



The Owners Voice to the Construction Industry  
**CONSTRUCTION USERS ROUNDTABLE**

# Construction Workforce: Building Comprehensive Labor Market Information

R-411  
November, 2009

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The Association of Union Constructors (NEA)

*Note: Membership listing current at time of publication*

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## **Notice:**

The purpose of this publication is to make available to industry the results of research and common owner practices. The information is provided solely for the individual consideration and education of Construction Users Roundtable (CURT) members and the industry. The publication does not necessarily represent the views of every CURT member company on this topic. The booklet is offered as an informational publication only. CURT intends only to synthesize current thought and trends concerning the topic. Neither CURT nor its committees make any warranty as to the completeness regarding the materials. Readers are encouraged to further research the topic before relying exclusively on these materials. Each CURT member and other readers of these materials are free, acting at their own discretion and in their own perception of business self-interest, to reject or adopt the recommendations in whole or in part. Adoption and/or reliance upon these recommendations is strictly voluntary.

The mission of CURT is to promote cost effectiveness for owners doing business in the United States by providing aggressive leadership on issues that will significantly improve project engineering, maintenance, and construction processes, thereby creating value for the owners.

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## **1. Intent**

This document focuses on how the Construction Users Roundtable (CURT) leveraged proven, innovative forecasting technology that collects, aggregates, and produces craft labor data used by industry for project planning and the development of targeted labor supply solutions; and how this technology can be used by government for labor market policy and program development. The report highlights the importance and use of regional networks comprising industry stakeholders to help build a comprehensive craft labor market information system. It demonstrates that for the craft labor forecasting model to be a valuable planning and decision-making tool, it must have the benefit of local stakeholder knowledge on the demand for and supply of construction crafts.

## **2. Why a Labor Market Information Program for Construction?**

In a 2001 CURT survey, 82 percent of respondents reported craft labor shortages on their projects. That shortage has continued to worsen since the study, interrupted only because of the severe recession that began in 2008. Those familiar with the cyclical nature of the construction industry understand that the pendulum always swings back. When it does, will the industry know with confidence which crafts are needed, how many, in which industry sectors, and where? Research CURT conducted in 2004 estimated that 200,000 to 250,000 new craft workers will need to be added per year through about 2016 to meet the demand.

To address this need, the Construction Workforce Development Center (CWDC) collaborated with CURT to

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develop the CWDC Labor Supply/Demand Forecasting Model. This model is designed to collect and aggregate information on capital and maintenance projects, as well as craft labor supply data. The tool is unbiased regarding union or non-union labor and will use information collected to provide a comprehensive understanding of craft labor supply and demand locally, regionally, and nationally. The tool enables the user to graph predictive forecasting trends to eliminate typical “going out of business” curves that frustrate the ability to adequately plan.

The model is based on a successful system developed by the Construction Sector Council (CSC) for the Canadian construction industry. This model has been shared by the CSC and adapted by CWDC with input from key players from the U.S. owner and contractor community. Access to basic aggregate data is available without cost but is limited to those who participate by inputting supply and/or demand data for the model.

The CWDC model is an industry-driven effort to provide information needed by industry to make informed project planning and human resource decisions, and by government to establish effective labor market policy. A key objective of the model is to increase construction industry productivity and efficiency levels on a sustainable basis.

The CWDC provides a web-based venue as a central location to collect, put together, and report the estimated construction labor requirements for select proposed major industrial capital projects. The system also includes industry’s current availability of skilled labor and a confidence index regarding ability to adequately staff projects. Going forward, the system will be expanded to include more comprehensive coverage of construction activity and assessment of the potential labor market implications.



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By collecting and aggregating data from a range of sources across the construction industry, the model delivers tremendous benefits for all key stakeholders, including:

- ▲ Timely data to assist construction owners with project and shutdown planning
- ▲ Reliable measures of future activity, training needs, and industry demographics generally and for specific crafts, rather than statistical trend lines
- ▲ Information to plan the flow of new apprentices to match industry needs
- ▲ Forecasts of local and regional labor demand that identify excess labor resources that can be redeployed in regions experiencing labor shortages
- ▲ Improved understanding of regional demand/supply craft labor imbalances and assistance in establishing long-term supply-side strategies
- ▲ Demonstration of the opportunities for stable employment to help maintain currently employed workers, attract experienced workers back to the industry, and recruit qualified new apprentices
- ▲ Easy access for inputting and updating data on a regular basis rather than relying on periodic surveys
- ▲ Common methodology to facilitate broad owner and contractor participation
- ▲ Customized reporting and internal project forecasting
- ▲ Tools to assist owners in determining and inputting craft requirement data

To achieve these objectives, construction industry stakeholders need a confidential, reliable, well-structured tool that will enable them to make the right project and human resource

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decisions at the right time. The CWDC Labor Supply/Demand Forecasting Model was designed to accomplish this.

## **Unique Industry Characteristics**

The construction industry is one of the world's most important economic forces. Even in a challenging economy, construction is still a significant economic driver, as evidenced by the federal government's significant spending on infrastructure construction through the American Recovery and Reinvestment Act of 2009. In a healthy economy, the United States capital and maintenance expenditures for construction are well in excess of \$1 trillion annually, approximately 13 percent of gross domestic product (GDP). This translates into the employment of nearly 12 million people, representing about 8 percent of the U.S. workforce, making construction one of the country's largest employers after the manufacturing and retail sectors.

A distinctive feature of construction is its relationship between workers and employers. In many industries, employers hire workers to meet the demands of the business cycle, usually on a long-term basis. However, in the construction industry, employers are continuously hiring to meet project needs, even during a downturn in the economy. This is due to the temporary nature of construction projects and the fact that construction is a cyclical activity.

To meet its labor requirements, construction must be flexible. In any given year, roughly one-third of construction workers work for more than one employer. Even the workers who stay with one employer may still work outside their state or region of residence. The higher flexibility, however, creates a high turnover rate, which increases the recruiting and hiring requirements of construction firms. These factors generate a

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workforce mobility rate that is, on average, twice as high as in most other industries.

If only a few firms dominated the construction industry, the labor market would function more efficiently. But the industry is highly fragmented, with many firms operating across residential and non-residential markets. There are approximately 636,000 construction companies nationwide, and 90 percent of construction companies employ 50 or fewer workers. Each firm hires only as many workers as it needs to meet each project need. This makes it difficult for unemployed workers to know which firms are hiring, where the work is by sector/region, or whether they need to upgrade their skills to secure work in the future.

Human resource planning and recruitment of new workers into the industry is difficult because the need for labor is closely linked to investments and capital availability, the most volatile component of GDP. During a downturn in the business cycle, construction activity may be halved and then doubled again over the next growth period. Employment opportunities can change dramatically, even for the experienced worker.

Even when hiring starts to pick up, many young people may be reluctant to enter the field because of the lack of job security. This is a critical issue, because it takes up to five years to train a skilled journeyman. In growth cycles, frequently, all the skilled, experienced workers are employed, but the skills of first- or second-year apprentices are not sufficient to meet industry requirements. The shortage of skilled workers causes a call for more apprentices, who enroll in larger numbers in vocational schools during the peak of construction activity. But the shortage of skilled workers often remains, and with the long training periods required, it is not possible to meet short-term needs.

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These features make the construction industry a challenging environment for any kind of forecasting intervention. Managing these peaks and valleys to ensure the construction industry has the skilled labor it requires is the driving force behind the CWDC craft labor forecasting program.

### **3. How CURT Did It**

Through the process of collaborative discussion, input, and research, CURT concluded that the industry needed an objective, scientific approach to better understanding labor supply and demand — this is particularly important for CURT members and similar non-members, most of which are engaged in industrial construction activity. The CWDC was engaged to research previous construction labor studies and approaches, consult with industry and governments, and identify best practices, with a view to developing an ongoing labor market information capability for the industry. This effort by CWDC led to the early foundation for a construction LMI program through the following activities:

#### **Construction Labor Market Studies**

Regional labor market studies in the United States have existed on many different levels and have been sponsored by many different organizations, including the U.S. Department of Labor, Employment and Training Administration, Bureau of Labor Statistics; labor groups; Local User Councils; state workforce planning boards; owners; contractors; consultants; and others. These studies articulate the unique challenges in the construction industry and focus on the industry's ability to manage the supply and demand for skilled labor. The value of these studies is frequently limited by timing, location, participation, scope, and information availability.

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## Industry Consultations

To augment this body of understanding and develop a more comprehensive picture of the construction industry, CURT and CWDC facilitated a series of meetings to identify labor market issues facing the industry. This process:

- ▲ Uncovered the need for more reliable and comprehensive craft labor market information;
- ▲ Articulated the issues driving the need for a system to anticipate labor supply and demand issues well in advance, and with more reliability than statistical trend lines;
- ▲ Led to the belief that local and regional participation would be critical for success; and
- ▲ Identified an effective model already developed in Canada that could be used as the foundation for developing a U.S. system.

## Best Practices

The Canadian CSC developed a comprehensive labor market information program for forecasting and assessing labor market conditions for 33 construction crafts by province. The system helped industry develop a better understanding of the issues among the key stakeholders and provide the opportunity, through regional committees, to meet to discuss and develop a common vision on industry labor needs and potential supply solutions.

At the core of the CSC craft labor forecasting system was the need to:

- ▲ Anticipate the demand for construction services
  - Where are the “*hot spots*”?
  - Get better demand information (major projects)
  - Translate demand into worker requirements

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- ▲ Establish a more realistic picture of labor supply
    - Availability of workers by craft and region
    - Demographics by trade
  - ▲ Understand the movement of labor (mobility)
  - ▲ Determine whether there will there be sufficient numbers of qualified construction trade persons available to satisfy requirements at the right time and in the right place

Rather than reinvent this technology, CWDC secured exclusive rights to develop and employ this proven model in the United States. The CWDC craft labor forecasting model launched the major construction projects demand side of the model in February 2009.

## 4. Key Elements of the CWDC Forecasting Tool

In response to the above needs, the CWDC developed a web-based planning and decision-making tool for labor market forecasting. The elements of the forecasting tool are:

- ▲ **State/regional approach** – Provides for user-customized searches allowing a granular search capability of aggregated data.
- ▲ **Regional Local User Council Network** – Local User Councils (LUCs) and similar networks comprising key industry stakeholders bring regional data and knowledge to the forecasting model, as well as the relationships, credibility, and capacity to increase participation in the model. In addition, the

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planned relationship with government stakeholders will expand the model to all construction.

- ▲ **Mid-term and long-term forecast** – Facilitates major project and shutdown planning, even when long-term craft requirement data is not available, and enables the development of supply-side solutions.
- ▲ **Macro-economic outlook** – The construction forecast will be grounded in the context of a broader economic forecast.
- ▲ **Craft Requirement** – Demand data is input by owners directly and is not second- or third-hand information. The owner is responsible for managing the project in the model throughout its duration.
- ▲ **Construction investment outlook** – Derived from major project information and validated through stakeholder network.
- ▲ **Supply-side tracking** – Builds on the data provided through traditional data sources, but brings a greater degree of validity through a contractor confidence index approach. Data sets collected come directly from contractor sources and are not second- or third-hand information.
- ▲ **Labor requirement assessment** – Provides a quantitative and qualitative analysis of labor requirements for 21 craft trades/occupations, and is scalable to easily include more.

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- ▲ **Confidentiality and Anti-Trust Protection** – Protocols built into the model ensure that only aggregate supply and demand data are available to users who access the system. Individual owners and contractors are not revealed in any outputs. Similarly, projects and supply data are not revealed or discernable to any user except the user who input that information or their designee. If a user initiates a search protocol and the model is unable to aggregate the output with other data in a way that will effectively shroud the owner, contractor, project, or survey, then the model will not provide an output.

## 5. Success Factors

Many essential factors contribute to the success of CWDC's craft labor forecasting system, and our analysis of the program indicates that all of the following must be present:

- ▲ Recognition that industry and its stakeholders bring life to LMI.
- ▲ Groundswell of industry support for a comprehensive LMI program.
- ▲ Craft labor forecasting program responds to an industry identified need.
- ▲ All segments of the industry, at the regional, state, and national levels, participate in the development of the forecasting system.



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- ▲ Governments (all levels) and other key stakeholders are involved in developing the forecasting model.
  - ▲ Forecast is built from the local, state and regional level, and then rolled up to present a national picture.
  - ▲ Key elements of the forecast model are built in an iterative manner, increasing the capability over time.
  - ▲ Forecasting model is tailored to reflect the unique characteristics and structure of the industry.
  - ▲ Industry leaders champion the craft labor forecasting system within their constituencies.
  - ▲ Methodology is, and is understood to be, credible and state-of-the-art.
  - ▲ Confidentiality and anti-trust protocols built into the system to protect the identity of individual participants and their projects and surveys are effective.
  - ▲ Forecasting system is used for decision making and planning by stakeholders.
  - ▲ Basic aggregate forecasting data are available without charge to raise awareness and promote the use of the information and system.
  - ▲ The forecasting tool includes the capability to facilitate periodic updates of major project information to help ensure the data are current.
  - ▲ Industry infrastructure (e.g., owners, associations, unions, contractor groups, construction education and

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training community) act as end users, representing the diversity of the industry that enabled the CWDC to tap into a broad cross-section of key stakeholders for development.

## **6. Components of the Forecasting Program**

There are four key components to the CWDC forecasting program:

- ▲ Demand Data Collection/Display
- ▲ Craft Labor Forecasting
- ▲ Supply-Side Tracking
- ▲ Macro-economic Outlook

### **Demand Data Collection/Display**

The forecasting process involves a number of steps to estimate construction investment and the demand for labor. These steps include:

- ▲ Establishing a regional network of industry stakeholders to embrace and use the craft labor forecasting model to input their capital, maintenance, turnaround, and ongoing maintenance projects, which will then bring regional realities to the aggregated forecasting data
- ▲ Educating the network on their role and the forecasting methodology

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- ▲ Working with the network and owners directly to gather and validate elements of the forecasts and outputs, including:
    - Collecting project information (capital, maintenance, turnaround, ongoing maintenance)
      - Project name and description
      - Project owner
      - Project life-cycle status
      - Project type (Industry)
      - Project state
      - Project zip code
      - Other customized sort options are available through customization
      - Project total installed cost
      - Project construction start and end dates
      - Project contacts (primary and secondary)
      - Project craft labor needs (daily, weekly, monthly, quarterly, or yearly)
    - Agreeing on key economic assumptions
    - Vetting results of macro-economic forecast
    - Vetting employment and labor force forecasts
    - Agreeing on labor market assessments
    - Agreeing on final outputs

The CWDC will implement this process throughout the United States and engage industry stakeholders and networks interested in developing LMI.

### **Craft Labor Forecasting**

This model aggregates and displays employment and labor force requirements for craft trades in the construction industry and, when fully developed, will include all other construction industries in the economy. Most projects are input into the model by the project owners through an Excel spreadsheet easy-input method; however, there are numerous instances

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when projects may be internally forecast or in the planning process, but the craft requirement data are unknown. These projects are critical for the model to effectively forecast three to five years into the future and can still be entered. Their status would be identified through one of the following options, which must then be updated or validated every 90 days to ensure it is properly tracked:

- ▲ Project on Hold
- ▲ Internally Forecast / Not Budgeted
- ▲ Budgetary / Not Approved
- ▲ Announced
- ▲ Environmental / Regulatory Approval Applied For
- ▲ Environmental / Regulatory Approval Applied Received
- ▲ Board Approval for Full Expenditure Received
- ▲ Construction Has Commenced
- ▲ Construction Completed

In instances where the craft demand is unknown, the CWDC model employs algorithms to assist owners in determining labor requirements for their project. These equations were obtained from sources where they were developed and used by owners for determining projects' craft labor requirements in advance of the availability of actual data. The equations are tailored for specific industry project types and are driven by construction investment expenditures, regional wage rates, experience with similar projects, and seasonal factors. The equations in the CWDC system are specifically calibrated for craft trades using data on construction occupations. The user has the choice of using the default settings (e.g., wage rates, craft distribution) that are programmed into the model, or they may include data known to them.

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## **Supply Side Tracking**

The supply side of the craft labor forecasting system is built around identification of the actual number of workers for each specific craft employed on a project at the time they are reported, and if the contractor is hiring or releasing those particular craft workers, or if there will be no change.

If the contractor is hiring specific craft workers, the following confidence index is used to describe capacity to find and hire those workers over the next 90 days:

- 0 = Unknown / not applicable
- 1 = Ample supply / no shortages
- 2 = Workers available locally or in adjacent markets to meet increased demand
- 3 = Occasional shortages because of coinciding project schedules
- 4 = Workers generally not available / increased employer competition for workers
- 5 = Shortages on almost all projects

Similar information is collected from organized labor through identification of workers employed and available for employment. The union hall would also identify their confidence rating for recruiting and training.

## **Macro-Economic Outlook**

Owner participation to identify major projects expected to drive regional construction activity is only one part of the CWDC forecast system. The system will be expanded to include broader measures of construction activity estimated through a macro-economic model that includes detailed construction investment projections by sector and state.

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The main determinants of future labor supply and demand are those associated with the performance of the state and regional economies. In the case of construction trades, for example, the amount of investment in the economy is the key determinant of the level of construction activity and the demand for construction trades. Population and overall labor force growth are important factors behind the supply of labor available to the construction industry as well as other industries. These determinants will be embedded in the macro-economic model at the state level.

The CWDC craft labor forecasting system is specific to the construction sector; therefore, a macro-economic model has not yet been developed for the United States. However, when fully developed, it can produce information that can be used in forecasts of the demand and supply for any of the occupations or trades in the economy. Although the macro-economic model can be used directly in other sectors' occupational forecasting, it may or may not be desirable to use the CWDC outlook produced by the models. The reason for this is that the CWDC forecast is determined with assumptions that mainly drive construction activity, such as major project announcements, against construction trade labor availability.

Other sectors could use the CWDC macro-economic outlook, or they could contract to develop an outlook based on a different set of assumptions to produce an industry-specific forecast. These assumptions would reflect the views of that sector's LMI network, thereby leading to a different macro-economic forecast.

An annual macro-economic outlook could be produced, and this approach could be shared and adapted by other industry groups. A significant part of the macro-economic modeling system is setting up a base-case forecast.

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## 7. Who Is Using The CWDC LMI?

Although the Canadian CSC model is only six years old, their craft labor forecasting program is well known and highly regarded within the Canadian construction industry as well as in other countries. It is used by thousands of construction industry stakeholders, including businesses, contractors, governments, industry associations, labor organizations, and educational institutions. It is regarded as being very applicable, relevant, and representative of the industry by an overwhelming majority of industry stakeholders and users. The CSC examined the use, value, and impact of the Canadian craft labor forecasting program through an industry stakeholder survey and focus-group discussions. In total, 350 survey responses and 43 focus-group participants contributed to the findings, the results of which are displayed below.

Launched in phases beginning in early 2009, the CWDC model has met with a groundswell of support in the U.S. construction industry. However, although we expect the user experience to be similar, we believe that more growth is essential before we can effectively gather most of these metrics.

<b>Who Uses the LMI Model?</b>		
<b><u>User</u></b>	<b><u>Canada</u></b>	<b><u>United States</u></b>
Government	27%	1%
Industry Associations	24%	7%
Owners	18%	50%
Contractors	18%	34%
Labor Groups	16%	3%
Education	10%	0%
Local User Councils	n/a	5%

U.S. metric as of 10/9/09

## How is the LMI Model Used?

**Q1: In what capacity do you use the LMI tool?**

	<u>Canada</u>	<u>United States</u>
Policy and decision making	61%	Insufficient Data
Training / apprenticeship program planning	60%	Insufficient Data
Construction project planning and scheduling	24%	Insufficient Data
Staffing (employee requirements) and recruiting	22%	Insufficient Data

## How is the LMI Model Used?

**Q2: For what specific purpose do you use the LMI tool?**

	<u>Canada</u>	<u>United States</u>
Identify and evaluate human resource challenges	78%	Insufficient Data
General information	69%	Insufficient Data
Make or support policy changes	52%	Insufficient Data
Overcome human resource challenges	42%	Insufficient Data
Make sound budgeting and planning decisions	27%	Insufficient Data
Help minimize business risks	21%	Insufficient Data
Identify and evaluate business opportunities	16%	Insufficient Data

### How valuable is the LMI?

General consensus in both Canada and the United States is that craft labor forecasts are very applicable, relevant, and representative of industry. Responses in Canada ranged from valuable to very valuable, and in the U.S., anecdotal evidence indicates a similar level of appreciation and appetite for the



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tool. None of the respondents regarded the craft labor forecasting model as without value.

## **8. User Benefits**

By collecting and analyzing data from a range of sources across the construction trades, the craft labor forecast system will provide a wealth of information for all key stakeholders in the construction industry by:

- ▲ Reliable measures of future activity, training needs, and demographics of the industry generally and for specific crafts, rather than statistical trend lines
- ▲ Timely data to assist construction owners with project and shutdown planning
- ▲ Providing easy access for inputting and updating data on a regular basis, rather than relying on periodic surveys
- ▲ Employing common methodology and facilitating broad owner and contractor participation
- ▲ Providing customized reporting and internal project forecasting
- ▲ Providing tools to assist owners in determining and inputting craft requirement data
- ▲ Providing research information that can be used for writing occupational profiles for the construction industry
- ▲ Providing research information that can be used as part of an economic background information package, and to offer concrete, well-sourced figures for industry and government reports
- ▲ Demonstrating stable employment to help maintain currently employed workers, attract experienced workers back to the industry, and recruit qualified new apprentices

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In terms of planning, the craft labor forecasts provide industry-specific data about:

- ▲ The crafts in demand within the construction sector
- ▲ The nature of this demand (key major projects driving demand)
- ▲ The supply of craft labor that is currently employed, which crafts are being hired, and the confidence level for finding and training those workers
- ▲ Trends in the industry that can be passed on, with confidence, to workers, potential workers, and employers. These are used to increase the overall understanding of labor strains in the sector and to assist with planning for skilled worker requirements over the next five years

Regionally, the craft labor forecast data can:

- ▲ Provide a good overview of economic activity in the area
- ▲ Forecast local and regional labor demand and identify excess labor resources that can be utilized in regions experiencing labor shortages
- ▲ Assist in evaluating general economic forecasts by providing an independent assessment of the trends in the construction sector
- ▲ Provide useful information for planning regarding apprenticeship training needs related to proposed projects and labor requirements
- ▲ Help develop a better understanding of regional demand/supply imbalances by craft and aid in establishing long-term supply-side strategies.

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## 9. Summary

In conclusion, the Canadian experience over the past six years in the development of a craft labor forecasting program has taught that this type of forecasting approach must be industry-specific and can be successful only if it is developed in response to an industry-identified need. It is too labor-intensive and too comprehensive to be embarked upon without significant industry support and input, and existing expertise.

The craft labor forecasting model must be built in the context of the specific industry (e.g., the CWDC craft labor forecasting model is focused on construction), reflecting those realities and incorporating the factors that drive and in all ways affect the structure and functioning of the industry. This is not a “one size fits all” model.

Through the involvement and reach of CURT, it is clear that an industry-identified need exists in the U.S., and that the CWDC Labor Supply/Demand Forecasting model is well on its way to meeting that need through a reliable, confidential, easy-to-use, web-based tool.



# Construction Users Roundtable Publications

The purpose of developing Construction Users Roundtable (CURT) publications is to disseminate recommendations, guidelines, and reports developed by the Construction Users Roundtable. CURT is focused on improving the cost effectiveness of the U.S. construction industry. These publications have been developed from the point of view of owners or users of construction services. Efforts by all segments of the industry, however, are vital if major improvement is to be the result.

This publication is one of a series from committees or study teams addressing a problem area.

Findings and recommendations of The Construction Users Roundtable are included in publication series classified as White Papers (WP), Reports (R), or User Practices (UP). In addition to these classifications, CURT publications are numbered based on the category of the topic:

Category	Number Code
Constructability	011 to 099
Contractor Management	101 to 199
Cost	201 to 299
Interface Management	301 to 399
Workforce/Industrial Relations	401 to 499
Material Control	501 to 599
Purchasing	601 to 699
Quality	701 to 799
Safety	801 to 899
Security	901 to 999
Strategy	1001 to 1009
Work Planning and Scheduling	1101 to 1199
Technology/E-Sourcing	1201 to 1299
Special Projects	2001 to 2099

## Examples:

WP-1201: A CURT White Paper on Reverse Auction

R-402: A CURT Report on Tripartite Initiatives

UP-801: A CURT User Practice on Construction Safety in Contractor Prequalification

# Available CURT Publications

## White Papers

- WP 401 Confronting the Skilled Workforce Shortage
- WP 1003 Construction Strategy: Optimizing the Construction Process
- WP 1201 Guidelines on the Use of Reverse Auction Technology
- WP 1202 Collaboration, Integrated Information and the Project Life Cycle in Building Design, Construction and Operation

## Reports

- R 402 CURT Tripartite Initiative Executive Summary
- R 402A CURT Tripartite Study on Extended overtime on Construction Projects
- R 402B Reducing Absenteeism Report
- R-402C Tripartite Initiative Report: Eliminating Work Disruptions and Jurisdictional Disputes
- R-405 CURT Tripartite Initiative Report: Project Stakeholder Responsibilities
- R 807, Construction Owners' Safety Blueprint

## User Practices

- UP 101 Construction Measures: Key Performance Indicators
- UP 201 Construction Project Controls: Cost, Schedule, and Change Management
- UP 403 Construction Labor: Managing the Construction Workforce
- UP 601 Construction Purchasing: Capital Purchasing & Contracting
- UP 701 Construction Quality: Achieving Quality on Capital Projects and Craft Worker Prequalification
- UP 801 Construction Safety: Contractor and Craft Worker Prequalification
- UP 802 Construction Safety: The Owner's Role
- UP 803 Construction Safety: Pre-Bid and Bid Clarification Meetings
- UP 804 Construction Safety: Contract Terms and Conditions
- UP 805 Construction Safety: Monitoring Performance
- UP 806 Construction Safety: Improving Safety Programs
- UP 1001 Construction Strategy: Selecting Contracting Strategies
- UP 1002 Construction Strategy: Selecting the Right Contractor

## **Tools**

- T 404 Construction Labor: Craft Employee Training Evaluation Tool
- T 808 Construction Safety: Owner Safety Blueprint Assessment Tool

## **Training Modules**

- TM 809 Construction Owners' Safety Blueprint Training Module

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