

Contractor Use of Safety Best Practices



Introduction

ABOUT THIS SMARTMARKET BRIEF

CPWR - The Center of Construction Research and Training and Dodge Data & Analytics have partnered on several major studies about construction safety since 2012. This Brief showcases the findings on safety best practices that emerged from two 2018 surveys conducted in May and September with the Dodge Contractor Panel. The May survey focused primarily on the use of Lean practices and on the relationship between leadership skills onsite and improved safety climate. The September survey included questions on materials handling, health and safety practices onsite and preferred communication methods, all of which are featured in this Brief.

Overall, the findings reveal that while most of the safety best practices featured in this Brief are widely known, few are currently used as standard practices by most firms, although GCs are generally more advanced in best practices than trade contractors. Also, many resources for information on practices are underutilized, especially given the high level of value ascribed to them by those who are using them, which shows that more must be done to make contractors (especially small ones) aware of them. Leadership skills by supervisors and foremen can effectively engage onsite teams to help improve safety, and Lean contractors, in particular, appreciate the importance of those leadership skills.

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Methodology

Two online surveys were conducted using the Dodge Contractor Panel in 2018 covering a variety of safety topics.

SURVEY ONE

The survey was fielded in May 2018. The topics included in this report from survey one are Lean construction and the impact of leadership skills on project safety.

RESPONDENTS

207 contractors responded to the survey.

Firm Type: In the analysis in this report, GCs is a blanket category covering general contractors, construction managers and design-builders. General contractors make up three quarters of this group.

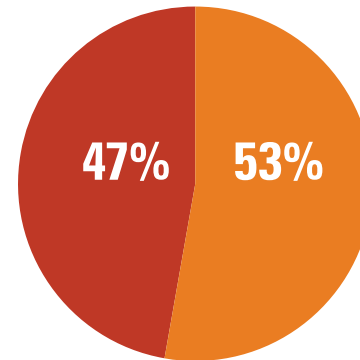
The remainder of the contractors participating are specialty trade contractors. They are referred to as trades in the chart at right and throughout the analysis.

Firm Size: Contractors were asked about the value of their companies' building projects in 2017, and two size groupings were created for analysis based on their responses and their firm type.

- **Small/Midsize GC:** Less Than \$100 Million
- **Small/Midsize Trade Contractor:** Less Than \$10 Million
- **Large GC:** \$100 Million or More
- **Large Trade Contractor:** \$10 Million or More

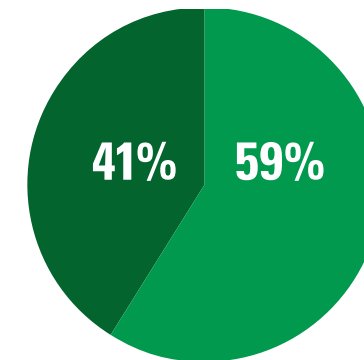
Survey One

Survey on Lean construction and the impact of leadership skills on project safety.



Company Type

- GCs
- TRADES



Company Size
According to Revenue

- **SMALL/MIDSIZE**
GCs Less Than \$100 Million
TRADES Less Than \$10 Million
- **LARGE**
GCs \$100 Million or More
TRADES \$10 Million or More

Methodology: Survey Responses

SURVEY TWO

The survey was fielded in September 2018. The topics included in this report from survey two are materials and equipment safety best practices, resources for information on safety, mentoring of subcontractors, and communication and toolbox talks.

RESPONDENTS

237 contractors responded to the survey.

Firm Type: In the analysis in this report, GCs is a blanket category covering general contractors, construction managers and design-builders. General contractors make up three quarters of this group.

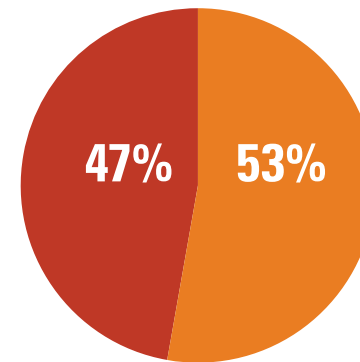
The remainder of the contractors participating are specialty trade contractors. They are referred to as trades in the chart at right and throughout the analysis.

Firm Size: Contractors were asked about the number of employees at their company, and all of them were grouped into the following categories.

- **Small:** 1 to 19 Employees
- **Midsize:** 20 to 99 Employees
- **Large:** 100 or More Employees

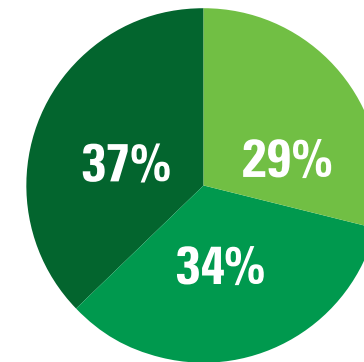
Survey Two

Survey on materials and equipment safety best practices, resources for information on safety, mentoring of subcontractors, and communication and toolbox talks.



Company Type

- GCS
- TRADES



Company Size

According to Number of Employees

- **SMALL** 1 to 19 Employees
- **MIDSIZE** 20 to 99 Employees
- **LARGE** More Than 100 Employees

Material & Equipment Safety Best Practices

METHODS BEFORE CONSTRUCTION STARTS FOR REDUCING NOISE EXPOSURE ONSITE

The National Institute for Occupational Safety and Health reports that about three quarters of construction workers are exposed to noise levels above the recommended limit, a serious risk to their health and well-being. Two best practices in the charts at right allow contractors to address this issue before they even start work onsite.

PURCHASING QUIETER EQUIPMENT

Most contractors (83%) purchase quieter equipment. However, it is not a standard practice in the industry because well over half of those report that their company could do this practice better.

- **Variation by Size:** The same percentage (38%) of respondents from small and large companies report that their companies do a good job purchasing quieter equipment. It is midsize companies (29%) that lag for this activity.

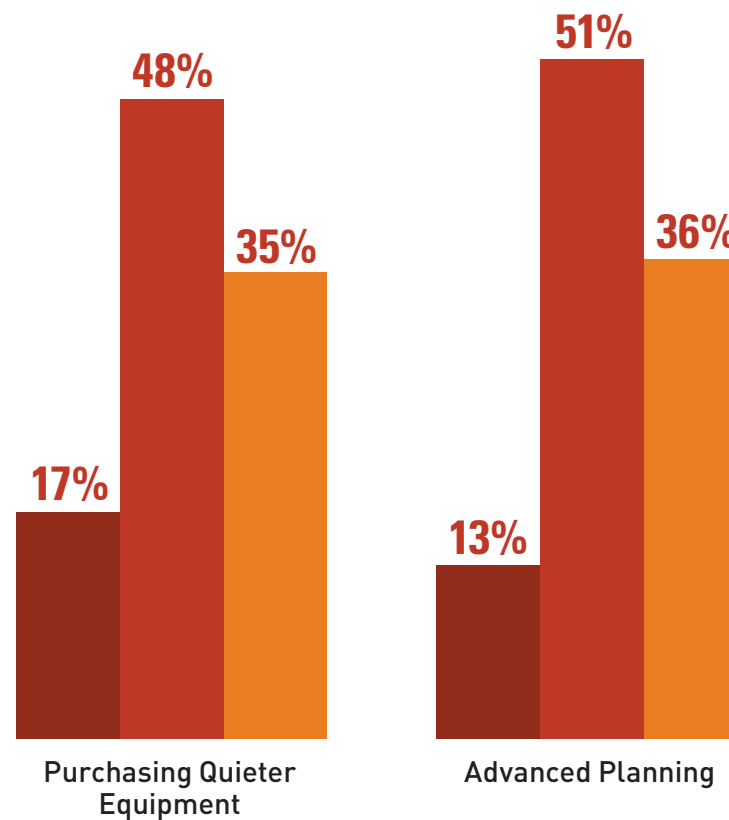
ADVANCED PLANNING

Most contractors do some advanced planning to reduce noise exposure, but over half of those also believe that their company can do better.

- **Variation by Size and Type:** Midsize companies also lag behind large and small ones in advanced planning. Also, 18% of trade contractors do not engage in advanced planning, compared with 8% of GCs.

Methods for Reducing Noise Exposure Onsite Before Start

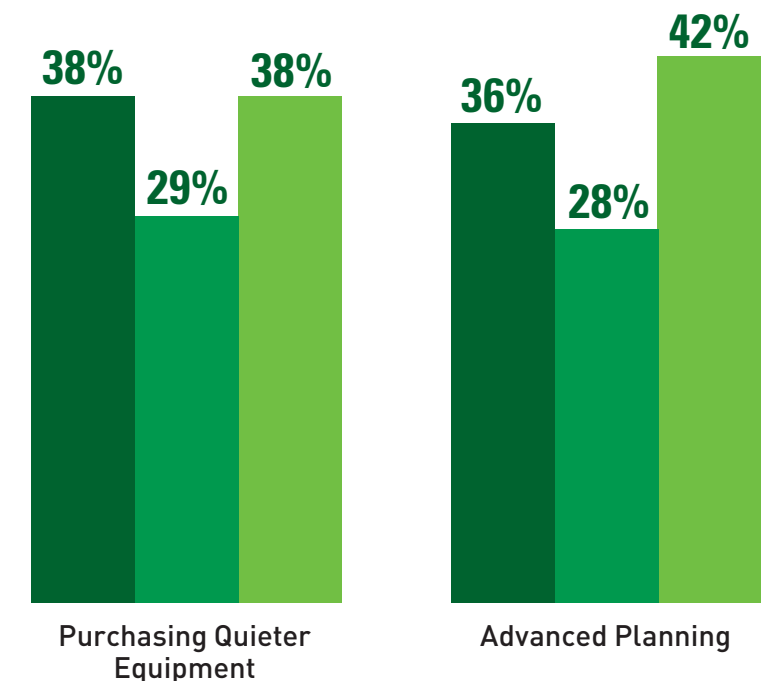
■ Haven't Done ■ Can Do Better ■ Does Well



Companies That Do These Noise Reduction Methods Well

By Size

■ Small ■ Midsize ■ Large



Material & Equipment Safety Best Practices: Noise Reduction

NOISE REDUCTION EQUIPMENT

Contractors were asked about the frequency with which they use equipment to reduce noise exposure.

HEARING PROTECTION

Although use of hearing protection onsite is widespread, with 85% of contractors saying that they use it more than 50% of the time, less than half (43%) say that they always use it, suggesting a significant opportunity for improvement in the industry.

- **Variation by Size and Type:** As the chart at right shows, small companies lag behind large and midsize ones in the use of hearing protection. Also, 50% of GCs always use hearing protection, but only 32% of trade contractors do.

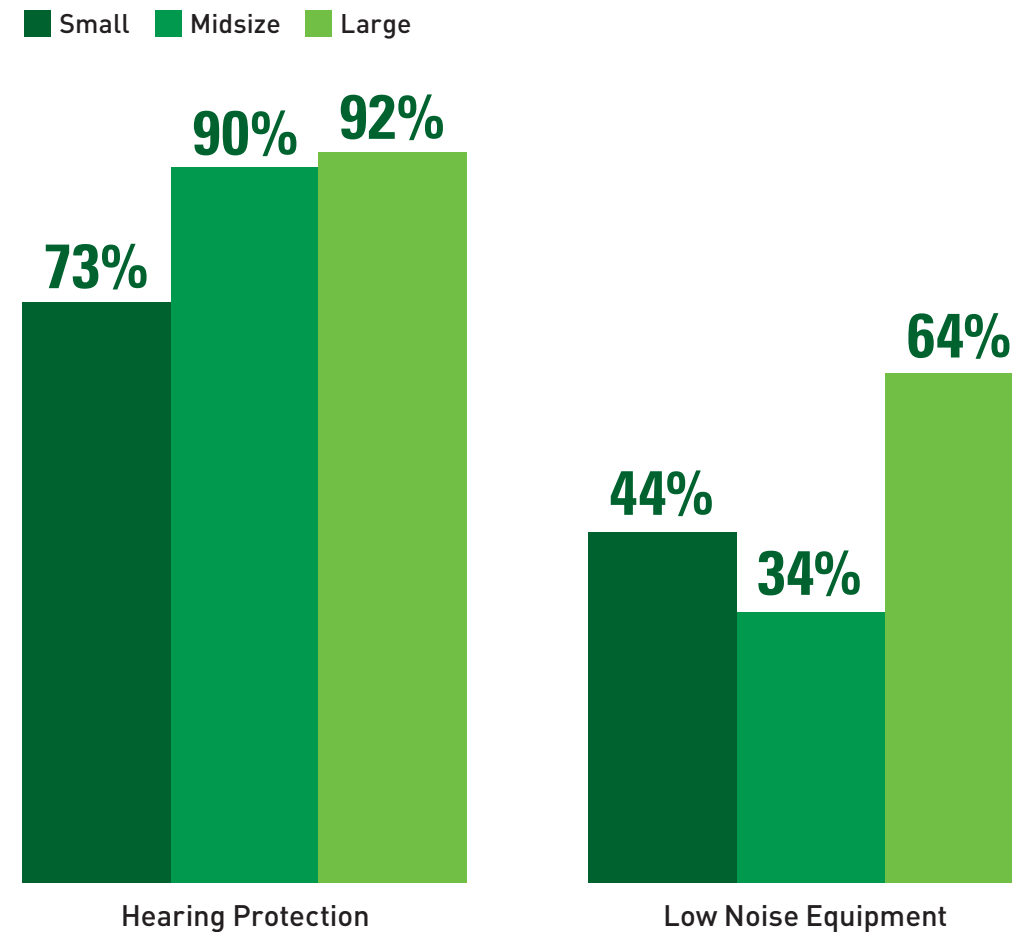
LOW NOISE EQUIPMENT

Use of low noise equipment is less common, with fewer than half (42%) of contractors using it more than half the time and only 6% always using it.

- **Variation by Size and Type:** 64% of large companies use this equipment more than half the time, but less than half of small or midsize companies do. Also, 21% of trade contractors never use it, compared with just 9% of GCs.

Equipment Used to Reduce Noise Exposure

Percentage of contractors using each practice 50% or more of the time



Material & Equipment Safety Best Practices: Noise Reduction

ONSITE PRACTICES TO REDUCE NOISE EXPOSURE

Two practices that can be conducted onsite to protect workers from the damage caused by noise are to place loud equipment behind barriers and isolate loud equipment from the work area.

PLACE LOUD EQUIPMENT BEHIND BARRIERS

Only 35% of contractors report that they place loud equipment behind barriers more than half of the time, revealing that this is still an uncommon practice in the industry.

- **Variation by Size and Type:** While large contractors use this practice more than others, only 40% are using it on more than half of their projects. Similarly, while GCs (35%) outnumber trades (18%) in frequently using barriers for loud equipment, that number is still disturbingly low.

ISOLATE LOUD EQUIPMENT FROM THE WORK AREA

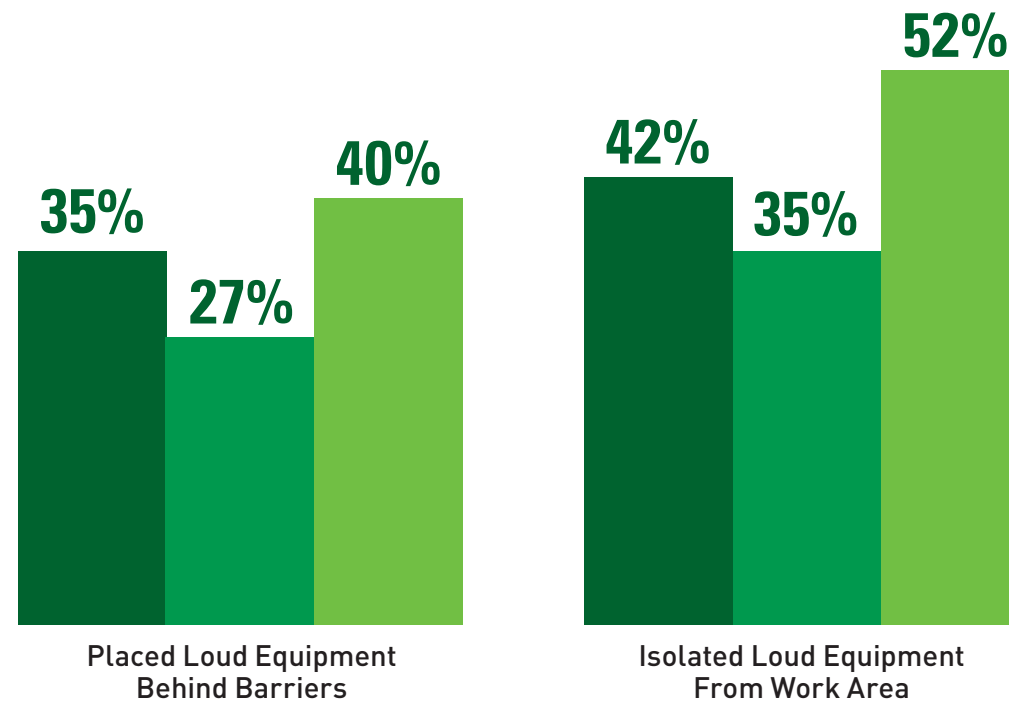
Isolating loud equipment is more common than placing it behind barriers, but it is still not widely practiced. Only 43% of contractors report that they do this more than half of the time.

- **Variation by Size and Type:** The pattern is very similar to the previous one for this practice, with large firms and GCs tending to use it more than midsize firms and trade contractors, but no group adopting it widely most of the time.

Onsite Practices to Reduce Noise Exposure

Percentage of contractors using each practice 50% or more of the time

■ Small ■ Midsize ■ Large



Material & Equipment Safety Best Practices: Injury Reduction

METHODS FOR PREVENTING MUSCULOSKELETAL INJURIES

A good safety program must help construction workers prevent musculoskeletal injuries. Contractors were asked how well their companies do two best practices to prevent injury: worksite and task planning, and using assistive lifting and other devices.

WORKSITE AND TASK PLANNING

Nearly all (94%) construction companies do worksite and task planning, and most (59%) believe their companies do these practices well. However, a sizable percentage (35%) believe their company can do better.

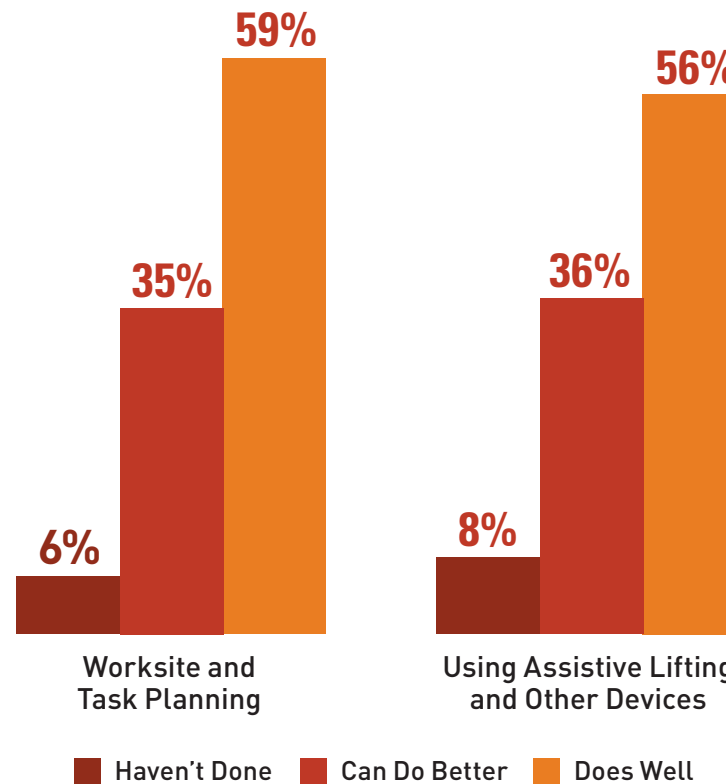
- **Variation by Size:** While nearly three quarters (72%) of those who work for large companies believe that their company does this well, only about half of those from small (51%) and midsize (56%) companies agree, suggesting that assisting smaller companies with this practice could help improve jobsite safety.

USING ASSISTIVE LIFTING AND OTHER DEVICES

Most contractors (92%) use these devices, and over half (56%) believe their company is effective at employing them.

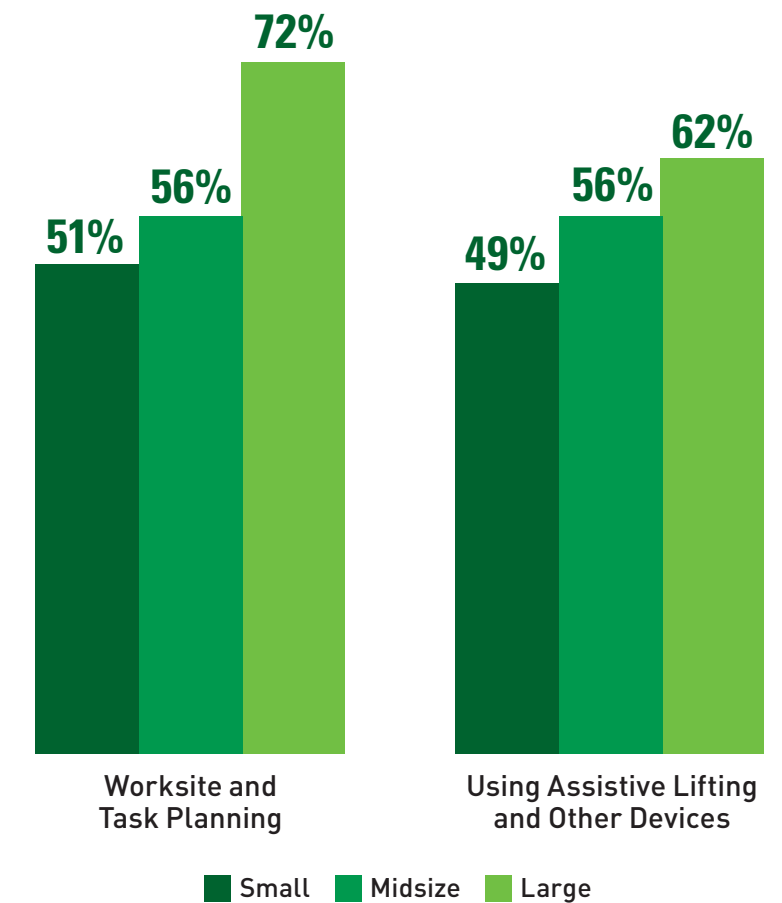
- **Variation by Size:** A higher percentage from large companies say that they are effective at deploying these devices than the others, but the difference is not statistically significant.

Methods for Preventing Musculoskeletal Injuries Onsite



Companies That Do Musculoskeletal Injury Prevention Practices Onsite Well

By Size



Material & Equipment Safety Best Practices: Injury Reduction

EQUIPMENT USED TO PROTECT AGAINST INJURIES

Several activities common on construction sites make workers vulnerable to injury, from working at a height, to moving heavy materials, to having to use tools in awkward positions. Reducing injuries not only improves worker health, but can help improve a company's reputation, reduce the stress placed on other workers and decrease impacts on project schedules.

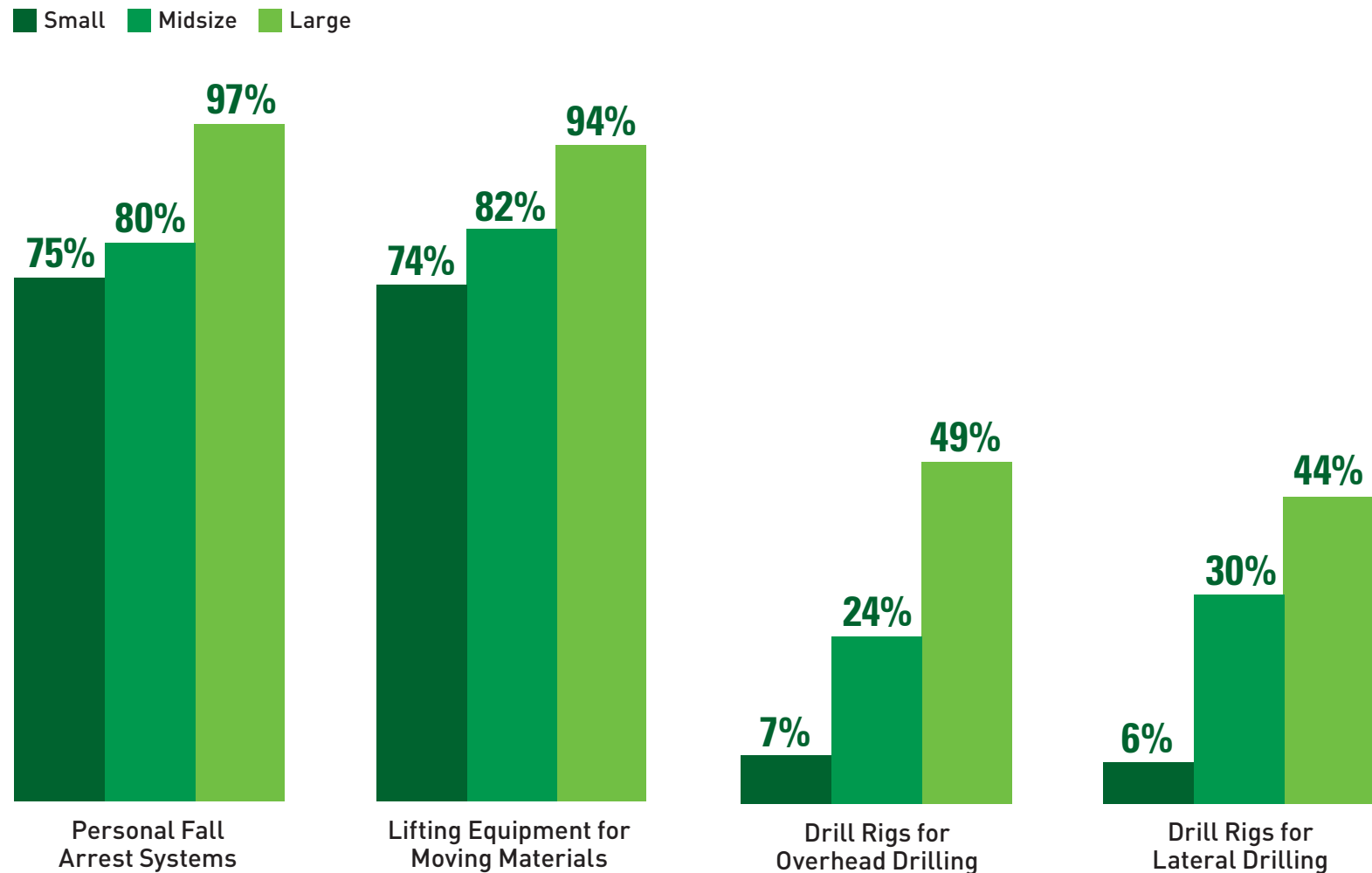
The four practices featured in the chart all help address these issues. While use of personal fall arrest systems and lifting equipment for moving materials are relatively common, especially among large companies, there is still room for wider adoption among the 36% of companies that do not always use personal fall arrest systems and the 58% that do not always use lifting equipment.

Drill rigs for overhead or lateral drilling are far less commonly used. In fact, almost no small firms use them more than half of the time, and less than one third of midsize firms do.

- **Variation by Type:** 95% of GCs use lifting equipment more than 50% of the time, but only 68% of trade contractors use it as frequently.

Equipment Used to Protect Against Injuries

Percentage of contractors using each practice 50% or more of the time



Material & Equipment Safety Best Practices: Injury Reduction

PRACTICES USED TO PROTECT AGAINST INJURIES

Safety practices that prevent injuries include rules and policies set by companies about lifting. Built-in anchors on existing structures for fall protection gear are also important for injury prevention.

MATERIAL HANDLING

While using two-person lift teams is relatively common for all contractors, with about three quarters reporting this is done 50% of the time or more, setting weight limits for lifting materials is only a common practice among large companies. On the other hand, storing materials off the ground between knee and waist height to help with lifting is far less commonly practiced, regardless of size or type of company. The fact that this practice requires more initial setup effort than setting weight limits or requiring the use of two-person lift teams may be why it is less frequently adopted.

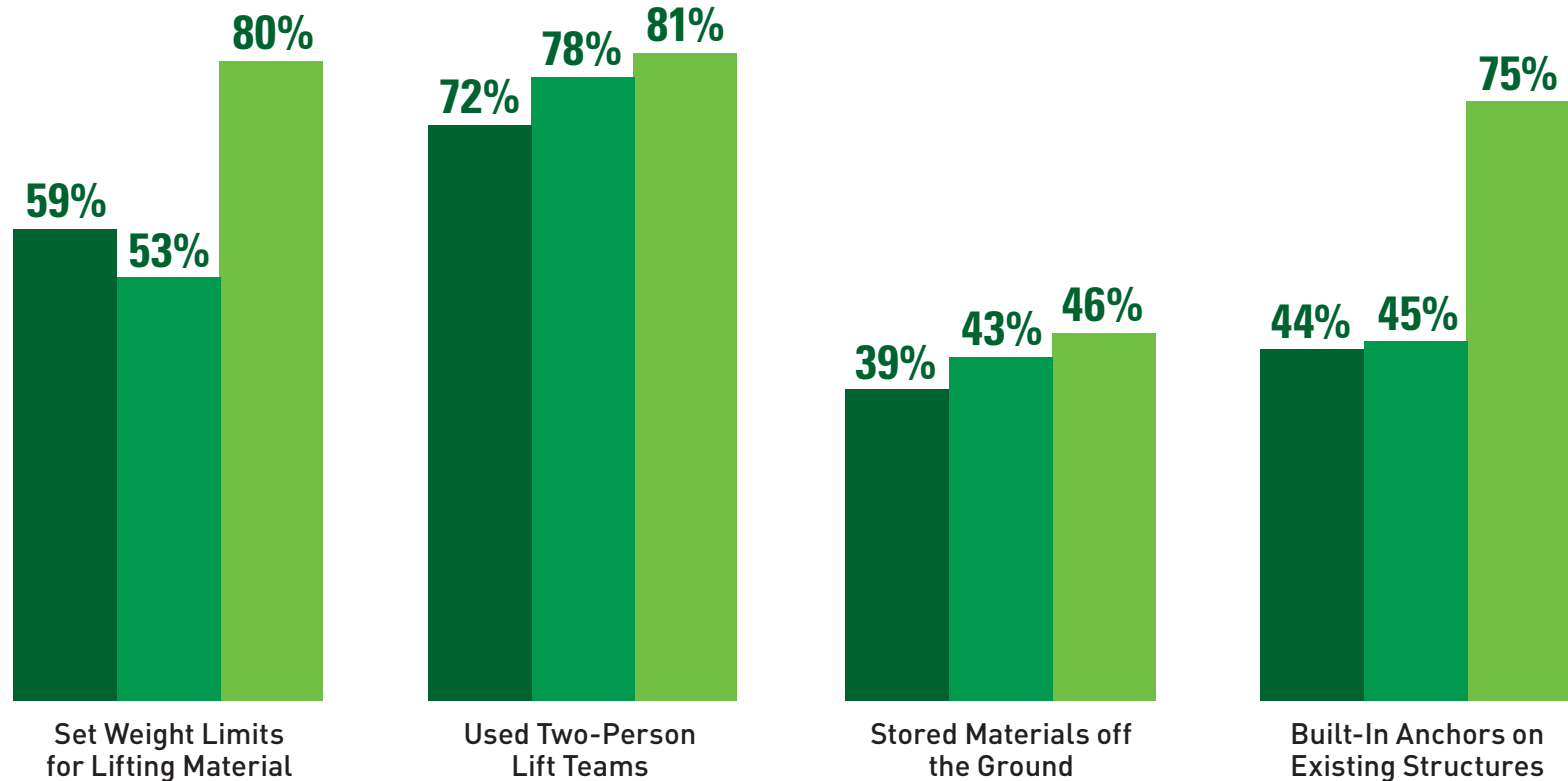
BUILT IN ANCHORS ON EXISTING STRUCTURES

Large companies more frequently use built-in anchors on existing structures than do midsize or smaller ones.

Practices Used to Protect Against Injuries

Percentage of contractors using each practice 50% or more of the time

■ Small ■ Midsize ■ Large



Material & Equipment Safety Best Practices: Material Procurement and Handling

MATERIAL HANDLING BEST PRACTICES

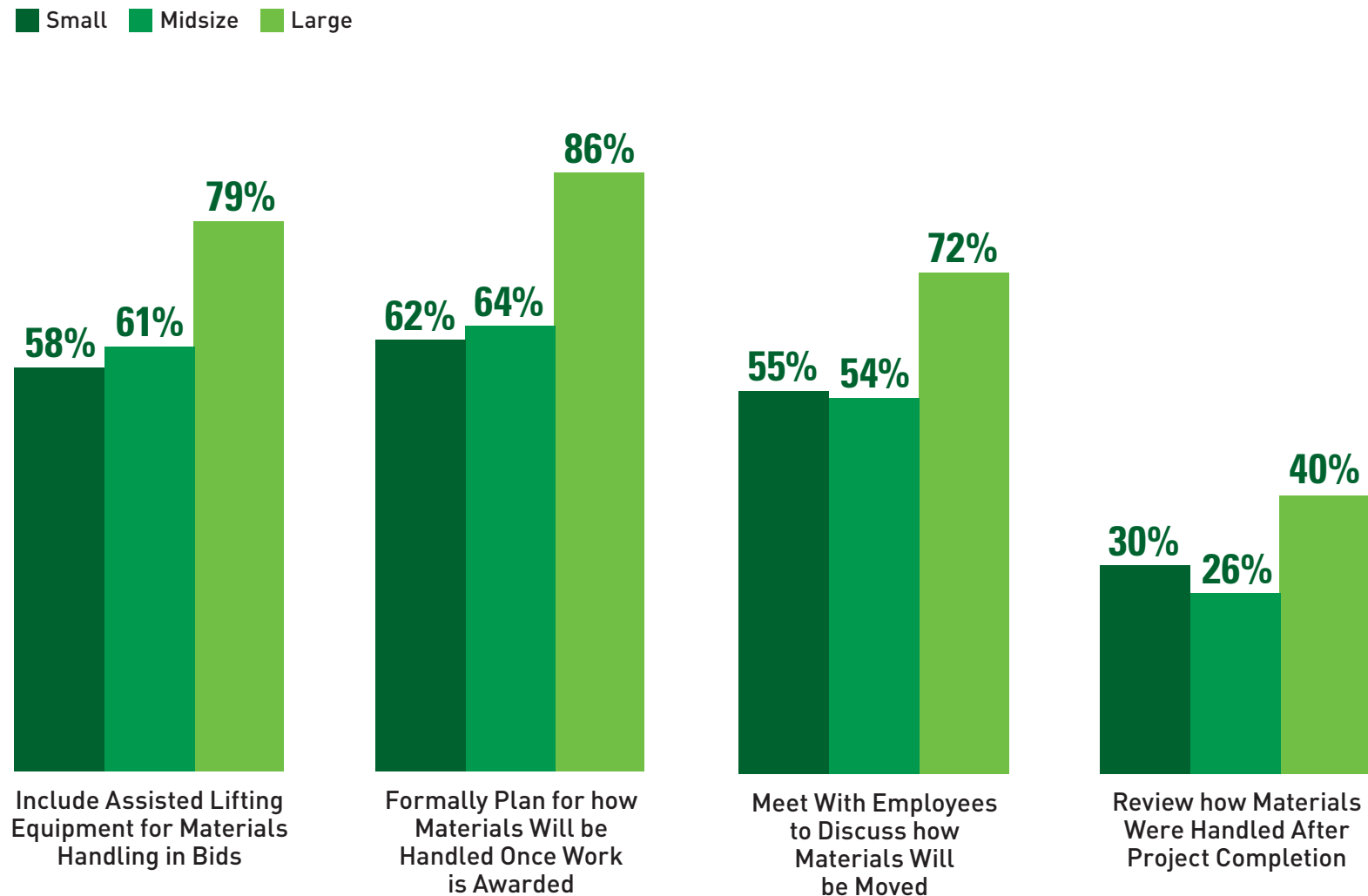
Materials are frequently handled and moved onsite, which generates safety risks. Rather than attempting to deal with this on an ad hoc basis, there is an advantage to careful consideration and planning for how to handle it and for analysis of how to improve these activities on future projects.

Four best practices for having a strategy in place for handling materials are listed in the chart at right. The most commonly used of these practices is having a formal plan for how materials will be handled once work is awarded, although it is also fairly common for companies to include assisted lifting equipment for materials handling in their bids and to meet with employees to discuss how materials will be moved. In all three cases, though, these activities are more frequently done by large contractors than by midsize or small ones.

However, it is less common for contractors to review how materials were handled after the project is complete, in order to improve their approach to handling them on future projects. This prevents best practices from being retained from project to project. While more common among large firms, most of them still do not do this on the majority of their projects.

Use of Materials Handling Best Practices

Percentage of contractors using each practice on 50% or more of their projects



Material & Equipment Safety Best Practices: Material Procurement and Handling

SAFE LIFTING BEST PRACTICES

Lifting materials can expose workers to injury, so safe lifting practices are critical. The most common practice for safe lifting is delivering materials close to where they will be used, which is done frequently by 91% of contractors. It is likely that the increased efficiency of having materials close to where they will be used is also influential in the wide adoption of this practice.

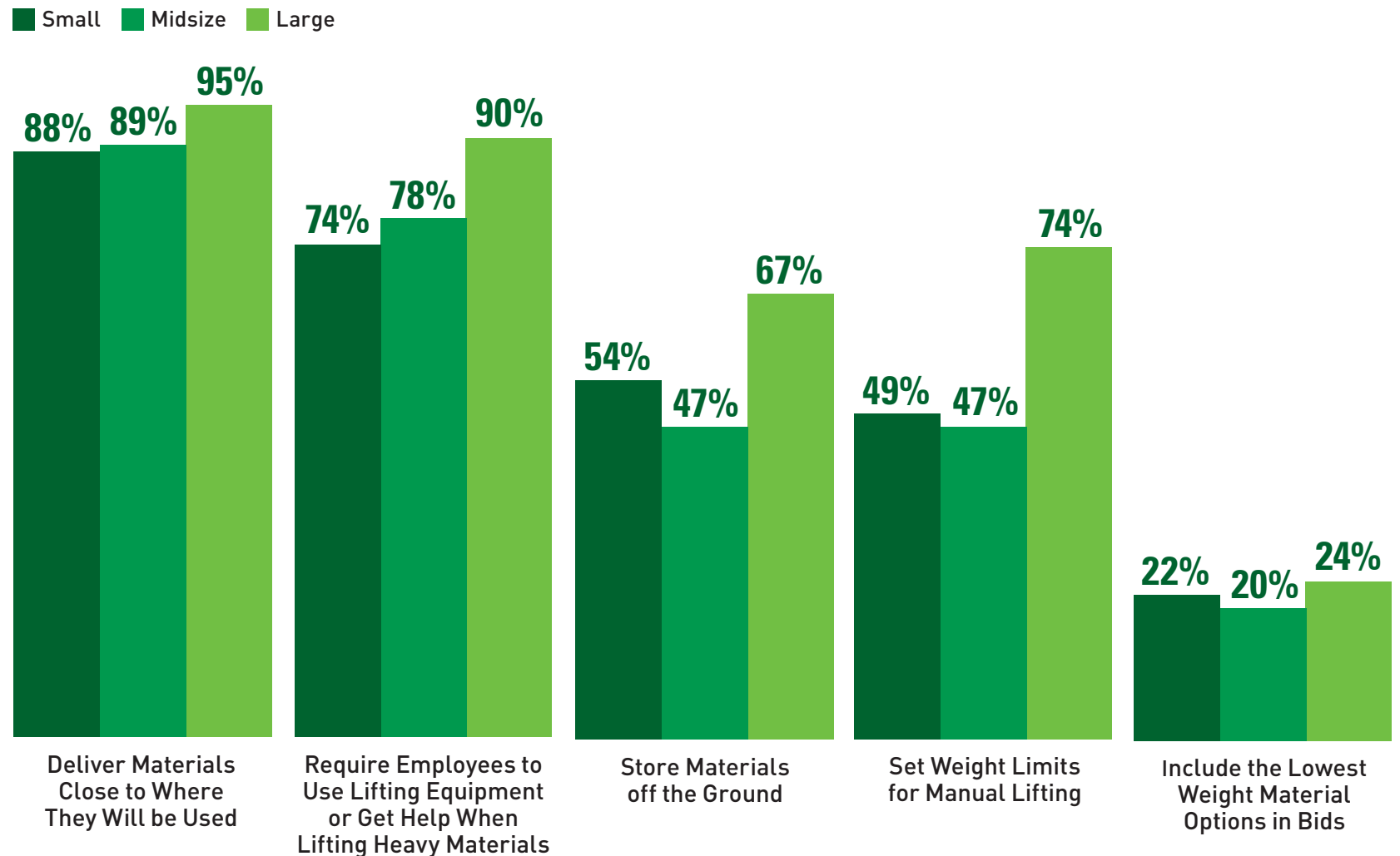
Another common practice is requiring employees to use lifting equipment or to get help when lifting heavy materials. While widely used, it is notable that only 37% of small and midsize companies and 58% of large companies always use this practice, suggesting there is still room for improvement.

Large companies more frequently report storing materials off the ground and setting weight limits for manual lifting than do small or midsize companies. These practices need to see wider adoption to improve safety across the industry.

Just as it is not common for contractors to include assistive lifting equipment in their bids (see page 10), it is also uncommon for them to consider the weight of materials in their bids. This suggests that engaging estimators in safety is an essential part of building a good safety culture across the company.

Use of Safe Lifting Best Practices

Percentage of contractors using each practice on 50% or more of their projects



Material & Equipment Safety Best Practices: Material Procurement and Handling

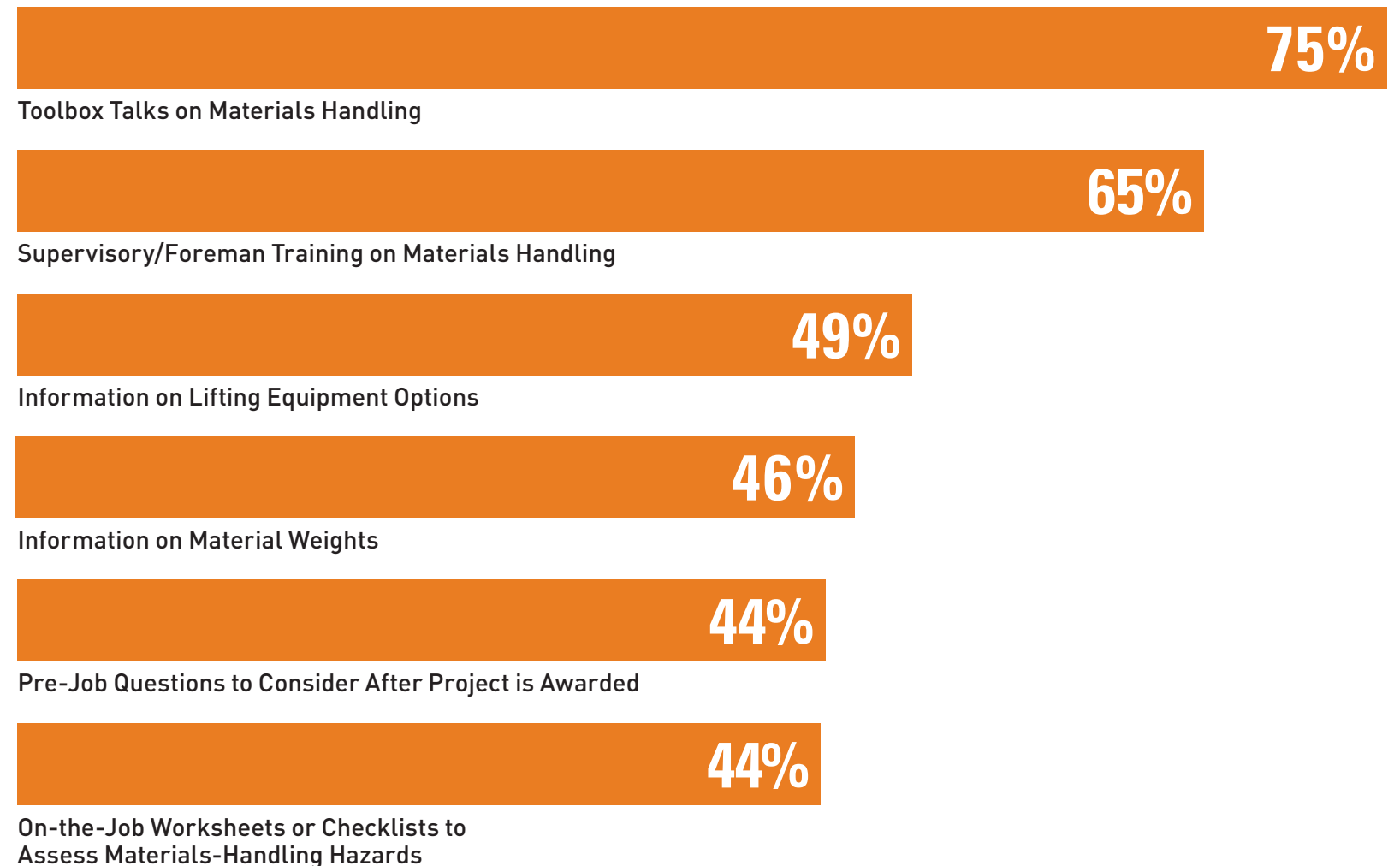
HELPING CONTRACTORS IMPROVE HOW WORKERS HANDLE MATERIALS ON JOBSITES

Contractors were asked to select approaches that would help their company address how workers handle materials onsite from a list of 13 options. The chart at right shows the top selections that they believe would be useful, all of which focus on more training or information.

- Toolbox talks are the best way to share information with workers about good materials handling practices.
- Training for supervisors and foremen on materials handling also scored well, but more with large (72%) and midsize (70%) firms than small ones (49%).
- Nearly half select providing information on lifting equipment options (49%) and on material weights (46%) to help companies recognize when lifting equipment is needed.
- Contractors want to provide better information to workers, including a list of pre-job questions to consider before work begins, and having worksheets or checklists for use onsite to assess the materials-handling hazards that they face.

While contractors do seek guidance on what to consider before work begins, questions to consider at the end of a project to help provide lessons learned is the least popular option, only selected by 15%.

Top Ways to Help Contractors Improve How Workers Handle Materials on Jobsites



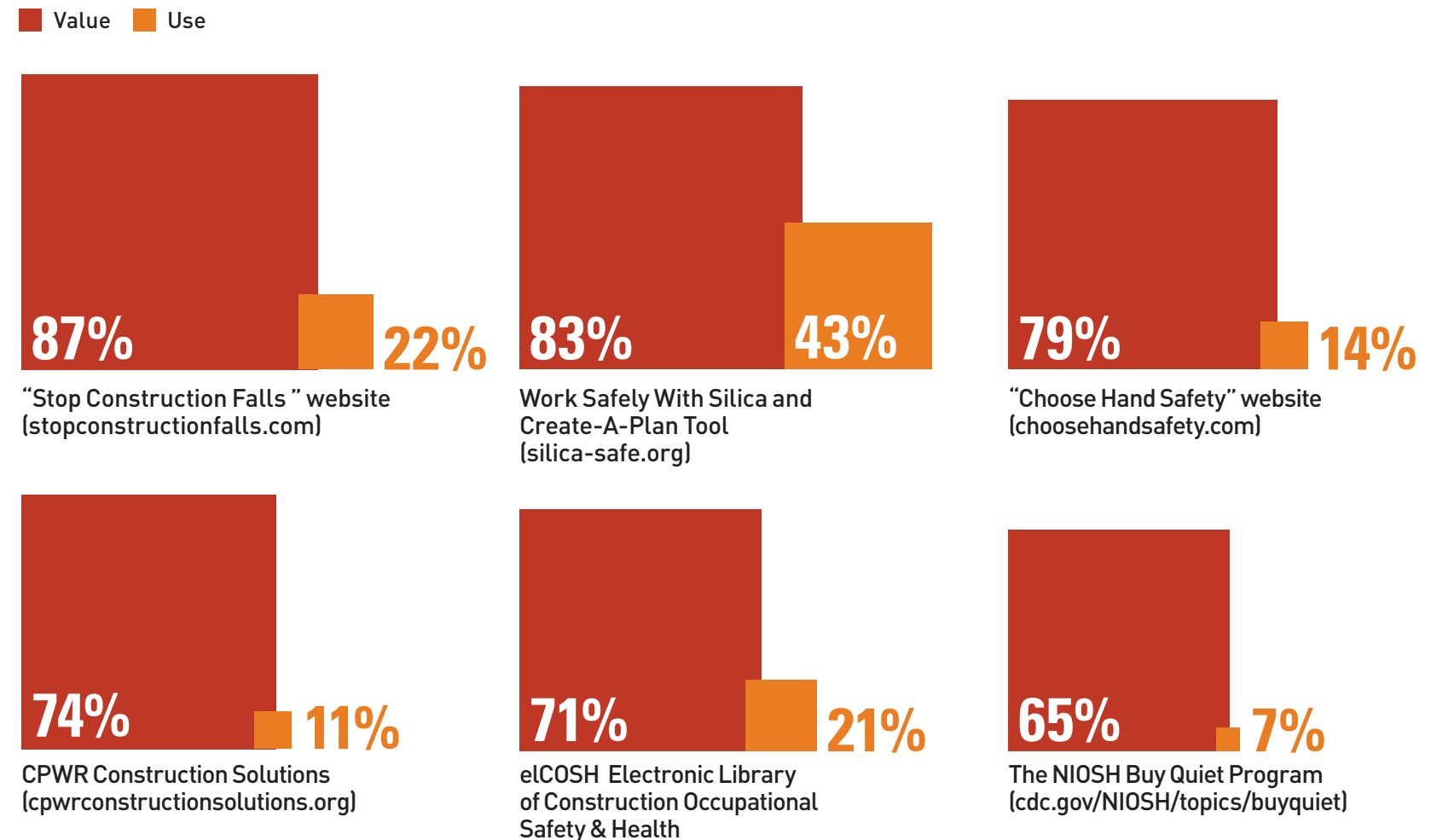
Material & Equipment Safety Best Practices: Resources

RESOURCES TO FIND OUT MORE ABOUT SAFETY ONSITE

There are many free resources available to the industry online to help promote best practices involving noise mitigation, avoiding musculoskeletal injuries and encouraging safer materials handling. However, currently only a few contractors (percentages noted in the light orange box designating frequency) take advantage of these resources.

The dark orange boxes, designating value, show the percentage of those using these resources who find them to be at least moderately valuable. These findings suggest that most people using these online resources do so because they find them useful, and that contractors seeking to take advantage of more safety best practices would likely benefit from beginning with them.

Value & Frequency of Use of Online Tools That Address Material and Equipment Safety



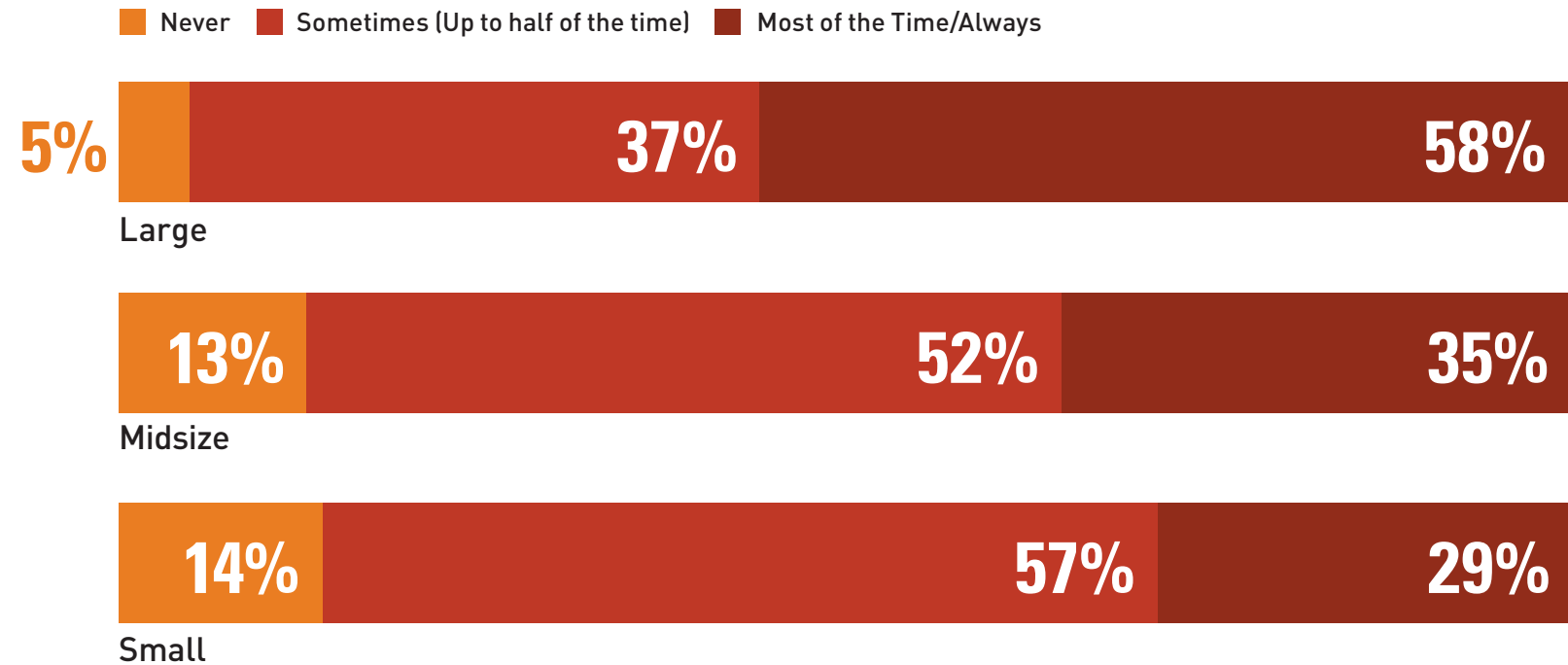
Best Practices in Safety Leadership

PROVIDING MENTORSHIP TO SUBCONTRACTORS

To have a good safety climate on a project, it is essential that all workers have the same expectations and behaviors in regard to safety, even if they work for different organizations. Therefore, one practice among GCs with a good safety culture is to mentor the subcontractors that work for them in their best health and safety-related practices. A large trade contractor that also utilizes subcontractors, such as a large mechanical contractor, may do the same.

The chart at right shows, not surprisingly, that large companies are far more likely to mentor subcontractors, with over half reporting that this is a widely used approach at their company. However, it is notable that even 29% of small companies will mentor subcontractors frequently, and another 57% mentor them on occasion, suggesting that many contractors realize that everyone needs to share the same knowledge and vision of safety to ensure a safe jobsite. However, the lower percentages among midsize and small companies also suggest that this is a practice that still can be more widely used in the construction industry.

Frequency With Which Organizations Provide Health and Safety-Related Mentorship to Subcontractors



Safety Leadership: Safety Mentoring of Trades

MEANS OF PROVIDING HEALTH AND SAFETY MENTORSHIP

Those who said that they mentor their subcontractors were asked about the means by which they provide that mentorship. The chart at right shows the percentage of those at small, midsize and large companies who use each of a variety of means.

PROVIDE TOOLBOX TRAINING RESOURCES

Small, midsize and large companies most commonly provide toolbox training resources as a means of mentoring their subcontractors. Other Dodge studies confirm that this is the most widely used means of providing safety information onsite.

PROVIDE ASSISTANCE CONDUCTING A JOB HAZARD ANALYSIS

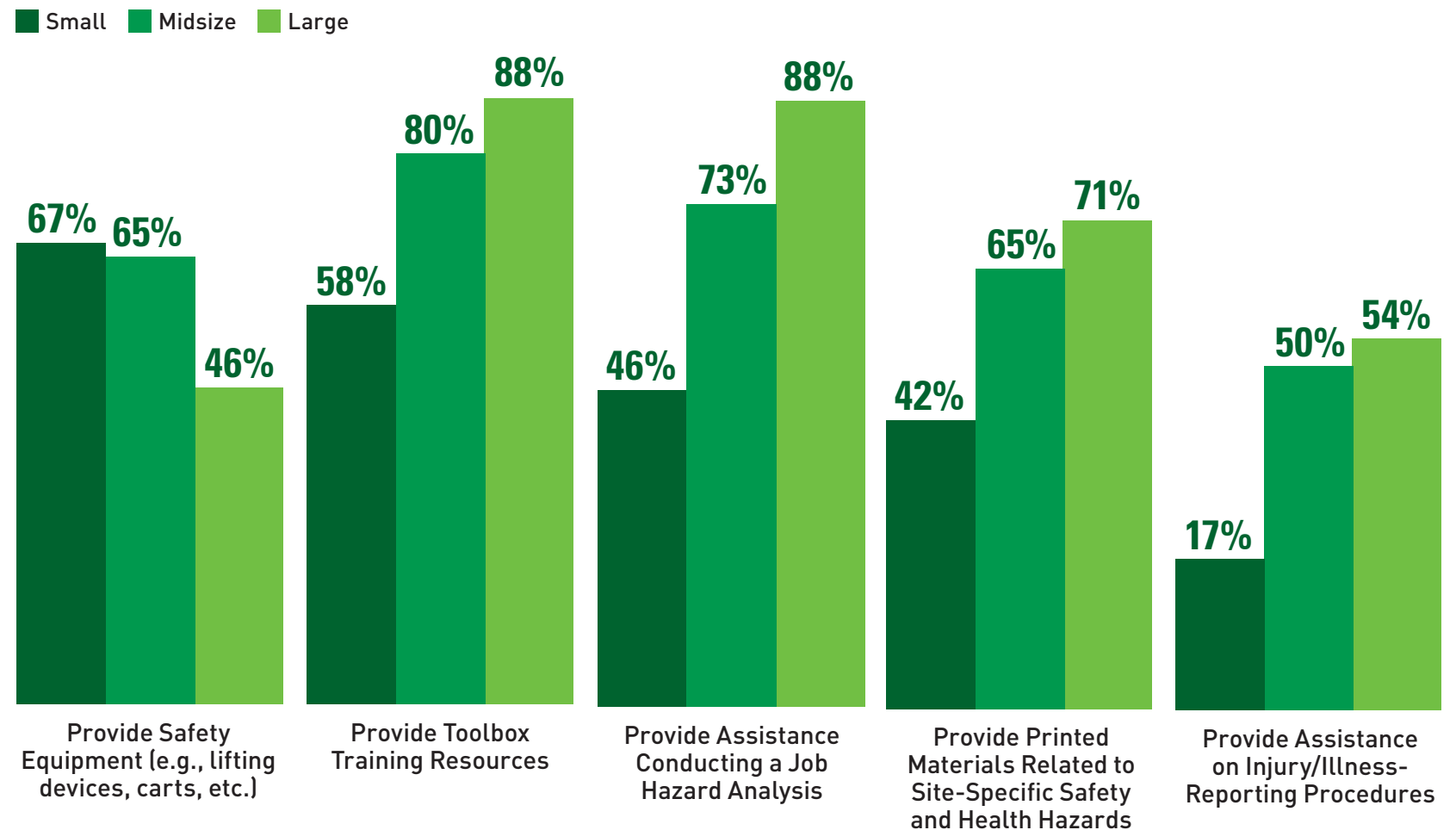
While the same percentage of large firms provide this assistance as provide toolbox training resources, midsize and smaller firms are less likely to offer this.

OTHER MEANS

Small and midsize firms are more likely than large firms to provide actual safety equipment, but midsize and large firms more frequently provide materials related to site-specific safety and health hazards, and assistance on injury/illness-reporting procedures.

Typical Means of Conducting Health and Safety-Related Mentorship of Subcontractors

According to those who conduct mentorship



Safety Leadership: Safety Mentoring of Trades

HELP NEEDED BY SMALL CONTRACTORS TO IMPROVE SAFETY PERFORMANCE

The chart on the previous page shows what companies typically provide to their subcontractors to improve safety performance. However, respondents were also given the same list of options and asked what they believe small contractors need the most. The responses from small companies to this question suggest that contractors do not always provide what they need most.

PRINTED MATERIALS RELATED TO SITE-SPECIFIC SAFETY AND HEALTH HAZARDS

Over two thirds of small companies think this would be helpful, but only about 40% of midsize or large firms recognize that this is important to small companies. It also ranks third among the materials actually provided to subcontractors.

ASSISTANCE CONDUCTING A JOB HAZARD ANALYSIS

One of the biggest disparities in perception about the value to small companies is this factor, with nearly all large companies regarding this as needed most by small companies, but only half of small companies agreeing.

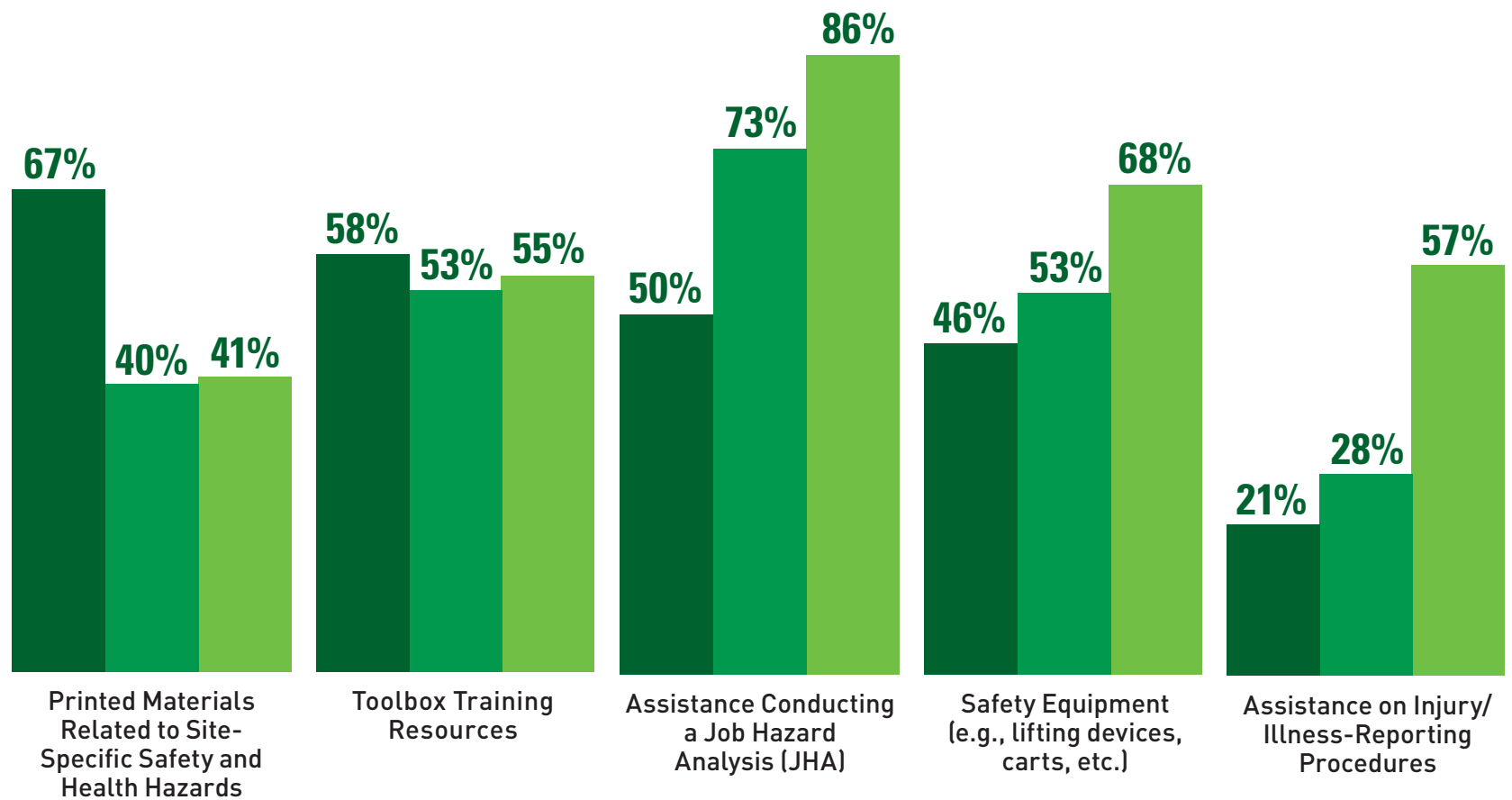
ASSISTANCE ON INJURY/ILLNESS REPORTING

Many more large contractors see this as needed by small contractors than small contractors themselves do.

What Small Contractors Need Most to Help Improve Safety and Health Performance

According to Those Who Conduct Mentorship

■ Small ■ Midsize ■ Large



Safety Leadership: Leadership by Supervisors and Foremen

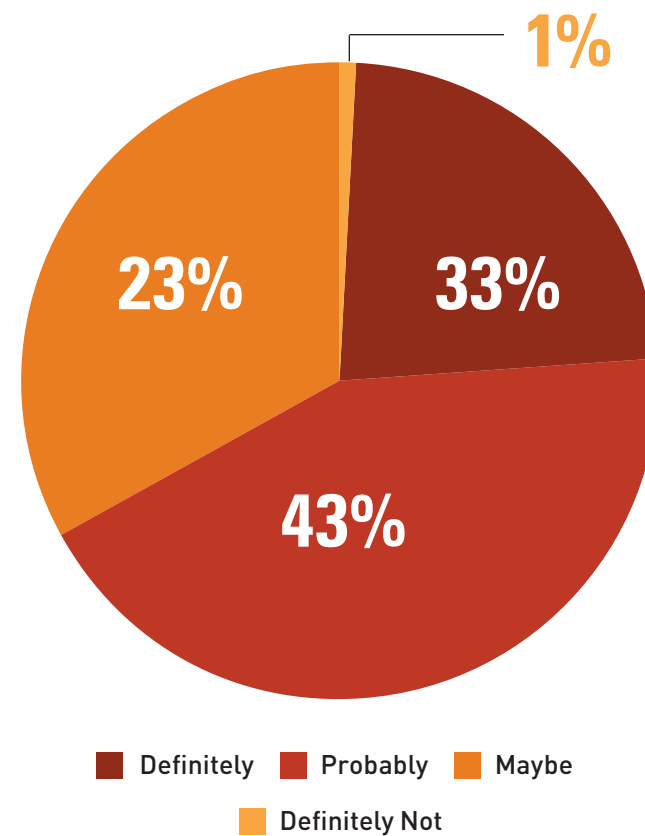
LEADERSHIP BY SUPERVISORS

Supervisors and foremen are in a unique position to impact safety on a project. Of course, their knowledge of safety is important to this task, but equally important is their ability to get crew members to engage with safety, including benefiting from their own direct knowledge and experience with the specific conditions onsite.

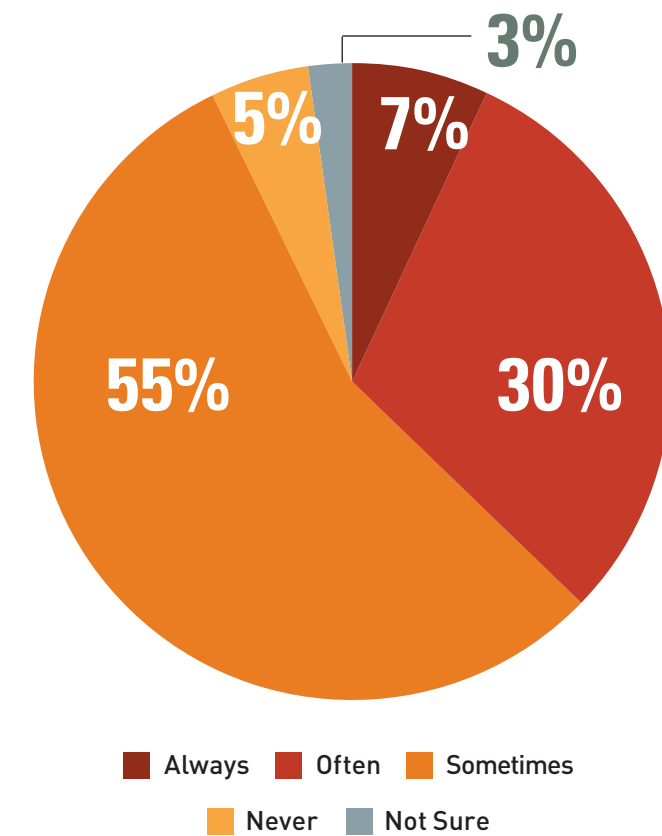
The majority of survey respondents understand this. One third (33%) believe that enhancing supervisor leadership skills definitely improves their ability to engage crew members to devise new ways to get work done more efficiently and safely, and another 43% thinks that it probably does.

However, far fewer, only 37%, think that supervisors always/often attempt to engage their crew members in safe practices in this way. This suggests the importance of providing leadership training to supervisors that will help them work with their crews to improve safety onsite.

Enhancing Frontline Supervisor Leadership Skills Improves Their Ability to Engage Crew Members to Devise New Ways to Get Work Done More Efficiently and Safely



Frequency With Which Supervisors Ask Crew Members to Devise Ways to Do Work More Efficiently and Safely



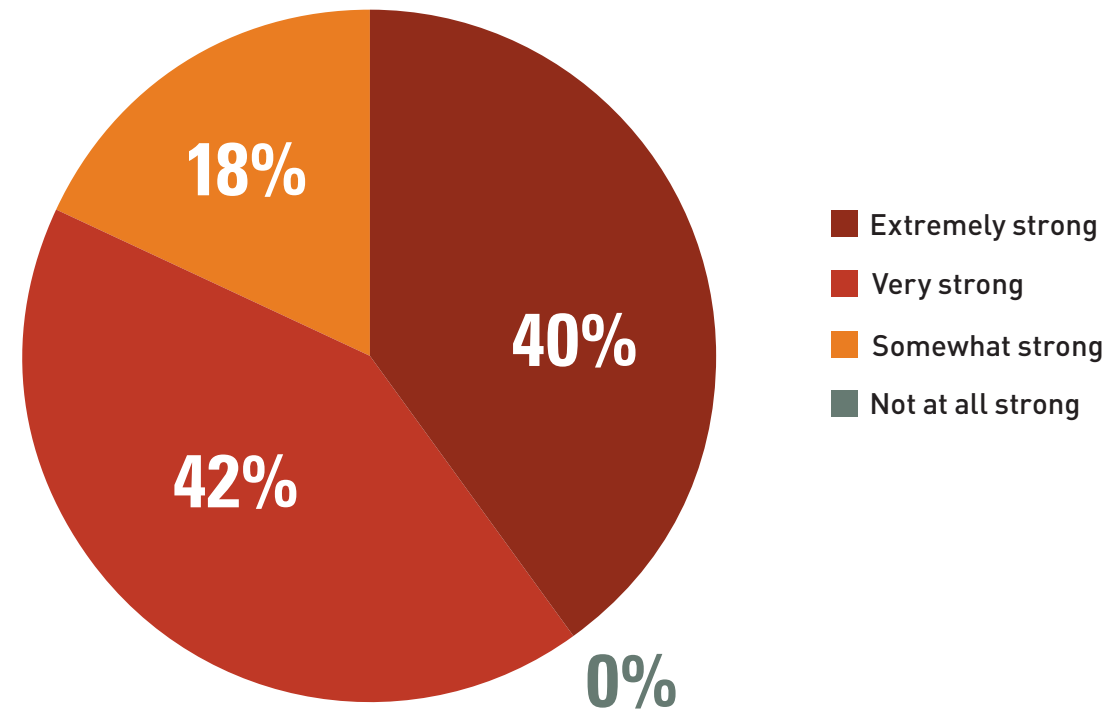
Safety Leadership: Leadership by Supervisors and Foreman

LEADERSHIP BY FOREMEN

To some degree, all survey respondents recognize that the leadership skills that foremen possess directly impacts the safety climate of their projects, and the overwhelming consensus is that this is a very to extremely strong relationship.

This finding demonstrates the importance of investing in foreman leadership skills. Being a good leader is about more than just technical knowledge, and it is a skill that can be learned, not one that has to be innately present. Jobsites are challenging, time-constrained environments, and available experienced workers like foremen are frequently in short supply, making it difficult to find the time to invest in leadership skill training. However, this finding demonstrates that the value in doing so is worth overcoming the challenges of finding the time.

Strength of the Relationship Between Foremen's Safety Leadership Skills and the Strength of Site Safety Climate



Safety Leadership: Communication and Toolbox Talks

SOURCES OF INFORMATION ABOUT SAFETY AND HEALTH THAT ARE PREFERRED BY CONTRACTORS

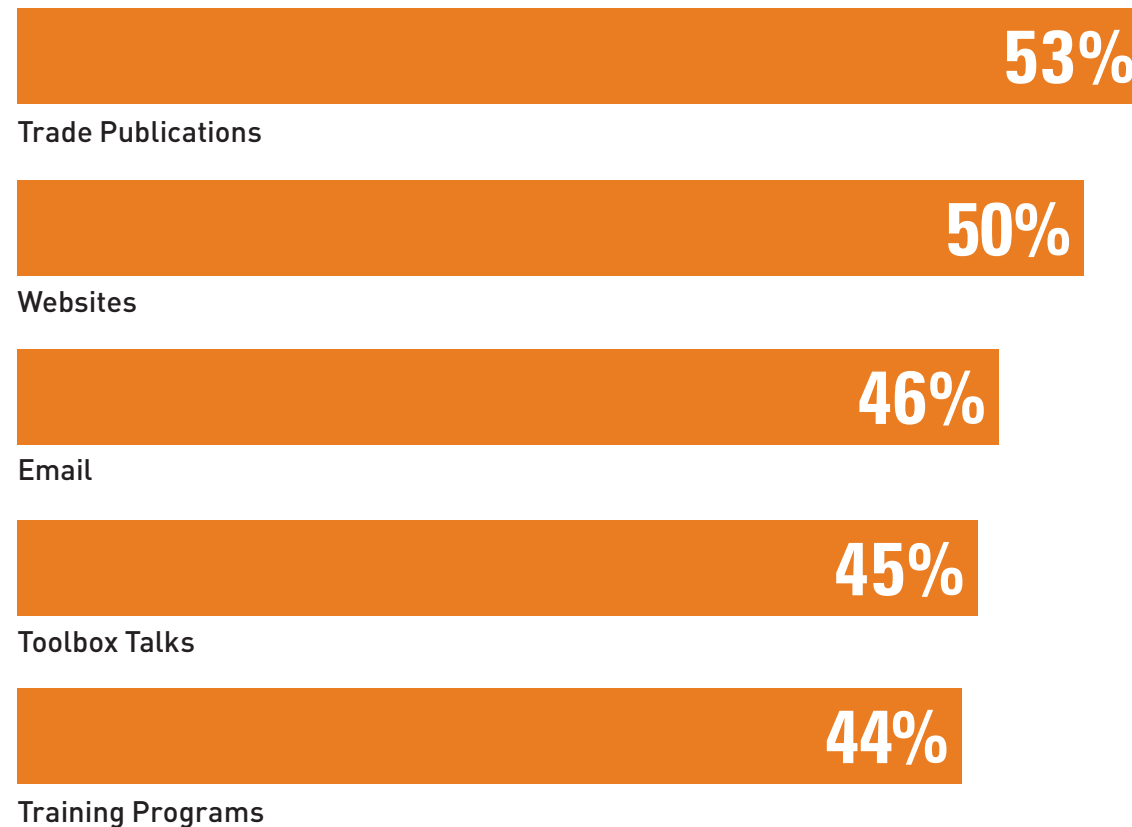
Contractors were asked to select their preferred sources for staying informed about health and safety issues, and the top five responses are indicated in the chart at right. These five score at least 15 percentage points higher than any other options provided, so they indicate the best means for reaching contractors.

Trade publications are the most widely preferred, most likely because they can be a good source of new information that contractors may have been previously unaware of, as can emails from organizations. Websites, toolbox talks and training programs, on the other hand, are more likely to provide more in-depth information and specific strategies addressing issues with which the contractors are already familiar.

VARIATION BY SIZE

- **Toolbox Talks:** Fewer small firms (30%) prefer toolbox talks than do midsize (52%) or large companies (50%). It is possible that these are more formal means of conveying information than small companies typically feel that they need.

Top Five Preferred Sources of Information About Construction Safety and Health



Safety Leadership: Communication and Toolbox Talks

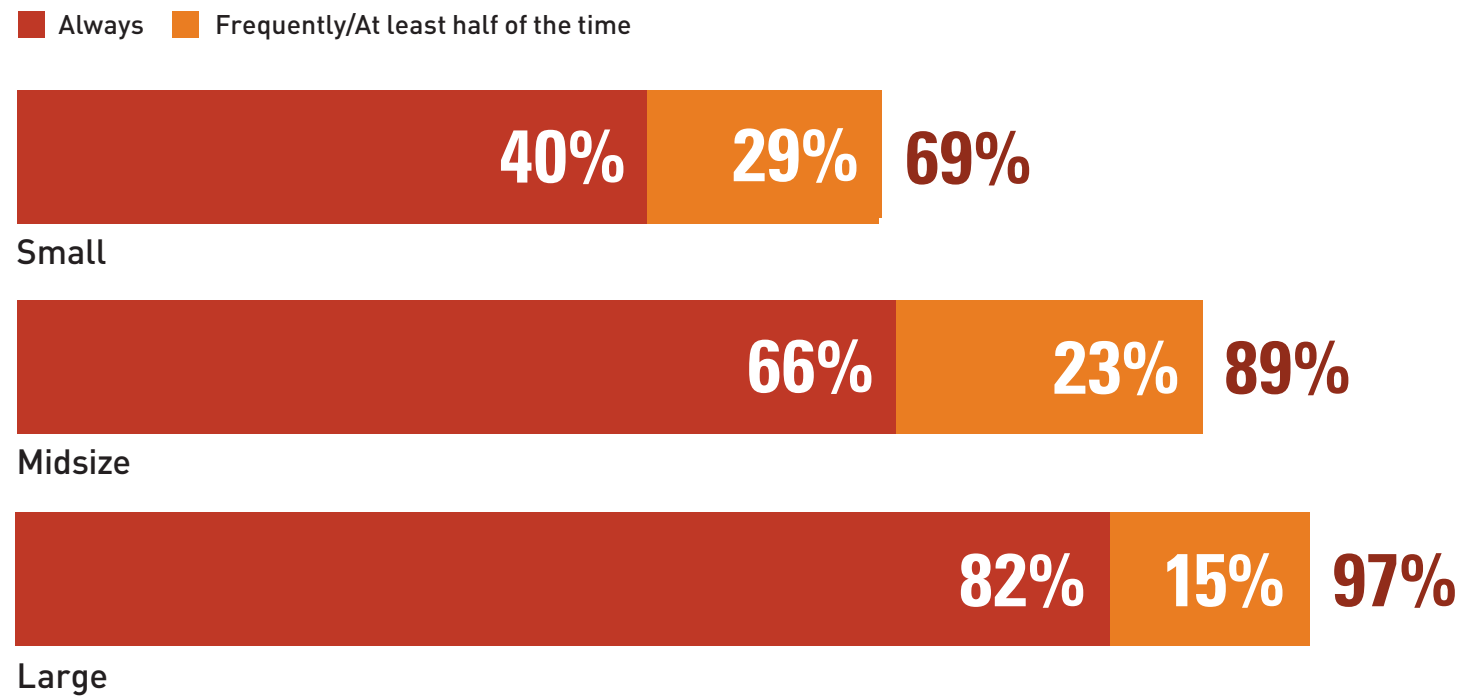
USE OF TOOLBOX TALKS

In previous safety studies by Dodge Data & Analytics published in the *Safety Management in the Construction Industry* and *Building a Safety Culture SmartMarket Reports*, contractors typically cite toolbox talks as the best means of conveying safety information to their workforce onsite. However, this study demonstrates that the use of toolbox talks by small contractors is less common than among midsize to large companies. In fact, among large companies, 82% report that they always use toolbox talks to provide safety information on specific tasks, so for large companies, these talks are a standard practice. However, only 40% of small contractors report the same.

VARIATION BY TYPE OF FIRM

Over two thirds (69%) of GCs always conduct toolbox talks for specific tasks, while only about half (55%) of trade contractors do.

Frequency of Contractors Conducting Toolbox Talks for Specific Tasks



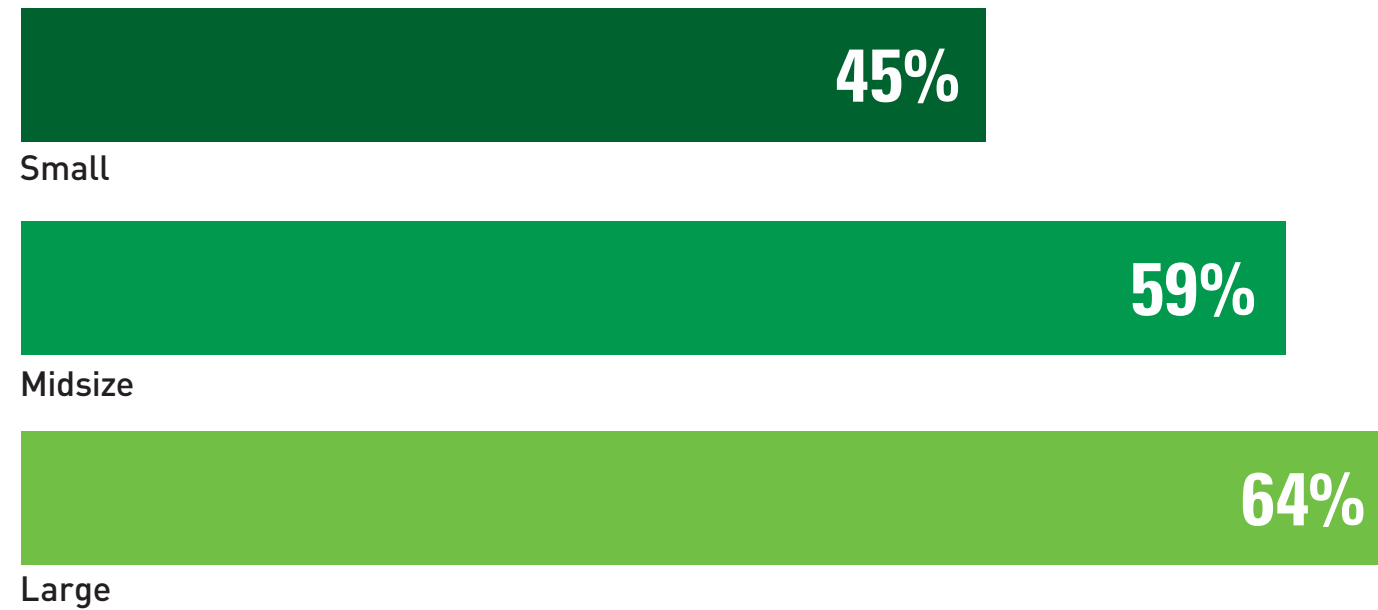
Safety Leadership: Communication and Toolbox Talks

USE OF CPWR TOOLBOX TALKS

CPWR provides toolbox talks on a variety of safety topics that can be downloaded for free from their website. Over half (57%) of the contractors who participated in this survey took advantage of this resource in the last year.

In particular, large and midsize contractors (as can be seen in the chart at right) and general contractors most frequently used these toolbox talks. While the findings suggest that much of the industry is familiar with these resources, it also demonstrates that a notable percentage, even among the large companies, may benefit from learning about and utilizing these to improve safety onsite.

Contractors Who Used CPWR Toolbox Talks in the Last Year



Lean Construction

EIGHT SOURCES OF WASTE

One of the core goals of using Lean construction is to eliminate waste from the process of building. Contractors were asked how familiar they are with the concept of the eight sources of waste that Lean attempts to eliminate. Nearly half (45%) reported that they were not familiar with this concept at all, and most of the remaining contractors (42%) identified themselves as somewhat familiar with it.

However, when questioned more precisely about the specific categories, the degree to which they report actively seeking to eliminate waste varied widely. (The chart shows what each category entails.)

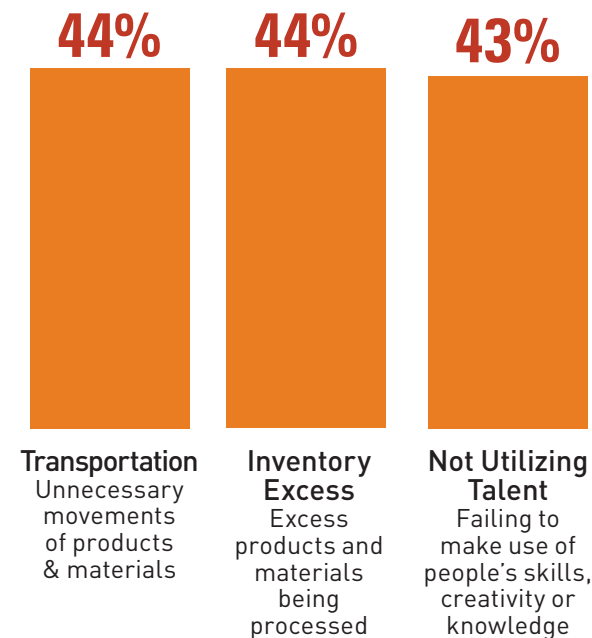
- Most contractors try to reduce waiting and defects.
- Just under half try to reduce lost efforts in transportation, inventory excess and under utilization of talent.
- About one third try to reduce motion waste, and one quarter try to eliminate excess processing.
- Only 8% felt that they tried to avoid more production than was needed.

There was no significant difference by firm size or type in the percentage addressing specific types of waste.

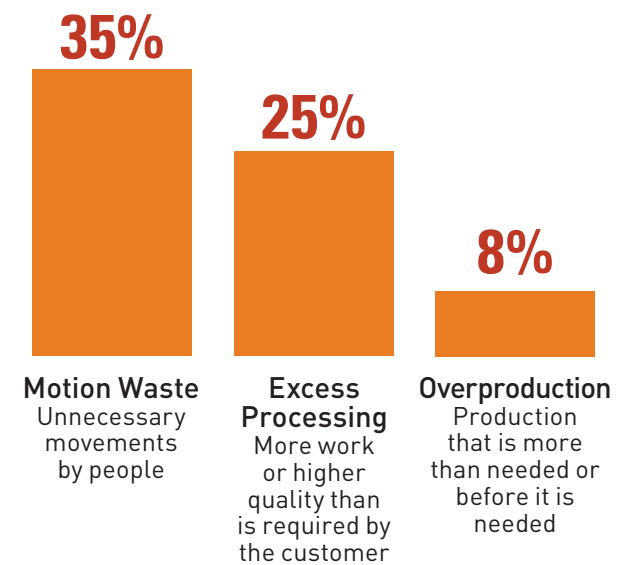
Sources of Waste That Most Contractors Try to Reduce



Sources of Waste That Some Contractors Try to Reduce



Sources of Waste That Few Contractors Try to Reduce



Lean Construction: Familiarity and Use

FAMILIARITY WITH AND USE OF LEAN

Most contractors (71%) are at least familiar with the concept of Lean construction, with GCs and large companies reporting the highest level of familiarity with Lean. This same question was asked in a study conducted by Dodge Data & Analytics and published in the *Lean Construction SmartMarket Report* in 2013, and at that time, only 52% of contractors were familiar with Lean construction. Since both studies were conducted using the Dodge contractor panel, it is clear that awareness of Lean has increased in the last five years.

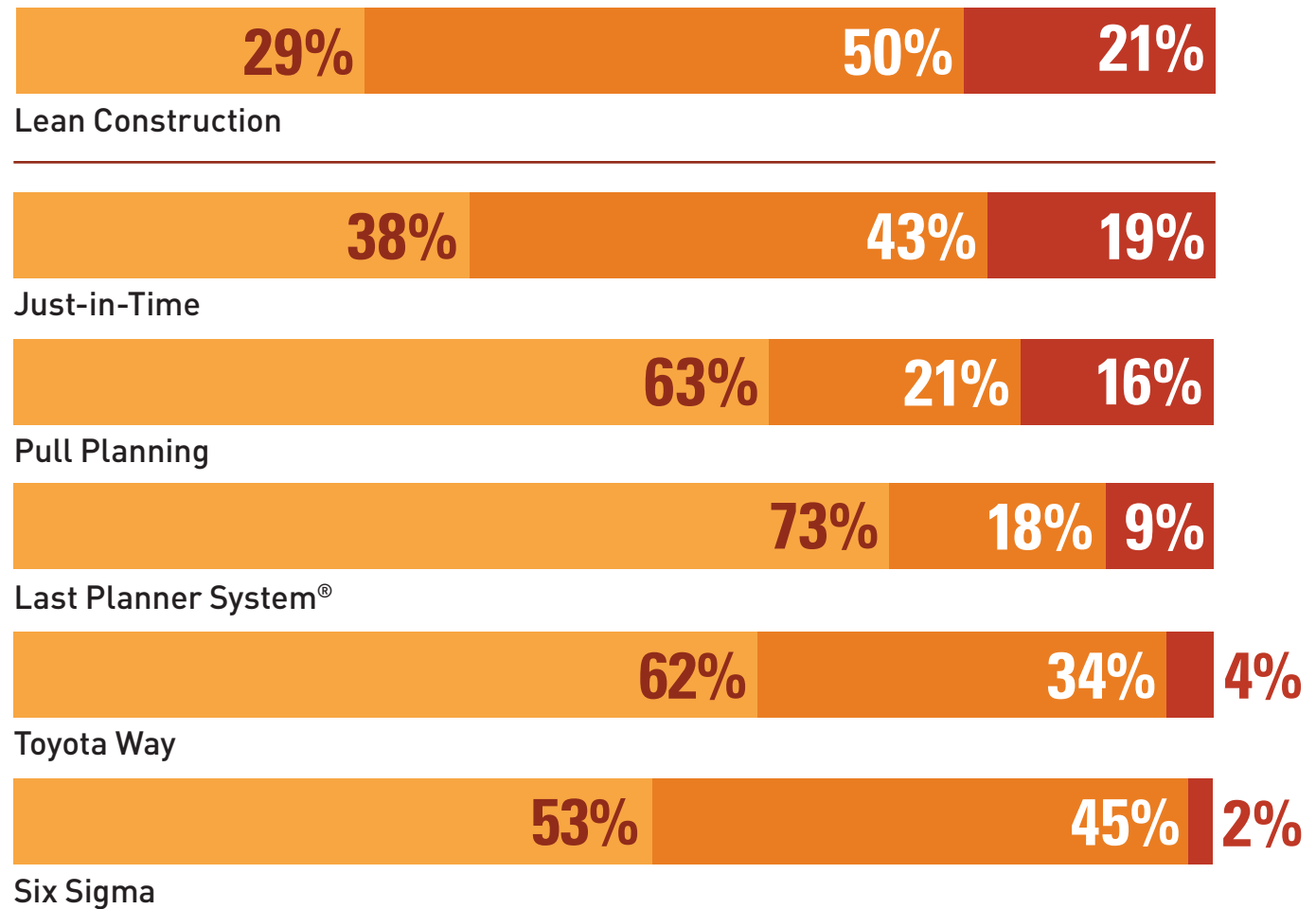
Use of Lean and specific practices, as the chart demonstrates, is still relatively low. The most common practice is Just-in-Time, with Pull Planning a close second. Last Planner System®, which is a more comprehensive approach, is adopted by only 9%. Practices drawn directly from manufacturing, including Toyota Way and Six Sigma, are the least common.

LEAN FAMILIARITY SCALE

The responses to this question were used to derive a Lean Familiarity scale ranging from no familiarity to high familiarity. This scale will be used to analyze responses to other questions about safety in this Brief.

Familiarity With and Use of Lean Construction

■ Not Familiar ■ Familiar ■ Implemented



Lean Construction: Project Leadership and Safety

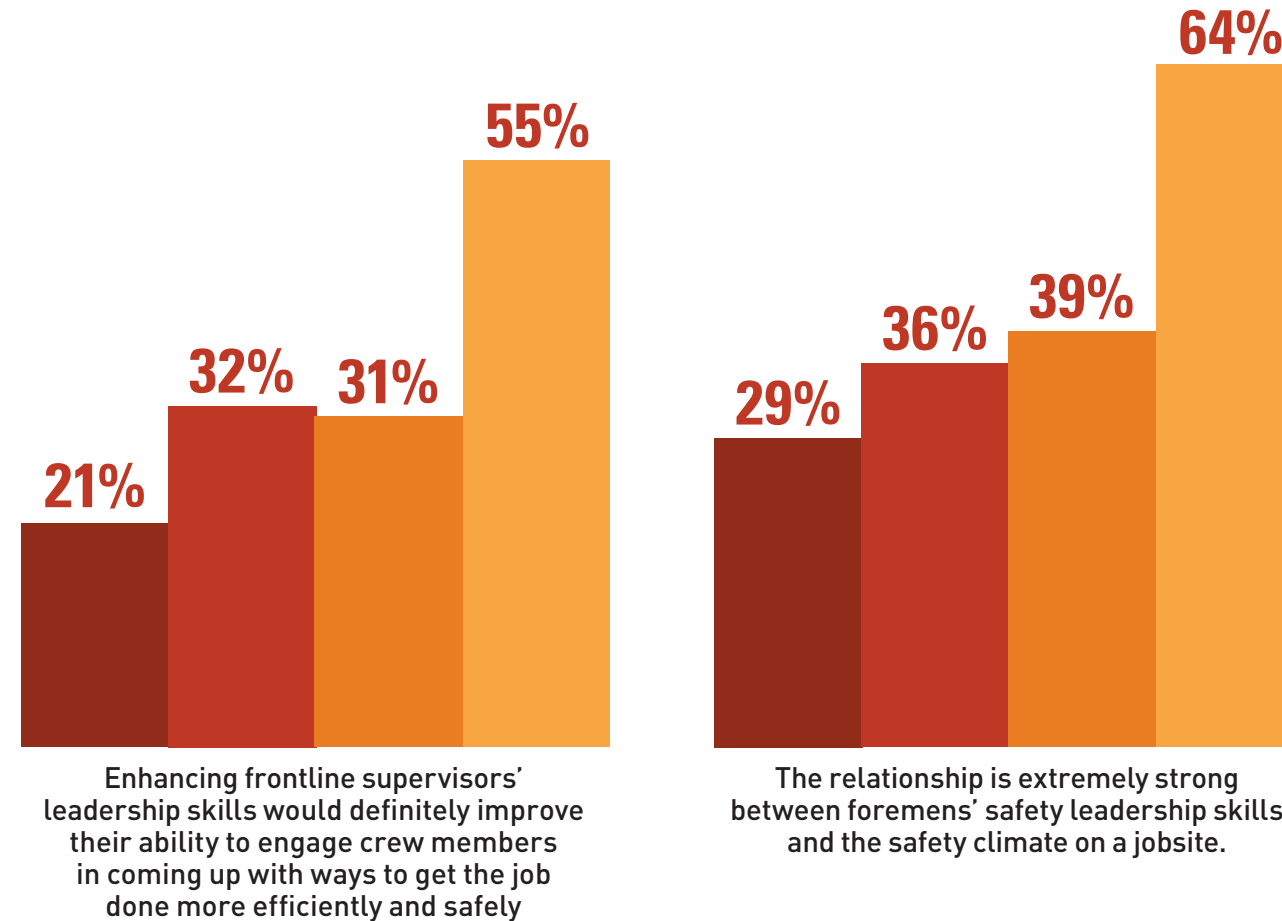
LEAN AND PROJECT SAFETY LEADERSHIP BY SUPERVISORS AND FOREMEN

As previously discussed on pages 17 and 18, leadership skills in supervisors and foremen onsite are critical. There is a clear correlation between a high level of Lean familiarity and recognition of the importance of these skills. The chart at right shows the findings of two questions about the impact on safety of leadership skills among supervisors and foremen already discussed on pages 17 and 18. However, here the findings are analyzed across the Lean familiarity scale developed from the question on page 23. While responses are roughly similar among those with no, low or even moderate Lean familiarity, those with high Lean familiarity (including many who have implemented some Lean practices) much more widely recognize the connection between leadership skills and enhanced safety.

Previous Dodge research on Lean, including case studies published in the *Lean Construction SmartMarket Report*, demonstrate that engaging workers and giving them a greater voice into the best project management is an important part of a successful Lean implementation. Clearly, the effort to have supervisors and foremen engage workers in larger initiatives also directly carries through to safety.

Lean and Project Safety Leadership

■ No Lean Familiarity ■ Low Familiarity ■ Moderate Familiarity ■ High Familiarity



Lean Construction: Project Leadership and Safety

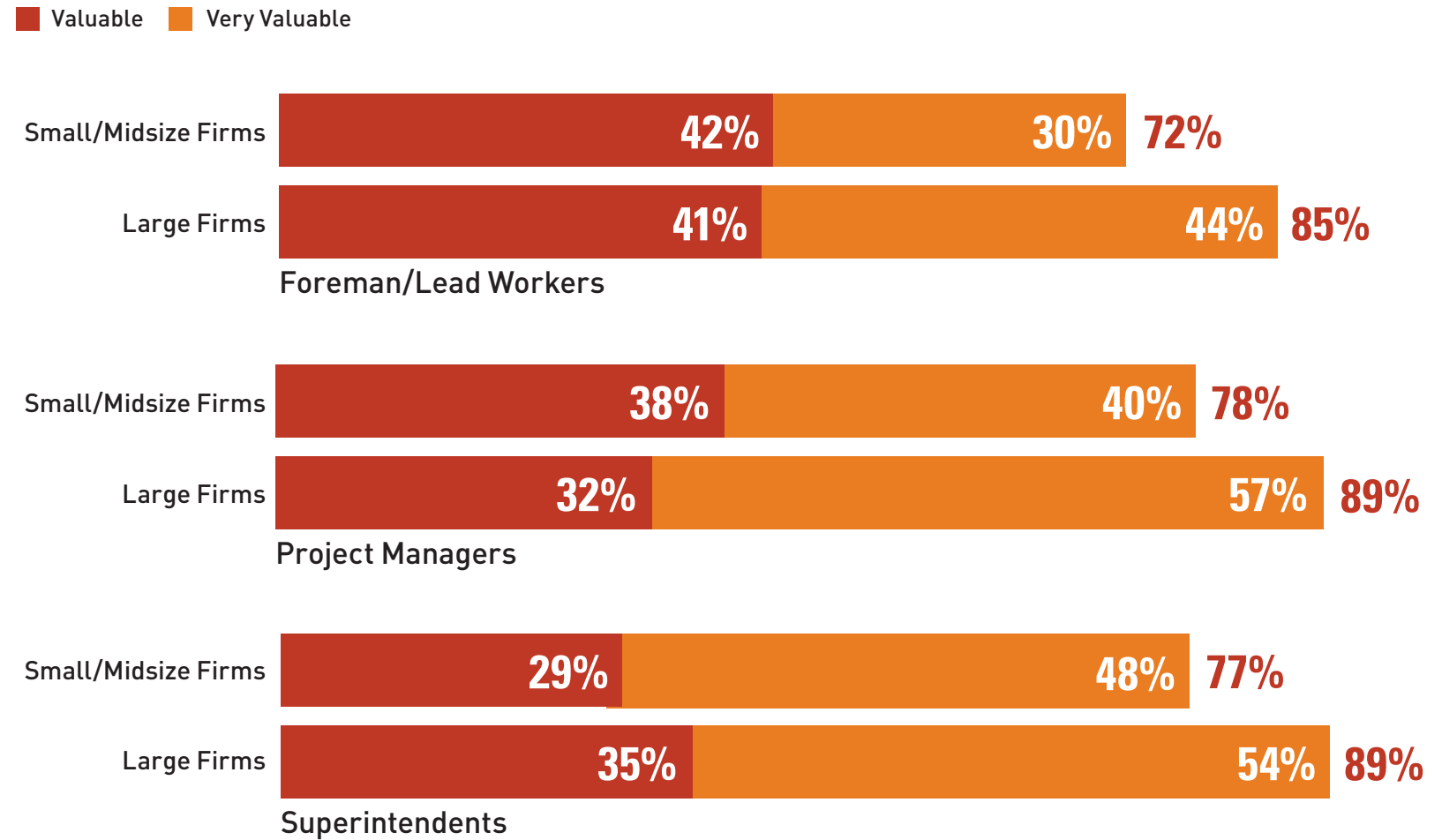
VALUE OF TRAINING ON LEAN CONSTRUCTION PRINCIPLES FOR VARIOUS ROLES IN A PROJECT

Nearly all contractors see the value of training project leadership on lean principles. While there is some variation across roles, it is notable how similar each response is, demonstrating the importance for each role to have this training.

Interestingly, even some contractors who consider themselves unfamiliar with Lean practices still believe that there might be value, since the percentage who consider it valuable to train each of these roles exceeds the percentage who report being familiar with Lean. This demonstrates the reputation that Lean has in the construction industry.

As the chart at right demonstrates, though, the value placed on training on Lean principles varies notably by size. Large companies are much more likely to see the value in this training for each role than small or midsize firms.

Value of Training on Lean Construction Principles for Various Roles



Key Takeaways

MATERIAL AND EQUIPMENT

Even though many safety practices related to material and equipment are widely used in the construction industry, this study reveals important opportunities for greater implementation, especially among smaller contractors, as well as a need for more general awareness about their applicability and education about their benefits.

Reducing Unsafe Noise From Construction Equipment: Despite the potential damage to workers' hearing that can be caused by loud equipment:

- Fewer than half of contractors frequently use low noise equipment.
- Only about one third of them frequently isolate loud equipment from work areas.
- Just one quarter frequently put loud equipment behind barriers.

Even the simplest of measures, wearable hearing protection, is still not used all the time by a majority of the respondents.

Reducing Injury Rates Related to Lifting and Falls: Small companies lag the rest of the industry in:

- Equipment investments for personal fall arrest systems, lifting equipment and drill rigs.
- Practices that require minimal direct investment, such as setting weight limits for lifting materials.

All sizes of contractors underutilize the practice of storing materials off the ground to avoid lifting-related injuries.

Safer Material Procurement and Handling Practices: Again, large companies far more frequently employ material-related best practices. This includes:

- Having estimators include assisted lifting equipment in their bids.
- Creating formal plans about material handling.
- Meeting with employees to discuss how materials will be moved.

NEED TO RAISE AWARENESS ABOUT THE VALUE OF SAFETY PRACTICES

The low levels of use of many of the safety practices reveal a major opportunity for industry to more actively quantify the benefits of safety practices in a wide variety of use cases

and educate contractors about the most effective means of implementing them.

NEED TO INCREASE USAGE OF ONLINE TOOLS THAT ADDRESS MATERIAL AND EQUIPMENT SAFETY

While many industry organizations such as CPWR - The Center for Construction Research and Training, the National Institute for Occupational Safety and Health (NIOSH), The Associated General Contractors of America (AGC) and the Lean Construction Institute (LCI) provide free online resources to help contractors learn more about safety practices, most contractors do not use the tools available to them. But those that do typically report a medium, high or very high level of value from their use. Wider use could help many contractors increase their adoption of safety best practices.

A partial listing of online tools that address material and equipment safety is shown in the Additional Resources section of this report (see page 28).

Key Takeaways: Best Practices in Safety Leadership and Lean Construction

BEST PRACTICES IN SAFETY LEADERSHIP

Mentoring subcontractors, developing leadership skills in supervisors and foremen, and good communication about safety are all ways in which companies improve their safety leadership.

MENTORING SUBCONTRACTORS ON HEALTH AND SAFETY

Most companies provide some mentoring of their subcontractors, but the means they use vary widely by the size of firm.

- It is most common for midsize and large companies to provide toolbox training resources and assistance with conducting job hazard analyses.
- Small companies most commonly provide safety equipment.

Regarding what resources large companies should give to smaller ones in order to encourage better safety practices:

- The large contractors believe that the most important things they can do for small contractors are to assist them in conducting job hazard analyses and to provide them with safety equipment.

- But the small companies themselves place the highest value on printed materials related to site-specific safety and health hazards, and toolbox training resources.

LEADERSHIP SKILLS IN SUPERVISORS AND FOREMEN

Most contractors recognize the impact of leadership skills in supervisors and foremen on jobsite safety.

- It is widely acknowledged that supervisors, in particular, need to be able engage crew members in actively participating in the development of safe practices.
- However in practice, far fewer report that supervisors are frequently engaging workers in this way.

SOURCES OF INFORMATION AND COMMUNICATION ABOUT SAFETY

Trade publications and websites are the top sources of information on safety and health preferred by contractors, with email, toolbox talks and training programs also important. Conducting toolbox talks for specific tasks is far more commonly done by large and midsize companies than by small ones.

LEAN CONSTRUCTION

Lean construction is focused on the elimination of waste from construction practices, but many Lean practitioners find that the improvement of processes and communication onsite that Lean entails also enhances safety.

FAMILIARITY WITH AND USE OF LEAN

Working familiarity with the concept of Lean has grown considerably since Dodge first studied this question in 2013. Although specific practices are still adopted by fewer than 20% of study participants, its value by users is widely recognized.

- Well over three quarters of contractors regard training on Lean principles as valuable for their foremen, project managers and superintendents.
- Most contractors work to eliminate waste due to waiting or defects, although far fewer seek to address issues like not utilizing talent and motion waste.

LEAN AND PROJECT SAFETY LEADERSHIP

Contractors that have a high familiarity with Lean concepts are much more likely to:

- Report that enhancing front-line supervisor's leadership skills would definitely improve their ability to engage crew members in coming up with new ways to get the job done more efficiently and safely.
- Recognize the relationship between the leadership skills of foremen and the safety climate on the project.

Contacts & Resources

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ADDITIONAL RESOURCES

CPWR - The Center for Construction Research and Training:
www.cpwr.com

CPWR Construction Solutions:
- www.cpwrconstructionsolutions.org

Choose Hand Safety: www.choosehandsafety.com

eLCOSH (Electronic Library of Construction Occupational Safety & Health): <http://elcosh.org/index.php>

Lean Construction Institute: www.leanconstruction.org

The NIOSH Buy Quiet Program:
www.cdc.gov/NIOSH/topics/buyquiet

Stop Construction Falls: www.stopconstructionfalls.com

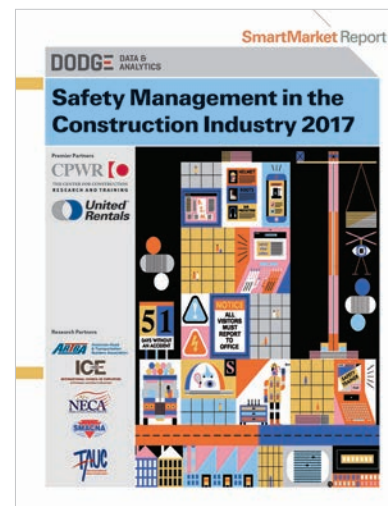
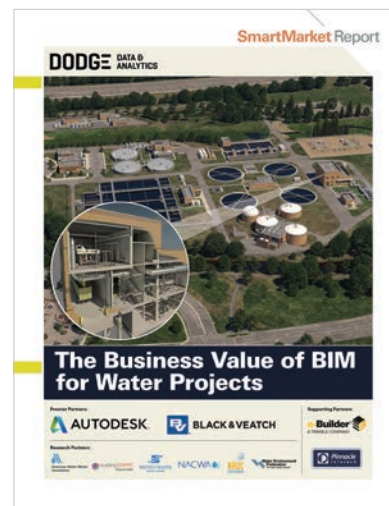
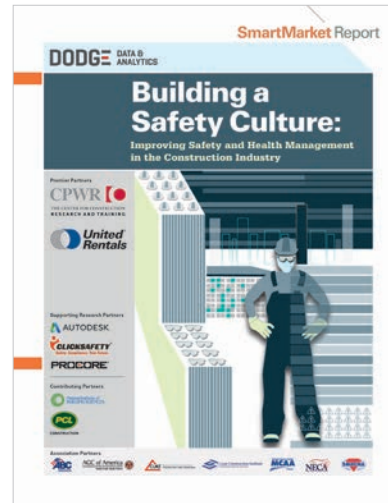
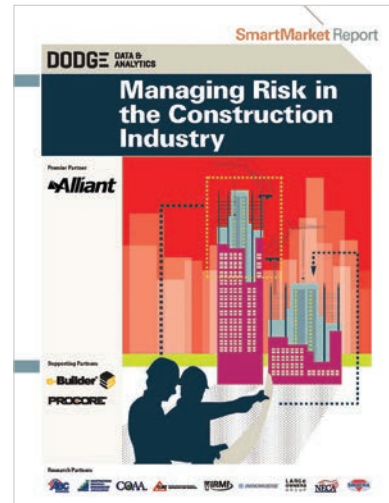
Work Safety with Silica and Create-A-Plan Tool:
www.silica-safe.org



Dodge Data & Analytics: Main Website: construction.com Dodge: construction.com/dodge
Research & Analytics: www.construction.com/products/dodge-research-analytics Sweets: sweets.com
SmartMarket Reports: construction.com/resources



Industry Insights



About Dodge Data & Analytics Dodge Data & Analytics is North America's leading provider of analytics and software-based workflow integration solutions for the construction industry. Building product manufacturers, architects, engineers, contractors, and service providers leverage Dodge to identify and pursue unseen growth opportunities and execute on those opportunities for enhanced business performance. Whether it's on a local, regional or national level, Dodge makes the hidden obvious, empowering its clients to better understand their markets, uncover key relationships, size growth opportunities and pursue those opportunities with success. The company's construction project information is the most comprehensive and verified in the industry. Dodge is leveraging its 100-year-old legacy of continuous innovation to help the industry meet the building challenges of the future. To learn more, visit www.construction.com.

About CPWR CPWR is the 501(c)(3) nonprofit construction safety and health research and training arm of North America's Building Trades Unions, which represents 14 international/national unions and over three million workers. CPWR encourages the elimination or reduction of conditions constituting hazards to the health and safety of workers in the U.S. construction industry, and promotes the maintenance and improvement of safe and healthy working conditions for workers. CPWR is currently the NIOSH-funded National Construction Research Center, and also has large, multi-consortia safety and health training and medical services programs funded by NIEHS, DOE, and DOL. (www.cpwr.com)

Get Smart About the Latest Trends.

For more information on these reports and others, visit construction.com/resources.