

National Construction Forum: Moving Forward for Industry Solutions

**National Academy of Construction
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Executive Summary

The National Academy of Construction hosted its Second National Construction Forum in Alexandria, VA from November 16-17, 2011. The event brought together 35 representatives from 25 constituent groups, universities and NAC, to work together to develop work plans that would integrate the efforts of key construction industry organizations and improve the efficiency and effectiveness of the capital project process.

The Forum included sessions on creating synergies and leveraging efforts among the organizations represented, focusing on three issues identified as top priorities for the group: industry image; workforce development; and sharing of industry best practices. This publication outlines the details of the event, as well as consensus findings and a path forward.

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1. Introduction

This document describes the National Academy of Construction's (NAC)¹ continuing work to develop a forum for addressing the pressing needs of the construction industry. To that end, it describes the Second National Construction Forum (NCF) held in Alexandria, VA on November 16 and 17, 2011. The purpose of this effort is to further establish the NCF as a significant national voice for identifying and promoting awareness of major industry issues, and for integrating the efforts of key organizations to drive improved efficiency and effectiveness in the capital delivery process. Products of this Second NCF were envisioned as:

- Inter-organizational alignment
- Dialog and focus on three key industry workstreams: image, best practices and workforce development
- Preparation of workstream plans and actions
- Development of a consensus path forward

The vision for the National Construction Forum is that it becomes a significant national voice for identifying and promoting awareness of major industry issues, and for integrating the efforts of key organizations to drive improved efficiency and effectiveness in the capital delivery process.

The NCF's Core Steering Team² sees the NCF mission as convening annual workshops and other working groups to identify major issues impeding the development and deployment of work force and capital project best practices, and facilitating the formation and execution of work streams to resolve these issues.

The Purpose of the National Construction Forum is to provide a significant national voice for the engineering, design and construction industry to help drive positive change.

Genesis of NCF

The creation of the forum was first discussed within NAC in 2007. A core steering team was formed and met periodically over a two-year period to plan the effort. The consensus on the forum's vision and mission was that it should identify the most important issues facing the national engineering, design, and construction (EDC) industry (owners, contractors, financiers) and leverage the synergy that exists within the industry to tackle these issues. The intent is to do this without asking any single group to change what it does. Rather, the NAC would like to act as a neutral broker to help the industry as a whole leverage what each group does. In this way, the NCF can emerge as an industry voice. The purpose is to be the national voice (which is currently missing), to integrate efforts, to reduce

¹ For more information on NAC, see Appendix A.

² The NCF Core Steering Team is listed in Appendix B.

redundancy, and to drive improved efficiency and effectiveness. During the course of the steering committee meetings, the design for the inaugural NCF workshop was developed, including the meeting process, forum vision and mission, and meeting agenda.

The 105 members of the NAC met at its annual conference in late October of 2009 and discussed the forum; the membership was enthusiastic about its chance to change the industry. They were honored to be able to facilitate NCF meetings since the forum is comprised of so many remarkable individuals from all parts of the industry. There is no NAC staff to do this work, only volunteers stepping up to make it a reality. The number of people attending made the inaugural meeting interesting and exciting. Members of National Academy of Construction and others (the “Steering Team”) instrumental in developing and organizing the inaugural forum are given in Appendix B.

The first National Construction Forum was held on November 1 and 2, 2009. Twenty-seven participants represented 15 national EDC organizations, also included owners, designers, contractors and academics in total representing 25 employers. The results were published in NAC Publication 2010-1. Highlights of the meeting included alignment and consensus that the NCF is a good idea and NAC is an excellent organization to serve as a neutral broker in this effort. The meeting produced a list of issues that need to be addressed collectively as an industry and a path forward, including an evergreening process. Subsequently, a Leadership Team was formed and met in September 2010 in Houston, TX. Four consensus work streams were pared to three and actions assigned to move the process forward. The Second NCF was planned and conducted based on this effort.

Workshop Session Products and Structure

The focus of the Second NCF meeting was to develop credible action plans to begin addressing three key areas of concern for the constituent groups. The agenda for the meeting is given in Appendix C.

Welcome, Safety and Introductions

The Forum began on the evening of the 16th as many of the attendees gathered for mixer, dinner and brief overview of the meeting expectations. At the start of the meeting on the morning of the 17th, the mission and vision of the NCF and NAC were again discussed, a short safety topic was given, and then each attendee was asked to introduce themselves, the organization that they are affiliated with, along with a short description of their expectations of the Forum. This background served as a basis for the exercises that followed.

Initial discussion on the 17th emphasized just how much the world’s need for economic growth depends on the construction industry. More specifically, the importance of growth in manufacturing is directly related to a healthy economy, and manufacturing depends directly on infrastructure for long-term success. Engineers, architects, and constructors are the transformers—the ones who, by establishing and supporting manufacturing structures, make it possible for manufacturers to bring ideas to life, and then, by building infrastructure, the ones who make it possible for people to benefit from the actual products.

The schedule for the remainder of the morning was for the three pre-selected workstream groups (i.e., the groups focused on workforce development, best practices implementation and industry image, respectively) to formulate action plans. These groups were charged with presenting their action plans in the afternoon. Before the groups broke out into their separate discussions, the purpose of the workshop was reiterated: to find the interfaces between the groups represented at the forum, and to find opportunities for learning and accelerated progress. The overarching purpose of the NCF is to act as an honest broker for the groups represented, convening, facilitating, and leading these discussions for the benefit of the industry, the country, and the world.

NCF participants are given in Appendix D

It was obvious during the initial introductions and purpose discussion that the participant's consensus was that NCF is working on areas that are critical to the success of the construction industry, there is much energy and interest to address these issues and that NAC was a good organization to be a neutral broker of this effort.

2. Workstream Breakouts and Discussion

Discussing the format of the roundtable discussions, the participants were reminded that the documents developed at and in conjunction with the 2009 meeting were available at the meeting in hard-copy and were also on the internet. These morning discussions would be conducted just as the 2009 discussions had been conducted: first, to define the industry problems, then to assess the gaps between the current and ideal states, and finally to formulate action plans to close the gaps. The difference was that we would be focusing on three target workstreams.

The facilitators for each group were introduced. Leading the discussion on best practice implementation were Wayne Crew of the Construction Industry Institute and Edd Gibson of Arizona State University. Marvin Oey of the the ASCE Construction Research Council, Neil Eldin of the University of Houston, and J.J. Suarez of CSA Group facilitated the session on industry image. Heading up the roundtable on workforce development were Don Whyte of the National Council on Construction Education and Research and John Dalton of Mustang. Participants were asked to choose a group and to begin the discussions. These groups worked in lively discussion breakouts throughout the morning. After adjourning for lunch, participants reconvened in a plenary session to hear each work stream group report on their discussions. Each of these group reports are summarized below beginning with Workforce Development.

A. Workforce Development Workstream

The Workforce Development group began by presenting the problem statement the group had developed. It read as follows:

For more than twenty years, the construction industry has recognized the emerging and growing shortages of **skilled** craft workers, but has **not** been able to formulate an industry-wide solution.

- The industry needs a comprehensive solution to increase the “**pipeline**” of entry level/new workers.
- We need to bridge our **skills gap** through an industry-wide effort to increase training and retention of incumbent craft professionals.
- Owners and contractors are **not committed** to workforce development.
- Owner and contractors are also **not committed** to attracting, educating, and retaining management and engineer workforce.

(Note: Since the term workforce development is so broad, this group decided to focus on the skilled or craft labor workforce at this time; the professional or white collar or management workforce also is facing shortages and challenges and will need to be addressed at a future time)

For more than twenty years, the construction industry has recognized the emerging and growing shortages of skilled craft workers, but the broad industry-wide support needed to solve the problem has not been obtained. The issue will intensify in the coming years as the industry recovers

The group characterized the ideal state of workforce development as industry-wide support for the development of craft professionals to counter the skills shortage construction is now facing. This widespread support would grow out of an appreciation of the great benefits professional development provides to society and the economy. By initiating and sustaining professional development programs at all levels, the industry would see a widened pipeline of new and entry-level workers, greater availability of skilled workforce, and renewed owner/contractor commitment.

The group formulated three approaches to closing the gaps between the current and ideal states of workforce development.

- 1. Cultivate owner commitment to working exclusively with contractors committed to craft workforce development.**
 - Ownership: NCCER and the Construction Users Roundtable are developing the Contractor Construction Assessment which is a tool designed to evaluate and assign a metric to the quality and commitment of a contractors workforce development program.
 - Create an industry-wide plan that allows for the sharing of previous data reports.
 - Develop a consistent funding pool to research and deliver the value proposition of training for contractors and owners
 - Increased training = increased safety = increased productivity = increased wages & profitability = success.
- 2. Support efforts to reemphasize career and technical education in our schools.**
 - Identify decision makers (e.g., leaders in career/tech education).
 - Gather information and expand general knowledge on the needs of the skilled craft workforce. Package and communicate these needs to stakeholders.
 - Provide better information to guidance counselors and other like parties in educational systems and institutions.
 - Equate technical and career training and experience to college education/degrees.
 - Apply/use the construction management model.
 - Offer ACCE accreditation
 - Allow for online entry to the crafts/skilled needs.
 - Establish steps for further development of workers over time.
 - Take inventory of apprenticeships/crafts.
 - Address the push to college versus career paths, when 75% of high-school students are not obtaining four-year college degrees.
- 3. Embrace technology and innovation.**
 - Investigate the effect of technology and innovation on the skilled worker shortage?

- Identify, develop, and disseminate data; conduct a study/survey on what has been done to embrace technology and innovation, and why it is not being embraced.
- Determine the effects of technology and innovation on productivity?; conduct benchmarking studies and collect data.
- Explore the motivations for embracing technological improvements and innovations, along with the benefits of their adoption; conduct a study to identify barriers or mindsets that impede or impair adoption.

After this presentation, the facilitators opened the floor for discussion, and participants first focused on isolating the causes of the current situation. There was general agreement that the reality is that the wages and benefits that craft workers received in the 1940s, 1950s, and 1960s are no longer available, and that these workers can no longer make a middle-class living. In response to the suggestion that tax incentives might be a way to drive up wages and benefits, other participants pointed out that some states with depressed craft wages already have tax incentives and that a deeper issue might be the decline of unionized workers since the 1970s. The facilitator acknowledged that the issue of unionization came up in the roundtable, but had not been explored. This is not factually correct as noted in the Workforce Stream's white paper "The quality and availability of training, certification and career education resources has increased dramatically since the early 1990s, along with owner and contractor involvement. On an annual basis, NCCER's training module completion rate has increased more than 2000 percent since 1995. Associations like ABC and AGC have invested heavily over the years to create craft training facilities and programs that are a significant part of the industry's training infrastructure. However, most still use the traditional evening and weekend approaches to training and their facilities largely sit idle during regular business hours. Typically, contractors are unwilling to give up their workers for training during regular business hours even though they would acquire a safer, more productive worker in a significantly shorter period of time." Commitment is the issue not capacity or infrastructure for training.

The discussion then shifted to the need for a holistic approach to addressing the problem, on that includes best practice implementation and attention to image. This brought up the matter of whether craft workers should even be called "workers." The idea was that it would be better and more appropriate to call them "craft professionals."

The conversation turned to the issue of technology and innovation, when one participant asked what kinds of technology and innovation could affect the industry's workforce crisis. The answer was that such technologies as computers in cranes and innovative devices and tools can make up for the shortage of people skills the industry now faces. The point was that because technology can lighten the load, the industry needs to identify the appropriate technologies that now exist and expand development of promising technological innovations. One member of the work stream group argued that the industry has not adequately embraced technology. And, he continued, while the industry has adopted innovations in material processes, it needs to do more to get them into craft workers' hands; there is a need for these workers to understand the whole concept of the building envelope.

Returning to the issue of wages, a comparison was raised between the annual pay of a teacher coming out of college (approximately \$23,000) and that of a welder (anywhere between \$60,000 and \$100,000). The point was that the industry can make an argument for providing a good living to its skilled workers. Responding to this comparison, another participant suggested that wages are taken care of by supply and demand. One of the group facilitators added that the group did not see anything actionable it could do about wages. He brought up the example of the effect that Hurricane Katrina had on wages along the Gulf Coast, and said that we would see it happen again.

One participant observed that, whenever any individual organization tries to tackle the challenge of workforce development, its complexity makes it seem intractable. Thus, everyone was encouraged to harness the collective energy and wisdom of the Forum to develop one concentrated approach. One participant noted that, during the workforce development roundtable, it was helpful and informative to hear what different organizations were doing. It is important simply to make sure that as many people as possible are aware of what is already being done. Offering an example of leveraging the information that everyone was learning from the Forum, perhaps CII could make its best practices available in secondary schools? Expanding on that idea, he added that the industry could establish vocational schools on the model of the vocational programs in public schools.

Taking up these suggestions, one of the roundtable participants pointed out that the training programs that already exist have the necessary capacity and quality; it is the commitment to get people into them that is lacking. In response, another participant made a call for putting training on par with safety as an industry imperative. At this point, the facilitator suggested that the Contractor Workforce Development Assessment (a tool developed by CURT and NCCER to measure contractor commitment to workforce training) could help owners realize this imperative.

The skilled craft training programs that already exist have the necessary capacity and quality; it is the commitment to get people into them that is lacking.

The discussion once again shifted back to worker pay, with a participant saying that, compared to what workers earned in 1973, they are making \$23 less per hour in real wages. He added that, because, on average, they are working for less money, it will make a difference if training, wages, and safety are increased. The roundtable facilitator re-emphasized the quality of training, saying that craft training now leverages iPads, web training, and simulators. His point was, that, even though all improvements—to training, wages, and safety—will help, the reality is that solving the problem will take time.

The question of how this effort would be going forward came up and one participant suggested that, after the other two workstream groups had made their presentations, the entire group could formulate the path forward.

Members of the Workforce Development workstream breakout:

- Jim Baker
- Chris Barger
- Mark Casso

John Dalton, Facilitator
Liz Elvin
Bob Krul
Bill O'Brien
Jim Porter
Don Ruble
Jeff Russell
Greg Sizemore
Don Whyte, Leader

B. Best Practices Implementation Workstream

The Best Practices Implementation workstream group began with a formulation of its problem statement, which, once articulated, had several components. First, not all best practices (BPs) are applicable to every project, project type, or organization, and they are not universally applied within individual organizations. Also, across the industry, the terminology for best practices is not universal. For example, the AGC/ASA calls them “guidelines for construction.” Furthermore, other groups use terms such “standard practices,” and these may differ from best practices. As far as motivations to use best practices are concerned, project demands and previous experience drive managers toward staying with their tried and true ways of performing their work. This resistance to change is also related to the industry’s unbalanced risk-sharing model. Determining whether any given best practice is applicable across all industry sectors is also a matter that requires attention. Also, legal liability might attach to any efforts to disseminate best practices across the industry, and thus, such concerns should be investigated. Another issue is the variation and differentiation that can come from different organizations’ internal best practices training. The reality that different organizations teach best practices in their own ways also engenders proprietary concerns about sharing them with other organizations. The industry’s improvement on best practices implementation is hampered without a baseline from which to measure progress.

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Opportunities

Having discussed the obstacles to high-quality, uniform implementation of best practices, the group then shifted its focus to current opportunities for meeting these challenges. The initial suggestion was for developing a standardized best practices vocabulary. This effort would be part of a larger effort to gain an industry-wide understanding of different organizations’ best practices. With this wider perspective and standardized vocabulary, best practices could be systematically incorporated into university and professional development curricula. The group proposed that, to develop this far-reaching ability to disseminate best practices, its members should first organize and synthesize them into a non-redundant system and then produce a construction best practices home on the internet. Systematizing best practices in this way, and then making them so accessible would improve the

portability and delivery of best practices and drive performance improvement. Moreover, it would drive evidence-based measurement of improvement and would allow best practices to be firmly tied to construction strategies. Group members are aware of similar efforts by CII and other associations, and understand that such industry fragmentation makes this NCF initiative complex.

Ideal State

The ideal outcome of this effort would be the consistent use of best practices across the industry. Since the worldwide web is ubiquitous, creating a “best practices wiki” would give the industry a central location for accessing the most up-to-date and reliable information on how to implement best practices. This centralized structure would have a variety of dimensions and arrays, enabling different levels of participation. As such, it would address implementation challenges on all types of projects and offer advice to participants at varying levels of expertise and responsibility. The best practices wiki would offer a clear return-on-investment for the utilization of best practices. Ultimately, the standardization and wide dissemination enabled by such an industry clearinghouse would drive a more systematic and thorough approach to teaching best practices in academia and life-long learning programs.

Gap Analysis

The industry’s current epidemic of underutilization of best practices is related to and exacerbated by the lack of a single source for them. Having an online clearinghouse for best practices would require a common set of terms, which would be the building blocks of a shared framework. In addition to closing these gaps, the industry also needs to do a better job of communicating the value proposition for using best practices. Another area of concern is the existence of gaps between what research shows to be best practices and what are taught as best practices in academia and industry. Also, it will be challenging to determine which best practices to begin with.

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Closing the Gap

Since developing a common set of terms and creating a common framework are both fundamental to closing these gaps, the initial step will involve the formulation of rules for starting both. Once these rules are in place and the terminology and framework are established, it will be necessary to determine who will create the online best practices wiki. Once this person or group has been identified, the next step would be to develop and populate the open source structure for the wiki. It will be important that the structure will allow for reviews and feedback. The wiki should have neutral, third-party host. The launch and continuing operation of the wiki should be supported by a publicity plan. In addition to providing state-of-the-art best practices and guidance on using them, the wiki should also provided research-based validation of BP return on investment. Finally, it should also give guidance on contracting strategies that promote best practice implementation.

Because this undertaking requires tremendous effort in the face of industry fragmentation and obstacles to communication, it will require substantial resources in terms of time and money. Among the challenges that must be met are the following: the proprietary nature of some best practices; the difficulty of identifying all best practices and of resolving any discrepancies among them; the development of semantics to support this deployment; the issue of liability if the recommended best practices are blamed for negative outcomes; and any differences in perspective (between contractors and clients) on what constitutes a best practice. Other issues to address would to determine how much detail to include in the materials provided by the wiki, where to start, how it will be maintained, and whether it will serve only the United States or be available globally.

Action Plan for Best Practices

Following are the action items for closing the gaps between the desired state and the current industry reality:

1. Decide who will take the lead on the ideas.
2. Develop a comprehensive collection of best practices.
3. Develop common terminology and framework.
4. Pilot an open-structure/source wiki on a few best practices (e.g., safety, front end planning).
5. Establish a set of rules on how to start.
6. Fully populate best practices wiki after pilot; include contracting strategies that promote best practices and research-based validation on the value of best practices.
7. Maintain the site.

In the discussion following this presentation, one participant suggested including reviews of best practices by industry organizations and schools as a part of the wiki. One participant cited work at CII to develop its knowledge structure. That effort took two and a half years to complete, and it involved only 250 documents. He cautioned that, were this workstream group to take on this kind of task for the entire industry, the effort could take much longer and involve much more work. He explained that, beyond addressing the differences in the practices and processes among the different industry sectors, the group would have to sort out the issue of the proper level of granularity, divergences in definitions, and other discrepancies.

Another participant added that while the industry is aware of this need to synthesize best practices, it has not yet had the will to meet it. He said further that, if this opportunity to make an alliance is seized, it can finally be tackled. In response to this point, another participant suggested that perhaps, since there are currently so many people leaving the industry who “do not know what they know,” there really should be a formalized renewal process for getting the knowledge locked in. He suggested further that this be made a contractual stipulation. Other participants noted that virtually all contractors look for ways to differentiate themselves, and that they use best practices in their work processes as they best fit for them. It was noted that this is what CII encourages its members to do. At this point, a participant summed up the issue at hand, saying that it was all about how the NCF defines itself and how it leverages what everyone in the industry is doing with best practices. He suggested that perhaps it would be best to simply act as a clearinghouse, without endorsing anything.

This suggestion brought up the issue of legal liability and whether it would apply to the NCF. It was pointed out that CII has immunity from liability by virtue of its association with a university. The group should make sure that this wiki would not expose the group to any liability. Another legal concern was over any proprietary claims that might be made against the wiki. A suggestion for preventing such claims was to establish the wiki as a project to which individual members contribute for the good of the industry. This suggestion prompted the response that such an approach would limit the wiki, since, ultimately, someone will have to pay for it. If it is a true “wiki”, it will be populated by everyone involved. Another participant brought up the Texas Digital Library a possible model for the wiki. This platform hosts online scholarly journals and also serves as a repository of information. He offered his help in contacting this group to explore this type of platform.

At this point, the questions was asked about who would be taking the lead if the NAC/NCF wants to be a sponsor of the best practices wiki. This effort would involve not just start-up costs, but also maintenance and other ongoing costs. One participant pointed out that he was not sure that such a repository was the way to link people. He suggested that it would be better to have a framework of best practices with links, adding that to develop such a framework and to collect the best practices would be a huge amount of work. He also added that, as far as the costs are concerned, the wiki could charge for advertising. One participant said that he believed the wiki should be owner-driven. Another participant said it might be possible to use the Google search function if the taxonomy was done properly. He added that coming up with such a search application would create a “community of best practices.” One response to this suggestion was that everyone involved in the NCF could create links to such a site from their own websites.

Members of the Best Practices Development workstream breakout:

Stuart D. Anderson
Wayne Crew, Leader
G. Edward Gibson, Jr., Facilitator
William Grosshandler
Steve Halverson
David Mendes
J.D. Slaughter
Janice L. Tuchman
Ray Topping

C. Improving the Industry Image Work Stream

The Improving the Industry Image group began by presenting a set of questions they sought to answer in their morning session. These questions were as follows:

- What is the current perception of the industry?
- Why should we change it?
- What is ideal image?
- What can we do?
- How do we do it?

Before addressing these questions, the group leaders reported that the group took three factors into consideration: 1) intellectual capacity, 2) time, and 3) money. They explained that the group felt that it was crucial to begin with an awareness of the available resources and to develop a realistic plan for how to use them.

The group agreed that people generally perceive the industry to be dirty, difficult, dangerous, low-paying, unglamorous, and low-tech. Further, they expressed their awareness of a public opinion that construction is a narrow and compartmentalized industry, a necessary evil to get infrastructure built, and an invisible process, the products and benefits of which are taken for granted.

Why the industry image should change

The group cited increasing funding and investment opportunities for research and public works as one of the chief reasons for changing the industry image. Other reasons were to attract and retain more people, to improve industry pride in its contributions, and to increase public acceptance, appreciation, and recognition of those contributions. Further, they argued, there is a need to draw other entrepreneurs into the industry. Lastly, they said that there is a need to recognize the ripple effects of not having a good image, and that all bad press about the industry should be actively balanced or countered with good press.

The ideal industry image

The group's formulation of the ideal image of construction included a more professional, higher-tech, and more innovative industry. The group members thought the industry should promote itself as a custodian of society or as a builder of the society's future. They also suggested that the industry position itself as an enabler and magnifier of modern life, an engine of the economy, and as a rising tide. They proposed these as tag lines for promotional campaigns, adding a final one: Construction Builds America.

The ideal image of construction included being perceived as a more professional, higher-tech, and innovative industry. The industry should promote itself as a custodian of society, and as a builder of the society's future. The industry should position itself as an enabler and magnifier of modern life and an engine of the economy. The following tag line was proposed: Construction Builds America.

What to do

The group members all agreed that the solution to the industry's image problem was all about communication to its major stakeholders: the public, lawmakers, schools and universities, and

professional organizations. The idea was that these stakeholders can play important supporting roles as far as the industry image is concerned.

How to do it

The consensus was that the industry first needed to change its (internal) image of itself before it could effectively change others' perceptions of it. Part of the problem, as the groups see it, is that the industry has so many sectors and is so diverse and uncoordinated in its messaging. The feeling was that, even if the industry does feel pride and has a positive image of itself, it is not articulating that message in any coherent way. To do this, the group suggested the following steps:

- Reach out to industry brethren by expanding the NCF effort out into the organizations participating in it.
- Find and equip educational champions and representatives in the entertainment industry to carry a consistent message.
- Maximize social media to reach out to public (and to young people).
- Better quantify the social and economic benefits/value of what the industry produces.
 - As an example, create a national construction value index and benchmark the industry's contribution against that of other local and international entities.

Action plan

The group formed two sub-teams, one to look into communicating with universities and another to address professional organizations. Both teams plan to conduct surveys to develop a common message. The surveys will ask two questions: 1) What is your perception/how do you score the industry?, and 2) What is missing in the industry? By querying each survey participant about what is missing, the teams hope to cluster and further analyze the results and then determine the necessary message. (One participant suggested that the questions might instead be "What attracts people to the industry?" and "What would attract you to the industry?" to get better results.) The plan is to develop the surveys by January 15, 2012, deploy them in February and March, and then compile the results in April.

The group leaders explained that the challenge was to ask the questions in a way that will uncover the driving issues behind the industry's negative image, but to word it in a way that would not constrain respondents' thinking. They thought it was important first to hear from people with the most at stake. After the results are compiled in April, when the message has been formulated, the plan is to take it to universities and engage students and professors in a contest to package and disseminate it in the most effective way. Once these free channels of input and talent have been leveraged, the message can be taken to industry organizations and funding for a formal publicity campaign can be solicited from them. Distributing the survey to CII members might be a good way to get more data, but that January might be too soon to be able to do that. The image team leaders said that the survey distribution date could be moved.

The discussion then shifted its focus to the development of a national construction value index, with questions about whether such an index should track the value-add of the industry as do current indexes

that track project success factors (e.g., schedule, cost, and safety performance). Jan Tuchman of McGraw-Hill said her organization could help, since it tracks project data up to completion. She added that the proposed index could show why it is worth investing in infrastructure. Another participant remarked that it would be important to differentiate between capital budgets and operating budgets. One participant suggested that the group look into what the National Institute of Standards and Technology (NIST) measures and find out which data they already have. Another participant emphasized the importance of also measuring the cost of not building or renewing infrastructure, and of asking what it would mean for the economy, the environment, and the general public good. With respect to the economic impact, she stressed the need to relate infrastructure renewal to employment, adding that it was important to make the professional career opportunities in construction (beyond field labor) more visible in any related publicity campaigns. (Her point was that the field labor that the public sees when infrastructure is being built represents perhaps only one third of the construction effort, and that the professional functions behind the scenes should be brought into the light.) Another participant added that it was also important to publicize completed products, so that the public would not continue to associate construction with the building process. This suggestion prompted someone else to suggest that the group could develop a website to promote success stories. One participant suggested that the industry could establish National Construction Week, and another pointed out that there is already a National Careers in Construction Week. His suggestion was that these ideas for promoting careers in infrastructure renewal could be incorporated into that yearly observance. This prompted others to mention the importance of the NCF establishing connections with initiatives like ACE Mentor and the Future Cities competitions.

Members of the Improving the Industry Image workstream breakout:

Richard Anderson
Bruce D'Agostino
Neil Eldin
Ed Jaselskis
Gunnar Lucko
Fernando Mondragon
Marvin Oey, Leader
J.J. Suarez, Facilitator
Lynda Stanley
Jorge Vanegas
Walter Wise

3. Path Forward

A final discussion on any additional issues that need to be addressed and the path forward for each work stream group was conducted, with a reminder to the participants that, by coming together to develop a common message/plan, they were addressing the industry's main obstacle--its extreme fragmentation. The current members of the industry make up the forum's main constituency, and that communicating a common message will be crucial to unifying everyone already in construction.

One participant suggested that the group meet a few times a year, since these meetings were so informative and productive. This brought up the matter of who would host more regular meetings and whether everyone present could contribute a set amount, say \$200, to establish a fund for them.

It is clear from the work in all the sessions that there are structural and resource barriers to this effort that will have to be worked vigorously in order to succeed.

At this point, the group paused and thanked Jimmy Slaughter and J.D. Slaughter for sponsoring the meeting. Responding to this appreciation for his generosity, Jimmy Slaughter said that although the NAC does not have the funds for these forums, it has been very worth the funding he has provided to get the NCF going and added that he is willing to continue to fund it.

Referring back to the issues surrounding the industry image, one participant suggested that the promotional efforts discussed might not be enough, and that perhaps the industry also needed to join the upcoming national debate about funding public works. He avowed that this might be too big an undertaking for the NCF, but added that, until it gets sorted out, these other issues will persist. One participant remarked that another big issue to tackle is convincing the banks of the need for infrastructure renewal and persuading them to release all of the money they are now holding so that it can be built. It was suggested that this effort should be extended beyond the banks to the private sources of funding, adding that regulation and/or contracting mechanisms might get in the way. Another attendee remarked that AIA has recently established a database of stalled construction projects, to see which are stalled for lack of funding. Her suggestion was that this database might be useful for matching funders to such projects. A participant wondered whether, since this "dam needed to be broken" to bring on infrastructure project, the group should initiate a feasibility study for such an approach. Another attendee responded, saying that the NCF has enough to do already and that this idea should be tabled for now. To break this logjam, a lot of the groups represented at the forum could coalesce around the issue of infrastructure renewal and involving manufacturing groups to create a task force with broader representation. ASCE involves national truckers in a similar effort, and that maybe someone from NCF could sit in on it.

The discussion shifted back to the goals of the forum, with an attendee saying that there were two principal challenges: 1) to have an integrated forum that generates actionable items, and 2) to create a repository for sharing information, both from industry and academia. He said he saw these as steps in

the right direction, adding that the forum might adopt Stanford University's concept of the iRoom—a virtual meeting space that goes beyond Webex by permitting video conferencing.

The question of a sustainability initiative then arose, with one participant saying that the industry is seen as a “hyper-consumer,” especially in the light of current materials shortages. He suggested that the NAC should take a stand to create areas of research activities—perhaps simply by generating a vision statement.

After some discussion, additional areas to consider for workstreams emerged:

- Impact of fragmentation on industry performance and potential for improvement and the most business effective ways to manage.
- Most industry-effective way(s) to fund infrastructure projects (Noted potential use of AIA database on stalled projects)
- Sustainability as it pertains to construction and the constructed environment.

The discussion shifted back to formulating the paths forward for the three workstreams. The next steps for each of the workstreams are:

1. A conference call to determine how to go about setting up the wiki framework for the Best Practices workstream will be conducted in the near future.
2. An "I" Room concept for integrating Forum actionable items and an information warehouse to facilitate sharing will be developed for the Image workstream. Members of the group will also work toward developing a survey guide as the next step and would organize a call to pursue this step.
3. The output from the Forum discussions will be processed into a draft action plan and will reconvene the Workforce workstream to finalize and formalize next steps. A call will be held to determine what the top two or three action items should be for the group.

The three workstream groups set up in this Forum will form the nucleus for future efforts in these areas.

A fundamental consensus of this Second NCF is that action must begin soon to build momentum.

The NCF Leadership Team planned to hold an interim meeting in late May to formulate specific path forwards, and in the meantime, the minutes and a summary of this meeting would be published.

Before adjourning the meeting, participants were asked to offer feedback on the meeting itself. One response was that the diverse representation was immensely valuable, but that certain other organizations should be involved, especially marketing groups. (In response to this suggestion, three participants volunteered to form a recruiting sub-team) Another suggestion was to have more central locations for future meetings. Jan Tuchman offered the McGraw-Hill conference room in NYC for the next Forum session. The Third NCF will be held in 2013 at a date and time to be determined.

In terms of future meetings:

- Meeting format and design were very effective.
- Facilities were good but better separation of the breakouts would have been helpful
- We need to consider growing the number of groups represented
- We need to include more public works representatives. Highways were specifically noted. We also need AIA in the room.

Offering his summative remarks, Jim Porter said that he had never been in any more active conversation than the one he participated in at this forum. He said that he was so impressed by the interest and passion he saw in everyone present.

Fundamental to the NAC forum idea is that we do not want to take anything away from the organizations participating in NCF. The desire is to coordinate work on key issues which will be of value to this effort.

Information on getting a copy of the NCF minutes is given in Appendix E.

Appendix A: National Academy of Construction

National Academy of Construction Mission

The mission of the National Academy of Construction is to recognize and honor distinguished achievement in the American construction industry and to make that reservoir of experience available for service to the nation.

National Academy of Construction Purpose

1. Provide recognition to past and present industry leaders for their personal contribution to the engineering and construction industry.
2. Establish a body of engineering and construction industry leaders who are available for advice and service.
3. Establish and administer an awards program to provide recognition to individuals who have made notable contributions to the industry.
4. Provide for a linkage among active industry participants and persons who have left active employment.

For more information, see <http://www.naocon.org/>

Appendix B: NCF Core Steering Team

Wayne Crew, Construction Industry Institute

John Dalton, Engineering & Construction Contracting Association/Construction Industry Institute

Neil Eldin, American Society of Civil Engineers CRC/ACCE

G. Edward (Edd) Gibson, National Academy of Construction

James Porter, National Academy of Construction/Business Round Table, Chairman

Liz Elvin, Associated General Contractors of America

James Slaughter, National Academy of Construction

J.D. Slaughter, Engineering and Construction Contracting Association

J.J. Suarez, Construction Industry Round Table

Greg Sizemore, Construction Users Round Table

Linda Stanley, Board on Infrastructure and the Constructed Environment, National Research Council

Don Whyte—National Center for Construction Education and Research

Appendix C: Second NCF Agenda

November 16 – Dinner and Set the Stage

5:30	Mixer
6:15	Dinner
7:00	Welcome and Safety Contact – Jim Porter <ul style="list-style-type: none">• NAC Introduction• Forum, Vision, Mission & Purpose• History of Forum
7:20	Workstream Overview <ul style="list-style-type: none">• Image – Dr. Neil Eldin• Best Practices – Wayne Crew• Workforce Development – Don Whyte
7:50	ASU Think Tank – Edd Gibson
8:10	Adjourn

November 17 – Workshop

7:30	Breakfast
8:00	Welcome, Introductions & Safety Contact – Jim Porter
8:20	Workstream Breakout Discussions* <ul style="list-style-type: none">• Image – Marvin Oey/Dr. Neil Eldin• Best Practices – Wayne Crew• Workforce Development – Don Whyte
9:20	Break
9:30	Continue Workstream Breakout Discussions* <ul style="list-style-type: none">• Image – Marvin Oey/Dr. Neil Eldin• Best Practices – Wayne Crew• Workforce Development – Don Whyte
10:30	Report Outs and Group Discussion*
11:30	Lunch
12:00	Workstream Action Plans* <ul style="list-style-type: none">• Image – Marvin Oey/Dr. Neil Eldin• Best Practices – Wayne Crew• Workforce Development – Don Whyte
1:30	Break
1:40	Current State Construction Industry – Introduction – Jim Porter
1:50	Current State Breakouts
3:00	Break
3:10	Report Outs and Group Discussion*
3:30	Selection of New Workstreams – Jim Porter
4:00	New Workstream(s) Action Plan – Jim Porter
4:15	Forum Feedback – Jim Porter
4:30	Adjourn

*Facilitators – JJ Suarez, John Dalton, Edd Gibson

Appendix D. NCF Attendees November 16-17, 2011

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Appendix E: Information on Gaining a Copy of the Meeting Minutes

Minutes from the meeting held on 16-17 November 2011 can be obtained by contacting any of the following individuals:

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