construction Management and Economics* observed: "The construction industry worldwide is known for its adversarial working relationships which exist between the stakeholders."²⁸
- Authors of an article in *Supply Chain Management* concluded: "The greater the level of complexity in a project, the greater the need will be for trust."²⁹

Significant improvements in project management will not be possible without addressing the quality of the relationships in a project. As one expert suggests, the construction sector needs to expand its thinking about "quality" beyond "product quality" to include "a total commitment to quality in every aspect of business practice," which includes the quality of partner and stakeholder relationships.³⁰

Project management experts emphasize the importance of establishing high-trust relationships among project partners in improving commitment to project goals, communication, and information sharing, along with viewing the project as a whole rather than its pieces. Moving in this direction starts with a greater focus on the client.³¹ Resource allocation and use improves, efficiencies are gained, and costs are reduced. These are called *trust dividends*.

Communication

Communication and trust go hand in hand. **The surest way to have open channels of communication is through mutual trust.** The more that parties communicate, the more they establish trust. Improving communication among project managers and project partners involves openly sharing information, ideas, knowledge, skills, and other resources. Good communication anticipates the other party's need for information. People do not share information if they don't trust each another. Large projects, in particular, need a high level of information exchange through effective teamwork. If project relationships lack trust, project risks are passed on to other stakeholders rather than seen as a shared responsibility.³²

One of the few studies to examine trust and communication in Canadian construction linked reduced project risks and costs to high-trust relationships.³³ Researchers identified three types of trust: competence trust (someone has the ability to perform tasks); ethical trust (someone will take care of your interests and consistently behave according to your expectations); and emotional trust (the relationship feels right for the individual). All three types of trust are important for project risk reduction. Positive experiences of working together successfully

build trust. As a result, the parties are more likely to share information, view the information received from each other as reliable, and trust each other to exercise greater autonomy at each stage of a project life cycle without fear of losing control.

For building trades unions and contractors, the implications are clear. Developing mutual trust is critical for project success. Each party has to take responsibility for this. **Practical steps that can help build trust include setting common project goals, having regular communications about all relevant aspects of a project, and having a shared understanding of the client's needs.** Contractors will have to focus on supporting their managers and supervisors to engage in trust-building behaviours, which has implications for leadership development and training. Building trades unions, for their part, will also have to focus on creating and maintaining trust, from the work-site to dealings with contractors and clients.

Lean construction

Lean construction focuses on better meeting customer needs by creating tightly integrated supply chains and production systems. This approach highlights common themes in the project management literature. The model of “lean production” developed in manufacturing and was made famous by Toyota in the 1990s. Lean production focuses on three things:

- Adding customer value at every step of the production process.
- Continuously eliminating waste and reducing costs.
- Creating a culture that supports all workers to continuously improve production processes and product quality through teamwork and individual initiative.³⁴

Lean construction tries to achieve an integrated construction project supply chain and production process. The main goals are to reduce waste and costs and to improve quality.

Not surprisingly, lean construction is stirring up a lively debate. Advocates claim that lean construction can be applied to all types of construction to significantly improve quality and productivity. However, critics claim that lean construction is limited to certain types of construction activity and that its production engineering focus does not consider negative implications for workers, such as job stress and work intensification.³⁵

More research is needed to fully understand the implications of lean construction for employers, clients, and workers. However, useful lessons from existing studies should be kept in mind by Alberta's construction employers as they consider adopting lean methods. And there are implications for unions, too.

A cornerstone of lean manufacturing is making tasks standardized. However, lean production does not require a less skilled workforce. In fact, Toyota invests heavily in training and expects workers to have a wide range of skills, all of which are acquired through carefully developed training programs that are coached by team leaders. Critics argue that this “multi-functionality” is nothing more than “multi-tasking.”³⁶ Still, Toyota and other lean manufacturers place great importance on developing and using workers' skills and creating work environments in which learning occurs on the job.

Making a car is a less complex process than building an oil sands plant, a heavy oil upgrader, or a pipeline. So there are limits to applying the lean model to industrial construction. For example, researchers at the Centre for Construction Industry Studies looked at pre-fabrication and pre-assembly industries, where the lean model may be most suited.³⁷ The benefits of using the lean model in these instances were:

- Shorter project duration;
- Reduced overall project costs;
- Increased craft worker productivity;
- Improved product quality;
- Increased worker safety; and
- Reduced environmental impact.

However, these benefits depend on pre-planning and good project coordination. The skill levels required for lean construction pre-fabrication and pre-assembly were no different than for traditional construction methods.

Successful applications of lean construction deepen and widen the skill base, especially for managers. For example, construction companies in Chile created a “lean construction professional profile” to develop new project leadership skills.³⁸ The St. Pancras Station in London, England (part of the Channel Tunnel rail link) achieved greater project coordination and effective material and information flows by using lean methods. A key to the success of this lean application was the use of 3-D modeling technology, which required additional skills and training. The net savings to the project was 6.4% of the investment.³⁹

Some experts suggest that applying lean construction “principles”—rather than creating an entirely new production system – can bring about improvements in project performance. **The lean model encourages a holistic view of a construction project, from beginning to end, with the clients’ needs foremost in mind.** Most important is developing three project success factors: communication and coordination; the involvement, commitment, and motivation of workers and managers; and trust among the participants.⁴⁰ The end result is that more work on the construction site is value-added for the customer.

Technology and learning

Construction is not as high-tech as many other industries.⁴¹ However, information and communication technology (ICT) is playing an increasingly vital role in managing and executing construction projects. **While ICT is not yet a major driver of productivity in construction, larger firms and projects are using and benefiting from ICT.** We can expect more ICT applications for construction project management. **So it is important to be ready to take advantage of ICT’s potential to improve project results.**

In order for ICT to become more widely used in construction, contractors first need to understand that its benefits outweigh initial costs. According to researchers at the Centre for Construction Industry Studies, information technology can have a positive impact on firm performance, including schedules and costs.⁴² Given the projected labour shortages in Alberta, it is important to figure out how using ICT can help businesses to operate “smarter.” As one expert suggested in *Engineering Construction and Management* “...Web sites are being created that give parties involved in complex building projects the information and collaboration capabilities that they need to complete their work correctly, efficiently, and on time – all under one digital roof.”⁴³

Web-based project management and collaboration is new to the construction sector. These ICT applications are both promising and challenging. ICT is promising because web-based, or “virtual”, project management tools have the potential to improve the sharing and use of information relevant to a project. ICT is challenging because project participants will have to find new ways to communicate and to gain the skills to do this effectively.

ICT is often used as a tool to improve the sharing of knowledge in organizations. It contributes to creating a “learning organization” — a work environment that enables the fullest use of workers’ knowledge, skill, and experience. Leading companies in other industries have become learning organizations by supporting front-line employees to share their knowledge and learn from each other how to find better ways to meet customers’ needs. Everyone in a learning organization is engaged in continuous improvement on behalf of customers or clients.

The construction industry has been slow to adopt these ideas about learning organizations. For example, the Egan Report on Britain’s construction industry stressed that service improvement and profitability in construction depended on finding better ways to use and share knowledge in construction.⁴⁴ This does not mean sharing the “how-to” knowledge of a particular trade. Rather, it refers to sharing basic project information so that all the pieces can be better coordinated and better ways of meeting customers’ needs can be identified and implemented. **So as Alberta contractors consider adopting new information technology, this also provides an opportunity to go a step further and set clear goals for organizational learning.**

Actions to improve project management

This section summarizes the workforce development implications of the above discussion for building trades unions, employers, clients and other industry stakeholders. Specifically, stakeholders can take action on the following issues:

ACTIONS UNIONS CAN TAKE

- Initiate multi-stakeholder discussions of the role of trust in project success. Building high-trust relationships needs to be a priority for major contractors, clients and construction trades unions. This can only be achieved if all parties are committed to this goal.
- Use the information in this report as a basis for identifying 3 or 4 ways that unions can add value to the project management process, contributing to better communication, integration and coordination at all phases of projects in which their members are involved.

ACTIONS CONTRACTORS CAN TAKE

- Incorporate communication and trust-building into project management training.
- Partner with university researchers to document the costs and benefits of lean construction applications in Alberta, including human resource implications.

ACTIONS ALL INDUSTRY STAKEHOLDERS CAN TAKE

- Identify and disseminate construction project management best-practices within Alberta.

Larger firms and projects are using and benefitting from information and communications technology (ICT)...so it is important to be ready to take advantage of ICT's potential to improve project results.

III. Human Resource Management

Construction industry experts have identified human resource management (HRM) practices as one of the weak links in the construction industry's performance. In fact, there is growing emphasis on how HRM is a key to business success. This section briefly describes four major HRM areas that have good potential to improve overall construction industry performance. These areas are: improving team effectiveness; taking a strategic approach to HRM; creating safety cultures; and reducing recruitment costs.

Team effectiveness

Construction is all about teamwork. Basically, teamwork refers to “cooperative effort by the members of a group or team to achieve a common goal.”⁴⁵ We already noted that much of the potential productivity gains from lean construction come from improved teamwork across all stages of a project. But it is possible to increase team performance without adopting lean construction. Doing so requires keeping basic teamwork principles at the forefront of project management.

HUMAN RESOURCE MANAGEMENT POTENTIAL

“There are countless examples of corporate and project crises in the construction sector which have arisen as the result of people’s behaviour, and it would seem that human resource management (HRM) has the potential to eliminate more construction risks than any other management approach. More importantly, HRM has the potential to release a significant amount of productive potential in the construction industry, which has remained untapped because of widespread ignorance of good practice in this area.”

— M. Loosemore, A. Dainty, H Lingard.
Human Resource Management in Construction Projects: Strategic and Operational Approaches.
London and New York: Taylor & Francis, 2003, p. 1.

Team effectiveness depends on team members' level of cooperation. Cooperation is fostered when team members feel they are part of a team and have worked together over time. In addition, team effectiveness has to be cultivated by the employer. Most critical is the role of front-line managers. These supervisors must ensure that teams have a supportive environment in which to operate, that each team member understands their individual and team responsibilities and rights, and that teams have the necessary information to achieve their goals.⁴⁶ In short, employers need to invest time and effort in designing teams, supporting them to succeed, providing a positive environment for effective teamwork, and ensuring that team leaders have the appropriate training and attitudes to promote team performance.

Establishing these conditions for team effectiveness is more difficult in construction than in manufacturing. Unlike a Toyota factory, or other stable work teams such as mining crews and audit teams, construction project teams have a limited life span and may lack a stable and well-defined membership. Even so, **there are actions that members of a construction project can take to improve team effectiveness.** For example, skilled craft workers can be assembled on a worksite into a "real team" if they know how to collaborate. This is where building trades unions can play an important role, training their members in teamwork skills.

As the construction sector in Alberta strengthens supervisory training, it is critical to include team leadership as a core competency. Effective team leaders have specific characteristics. These competencies can be taught and should be used in recruiting, selecting, and training team leaders or supervisors.⁴⁷ Effective team leaders:

- Clearly communicate project goals;
- Align team members' goals with project goals;
- Foster a culture of cooperation and open communication;
- Delegate responsibility;
- Foster a feeling of empowerment among team members;
- Train team members as equals and support them in non-task oriented ways;
- Cultivate a positive work ethic; and
- Manage conflicting perspectives among multiple sub-contractors.⁴⁸

The traditional approach to supervision does not fit high-performing teams. That's because high-performing teams direct themselves; they are not supervisor-directed. A self-directed team consists of skilled workers who have the right combination of technical and "soft" (people) skills needed to work toward a common goal. Effective site supervisors spend more time coaching team members and focus on what matters for the client.⁴⁹ **Self-directed teams typically have better safety records, higher productivity, less overtime, and higher worker morale and satisfaction.**⁵⁰ **These are important goals in construction.** Team members make most of the task-specific decisions and monitor quality. As a result, fewer supervisors are required, an important consideration given shortages of construction managers.

Thinking strategically about people

Construction lags behind other industries in adopting human resource management “best practices”.⁵¹ This gap must be closed, otherwise recruitment and retention will remain chronic problems and performance will not improve. The unique character of construction — fragmented, project-based, and reliant on sub-contractors — only goes so far in explaining this lack of emphasis on people practices.

The good news is that construction industry researchers and practitioners are paying more attention on how to improve HRM. Promising trends are the growing importance of a “strategic” focus on people and the need to develop workplace cultures as the foundation for project success.

Over the past 10 to 15 years, human resource management has made a significant leap forward. HRM is no longer just about personnel functions, such as pay and benefits or recruitment. While these “nuts and bolts” functions of HRM remain important, all aspects of an organization’s people practices are increasingly viewed as critical to the success of the business.⁵² As a result, HRM has become linked to business strategy, ensuring that all people policies, programs, and practices directly contribute to business success. Not only does performance improve, but so too does employees’ quality of work life, which in turn contributes to improved engagement and retention.

By truly valuing their employees, construction employers such as Graniterock (see example on page 28) make the most effective use of peoples’ talents and earn a reputation as an excellent employer. What’s more, the workplace culture is based on trust. Employers are paying more attention these days to creating attractive and productive workplace cultures. An organization’s culture — the values and norms that guide how people work together — is now recognized as a distinctive competitive advantage. Culture defines what is unique about the organization and its people – things that are difficult for competitors to copy.

However, because construction is project-based, most skilled trades workers are obtained through sub-contractors. Attachment to one particular employer is weaker than, say, someone working as a teacher, a nurse, or a banker. Craft unions historically have instilled the values and norms of the trade — including pride and a sense of professionalism — which their members carry from worksite to worksite. Still, **there is no reason that major contractors and sub-contractors, as well as large industrial projects, can’t develop a strategic approach to HRM and foster project cultures that improve both performance and quality of work-life.**

Safety culture

Most employers in the construction sector want to create a safe work environment, or a “safety culture.” **A safety culture can be a springboard for achieving a strategic approach to HRM and the positive workplace culture just outlined.**

Take for example the construction of Heathrow airport’s new Terminal Five (in London, England). BAA (the company that runs Britain’s airports) and its construction partners set a very high safety level for construction of this new terminal: the site would be injury free. Achieving this goal required a safety culture on a project that involved 60,000 people, with 7,000 at any one time on-site. Twice, the project achieved two million person-hours without a reportable accident.

BAA and its partners reached these goals through strong leadership and extensive training. Using a train-the-trainer approach, safety leadership teams ran safety commitment workshops for all workers and managers. Especially important was getting managers to change their thinking: “We had to get the human factor in — to get managers to see the workers as fathers, brothers and sons.”⁵³ An employee survey found that 78% of workers believed they could stop the job and talk to their supervisor if they saw an example of unsafe working. Accident investigations used a blame-free approach. Suppliers also participated in the training. In fact, BAA refused to deal with suppliers if their facilities were not safe.

Heathrow’s Terminal 5 may be on the same scale as oil sands developments. The relevant lesson, then, is that **it is possible on mega projects to change cultures and train all employees and managers to work together more effectively, which also means working safely.**

Reducing recruitment costs

Recruitment and turnover impose major costs to employers — costs that can be reduced. The full cost of replacing a worker who quits (costs of separation, replacement, and training) typically ranges from 1.5 to 2.5 the annual salary for the job, depending on the job level. This does not include lost productivity.⁵⁴ Calculating the cost of a worker quitting has to take into account the following⁵⁵:

- **Separation costs:** exit interviews; administrative functions related to termination; and separation or severance pay.
- **Vacancy costs:** increased overtime or temporary employees needed to complete the tasks of the vacant position.
- **Replacement costs:** attracting applicants; interviews; testing; travel/moving expenses; pre-employment administrative expenses; medical exams; equipment, clothing, and tools; and acquisition and dissemination of company information.
- **Training costs:** formal and informal training and mentoring.
- **Productivity costs:** performance differences in productivity between those who leave and their replacements, as new hires learn the job.

EXAMPLE OF A STRATEGIC APPROACH TO HRM

Graniterock is a California-based quarrying, concrete supply and construction company with over 700 employees. It is on the list of 100 Best Companies to Work for in America, published by *Fortune* magazine, and has won the National Baldrige Award for Quality. The company's quality goals and business plans are based on its customers' needs. The company also places a high priority on employee development, health and welfare, and safety. *Graniterock* has performance measures on people development, financial performance, supplier performance, and customer needs. Work is team based, with the use of task forces, functional teams, and quality teams. Team members use individual development plans to track their own skill and knowledge development and to set long-term training and development goals. The company's future human resource needs and its quality objectives are linked with individual employees' aspirations and abilities. To support this approach, all managers are extensively trained in coaching and HRM skills. People development and performance are not seen as "HR" issues, but as a shared responsibility.

— Martin Marosszeky.

Best practice in the construction supply chain.

ASQ World Conference on Quality and Improvement Proceedings, 2005, pp. 217-28.

In addition to the above measurable costs, there are hidden costs that are difficult to measure. These include increased workloads for existing workers, the stress of turnover, and decreased employee morale and work group productivity if a valued team member leaves.

Turnover cost calculations can be done for a company. However, such studies are rare in construction.⁵⁶ The health care sector has perhaps the most thorough information on turnover costs for employers. Job dissatisfaction is a major factor in turnover among nurses, so many health care organizations make retention a priority. As one study of a US medical centre concluded, with the cost of turnover representing upward of 5% of the organization's total operating budget, it would be cost neutral (and more effective) to offer each departing nurse 86% of their annual salary to stay or to offer every nurse on staff a 33% annual retention supplement.⁵⁷ Obviously, these retention tactics are not recommended, but do illustrate the importance of improving retention rates.

Research identifies the following successful recruitment practices, which contribute to retention:

- Efforts are made to fit the worker to the job.
- Adequate information is provided on the job and company.
- Trained recruiters are used.
- Applicants and new hires are treated fairly and respectfully.
- Worksite expectations (the culture) are clearly communicated.

There also is growing recognition that a positive employer "brand" helps in the selection and orientation of new workers.⁵⁸ A positive employer brand signals the unique advantages of working for the company, or in the case of building trades, becoming a journey person. **Unions and contractors have complementary roles in hiring and orientation, so a coordinated approach to co-branding a trade and its major employers would be most effective.** Pooling information for large worksites or projects and giving them a "brand" of their own also may help, especially to instill worker pride.

Recruitment and retention go hand in hand. If care is taken in the selection and orientation of new employees, the chance of them quitting is reduced. Construction trade unions can help raise awareness in the industry about this strong link between recruitment and retention.

Actions to improve human resource management

This section suggests ways that building trades unions, employers, clients and other industry stakeholders can strengthen human resource management in Alberta's construction industry. Based on the above discussion, actions can be taken on the following issues:

ACTIONS UNIONS CAN TAKE

- Identify ways to incorporate teamwork competencies into training programs for members.
- Document how unions contribute to reducing the costs of hiring and turnover for contractors.

ACTIONS CONTRACTORS CAN TAKE

- Incorporate team leadership and mentoring competencies into supervisory training.
- Provide examples of unionized contractors that use best-practice strategic human resource management, and share the practical lessons across the construction sector.

ACTIONS ALL INDUSTRY STAKEHOLDERS CAN TAKE

- Define the teamwork competencies required to create motivated, committed, and productive teams that take pride in their work.
- Develop a work-site "safety culture" model that can be widely applied in the sector and that supports positive and productive people practices. Use case studies of successful safety cultures to disseminate this model.

THE KEY TO RETENTION

"There are some construction industry companies that have no labour shortages, little if any turnover and still have the kind of skilled employees that they need to accomplish their business mission as well as meet the needs of their clients. These companies take care of their people by offering challenging work, competitive pay, a full package of benefits and sometimes even a stake in the company. In other words, they are very serious about people."

— ENR: *Engineering News-Record*, May 8, 2006.
Editorial: Staff turnover caused by poor policies can strangle firms.

Conclusion

This report has identified a number of workforce development suggestions for the building trades unions, employers, clients, and other industry stakeholders. The recommended actions at the end of each section are intended to stimulate further discussion within BTA and its partners about next steps in developing workforce solutions. BTA and its member unions can take a leadership role, especially when it comes to building a high-skills pathway to the future construction workforce in Alberta. It also can lead the way forward by inviting other industry stakeholders to develop a shared agenda for linking people and performance in Alberta's construction sector.

Based on the evidence presented, there is ample scope for innovation in skills development, project management, and human resource management in the construction industry.

From the research outlined in this report, the future of the construction sector depends on developing better people systems. It now is up to industry stakeholders to find ways to do this.

BTA and its member unions can take a leadership role in developing workforce solutions involving better people systems.

The future of the construction sector depends on it.

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The Skilled Trades Advantage.