



TABLE OF CONTENTS

Executive Summary ————————————————————————————————————	2
Highlights —	3
Methodology —	4
A/E/C Future Focus	4
Scenario 1: Perfect World View	8
Scenario 2: Struggle for Sustainability	9
Scenario 3: Building Walls	10
Scenario 4: Controlled Environment	11
Survey Results	13
Demographics	22
Conclusion	25

Acknowledgements

This *Tenth Annual Survey of Owners* is possible only through the leadership provided by Construction Management Association of America (CMAA). In addition, special thanks go to the owner members of CMAA, Construction Users Roundtable (CURT), Council of Educational Facility Planners International (CEFPI), Construction Owners Association of America (COAA), International Society of Pharmaceutical Engineers (ISPE), Western Council of Construction Consumers (WCCC), Construction Industry Institute (CII), North Central Electric Association (NCEA), Society of American Military Engineers (SAME), National Association of Industrial and Office Properties (NAIOP), and Health Facility Institute (HFI). Consulting, technology and other service providers to the AEC industry including AutoDesk, Contax LLC, e-Builder and Meridian Systems, supported the distribution of the survey request to their customers. Several friends of FMI assisted in international or market segment specific distribution. These friends include Dr. Dongping Fang and Dr. Jiayi Pan both from Tsinghua University in Beijing, David Bentley, Dr. Paul Giammalvo, Bart Grasso, Glyn Hazelden, Peter Hessler, and Angus Warren. Last, FMI and CMAA would like to thank Mimi Wheeler, an intern from North Carolina State University for her input and analysis.

Copyright © 2009 FMI Corporation. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means without permission from the publisher: FMI Corporation, 5171 Glenwood Ave., Raleigh, North Carolina, 27612, 919.787.8400.

EXECUTIVE SUMMARY

2009 marks the tenth time that FMI and the Construction Management Association of America (CMAA) have collaborated on a survey of construction owners. These surveys have addressed such current topics as accelerating use of program management, implementation of Building Information Modeling (BIM), and more effective risk management strategies. Individually, the surveys present snapshots of practices and attitudes in the owner community at given points in time. Collectively, they offer an opportunity to follow changes in these attitudes and practices and gain early insight into subjects that are becoming more or less important to owners over time.

HIGHLIGHTS

- Use of outsourcing in all project phases has either increased between 2006 to 2009 or will increase between 2009 and 2014
 - Program activation/commissioning and O&M demonstrate a 60 percent and 30 percent acceleration in outsource use, respectively
- Owners are taking a more holistic view of their capital construction efforts and expect a broader set of services from pre-design to O&M functions
- Between 2009 and 2014 owners attach significantly more importance to the following areas:
 - Selecting the most effective project delivery system
 - Maintenance management support in both process and technologies
 - Proactive strategies to avoid claims and disputes
 - Development and use of a construction management plan
 - □ Effective documentation and processes designed to support facility commissioning or turnover
- Eighteen percent of owners cited team coordination achieved by applying technology enhanced processes as the area needing greatest improvement
 - Architects and general contractors are percieved as providing less coordination, while program managers and construction management service providers are perceived as performing better in this regard

[Highest value support]
"Be proactive and make recommendations; don't simply identify problems and areas of risk."

- Large Institutional Education Owners

- Internal communication among owner staff and effective cost control and management efforts from their senior managers are areas needing improvement for many owners
- Knowledge transfer, experience building through training, recruitment, and aging workforce solutions are top opportunities for represented labor leaders to meet owners' expectations
- Different types and sizes of owners maintain different expectations and priorities
 - □ Today, private/closely held organizations want a full range of services and more support, particularly in the pre-design or design phases and post-construction phases
 - □ Today and in the future, state agencies expect to perform the front-end activities in house
 - □ Today and in the future, publically traded owners do not want tactical help, particularly in monitoring cost, addressing compliance, defining scope of work, and work conformance testing
 - □ In the future, federal agencies are anticipating the need for more help with upfront pre-design or design services and construction oversight
 - □ In the future, municipal agencies anticipate needing help with claims support and compliance monitoring activities
 - Large owners with programs greater than \$500 million do not want tactical help, particularly in building budgets, defining scope of work, commissioning, finding likely claims and building schedules
 - Small owners, with programs less than \$100 million, place the greatest importance on services that occur before construction begins or post-construction, specifically, leading the project team, defining responsibilities, addressing design comments, administrating contracts, building budgets and scopes of work, and commissioning or maintenance support.

METHODOLOGY

The first group of survey questions asked owners about their current use of outsourced services across the different stages of a construction project and whether their rate of outsourcing was higher in 2009 than it had been in 2006, and what further change they expected between now and 2014.

The second group of questions presented 28 specific tasks or functions commonly performed by professional construction and program managers and asked owners to determine the importance of each, using a scale that ranged from "not at all important" to "very important." These 28 tasks were derived from a study conducted by CMAA in 2006 to identify the specific components of the Construction Management (CM) profession and associate each of these functions with the *CM Standards of Practice* promulgated by CMAA.

The 2006 study was part of an effort by the Construction Manager Certification Institute (CMCI) to achieve accreditation for its Certified Construction Manager (CCM) program from the American National Standards Institute. The study identified 120

represents evide FMI has long be	sourcing of program activation nee of a long-term trend der elieved one of the transform tices and toward preferred ser	manding a broader set nations occurring in t	t of services from tradi the design/construction	tional design and cor	struction firms.
	ı				
Inflection	Point: Perspectiv	ves and Expe	riences Shift I	mportance of	Function
	Point: Perspective or functions that are viewed				
Several services	Point: Perspectiv				
Several services	Point: Perspective or functions that are viewed				
Several services	Point: Perspective or functions that are viewed				
Several services	Point: Perspective or functions that are viewed				
Several services	Point: Perspective or functions that are viewed				
Several services	Point: Perspective or functions that are viewed				
Several services	Point: Perspective or functions that are viewed				
Several services	Point: Perspective or functions that are viewed				
Several services	Point: Perspective or functions that are viewed				
Several services	Point: Perspective or functions that are viewed				

Inflection Point: Holistic Strategy

These shifts in importance also portend a growing owner emphasis on true life-cycle cost calculation and an ever-stronger desire for contractors to help them predict and control long-term costs. This holistic strategy can be observed by the increasing number of owners using both a program management, versus a project-centric, approach and an asset management approach to capital construction. This approach is demonstrated by the top 10 most important standards of practices containing at least one practice originating from each of the major phases of the construction process. In addition, five of eleven areas most frequently mentioned for improvement by owners relate to or infer the use of a life cycle cost type approach.

The most important services today remain so in the future. Presented in standards of practice or activities as rated by responding owners.

t are four depictions of the most important

10c - Work Conformance9e - Contractor Compliance10d - Risk Mgt.10b - Build Schedule

8d - Scope of Work

9e -

Today's top two concerns, as measured by the frequency of "very" and "quite important" rankings only, deal chiefly with assuring that a project is built in conformance with the contract documents. They remain the most important considerations five years from now. The third through fifth items in 2014, measured by the frequency of "very" and "quite important" rankings, although new to the "top five" in 2014, are actually ranked sixth through eighth in 2009, and have moved up without changing their order.

The three items they replace – scope of work, punch list, and critical path schedule – will fall out of the top five to 13th, eighth and ninth positions, respectively. "8d Scope of work: Developing the scope of work for bid packages" is the only 2009 top five factor that falls out of the top 10 in 2014.

In some cases a relatively small gain in importance rating has resulted in a move of several spaces up the ranking list. For example, "7d Address Comments: Ensure that review comments are adequately addressed during the design phase" is ranked as quite or very important by 85 percent of respondents today and 92 percent for 2014, a gain of 9 percent. This gain was sufficient to move this factor from eighth place to fifth.

Team coordination in some form was mentioned most often across all provider categories. This includes integrated project delivery, more use of BIM, adoption of 3D and 4D design techniques, and similar factors. The processes necessary to implement these types of techniques demand integration across the construction supply chain and are also necessary to utilize a full life cycle or asset management approach to capital construction.

Taken together, the combination of highly important standards of practice and general comments describe an environment where owners of all types are looking for a more effective collaborative approach from their service providers. This is fully consistent with the comprehensive view of projects that is revealed by the other survey questions.

A/E/C FUTURES RESEARCH

What?

During 2008 and 2009, the economic and financial turmoil has resulted in a dramatic shift in the way the business environment for the architecture, engineering and construction (A/E/C) industry will affect the participants. FMI/AMI undertook a research effort to better define this shift and support industry participants in addressing the following:

Clearly define critical <u>uncertainties</u> and <u>certainties</u>
Identify as many potential <u>wildcards</u> as possible and bring them to light
Articulate <u>strategic implications</u> of each scenario and describe the resulting market shape
Share <u>winning strategies</u> that will leverage or defend against the strategic implications

The responses to these areas answer a key question, "What might that future look like?" FMI/AMI described four possible futures to engage and stimulate senior leaders as they struggle with the development of robust strategies to ensure their firms thrive over the coming generation.

Why?

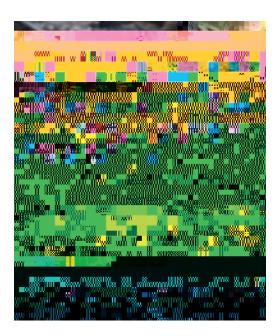
The conventional wisdom is that the A/E/C industry does not shape its own destiny; instead, it reacts and responds to the economy, owner demands, labor needs, etc. The typical planning cycle for the majority of firms is 1-3 years into the future and in some ways r

F

Inflection Point: Dominant Forces Shaping A/E/C Industry

A combination of FMTs research and responses to the *Tenth Annual Survey of Owners* support the identification of six forces that are dominant in defining the inflection points discussed. These forces are described below and discussed more fully in the context of each of the four presented scenarios.

- t tendency for or against free trade, levels of international hostilities or peaceful relations and the ability of companies and citizens to work, travel and immigrate internationally
- $\mathbf{e} = \mathbf{e} + \mathbf{e} +$
- e g g t a v t research, development and application of innovations and technologies, particularly as they affect the A/E/C industry in process use and application of labor and other resources; examples include Building Information Modeling (BIM), nanotechnology applications for new materials, etc.
- e macro economic trends or tendencies both globally and nationally for money supply, debt, lending practices and growth expectations particularly as these factors affect the A/E/C industry
- t t trend toward or away from democratic societies, the maturity or stability of governments, levels of corruption or lack thereof and the tendency to be bureaucratic or lean and efficient
- v ^f e t f ue e rate at which peoples embrace practices that lead to cleaner air and water, alternative energy sources and sustainable living practices especially as it affects the built environment



SURVEY RESULTS

FMI and CMAA developed a series of questions to test the owners' shifting perspectives using past data collected from the 2006 owners study¹ and then contrasting it with responses reflective of both today and forecasting out to 2014. Owner rated each service in the context of where it falls on the supply chain and described its importance to their capital construction program and how frequently they outsourced it. As described earlier, the 28 standards of practice tested originate from a list of 120 items developed by CMAA. These 28 services are organized across the capital construction supply chain in eight steps and presented in summary names in t and with full descriptions in t.

In 2006, FMI and CMAA tested the frequency of outsourcing of services falling under each of the supply chain steps.

Construction performance and design services were the most heavily outsourced phases of construction² (t). A comparison to 2009 responses and 2014 expectations demonstrates greater use of outsourcing in each phase between 2006 and 2014, except in design services and construction performance. The design services function typically precedes construction execution by six months to two years. In 2006, the level of outsourcing represented a high watermark for activities and demanded more outsourcing. The providers of these types of services began to see the slowdown in activity in 2008. Once the financial crisis was in full swing in October 2008, owners both reduced their pre-construction activities and pulled those activities still being performed in-house to make use of internal resources. FMI believes this is a short-term trend and will reverse once the level of pre-design, design oversight and design activities return to normal. This is in part visible in both design services and constrexecu64 Tw6.29792 .7.6 9 967.66669 expects (In inf o006, 02thaof se9ign .368891cl89 1 -eduuuu7l being per)T[k-0.

t are likely impactinut 10 percent of the			

F

t

Relevance and Importance of Services

A total of 28 activities to support all phases of capital construction program were tested to establish relevance and importance to owners. In all instances, the standards of practice tested are viewed as being more important as we move into the future.

t presents each of the 28 standards of practice tested in the *Tenth Annual Survey of Owners*. The frequency of the selection of "very important," "quite important," "fairly important," "slightly important," "not at all important," and "not

applicable" is described in this same exhibit.

t provides the five questions demonstrating the most consistent answers, meaning the responses vary widely. In both cases, standard deviation of the responses measures the degree of consistency. The degree of consistency can also be observed in t by the data exhibiting more balance between the available importance choices. As an example, "6b - Find Likely Claims" in t shows many more respondents selecting "slightly important" and "not at all important" than the surrounding question and it is one of the top five least consistent questions.

The 2009 most consistent ratings reflect standards of practice that were also the most important practices. The least consistent practices tended to be of lower overall importance. An expansion of the list of least consistent practices to 10 demonstrates that nearly all of them originate from either the earliest or latest supply chain steps of pre-design or design and post-construction respectively. It is FMI's opinion that this observation is linked to more owners demanding a broader set of services across the supply chain yet a large group of owners still view and apply these services in a silo approach. By 2014, the degree of inconsistency falls for the 2009 top five least consistent and on average, their importance demonstrates the most dramatic increase, reinforcing the trend of owners demanding a broader set of services across the supply chain.

Exhibit 8	2009 Most and Least Consistent Importance Ratings			
Top 5 Most Consistent (Lowest Standard Deviation)			Top 5 Least Consistent (Highest Standard Deviation)	
10c - Work Conformance		-	12c - Maintenance Technology	
9e - Contractor Compliance			8e - Project Delivery System	
11d - Punch List			6b - Find Likely Claims	
10d - Risk Mgmt.		_	6c - Avoid Claims	
11b - Monitor Testing		-	5d - Define Responsibilities	

Owners believe that the importance of all components of the capital construction supply chain will increase over time. Items rated most important in 2014, as defined by over 92 percent of responses as "Very" or "Quite Important", include:

- e t Ensure review comments are adequately addressed during the design phase
- e t¹ t ¹ e Monitor contractor compliance with contract requirements
- u où e où e Develop construction schedule
- f 's e Manage conformance of work to contract documents during the construction phase
- ge e t Monitor risk management and implementation of safety plans

Surprisingly, "6c Avoid Claims" ranks among the least important elements of construction program management. This may be a result of more complex risk management practices which received high importance ranking.

Different types and sizes of owners rate the importance of each standard of practice differently. In 2009, private/closely held firms rated 20 of the 28 standards of practice with scores falling below the average of all respondents indicating less use, need, and importance of these functions. Conversely, publically traded firms and state agencies rated 21 and 20 of the 28 standards of practice respectively, above the average of all respondents indicating more use, need, and importance of these function. Federal agencies and municipalities are much more balanced essentially splitting the ratings of practices with half above and half below the overall average rating (t).

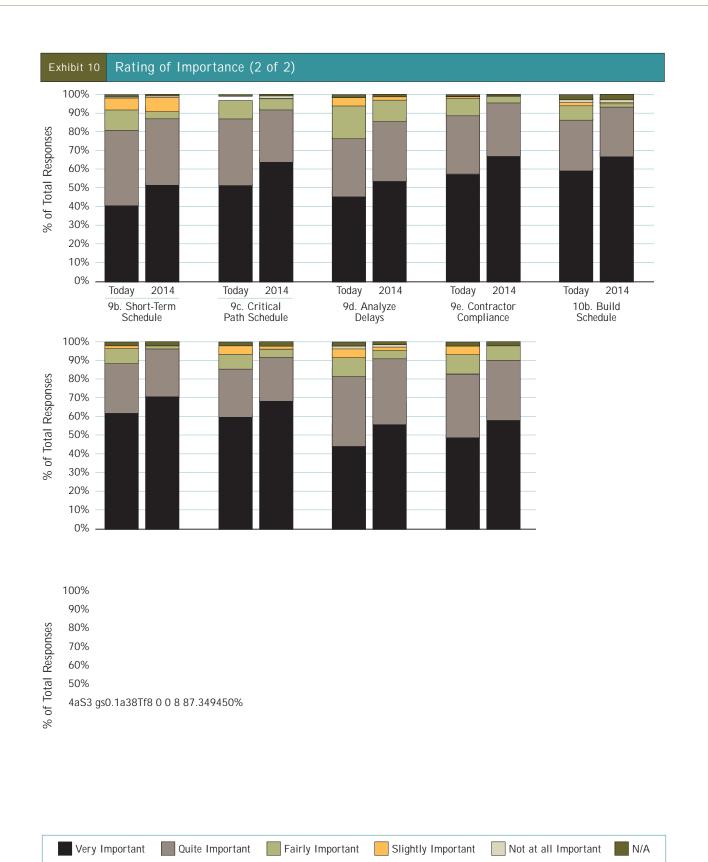
wner Type/Size	Theme	Descriptions
oday		
Private/Closely Held	Broad support needed, particularly front and back end	Items rated as having higher importance 5c - Lead Project Teams 5d - Define Responsibilities 5e - Integrate Budgets 6b - Find Likely Claims 6c - Avoid Claims 8e - Project Delivery System 10d - Risk Mgt. 11c - Commissioning
Today and in the Future		
Publicly Traded	Tactical help not desired	Items rated as having <u>lower</u> importance 6b - Find Likely Claims 6d - Monitor Cost 7d - Address Comments 8c - Build Budget 8d - Scope of Work 10c - Work Conformance
State or Provincial Agencies	Upfront activities in house, we need less help	Items rated as having <u>lower</u> importance 5b - CM Plan 5c - Lead Project Teams 5e - Integrate Budgets 6b - Find Likely Claims 6c - Avoid Claims 9c - Critical-Path Schedule 9e - Contractor Compliance 10d - Risk Mgt.
Annual Spend Greater than \$500 Million	Tactical help not desired	Items rated as having <u>lower</u> importance 6b - Find Likely Claims 8c - Build Budget 8d - Scope of Work 10b - Build Schedule 11c - Commissioning
In the Future		
Federal Agencies	Upfront help, along with construction oversight support is important	Items rated as having <u>higher</u> importance 5c - Lead Project Teams 6b - Find Likely Claims 6c - Avoid Claims 6e - Design Conformance 9b - Short-Term Schedule 9d - Analyze Delays
Municipal Authorities	Claims support and compliance assurance is important	Items rated as having <u>higher</u> importance 6b - Find Likely Claims 9e - Contractor Compliance 10c - Work Conformance 11d - Punch List

7





F M +



F

Exhibi	it 11 Standards	of Practice Question Listing
Q#	Summary	Full Question
Pre-[Design Phase - 5: Perf	ormance of Pre-Design Services
5a	N/A	What percentage of activity involved with the pre-design phase of your program is outsourced today and in 2014?
5b	CM Plan	Develop and implement the Construction or Project Management Plan using measurable goals and objectives that define a successful program or project.
5c	Lead Project Teams	Organize and lead project teams by implementing project controls, defining roles and responsibilities and developing communication protocols.
5d	Define Responsibilities	Define responsibilities and management structure of project management team.
5e	Integrate Budgets	Interpret and integrate conceptual budgets provided by the owner and assess impacts on the project cost.
Desig	gn Phase - 6. Oversigh	t and Management of Design Services
6a	N/A	What percentage of the oversight of design phase services is outsourced today and in 2014?
6b	Find Likely Claims	Identify elements of project design and construction likely to give rise to disputes and claims.
6c	Avoid Claims	Develop strategies and procedures to avoid disputes and claims.
6d	Monitor Cost	Monitor cost as the design is developed.
6e	Design Conformance	Review design documents for conformance with scope and budget requirements.
Desig	gn Phase - 7. Performa	ance of Design Services
7a	N/A	What percentage of the performance of design services is outsourced today and in 2014?
7b	Site Conditions	Identify unique site conditions and their impact on construction sequencing and operations.
7c	Discipline Coordination	Review design documents for coordination between disciplines.
7d	Address Comments	Ensure review comments are adequately addressed during the design phase.
Proc	urement Phase - 8. Pe	rformance of Procurement Services
8a	N/A	What percentage of the performance of procurement services is outsourced today and in 2014?
8b	Contract Administration	Develop contract administration and documentation procedures.
8c	Build Budget	Develop project budget taking into consideration project and owner objectives, cost constraints, and procurement strategies
8d	Scope of Work	Develop scope of work for bid packages.
8e	Project Delivery System	Determine what project delivery system(s) or method(s) best fits your program or project.
Cons	truction Phase - 9. Ov	ersight and Management of Construction
9a	N/A	What percentage of the oversight of construction is outsourced today and in 2014?
9b	Short-Term Schedule	Review detailed short-term schedules with contractor(s).
9c	Critical-Path Schedule	Develop and manage a critical-path schedule.
9d	Analyze Delays	Analyze concurrent delays, compensable and non-compensable delays.
9 e	Contractor Compliance	Monitor contractor compliance with contract requirements.
Cons	truction Phase - 10. C	Construction Performance
10a	N/A	What percentage of construction performance activity is outsourced today and in 2014?
10b	Build Schedule	Develop construction schedule.
10c	Work Conformance	Manage conformance of work to contract documents during the construction phase.
10d	Risk Management	Monitor risk management and implementation of safety plans.
10e	Project Communication	Organize and lead team member communication and interaction.
Post-	-Construction - 11. Pro	ogram Activation, Commissioning, and/or Turnover
11a	N/A	What percentage of your program activation activities are outsourced today and in 2014?
11b	Monitor Testing	Monitor the acceptance and performance testing to see that it is conducted in accordance with contract requirements.
11c	Commissioning	Completion and submission of all commissioning, facility turnover, LEED, and other documentation necessary to suppor facility transfer or certification obtainable during the post-construction process.
11d	Punch List	Develop the project punch list of remaining contract work and ensure it is completed by the specified time frame.
Post-	-Construction - 12. Op	erations and Maintenance
12a	N/A	What percentage of operations and maintenance activities are outsourced today and in 2014?
12b	Maintenance Management	Design a maintenance management system to address issues of maintenance effort, schedule, materials required, and spare parts inventory.
12c	Maintenance Technology	Utilize Geographic Information Systems, Global Positioning Systems and Building Information Management Systems to provide effective maintenance management.

General Questions

Owners were asked to define the areas of greatest improvement potential for various function types and team coordination, including more use of BIM, integrated project delivery, and 3D/4D design techniques, accounted for 18 percent of all responses. This was the number one area of improvement for every group or function type with the lone exception of labor/unions, for which knowledge transfer and safe workplace were the most frequently mentioned.

t breaks down the major improvement themes that emerged for each function type.

Eleven themes account for 48 percent of all responses and these themes are presented below with their percentage contribution. The remaining comments covered a wide range of topics representing 1 percent or less of all responses.

1. Tea[(wners wer)20(e 1nses.-3Peh 52.7578ons)Tj themes are prwJ0 -1.61111 TD0gy (18%) 0 9 410.9563 652.7578 Tm0 0 0 1 k3.15

2

DEMOGRAPHICS

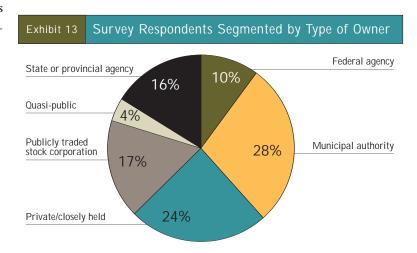
The FMI/CMAA *Tenth Annual Survey of Owners* had 191 international participants representing every owner type, type of construction, industry sector, and geography. The annual capital construction expenditures reported from this group of owners totaled approximately \$71 billion and covers an estimated 7,000 projects annually. Twenty-seven owners, approximately 15 percent, reported annual capital construction spending over \$1 billion.

Municipal authorities make up the largest respondent type at 28 percent in t . Together, publicly traded stock corporations and private/closely held firms make up roughly one third of organization types with 31 percent. In 2008 and 2007, publicly traded stock corporations and privately/closely held accounted for over 40 percent of the respondents.

No particular type of construction dominated the results of the survey. Two types demonstrated greater than 10 percent of the total responses and an additional eight types generating 5 percent or greater in t. Office/professional makes up the largest single group at 14 percent followed closely by education at 12 percent. In the 2008 study⁶, a much larger group of manufacturers and energy firms reported large capital programs which have fallen in both size and number. This shift makes the mix of construction types more similar to the result of the 2007 study⁷.

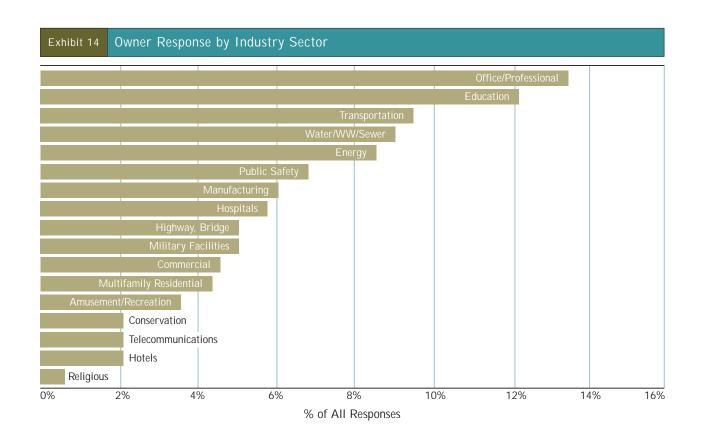
Fifteen percent, or 27 owners, reported annual capital project spending over \$1 billion and an additional 8 percent reported programs between \$500 million and \$1 billion in size in to 1. In combination, over 50 percent of the owner participants reported programs ranging from \$26 million to \$500 million in size. In comparison to the 2007 and 2008 studies, the number of programs greater than \$500 million has decreased and the number of programs \$100 million and smaller has increased.

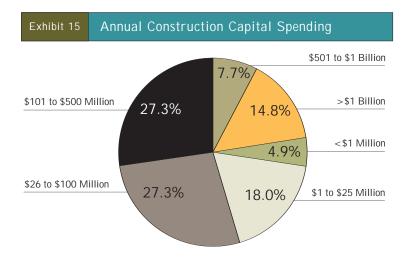
This is in part driven by economic factors as well as a reduction in publically traded owners participating in the study.



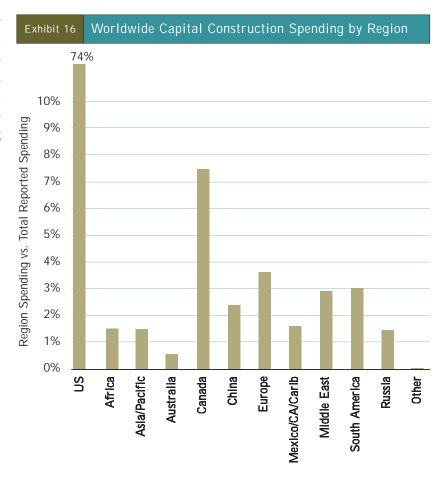
FMI Corporation, int , nn a . n.r. at , ..., on t. ... C r., ... port on Mana in Capita ros. t, i. . . as i ... C.

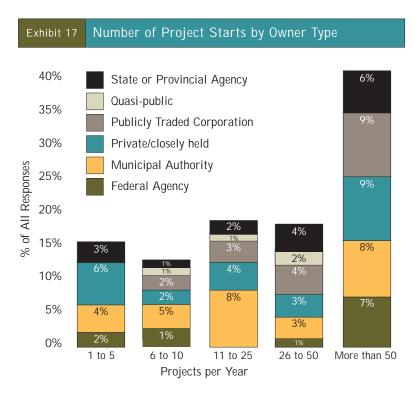
⁷FMI Corporation, Eighth Annual Owners Study, "The Perfect Storm – Construction Style," Raleigh, NC, 2007.

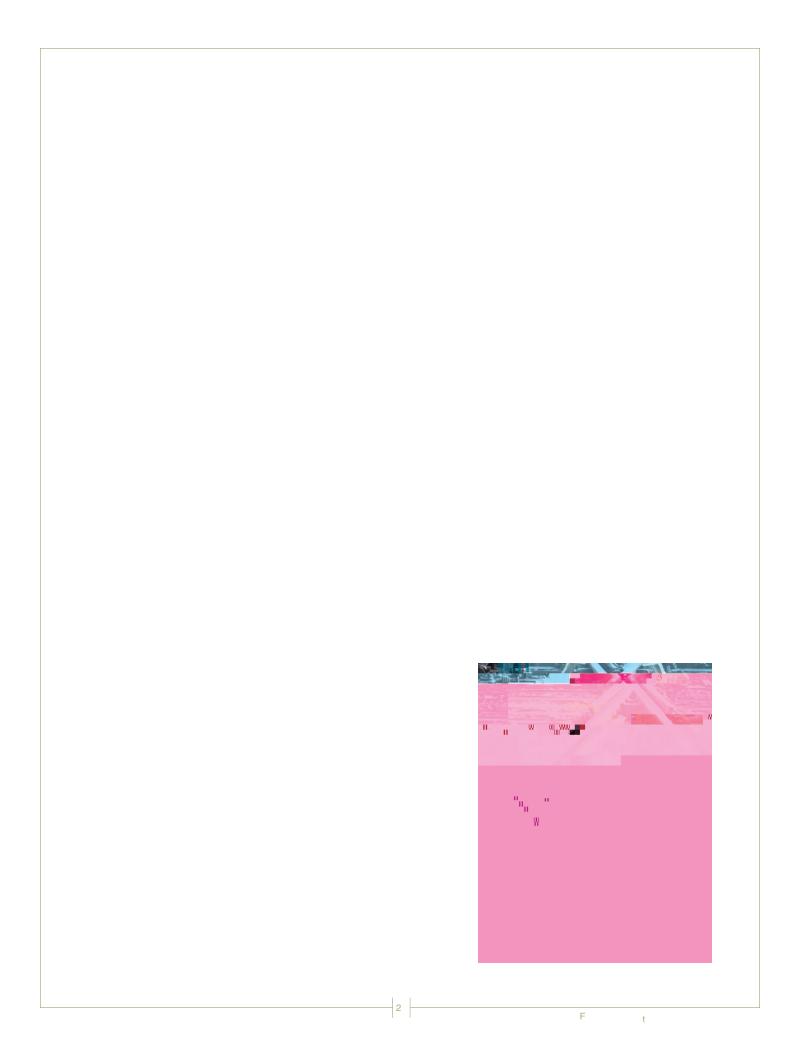




FMI has made an intentional effort to increase the amount of international participation in the owners study in order to contrast U.S. and North American trends with those worldwide. Seventy-four percent of the reported capital construction spending w







ABOUT FMI

Founded in 1953 by Dr. Emol A. Fails, FMI provides management consulting and investment banking for the worldwide construction industry.

FMI delivers innovative, customized solutions to facility owners; contractors; construction materials producers; manufacturers and suppliers of building materials and construction equipment; property managers and developers; engineers and architects; surety companies; and industry trade associations.

FMI's experienced professionals assist owners with the development of sourcing strategy, assessing design and construction unit performance and support for management skill development. Services provided to other construction industry businesses include strategic planning, leader and organizational development, business development, research, mergers and acquisitions, peer groups, private equity placement, project execution, and training.

Raleigh-Headquarters

5171 Glenwood Avenue Suite 200 Raleigh, NC 27612 P.O. Box 31108 Raleigh, NC 27622 T 919.787.8400 F 919.785.9320

Denver

55 Madison Street Suite 410 Denver, CO 80206 T 303.377.4740 F 303.377.3535

Phoenix

5080 N. 40th Street Suite 245 Phoenix, AZ 85018 T 602.381.8108 F 602.381.8228

Tampa

308 South Boulevard Tampa, FL 33606 T 813.636.1364 F 813.636.9601

www.fminet.com

FI