



**CONSTRUCTION USERS  
AND INNOVATION**

**Construction Users Roundtable  
Membership Meeting**

Presented by the  
**Construction Innovation Forum**

Rasha Stino, Ph.D. – Editor  
Robert I. Carr, Ph.D., P.E. – Founding Director  
Tim Alter – Chair, Executive Committee

Dearborn, Michigan  
April 29, 2004

- Good afternoon
- My name is Tim Alter
- I am the Construction Innovation Forum Executive Committee Chair and
- With me today is Rasha Stino and Bob Carr
- Rasha is CIF Editor and an Executive Committee Member.
- Bob is a CIF Founding Director, Vice-Chairman Emeritus, and Founder of the NOVA Award.



- We are here today to propose a **COLLABORATION** between CURT and CIF.
- The purpose of such a relationship would be to increase the pace of innovation in our industry



## OUR GOALS ARE ONE

### CURT/Owners

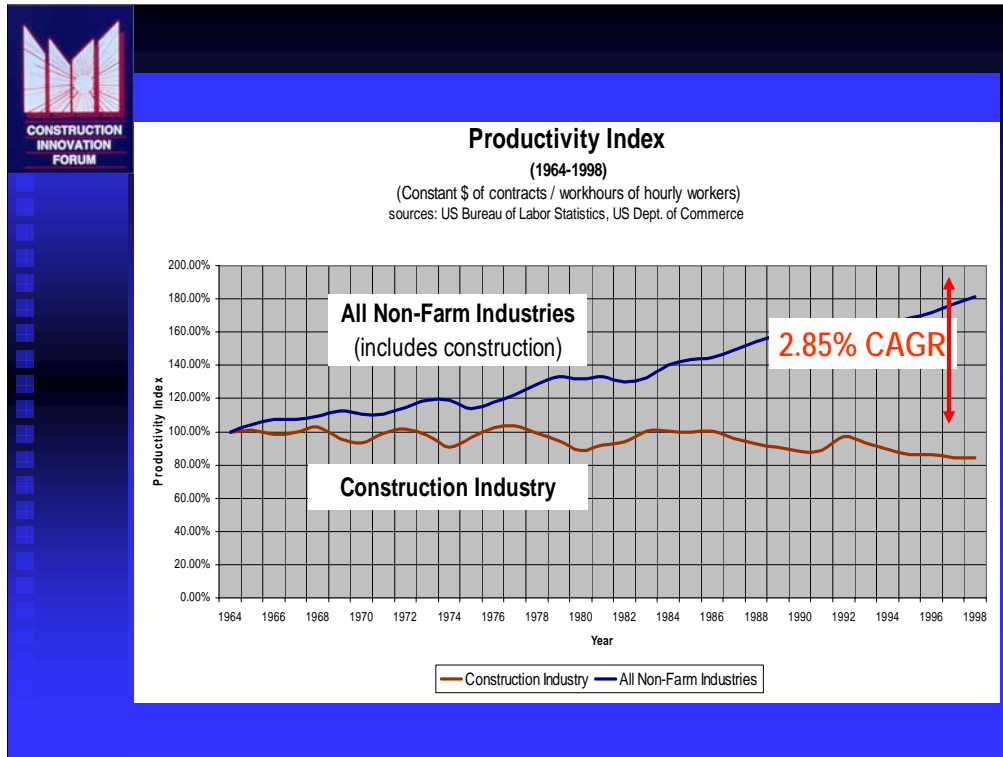
Recognize construction excellence, promote industry best practices and drive improvements in construction performance

### CIF

Recognize, promote and disseminate information on innovations that improve quality and cost effectiveness of construction

**We at CURT and CIF share the same cause**

**As you can see our goals are in alignment**



•This slide illustrates that productivity in the construction industry is not keeping pace with other industries

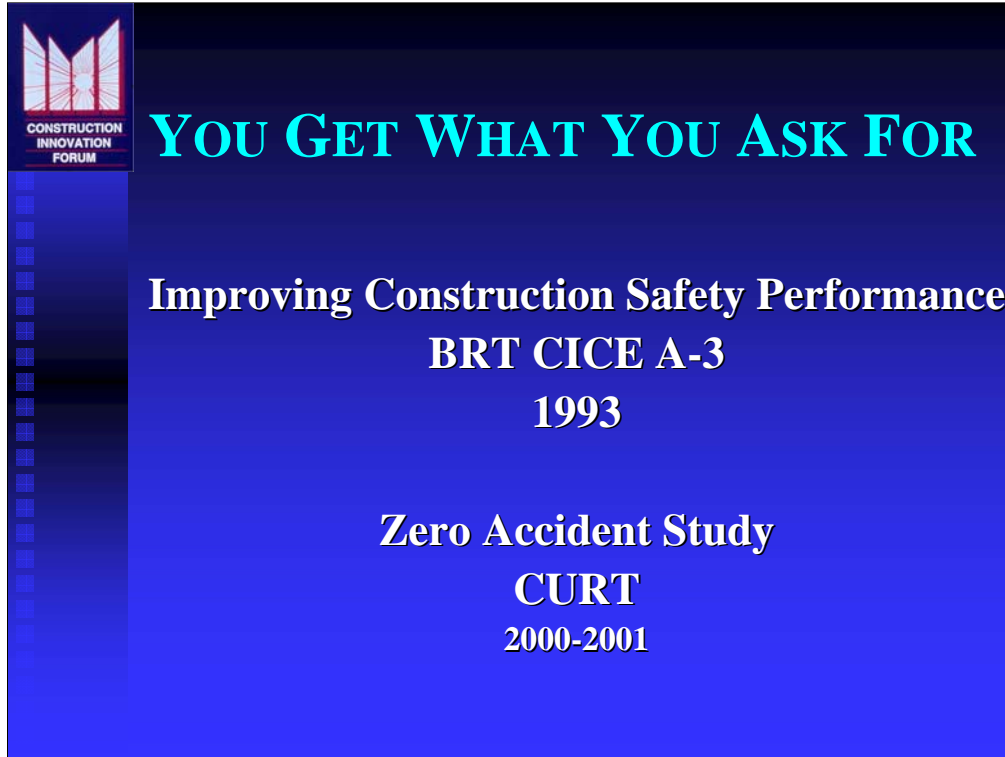
•Innovation is one of the most significant drivers of productivity.

•Our industry needs significant improvement and we need it now

In the Electronics industry 2 years and a computer is obsolete

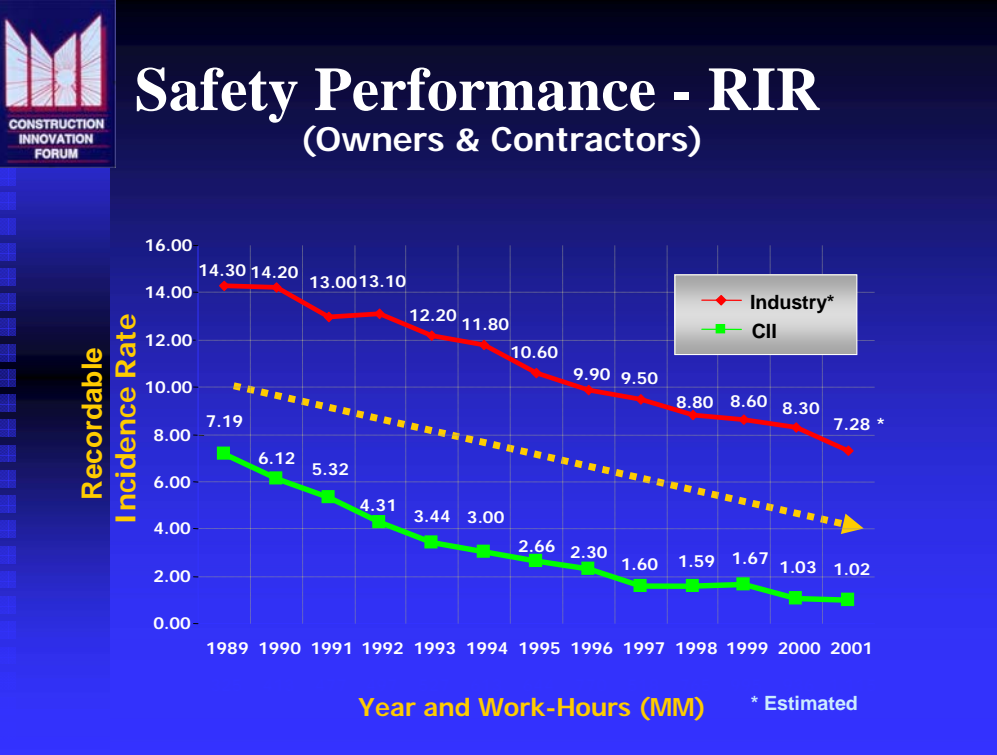
In the construction industry we use the same means and methods for decades

We are not keeping pace with the rest of the world



**We believe at CIF that you get what you ask for**

**Owners asked for construction safety improvement in 1993  
and again in 2001**



**YOU GOT RESULTS!**

**Owners have had a positive positive impact on improving safety performance in the construction industry.**

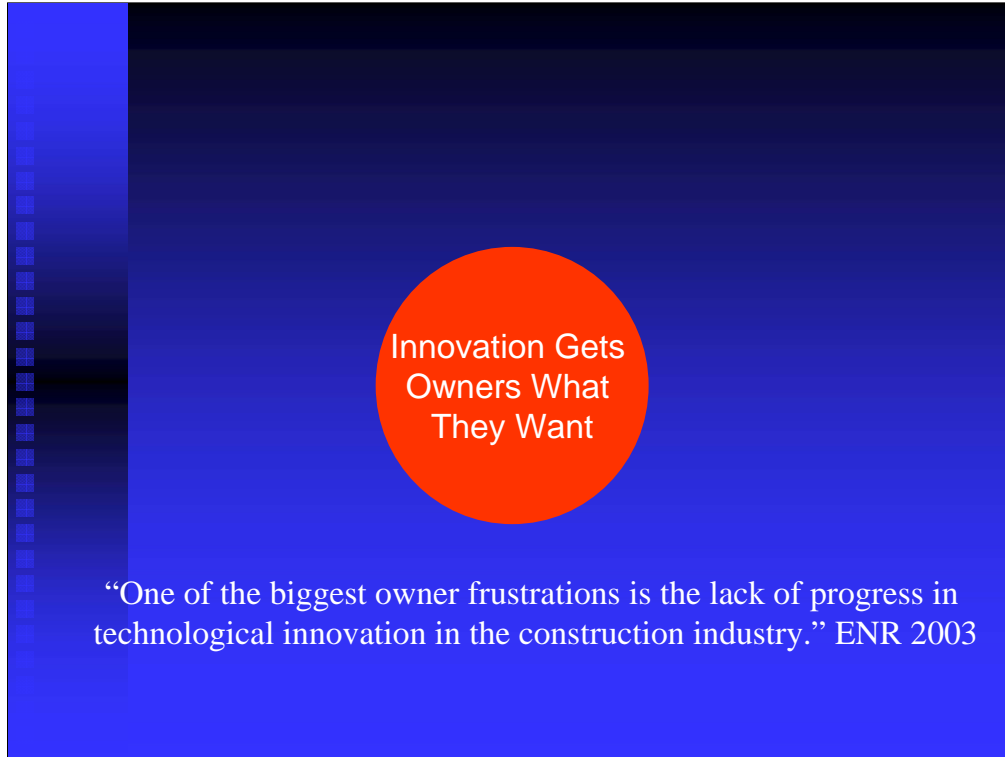


**CURT and CIF can Improve the Pace of Innovation in Construction**

**We performed a survey of your organization two weeks ago regarding innovation**

**Rasha will review those results with you now**

**Rasha**



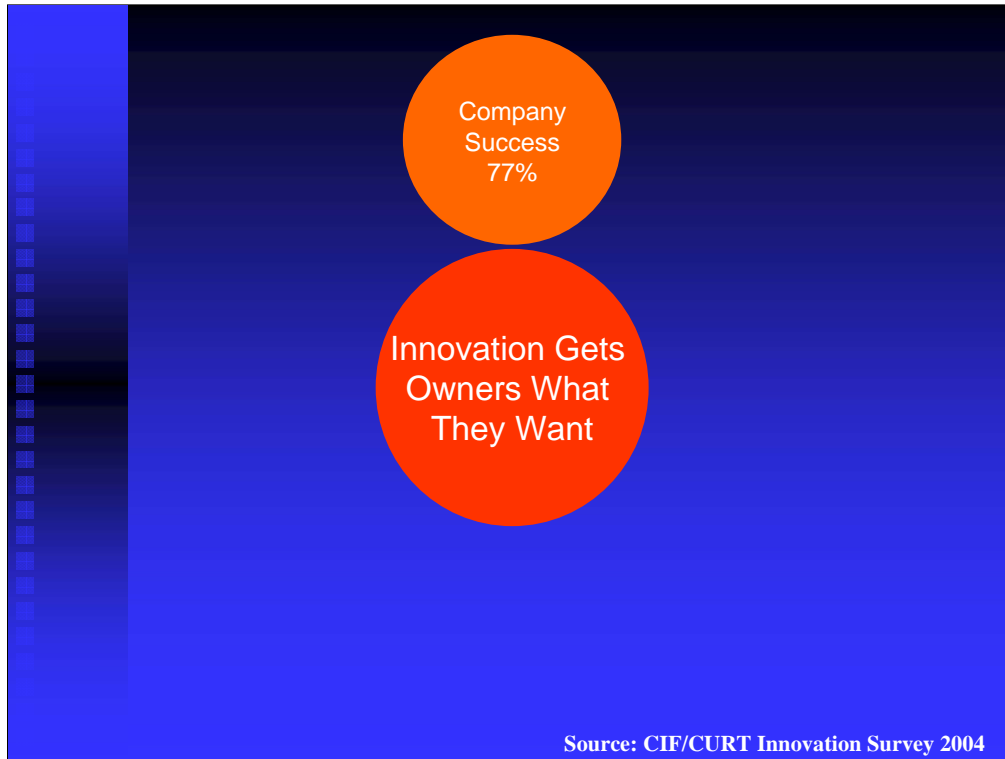
•Thank you, Tim

•Owners have clearly been expressing concern over the pace of change in construction. In fact CURT Owners stated that, (read quote from 2002 ENR).

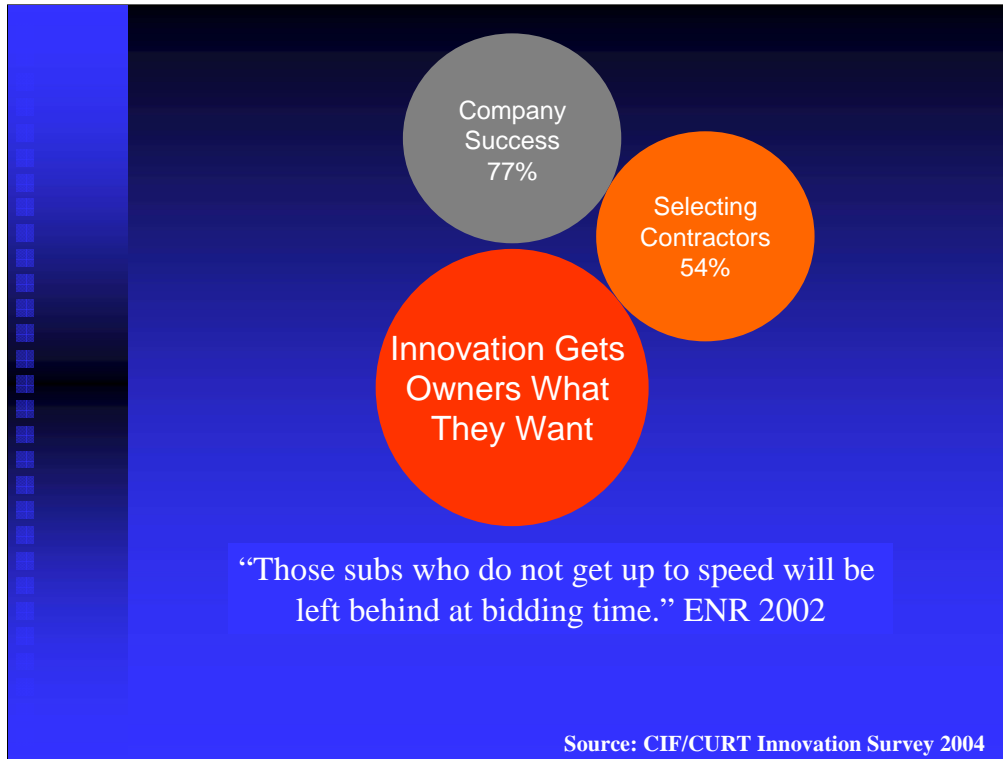
•This survey gave us the opportunity to quantify and better understand your opinions and preferences regarding construction innovation.

•We had an excellent response rate. 47 of you responded to our survey and this is what you had to say:



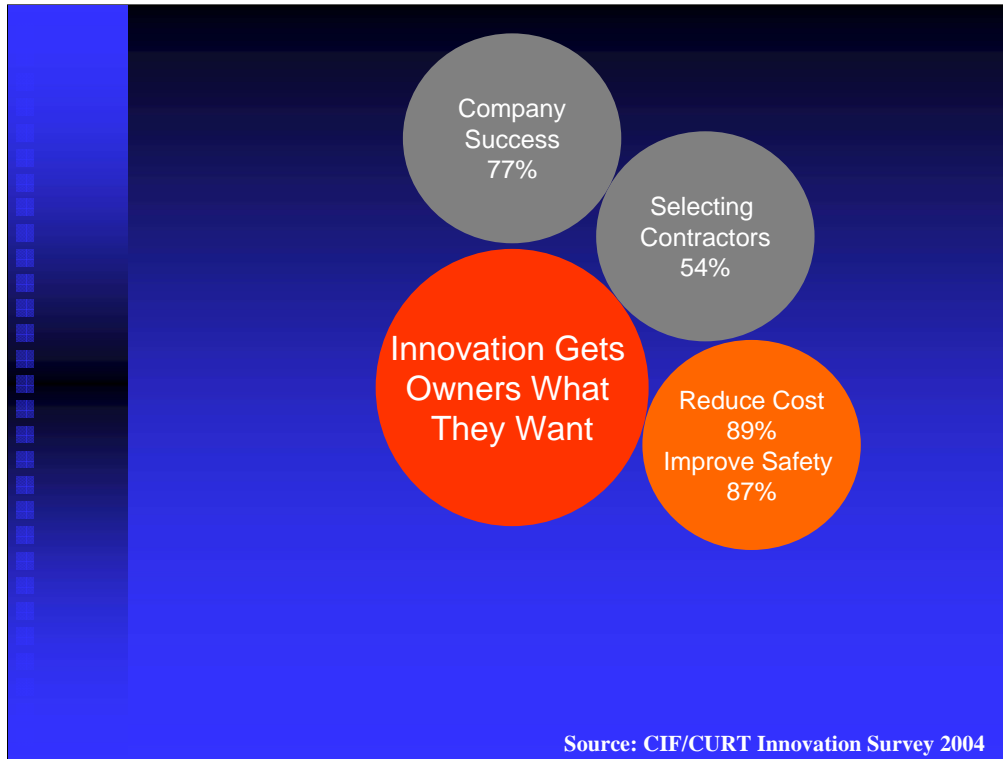


**•77% find innovation in the construction industry important to crucial to your company's success**



•More than half of you believe that innovation is an important factor in selecting contractors to perform construction work for your company.

•This is an important message to the contracting community, in fact, in a 2002 ENR article, Owners and CURT Members indicated that contractors who are not up to speed are left behind at bidding time.



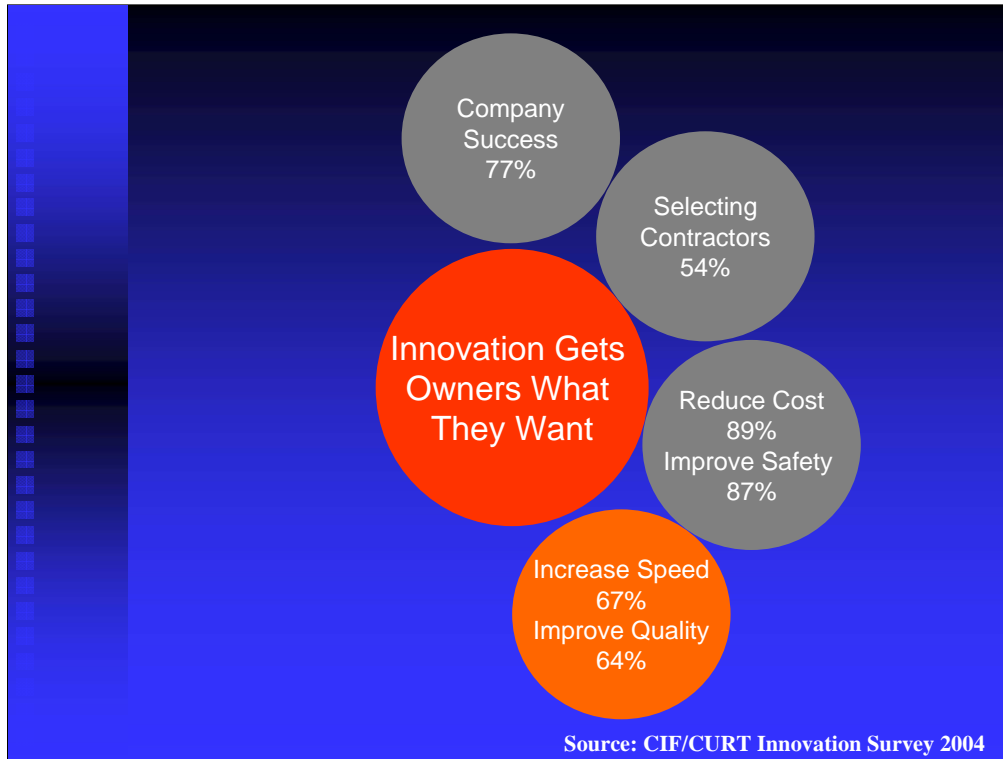
•When asked to rank the criteria that you found most important in deciding to use an innovation on your construction projects:

•Almost 90% of you ranked Reduces Construction Cost and Improves Worker Safety in the top 3 criteria.

OR

•89% of you placed Reduces Construction Cost in the top 3

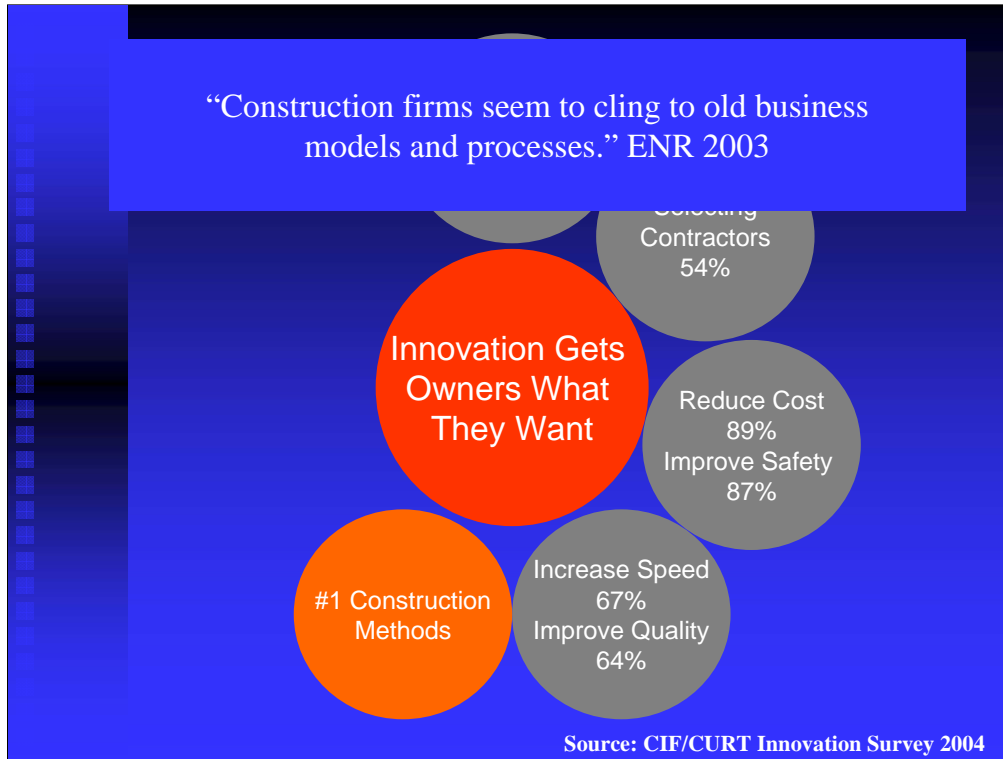
•87% placed Improves Worker Safety in the top 3



•About two-thirds of you feel that:

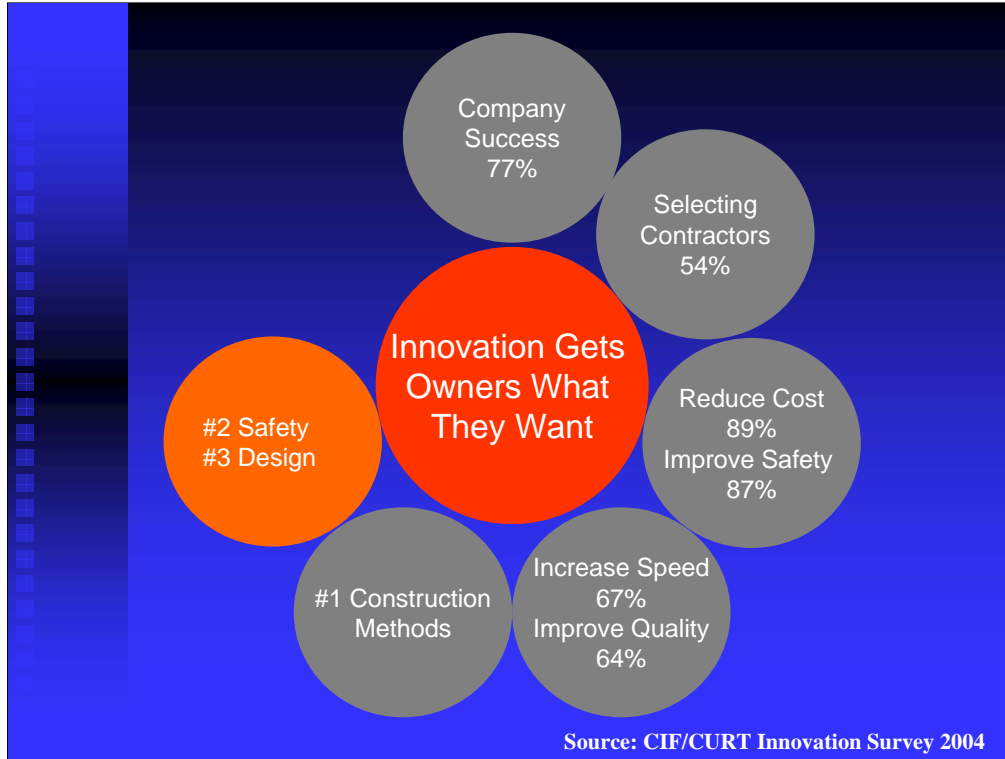
- Increasing Construction Speed &
- Improving Project Quality

are a close tie in the top three criteria for selecting an innovation for your construction projects.



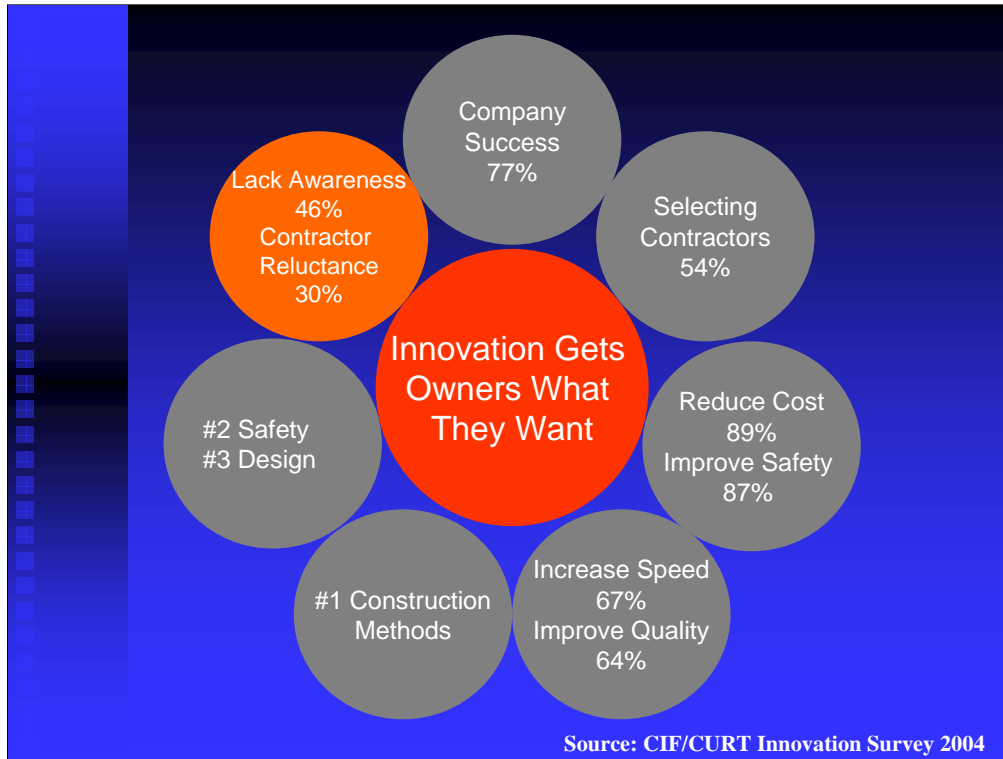
**Next, we asked you which segments of the construction industry are in most need of innovation:**

- **Construction Methods came in as the #1 area in most need of innovation, or as you put it (read ENR quote)**



•Worker Safety was ranked as the second segment in most need of innovation, followed by

•Design at #3 (in fact, Owners/CURT noted in the 2003 ENR article that the design community, like the contracting community, is not taking advantage of technological innovation).



•Finally, when asked “What is the greatest barrier to incorporating innovations on your construction projects?”

•46% of you identified “Lack of awareness about applicable innovations,” and

•30% of you identified “Reluctance on the part of contractors.”

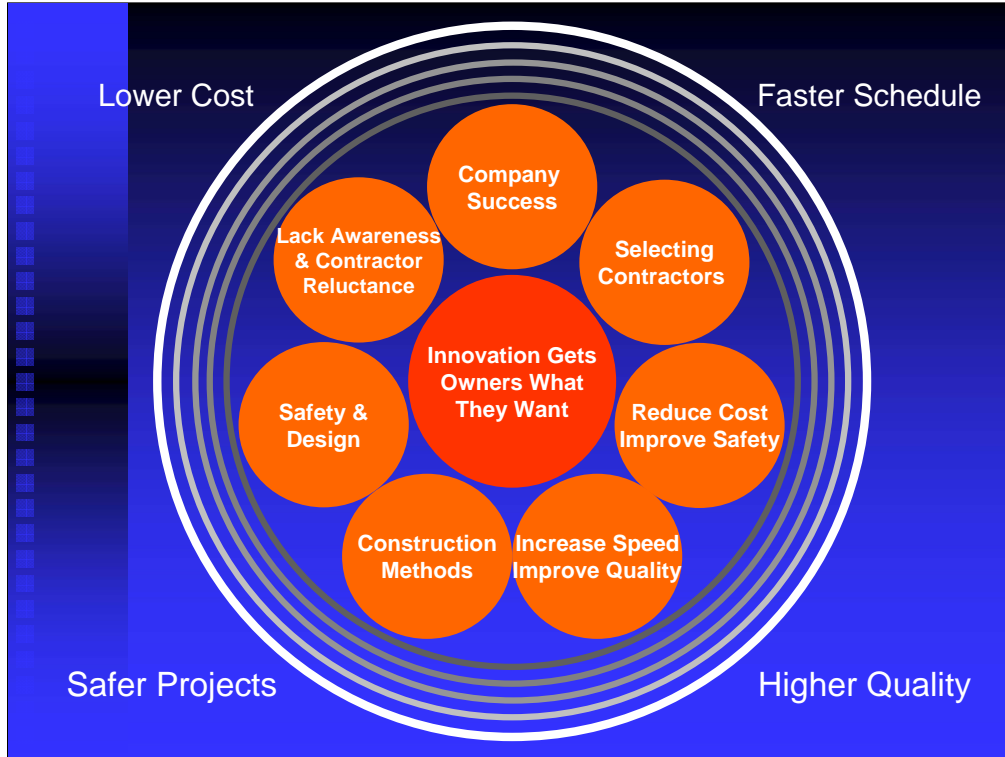
•Other individual answers were:

“Unwillingness to take risk, i.e. be first to prototype.”

“Whole concept of innovation not part of construction culture.”

“The OWNER has to REQUIRE innovation from suppliers or IT WILL NOT HAPPEN.” (Emphasis by respondent)

“Risk aversion”



•As Tim stated earlier, we believe that you get what you ask for. As Owners and Members of CURT you can and ARE DRIVING improvements in the construction industry that have and will continue to bring about progressively better Industry Practices.

- Owners/CURT Driving construction innovation can lead to:
  - More Cost effective projects
  - Faster Schedules
  - Safer Projects and
  - Higher Quality Work





**Rasha: Next, Bob will discuss the Construction Innovation Forum's various efforts to deliver construction innovations to you, the Owners, and the construction industry....Bob**

**Bob: CIF is a grass-roots, all inclusive, industry wide, 501.c.3 organization formed in 1986 to recognize and encourage innovation in construction.**



**CIF created the NOVA Awards in 1989 to recognize the most outstanding innovations worldwide that have proven to improve quality and reduce costs.**



- Among construction awards, the NOVA Award is unique.
  - First, it addresses the full breadth of facility construction and maintenance.
  - Second, CIF itself identifies important innovations and directly solicits their nomination. (This produces two-thirds of the nominations received.)
  - Third, the 475 nominated innovations form a unique database.
  - Fourth, the Jury selects a short-list of the best 7 to 10 innovations for in-depth CIF investigation.
  - Fifth, the Jury selects NOVA Award winners based on the investigations.
  - Sixth, CIF prepares a script and a video on each winning innovation, which is shown at the Banquet and distributed broadly.



## NOVA AWARD WINNING INNOVATIONS INCLUDE

- Safety and training
- Green construction
- Advanced imaging
- On-site child care
- Modular design
- Seismic/dynamics
- Concrete technology
- 3D as-built drawings
- Labor/management
- Non-destructive testing
- Subsurface exploration
- Performance monitoring
- Moisture protection
- Advanced structures
- Control systems
- Composite structures
- Innovative projects
- Automation

•The CIF has presented 63 NOVA Awards, originating in 11 countries, over its 15 years.


•NOVA Award innovations span construction, from safety and training to advanced imaging, to on-site child care to automation to moisture protection.



## OWNER DRIVEN/INVOLVED NOVA AWARDS


Massachusetts Water Resources Authority Effluent Outfall Tunnel Ventilation	Consumers Power Palisades Steam Generator Replacement
Phillips Petroleum EKOFISK Protective Barrier	Iowa Department of Transportation Paradigm In-Place Concrete Recycling
U.S. Department of Defense Electro-Osmotic Pulse	British Gas Pipebursting
Chesapeake Bay Foundation Green Building Technologies	Canadian Pacific Rail Railroad Tunnel Ventilation System
U.S. Postal Service Kit of Parts	City of New York Recycled Plastic Timber
DTE Energy Laser Scanning 3D As-Building	Rockwell International Retrofit of Seismic Isolators
General Motors Corporation Mobile Parapet for Roof Edges	Michigan Department of Transportation Concrete Maturity and Temperature
Electric Power Industry MOST Boilermaker Programs	Massachusetts Turnpike Authority Concrete Tunnel Jacking
Ford Motor Rouge Complex Sustainability	

**These 17 NOVA Award innovations directly involved construction owners. I will show several of them.**



# OWNER DRIVEN/INVOLVED NOVA AWARDS

<p>Massachusetts Water Resources Authority Effluent Outfall Tunnel Ventilation</p> <p>Phillips Petroleum EKOFISK Protective Barrier</p> <p>U.S. Department of Defense Electro-Osmotic Pulse</p> <p>Chesapeake Bay Foundation Green Building Technologies</p> <p>U.S. Postal Service Kit of Parts</p> <p>DTE Energy Laser Scanning 3D As-Building</p> <p>General Motors Corporation Mobile Parapet for Roof Edges</p> <p><b>Electric Power Industry MOST Boilermaker Programs</b></p> <p>Ford Motor Rouge Complex Sustainability</p>	<p>Consumers Power Palisades Steam Generator Replacement</p> <p>Iowa Department of Transportation Paradigm In-Place Concrete Recycling</p> <p>British Gas Pipebursting</p> <p>Canadian Pacific Rail Railroad Tunnel Ventilation System</p>
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Year	Lost Time Injuries per 100 Workers
1990	13.54
1991	8.42
1992	7.24
1993	6.96
1994	3.64
1995	2.58
1996	2.30
1997	0.70

- Major power plant owners, contractors, and the Boilermakers created the MOST nationwide programs in safety, drug testing, welder qualification, and project manning
- This reduced boilermaker lost-time injury rates by 95%, from 13.54 injuries per 100 workers to 0.70 in seven years and saved owners a billion dollars.
- This inspired Detroit area building trades, contractors, and owners to develop the “Safe2Work” program.
- These, in turn, inspired the AFL-CIO Building Trades to institute the “Smarter Skills and Security System” nationally.

**CONSTRUCTION INNOVATION FORUM**

## OWNER DRIVEN/INVOLVED NOVA AWARDS

- Massachusetts Water Resources Authority  
Effluent Outfall Tunnel Ventilation
- Phillips Petroleum  
EKOFISK Protective Barrier**
- U.S. Department of Defense  
Electro-Osmotic Pulse
- Chesapeake Bay Foundation  
Green Building Technologies
- U.S. Postal Service  
Kit of Parts
- DTE Energy  
Laser Scanning 3D As-Building
- General Motors Corporation  
Mobile Parapet for Roof Edges
- Electric Power Industry  
MOST Boilermaker Programs
- Ford Motor  
Rouge Complex Sustainability
- City of New York  
Recycled Plastic Timber
- Rockwell International  
Retrofit of Seismic Isolators
- Michigan Department of Transportation  
Concrete Maturity and Temperature
- Massachusetts Turnpike Authority  
Concrete Tunnel Jacking

- In one short North Sea construction season, Phillips Petroleum built a massive circular concrete sea wall to protect Ekofisk, its largest North Sea oil field.
- The base was cast in two halves at Rotterdam, Holland, then shipped to Alfjord, Norway for additional slip forming.
- The two halves were then floated and towed into position, joined by post-tensioning, and sunk using gravel ballast.



# OWNER DRIVEN/INVOLVED NOVA AWARDS

Massachusetts Water Resources Authority  
Effluent Outfall Tunnel Ventilation

Consumers Power  
Palisades Steam Generator Replacement

Phillips Petroleum  
EKOFISK Protective Barrier

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Paradigm In-Place Concrete Recycling

U.S. Department of Defense  
Electro-Osmotic Pulse

Chesapeake Bay Foundation  
Green Building Technologies

U.S. Postal Service  
Kit of Parts

**DTE Energy  
Laser Scanning 3D As-Building**

General Motors Corporation  
Mobile Parapet for Roof Edges

Electric Power Industry  
MOST Boilermaker Programs

Ford Motor  
Rouge Complex Sustainability





- On its Monroe Power Plant retrofit, DTE Energy set contractor innovation as a primary contract criteria.
- Laser scanning 3D as-builting was one of the innovations employed, and it alone saved 10 million dollars.



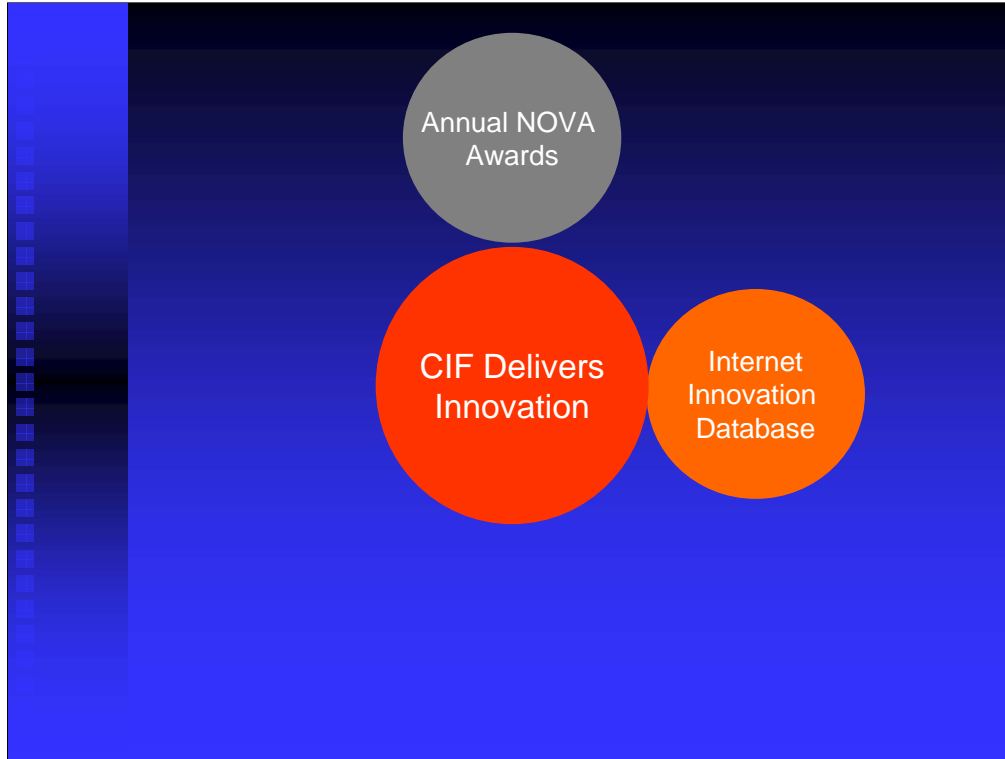
**CONSTRUCTION INNOVATION FORUM**

## OWNER DRIVEN/INVOLVED NOVA AWARDS

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Ford Motor Rouge Complex Sustainability			

•British Gas, PLC of the UK developed the pipebursting machine, which is now used widely to replace old and undersize gas and sewer lines.

•The pipebursting machine is pulled through fracturable pipes, such as concrete, clay, or cast iron pipes, breaking the pipe into pieces, and pulling into place a new plastic pipe of the same or larger size.



**The CURT survey showed the greatest barrier to incorporating innovations in your projects is lack of awareness of applicable innovations.**

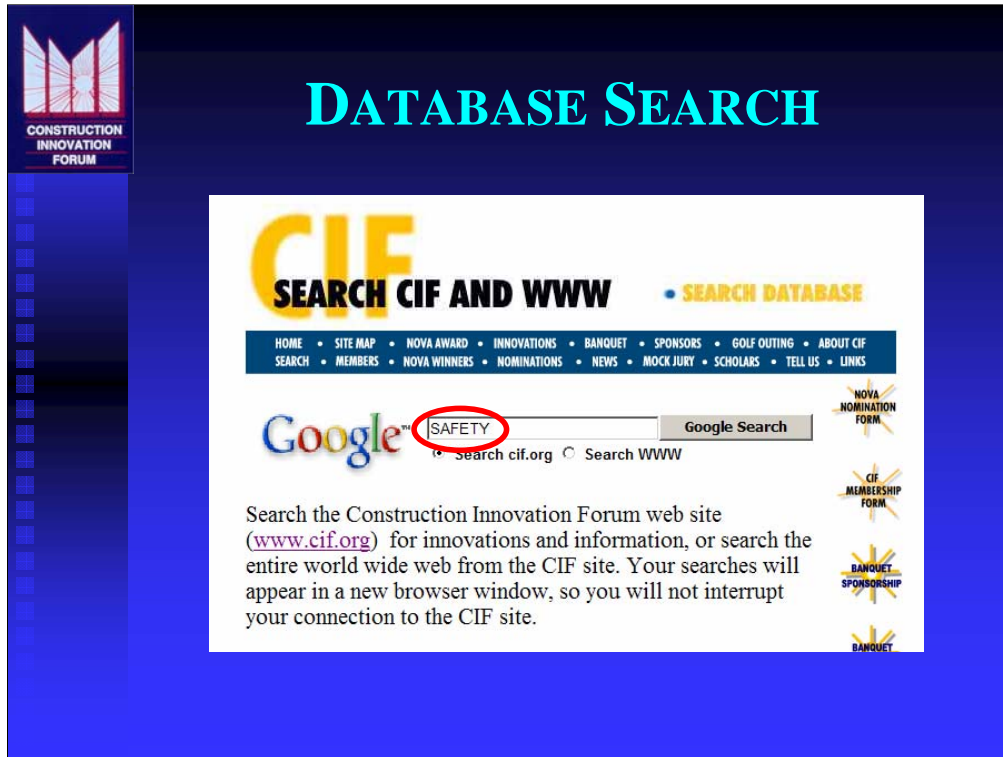
**The 475 construction innovations in the free internet searchable CIF database provides one solution.**

The screenshot shows the homepage of the Construction Innovation Forum. At the top left is the CIF logo. The main header features the URL [www.cif.org](http://www.cif.org) in large blue letters. Below this is a banner for the "CONSTRUCTION INNOVATION FORUM" with a silhouette of a construction worker. A navigation menu includes links for NOVA AWARD, SPONSORS, INNOVATIONS, BANQUET, GOLF OUTING, and ABOUT CIF. A secondary menu contains links for SITE MAP, NOVA AWARD, INNOVATIONS, BANQUET, SPONSORS, GOLF OUTING, ABOUT CIF, MEMBERS, NOVA WINNERS, NOMINATIONS, NEWS, MOCK JURY, SCHOLARS, TELL US, and LINKS. The "SEARCH" link in the secondary menu is circled in red. The main content area includes a "Welcome to the Construction Innovation Forum" section, a "2004 NOVA Awards Banquet" announcement, a "2004 Nominations Are Here" section, and a "Be a NOVA Award Sponsor" section.

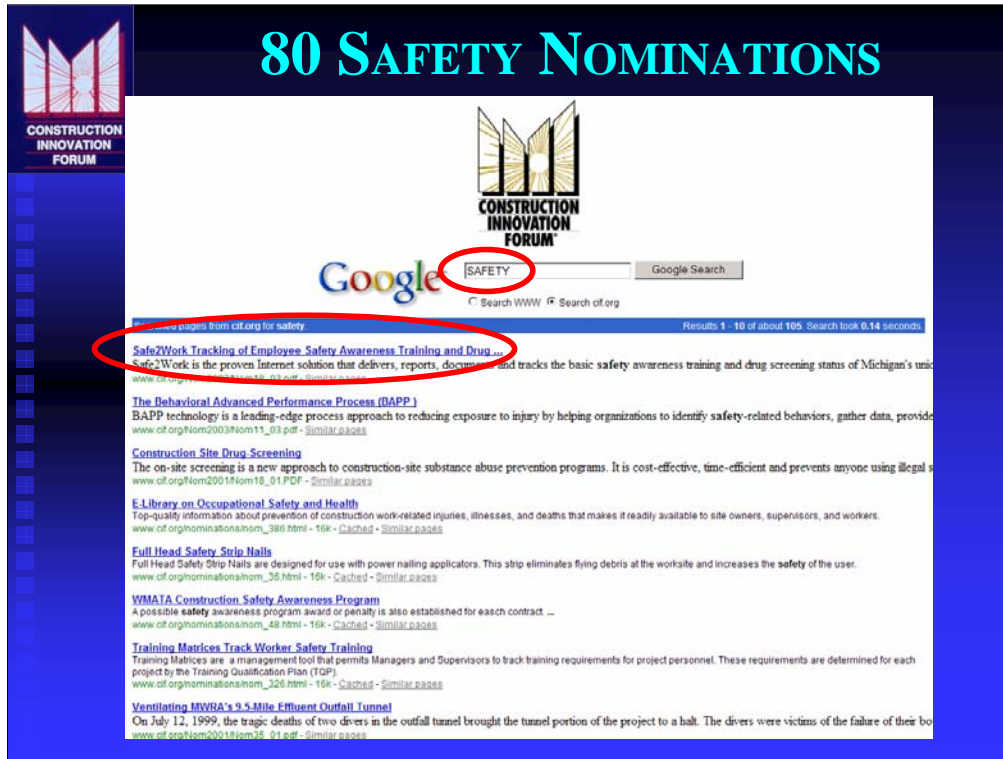
•The “search” hyperlink at cif.org links to a Google search of the CIF database.

•Entering one or more keywords for the Google search, “safety” in this example, pulls up a list of relevant innovations, shown here, of which there are 80 innovations involving safety.

•Each item’s hyperlink, “Safe2Work” in this example, links to a description of the innovation and a point of contact for additional information.



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# “SAFE 2 WORK”

INTERNET TRACKING OF WORKER STATUS

2003 Nova Award Nomination 18

## Safe2Work

### Tracking of Employee Safety Awareness Training and Drug Screening Status

#### What the innovation is:

Safe2Work is the proven Internet solution that delivers, reports, documents and tracks the basic safety awareness training and drug screening status of Michigan's unionized construction population. It provides verification of individual worker's drug test status and safety training status - all in one, centralized, online database location. Safe2Work™ simplifies record keeping for safety professionals and company administrators at all levels. It accurately and reliably reports the workforce readiness of a very mobile employee population from wherever there is Internet access, 24 hours a day. Currently, Safe2Work™ documents and tracks 30,000 drug tests annually and records the 50,000 mastered, online, safety-training tests of 10,800 workers. (This increases each month.)

#### Where and when it originated:

The planning of the Safe2Work™ Program began in 1998 as a collaborative effort among the Safety Committee of the Great Lakes Construction Alliance, Management and Unions Serving Together (M.U.S.T.) and Coastal Training Technologies Corp., Virginia. Its development culminated in the launching of the Safe2Work™ website on July 5, 2000.

#### Where it has been used, and is expected to be used in the future:

Poised to expand nationwide, Safe2Work™ currently serves the unionized construction population throughout the state of Michigan. First endorsed by Detroit Edison, the CDROM basic safety foundational awareness training of Safe2Work™ is (to date) part of the mandated bid package requirements for General Motors, Detroit Edison, Ford Motor Company and Daimler Chrysler.

Contact: Great Lakes Construction Alliance • 277 Gratiot, Suite 400 • Detroit, MI 48226 • 313-964-2662 • Fax 313-964-5511 • info@glca.cc • www.glca.cc • www.safe2work.com

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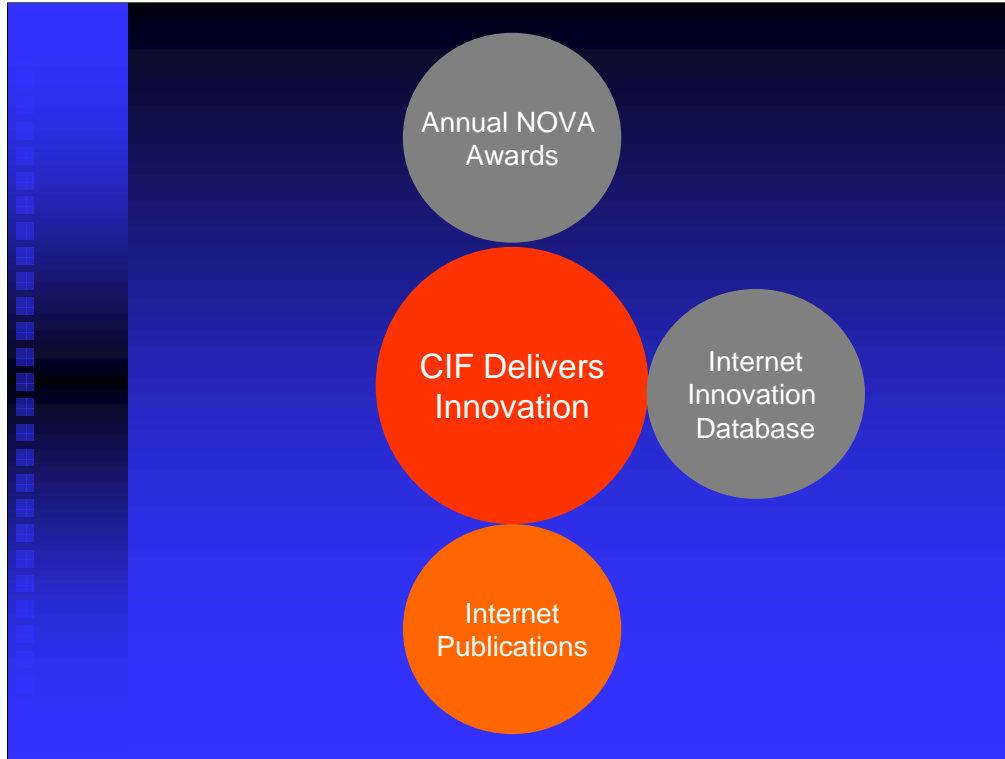


## INNOVATIONS IN DATABASE

■ Safety	80	■ Workers	126
■ Quality	68	■ Automation	46
■ Cost/Value	154	■ Manage	73
■ Structure	105	■ Contractor	87
■ Composite	68	■ Owner	48
■ Concrete	153	■ Seismic	23
■ Steel	129	■ Soil	46
■ Computer	77	■ Roof	45

**Note: Many innovations impact more than one area.**

**There are many innovations in the database on any construction topic**



- The CIF freely distributes publications via the internet on innovations and construction innovation research.**
- NOVA Award investigation reports are also available to researchers upon request.**



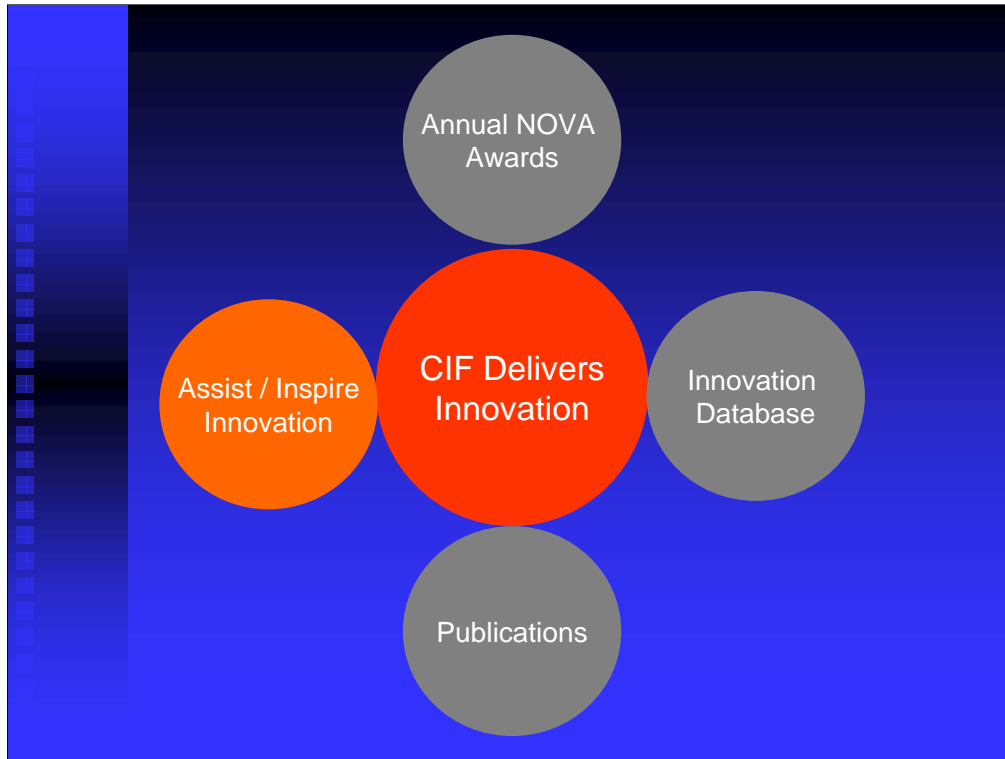


## CIF PUBLICATIONS AT WWW.CIF.ORG

- NOVA Nominations and their Annual Summaries
- “Annotated Bibliography of Construction Innovation”
- “Construction Industry Innovation” BRT Construction Conference
- “Construction Users and Innovation” (this presentation)
- Detroit Owners’ Role in Construction Improvement
- *Construction Business Review* “Technology” column
- Annual “Mock Jury Kit”
- Nomination Investigation Reports (w/ 5 yr delay)
- *Innovator* Newsletter

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**•Looking back 17 years, the CIF invented the term “construction innovation,” and its NOVA Awards proved “construction innovation” was alive and important and not just an oxymoron.**

**•The CIF assists other construction innovation awards and organizations, such as the CERF Construction Innovation Centers and the Charles Pankow Innovation Award.**

**•Just as the BRT CICE project inspired CERF, CII, CIF, and CIFE, the CIF and NOVA Award inspired a host of construction innovation initiatives worldwide, including those shown here.**



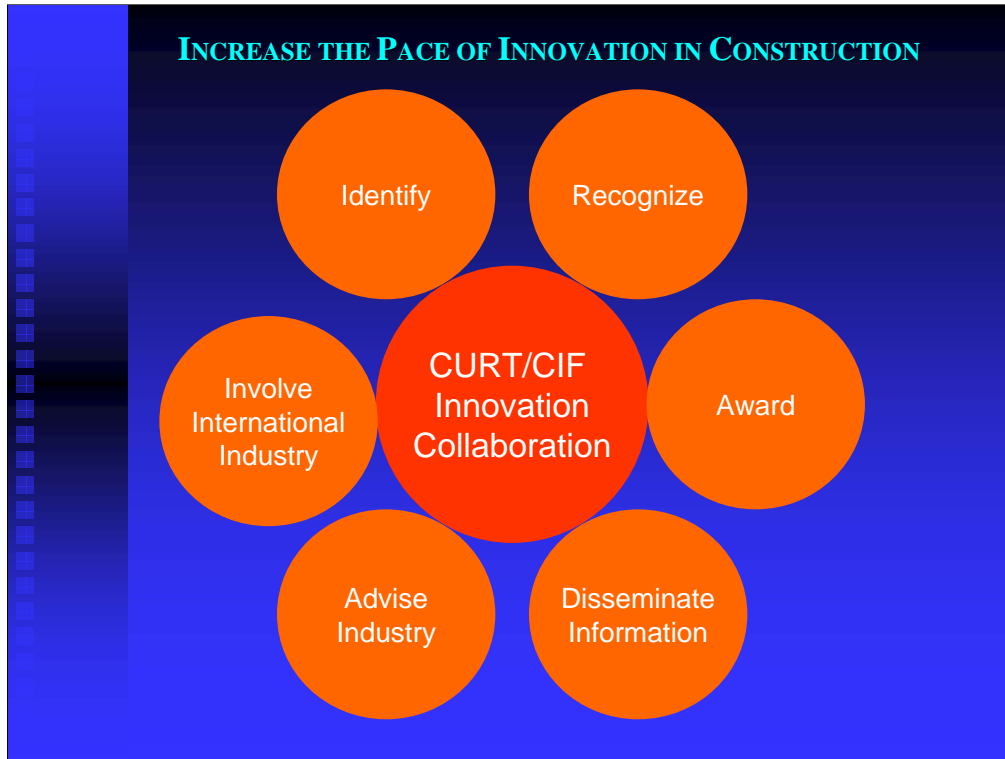
## ASSIST/INSPIRE INNOVATION PROGRAMS

- CERF Construction Innovation Centers & Pankow Award for Innovation
- Henry C. Turner Prize for Innovation in Construction Technology
- CII Emerging Technologies Project
- Great Lakes Construction Alliance (GLCA): Safe2Work Program & Gender and Race Diversification Excellence (GARDE) Award
- *Construction Innovation*, an ejournal by Arnold Journals On-Line
- *Construction Innovation*, quarterly, National Research Council, Canada
- Construction Innovation Forums 2001, 2003, National Steering Committee for Innovation in Construction, Canada:
- DTE Energy, City of Detroit, DuPont, General Motors, Michigan DOT, University of Michigan, BRT Construction Group
- Master of Science in Construction Innovation in UK: Loughborough University, Glasgow Caledonian University, University of Strathclyde
- Australian Center for Construction Innovation (ACCI)
- Cooperative Research Centre for Construction Innovation, Australia
- European Council for Construction, Research, Development, and Innovation (ECCREDI), European Commission, Belgium
- *Built Environment & Manufacturing Innovation*, bimonthly, Australia
- Int'l Council for Research & Innovation in Building & Construction (CIB) (1998)
- *Construction Business Review* and its monthly "Technology" column

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