Going Strong: The US Construction and CM Market

Presented to ConsMa 2023

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What I Will Talk About

1. Overview of Current State of US Construction Market
2. Construction Workforce
3. Impacts of COVID-19
4. Major Trends and Challenges in US Construction Market
5. Overview of the US Construction Management (CM) Industry
6. Update on CMAA
7. Some Closing Thoughts

BLUF (Bottom Line Up Front)

1. US construction market is large, strong, and diverse

2. The market is forecast to continue to grow

3. However, the construction market face several challenges

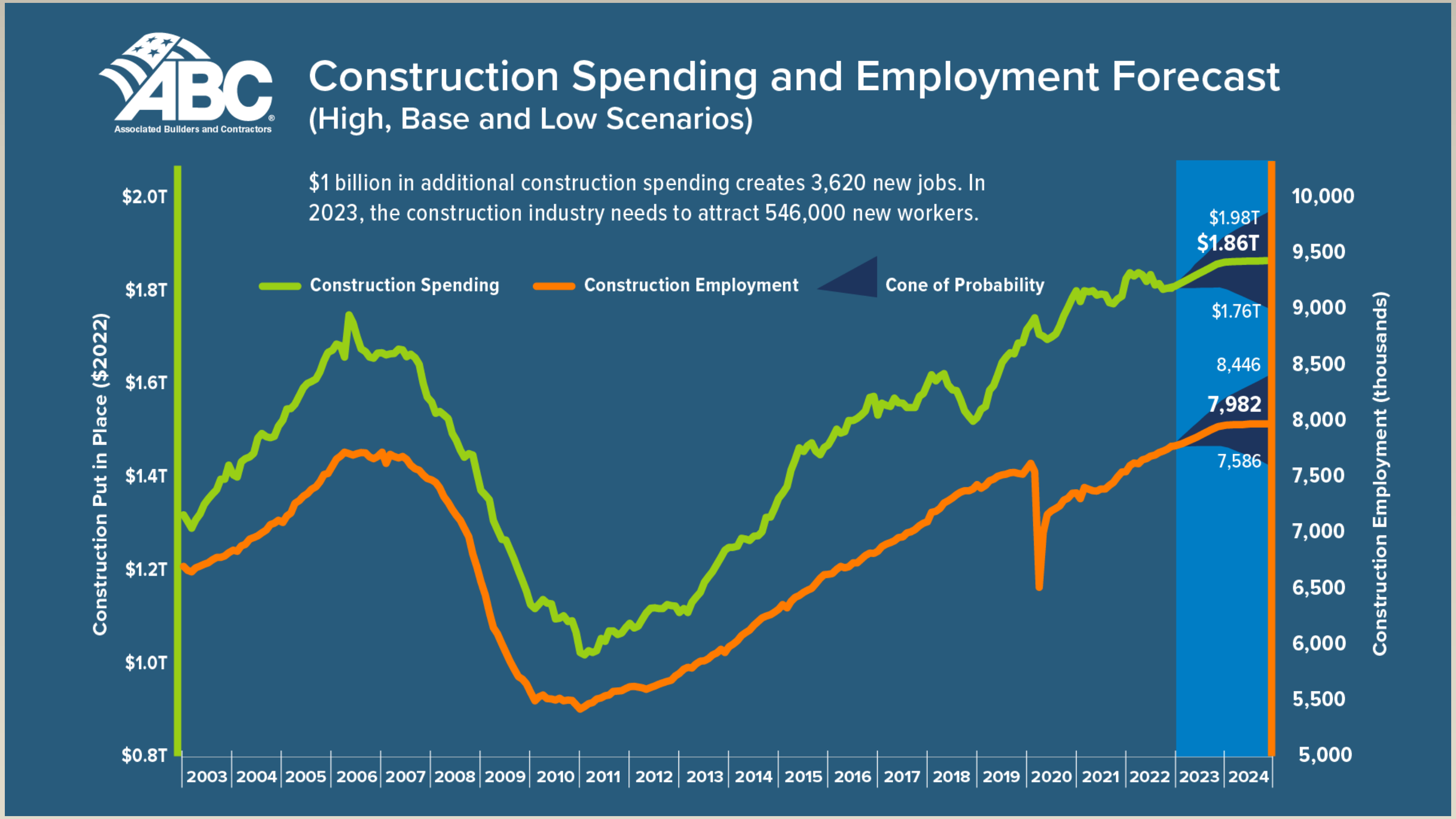
4. The CM market is also strong but faces similar challenges including resources.

5. CMAA remains the premier US CM association with a wide range of resources

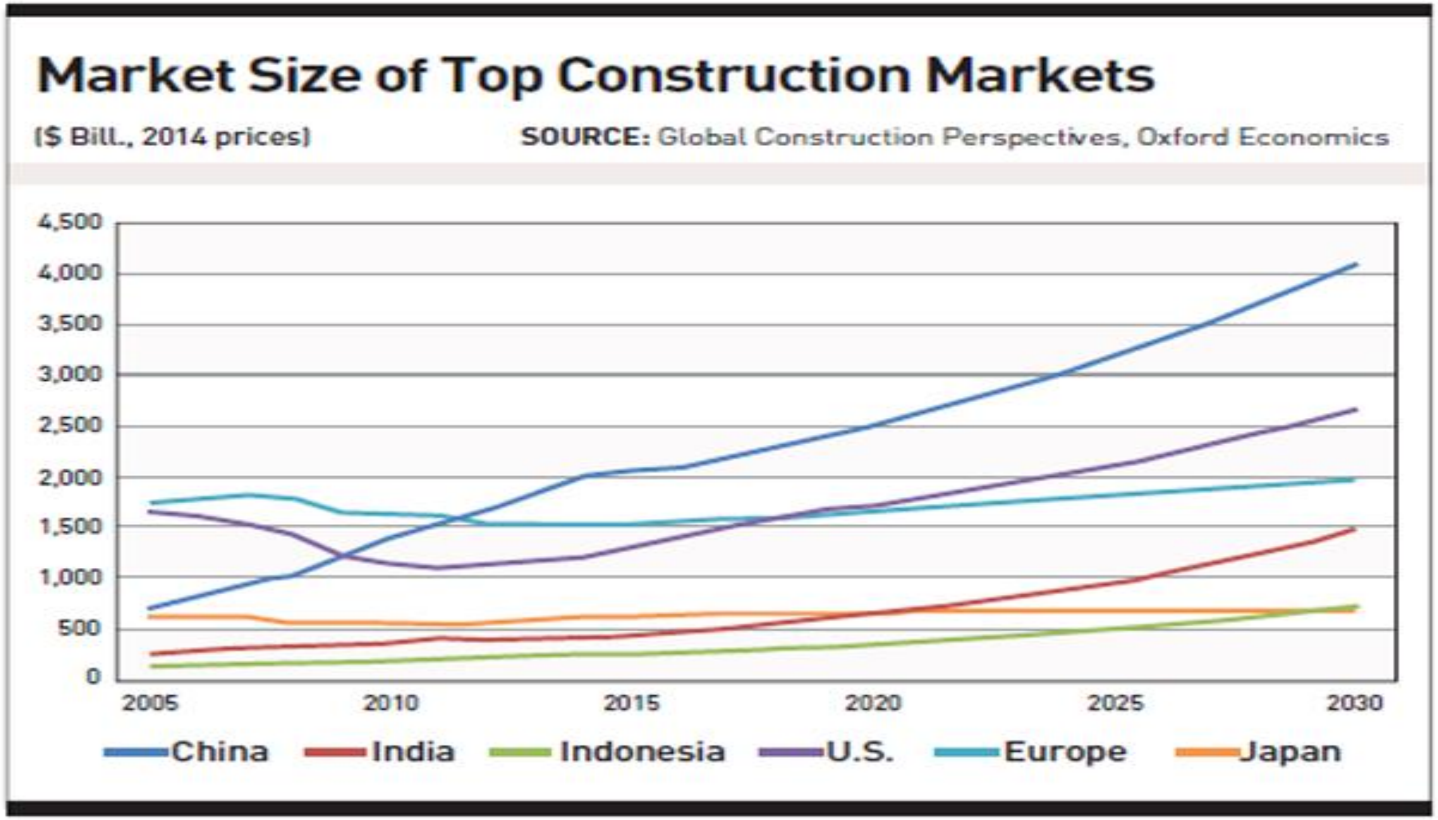
6. Some big unknowns that may have a significant influence on construction

US Construction Market

US Construction is a $1.8 Trillion Market 7% of US GDP (Gross Domestic Product)



US Construction Market 2nd in Size to China



Source: The B1M

US Construction By Sector

Value of Construction Put in Place: Non-Building, Non-Residential & Commercial, and Residential 2020-2022

Billions($)	*2020*	*2021*	*2021-2020 Y/Y%*	*2022**	*2022-2021 Y/Y%*
Non-Building	**$276**	**$277**	**0.4%**	**$274**	**-1.3%**
Water Supply Systems	$19	$19	1.4%	$21	7.3%
Sewage & Waste Disposal	$27	$28	2.9%	$30	7.9%
Streets and Highways	$102	$101	-1.6%	$102	0.8%
Power Plants/Pipeline/Communications	$118	$121	2.3%	$113	-7.2%
Total Conservation and Development	$9	$8	-11.3%	$9	10.5%
Non-Residential & Commercial	**$580**	**$547**	**-5.7%**	**$567**	**3.2%**
Office	$93	$87	-6.7%	$85	-2.7%
Communication	$24	$25	3.4%	$24	-2.8%
Transportation	$61	$57	-6.7%	$55	-5.1%
Public Safety	$18	$12	-31.2%	$11	-19.5%
Lodging	$28	$18	-36.0%	$17	-16.7%
Educational	$111	$98	-11.1%	$97	-4.0%
Amusement and Recreation	$28	$25	-10.6%	$26	2.1%
Manufacturing	$75	$79	4.6%	$93	23.1%
Health Care	$49	$48	-0.3%	$51	5.6%
Religious	$3	$3	-15.7%	$3	-7.4%
Commercial	$90	$95	5.4%	$105	14.2%
Residential	**$644**	**$803**	**24.6%**	**$929**	**19.0%**
Total Construction	**$1,500**	**$1,626**	**8.5%**	**$1,769**	**10.1%**
Total Public Construction	$369	$347	-6.0%	$348	-1.3%
Total Private Construction	$1,130	$1,279	13.2%	$1,421	13.3%

*2022 is only January - July and July is preliminary data

Source: Rockport Analytics, U.S. Census Bureau

Housing is the largest single sector, followed by commercial and other buildings.

Drivers of the Construction Industry

- Strong Economy
- Low interest rates
- Demand for housing and commercial
- Federal Government funding increases – 2021 and 2022
  - Infrastructure Investment and Jobs Act (IIJA) - $1.2 trillion for infrastructure and transportation projects
  - The CHIPS and Science Act - $280 billion for research and manufacturing of semiconductors
  - Inflation Reduction - $391 billion for energy and climate change projects

Top 400 US Contractors

$425 billion in 2021

Buildings comprise 57% of construction revenue with transportation at 15%.

Top 100 contractors had annual revenues from $925 million to $16 billion

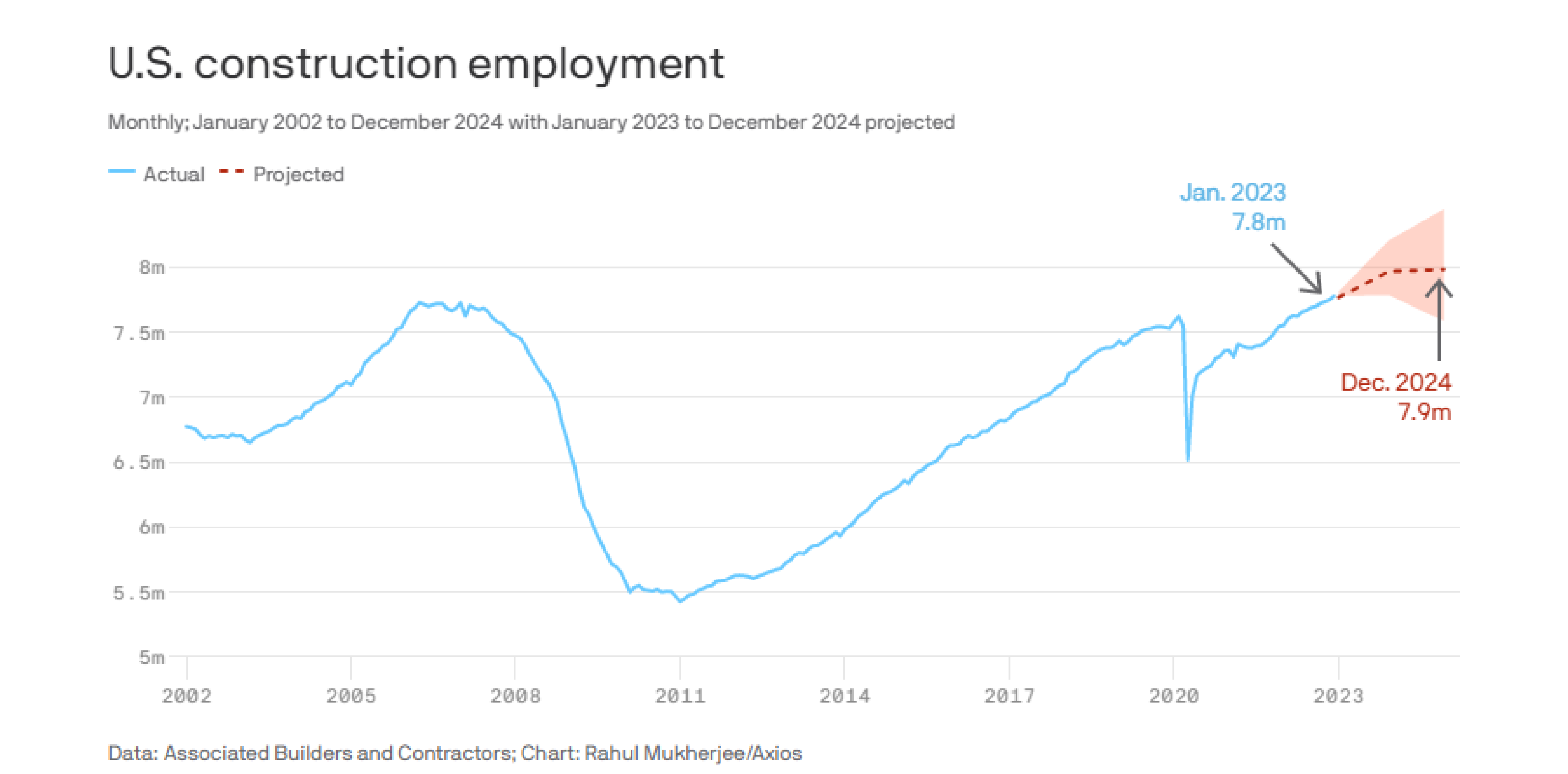
#54 **FORTIS CONSTRUCTION** recently topped out on Meta's 1.8-million-sq-ft data center in Singapore, the technology giant's first in Asia.

The Top 100 Contractors by New Contracts

RANK 2022		NEW CONTRACTS IN $ MIL.
1	THE TURNER CORP.	16203.00
2	STO BUILDING GROUP INC.	11032.00
3	THE WHITING-TURNER CONTRACTING CO.	10000.00
4	DPR CONSTRUCTION	9813.52
5	FLUOR	8752.50
6	PCL CONSTRUCTION	8581.94
7	SWINERTON	7370.60
8	GILBANE BUILDING CO.	6941.42
9	CLARK GROUP	6742.40
10	MCCARTHY HOLDINGS INC.	6437.74
11	SKANSKA USA	6284.10
12	ARCO CONSTRUCTION COS.	6058.80
13	JE DUNN CONSTRUCTION GROUP	6012.79
14	HOLDER CONSTRUCTION	5764.00
15	AUSTIN INDUSTRIES	5741.20
16	CLAYCO	5700.00
17	BRASFIELD & GORRIE LLC	5405.18
18	HENSEL PHELPS	5300.28
19	HOFFMAN CONSTRUCTION	5200.00
20	BECHTEL	4832.00
21	MICHELS CORP.	4755.00
22	BALFOUR BEATTY US	4742.50
23	TUTOR PERINI CORP.	4531.70
24	AECOM	4354.94
25	THE WALSH GROUP	4314.83
26	MORTENSON	4218.43
27	ASRC INDUSTRIAL SERVICES	3950.00
28	RYAN COS. US INC.	3850.00
29	TRUEBECK CONSTRUCTION	3535.70
30	BURNS & MCDONNELL	3435.00
31	BARTON MALOW HOLDINGS LLC	3414.95
32	HITT CONTRACTING INC.	3352.05
33	ALBERICI-FLINTCO	3203.26
34	ZACHRY GROUP	3021.81
35	CONSIGLI CONSTRUCTION CO. INC.	2938.00
36	INFRASTRUCTURE AND ENERGY ALTERNATIVES INC.	2925.00
37	BARNHILL CONTRACTING CO.	2877.03
38	KIEWIT CORP.	2717.67
39	GRAY CONSTRUCTION	2716.74
40	MOSS	2602.65
41	THE YATES COS. INC.	2592.80
42	BUILD GROUP	2488.00
43	THE CONLAN COMPANY	2479.80
44	WALBRIDGE	2473.61
45	FERROVIAL US CONSTRUCTION CORP.	2280.31
46	GRANITE CONSTRUCTION INC.	2241.12
47	BLACK & VEATCH	2158.82
48	BIG-D CONSTRUCTION	2141.00
49	FCL BUILDERS LLC	2100.00
50	EVANS GENERAL CONTRACTORS	2100.00
51	THE MCSHANE COS.	1988.38
52	MANHATTAN CONSTRUCTION GROUP	1944.71
53	SUNDT CONSTRUCTION INC.	1917.17
54	HASKELL	1881.70
55	ALSTON CONSTRUCTION	1860.00
56	ROBINS & MORTON	1850.00
57	HANOVER CO.	1790.00
58	CHOATE CONSTRUCTION CO.	1762.71
59	THE CIANBRO COS.	1641.00
60	OKLAND CORP.	1630.00
61	SUFFOLK CONSTRUCTION CO. INC.	1617.17
62	HUNTER ROBERTS CONSTRUCTION GROUP LLC	1600.00
63	MESSER CONSTRUCTION CO.	1592.00
64	THE WEITZ CO. & AFFILIATES	1583.58
65	LENDLEASE	1537.40
66	ROGERS-O'BRIEN CONSTRUCTION	1530.80
67	THE KOKOSING GROUP OF COS.	1496.36
68	CLUNE CONSTRUCTION	1417.00
69	COLAS INC.	1384.00
70	SOUTHLAND HOLDINGS LLC	1380.00
71	CLANCY & THEYS CONSTRUCTION	1372.63
72	PEPPER CONSTRUCTION	1367.87
73	DRAGADOS	1354.55
74	HATHAWAY DINWIDDIE CONSTRUCTION CO.	1350.00
75	THE RUDOLPH LIBBE COS. INC.	1338.00
76	HAWAIIAN DREDGING CONSTRUCTION CO. INC.	1308.00
77	SHAWMUT DESIGN AND CONSTRUCTION	1279.20
78	FLATIRON CONSTRUCTION	1226.25
79	C.W. DRIVER COS.	1204.25
80	ALLAN MYERS	1199.12
81	OHL USA INC.	1184.00
82	WEBCOR	1169.00
83	DENNIS GROUP	1136.44
84	THE PIKE COS. LTD.	1108.00
85	THE CHRISTMAN CO.	1100.00
86	E.E. REED CONSTRUCTION LP	1089.00
87	AMES CONSTRUCTION INC.	1073.00
88	GARNEY HOLDING CO.	1052.00
89	KPRS CONSTRUCTION	1050.00
90	APTIM	1047.00
91	JINGOLI - DCO	1019.50
92	PJ DICK - TRUMBULL - LINDY PAVING	1018.40
93	KAST CONSTRUCTION CO. LLC	1018.38
94	LEVEL 10 CONSTRUCTION	1007.00
95	ADOLFSON & PETERSON CONSTRUCTION	1003.52
96	IOVINO ENTERPRISES	1000.50
97	J.T. MAGEN & CO. INC.	999.40
98	CATAMOUNT CONSTRUCTORS INC.	990.20
99	LEASE CRUTCHER LEWIS	957.00
100	GRAYCOR	952.00

CONSTRUCTION WORKFORCE

Construction Employment Continues to Grow



Workforce Continues to Change

- Unemployment <5%
- Need for 550,000 additional workers in 2023 per ABC (Associated Builders and Contractors)
- 88% of workforce is non-union
- Workforce is aging with 1 in 4 older than 55.
- Engineering graduates now the highest paid jobs according to the US Federal Reserve Bank

Impacts of COVID-19

Significant, not catastrophic

Most construction continued

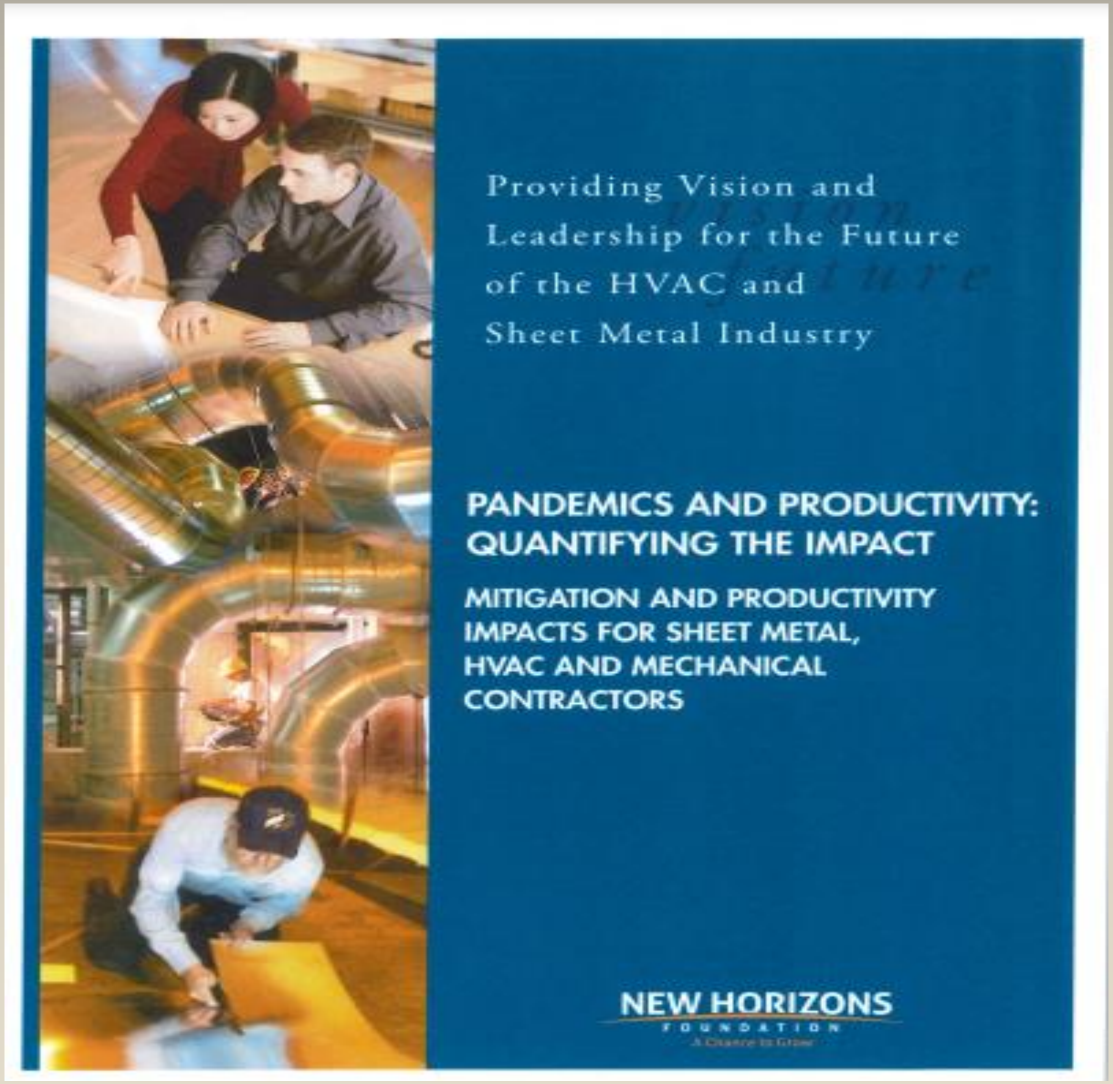
Owners, Contractors worked together to manage impacts

Government struggled with necessary protocols

Many claims for increased costs, delays, productivity loss

COVID accelerated trend for hybrid working.

- Only 50% US office workers returned full time
- Impact to office and building construction market
- Impact to City urban cores.



Major Trends and Challenges

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TRENDS

Environmental Social Governance

Sustainable construction
Reduce energy and waste
Positive societal impacts
Ethical business practices

Technology

Drones
Modular construction
Pre-fabrication
3D Printing
BIM
Digital Twin with GIS

Diversity Equity Inclusivity

Common throughout business sector
Strengthens workforce
A priority for Gen Z
Requirement in public projects

Supply Chain Volatility

Material price volatility
Inflation
Longer lead times

Smart Cities

$109 billion by 2026
Growing world-wide
Integrates technology, sustainability, citizen connection

CHALLENGES

Workforce Gaps

- Aging workforce
- Worker supply
- Hybrid working
- Training

Economic

- Recession
- Interest Rates
- Inflation
- Supply Chain

Productivity

- Has declined since 1970
- A global issue, not just US
- No clear cause or solution

Megaproject Failures (>$1B)

- 9 of 10 projects over budget
- Cost overruns >20%
- Delays common
- Multiple reasons for overruns
- Yet, number and size growing

Technology

- Lack of interoperability
- Limited BIM Usage
- Reluctance due to Costs

OVERVIEW OF US CM INDUSTRY

Program and CM Fee Revenue in 2021

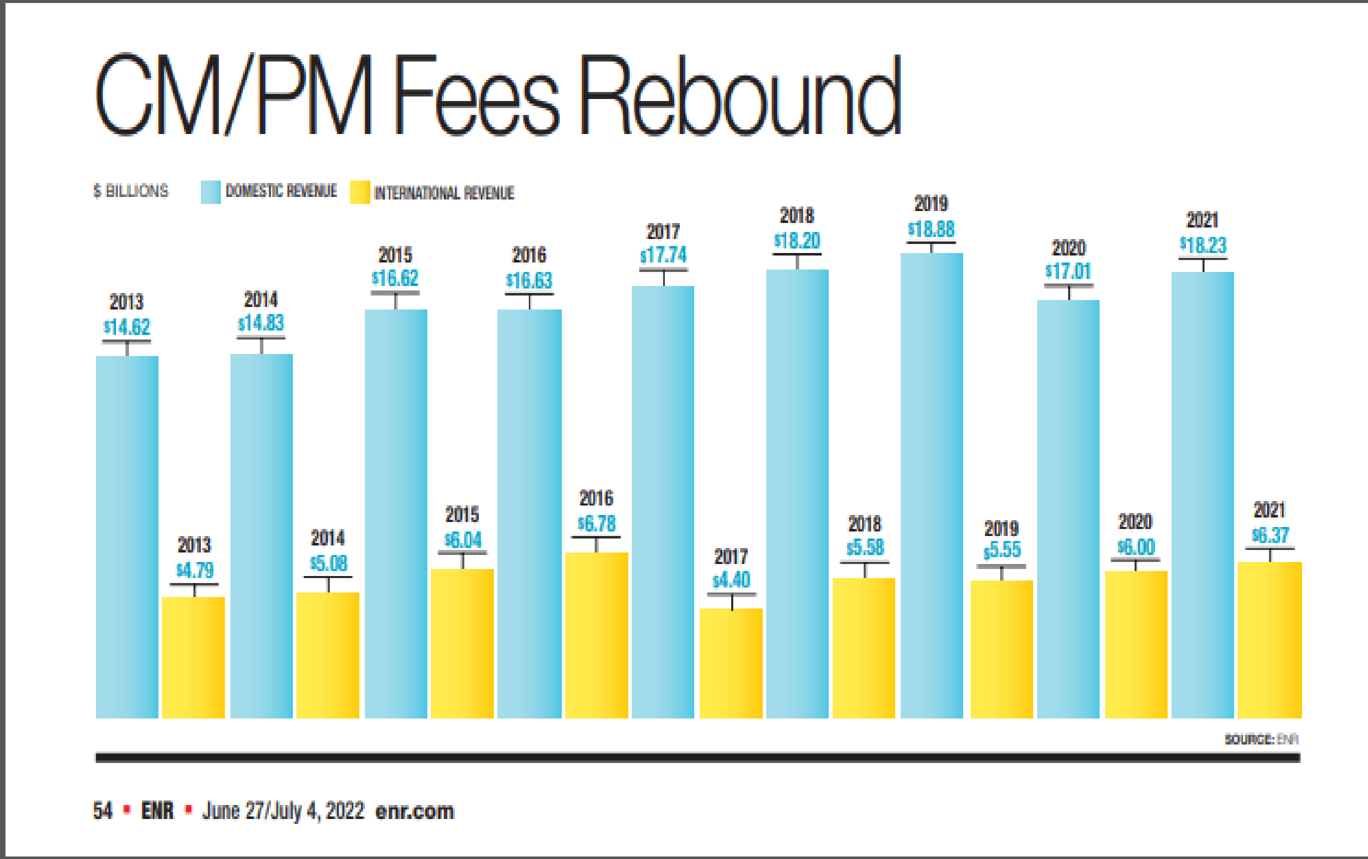
$24.5 billion US and international fees

PM fees = $16.2 billion

CM fees = $7.7 billion

Recovered from 2020 downturn

Continued growth in 2022 and 2023



CM Workforce

478,000 CMs in 2021 per BLS

46,000 CM job openings per year

Employment to grow 8% in 10 years

CM workforce likewise aging

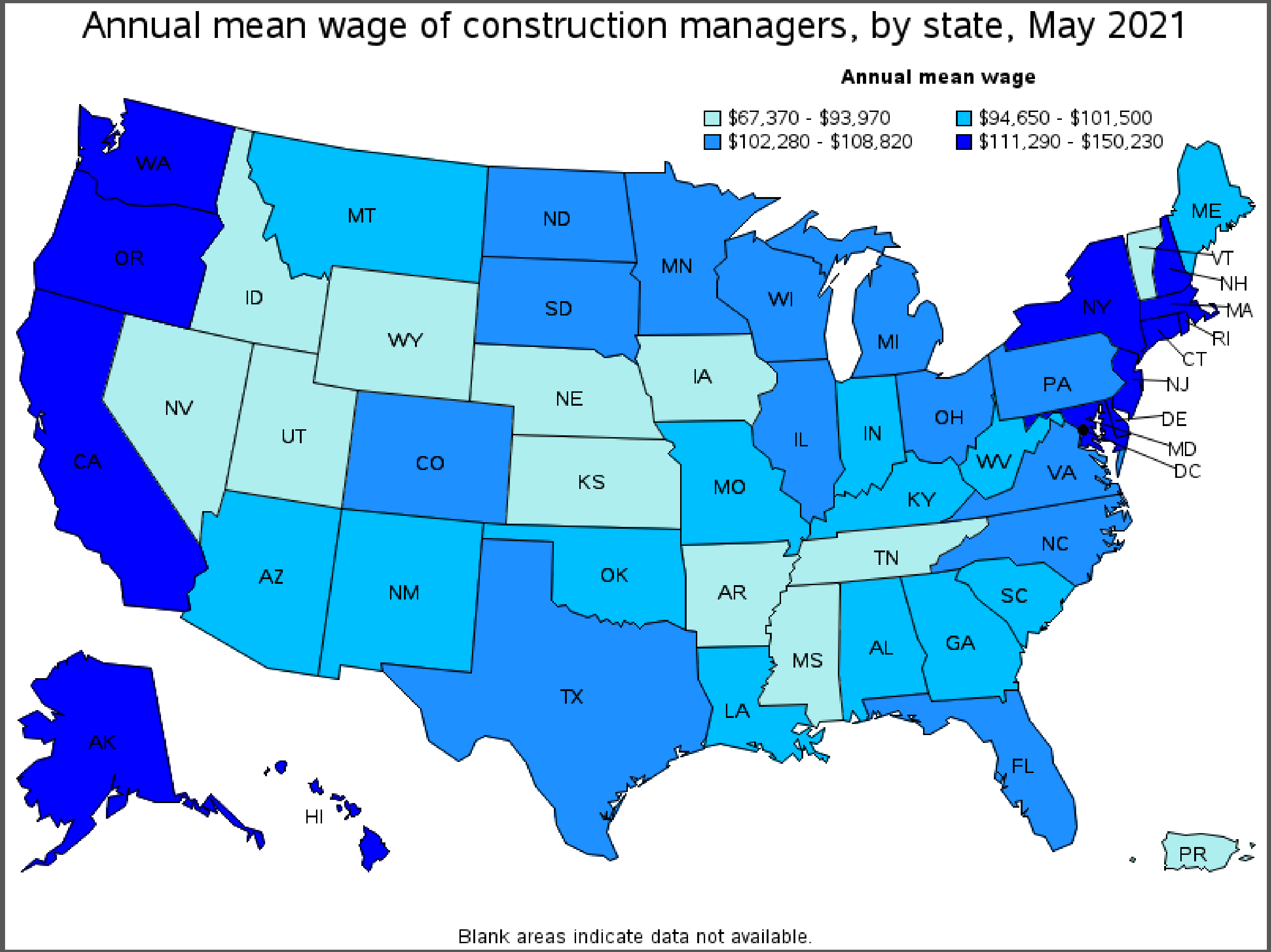
Summary

Quick Facts: Construction Managers	
2021 Median Pay	$98,890 per year $47.55 per hour
Typical Entry-Level Education	Bachelor's degree
Work Experience in a Related Occupation	None
On-the-job Training	Moderate-term on-the-job training
Number of Jobs, 2021	478,500
Job Outlook, 2021-31	8% (Faster than average)
Employment Change, 2021-31	36,400

Source: US Bureau of Labor Statistics

Salaries by State

US North East and West Coast states pay the highest CM salaries.

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CMAA Remains Strong and Vibrant

19,000 members

4,700 CCMs

7700 CMITs

30 Chapters across the US

Two annual conferences

Extensive Body of Knowledge

Training resources

Project Awards in 20 categories

ABET CM accreditation reviewer

CMAA Foundation scholarships

CMAA Celebrated its 40th Birthday in 2022

Extensive Body of Knowledge and Training Materials

Standards of Practice

Building Information Modeling (BIM)

Contract Administration

Cost Management

Professional Practice

Project Management

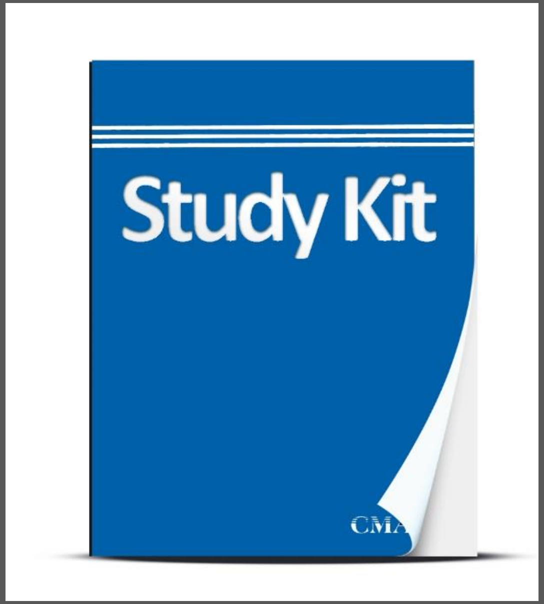
Quality Management

Sustainability

Safety & Risk Management

Time Management/CPM Lab

Value Engineering



Published Documents

CM Standards of Practice

Capstone: The History of CM Practice and Procedures

CII Publication IR166-3: Best Practices Guide

Contract Administration Guidelines

Cost Management Guidelines

Risk Management Guidelines

Quality Management Guidelines

Sustainability Guidelines

Time Management Guidelines

Multiple Levels of CM Certification Credentials Available – For New Graduates to Seasoned CM Professionals

CMIT

- 18+ of age
- Letter of support from professor, superior officer, or supervisor
- Complete Capstone
- Passed CMIT Exam
- Expires after 7 years

CMIT L2

- Passed Professional Practice
- Passed Quality Management
- Passed Cost Management
- Complete Soft Skills
- Complete 6 months of experience in each
- Expires after 7 years

CMIT L3

- Passed Contract Administration
- Passed Safety & Risk Management
- Passed Time Management
- Complete Soft Skills
- Complete 6 months of experience in each
- Expires after 7 years

CMIT L4

- Passed Project Management
- Passed Sustainability
- Passed Value Engineering
- Complete Soft Skills
- Complete 6 months of experience in Project Management and Sustainability with some experience in Value Engineering.
- Expires after 7 years

CACM

- 12 months of RIC experience in any area or 4 years of construction experience
- Minimum of 2 references to verify experience
- CMIT L1-4, qualifying degree, or additional construction experience
- Passed CACM Exam
- Renew every three (3) years

CCM

- 48 months of RIC experience
- Minimum of 2 references to verify experience
- Qualifying degree or additional construction experience
- Passed CCM Exam
- Renew every 3 years

SOME CLOSING THOUGHTS

Won't Solve Our Productivity and Megaproject Problems Anytime Soon

- Causes are Unclear
- May be built into how we do construction
- Projects are unique, unlike manufacturing
- Too many competing interests
- Hirschman's dictum (1967) – "*if people knew in advance the real costs and challenges in delivering a large project they probably would never have touched it.*"
- New book may offer some answers – "*How Big Things Get Done: The Surprising Factors that Determine the Fate of Every Project From Home Renovations to Space Exploration and Everything in Between*", by Flyvbjerg and Gardner.   Includes 11 recommendations to improve delivery.

Adoption of New Technologies is Too Slow

- BIM still struggling to become standard for how we deliver projects
- Software tools are too fragmented and lack the necessary broad interoperability
- Owners and Contractors are reluctant to invest money and time
- Change is hard

Workforce Gap is A Big Issue

- Shortage of workers – unemployment is essentially zero
- Aging workforce
- Not attracting enough immigrants and women to industry
- Not enough skills development, e.g. to build advanced semiconductor factories under CHIPS Act
- Low productivity, lack of technology and innovation expand the problem

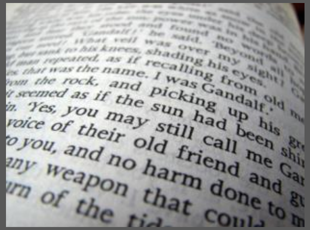
Rebuilding Ukraine is a Major Opportunity

The Big Unknown

Game Changers for Humanity

Fire

Wheel



Writing

Steam Engine

Airplane

Internet

AI

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