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Variations in States' OSHA Consultation Programs in Construction

Wayne B. Gray
John Mendeloff

Clark University

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8484 Georgia Avenue
Suite 1000
Silver Spring, MD 20910

PHONE: 301.578.8500
FAX: 301.578.8572

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Executive Summary

This report provides information for understanding the operations and outputs of OSHA's On-Site Consultation program and its relevance to preventing hazards, injuries and deaths in the construction industry. OSHA's consultation program has operated in some form since the 1970s, but this report focuses on more recent years—from 2016 to 2022—making it more relevant to current decision-making. Our earlier research (Gray and Mendeloff 2023) found that construction fatality rates are significantly lower in states with higher rates of consultation visits. The goals of the current research are to identify differences across states in their consultation activities and to consider how those differences might impact the effectiveness of consultations in preventing fatalities and serious injuries in construction.

We conducted interviews with 31 state Consultation Program Managers (CPMs) to discuss their programs' activities, outcomes and possible impacts on injuries. The interviews included all 21 states where OSHA has given authority for private sector enforcement to state agencies ("state plan" states) as well as a sample of 10 states where federal OSHA itself operates the enforcement program ("federal OSHA" states). We also analyzed data provided by OSHA from the OSHA Information System (OIS) database covering all consultation visits conducted by all states from 2016 through 2022. This enabled us to identify differences across the states and to compare them with the interview results. Finally, to see whether different state program characteristics impacted the observed relationship between consultation visit rates and construction workplace fatality rates, we looked at adjusting visit rates for the intensity of a state's consultation visits.

While much of the day-to-day operation of state consultation programs is similar across states, our interviews identified substantial differences among them. One obvious difference is funding. The consultation program requires a state to contribute only 10% of the program cost, with the federal government paying 90%, but many states contribute more than 10%. This is more common among state plan states. There's a correlation of +0.49 between a state's funding share and its number of consultation visits per 1000 construction employees. Providing extra state money seems to be connected to the funding source – states where consultation funding is tied to the state workers' compensation system tend to contribute more than states where the program funding is coming from general state government revenue.

Based on the interviews, concentrating more on construction is sometimes connected to a perception that construction is especially hazardous, though it can also be driven by having individual consultants with a background in the construction industry and good relations with the firm managers who are deciding whether to request a consultation visit. During the period we examined, the share of consultations in construction ranged across states from 6% to 78%. State plan states tended to concentrate more on construction, with 8 of the top 10 rates of consultation visits per 1000 construction workers while federal states had 9 of the bottom 10 rates.

We also identified differences across states in the way they allocated their consultation activity within construction. These differences were often reflected in the data they reported in the OIS. One key difference is how states record a visit to a large construction worksite where the consultant reviews activities involving a general contractor and several subcontractors. Some states record a single visit to the general contractor, while other states encourage the subcontractors – with the consent of the general contractor - to request their own consultations during the visit, so a single trip to the worksite could generate multiple visit records. This can be seen in the OIS data, with the first group of states recording a higher share of their visits at general contractors, while the second group have more visits recorded at specialty trades. Another difference is that some states report a full/comprehensive scope in the OIS data for most of their visits, while other states report more of their visit scopes as limited.

Who gets a consultation visit and the reasons behind it may influence the visit's impact on workplace hazards. OSHA consultation programs must rely on firms asking for a visit, with the reasons behind the request showing considerable differences across states. Many states describe an indirect connection where the threat of OSHA enforcement can lead firms to request a consultation visit to fix any hazards and avoid the risk of being penalized for violations. We see in the OIS data that states with higher inspection rates tend to have more frequent consultation requests. In a few states, firms that have had an enforcement inspection are encouraged to request a consultation visit as part of their settlement agreement; in other states, firms that had a worker complaint that seemed less serious are referred to the consultation program to address the issue. States also follow a variety of outreach strategies to encourage consultation requests, with many requests attributed to referrals by previous consultation clients. Some states get most of their visits from firms that were their clients in previous years, while others focus more on visiting new firms.

After identifying these potentially important differences across states, we considered how we could incorporate them into our earlier analysis of the connection between state consultation program activity and workplace fatalities in construction. Using the same control variables and the same estimation methods we used in the earlier analysis, along with fatality records from OSHA's accident inspection records, we estimate a similar negative connection between construction fatalities and state consultation visit rates that were found in the earlier data, though the impacts are a bit smaller.

For our earlier research, OSHA had provided us with the consultation visit rates in construction for each state from 1992 to 2016. We multiplied the state's visit rate by a measure of visit intensity, the average number of hazards identified per construction visit, using the state's average intensity values for 2016-2022. Our analysis finds that the significant connection between consultation visit rates and workplace fatality rates is maintained when we account for the intensity of a state's consultation visits.

Future research could benefit from access to earlier years of detailed data on consultation visits, allowing the regression analysis to incorporate changes in the intensity of a state's consultation visits over time. Research could also benefit from access to the firm and worksite identifiers used in earlier research (Mendeloff and Gray, 2002), allowing the use of more sophisticated analyses including firm-level changes over time. Such research could help identify whether the relationship we observe between state consultation visit rates and lower fatality rates in construction workplaces reflects a causal connection.

Key Findings

- States with higher consultation visit rates in construction and more intense consultation visits tended to have lower construction workplace fatality rates.
- States varied substantially in overall consultation activity and the percentage of their consultations focused on construction.
- As a group, state plan states averaged higher construction consultation rates than federal states, but also showed more variation across states. Nearly all of the highest-rate states were state plan states, but some state plan states had below-average rates.
- States differ in how they conduct consultation visits at multi-employer worksites. Some have each sub-contractor request their own visit, while others record a single visit for the general contractor. The latter group of states tend to record fewer consultation visits but more hazards per visit.
- Only a few states reported consultation requests directly resulting from settlement agreements that followed OSHA enforcement inspections, but most state program managers said that the threat of OSHA enforcement inspections was a significant incentive for firms to seek consultations.

Table of Contents

Executive Summary	i
Key Findings.....	ii
Tables and Figures	1
Background and Introduction	2
Plan of the Research.....	3
Differences Across States Identified from Interviews	4
Quantitative Data Source – OSHA Information System (OIS).....	5
Differences in Extent of Consultation Activity in Construction	7
Differences in Why Construction Firms Request Consultation Visits	10
Differences in Construction Visit Characteristics	12
Differences in Hazards Found per Construction Visit	14
Differences across Construction Industries.....	16
Regression Analysis of Consultations and Fatality Rates	18
Summary and Future Work	22
References.....	24
Appendix A	25
Appendix B	36
Appendix C	49

Tables and Figures

Figure 1. OSHA Consultation Visits in Construction, 1992-2022.....	7
Table 1. Overview of Consultation Visits across States, 2016-2022.....	8
Table 2. Variation in Source of Request across States, 2016-2022.:.....	11
Table 3. Variation in Visit Characteristics across States, 2016-2022.....	12
Table 4. Additional Visit Characteristics across States, 2016-2022.....	13
Table 5. Hazards Found on Construction Consultations and Inspections, 2016-2022.....	15
Figure 2. Comparing Visit Scope and Average Hazards Found, 2016-2022.....	15
Table 6. Average Annual Consultations and Inspections in Construction Industries, 2016-2022.....	17
Table 7. Summary Statistics for Regression Analysis.....	19
Table 8. Determinants of Workplace Fatalities in Construction.....	20
Table 9. Expanded Models of Workplace Fatalities in Construction.....	21
Table A1. Construction Consultations by State, 1992-2022.....	31
Table A2. Variation in Source of Request Across States, 2016-2022.....	33
Table A2a. Source of Request Codes for Table A2 Categories.....	35
Table A3. Variation in Visit Characteristics Across States, 2016-2022.....	36
Table A4. Additional Variation in Visit Characteristics Across States, 2016-2022.....	38
Table A5. Hazards found on Construction Consultations and Inspections, 2016-2022.....	40

Background and Introduction

This report provides information for understanding the operations and outputs of OSHA's Consultation program and their relevance to the goal of preventing hazards, injuries and deaths in the construction industry. OSHA's consultation program has operated in some form since the 1970s, but this report focuses primarily on more recent years—from 2016 to 2022—since those were the years for which we had complete data for all states.

This study (PS-23-2) was funded under the Small Study Program (www.cpwr.com/research/small-studies-program/) of CPWR-The Center for Construction Research and Training.

The rationale for this research came from an earlier study (Gray and Mendeloff 2023) that found construction fatality rates to be significantly lower in states with higher rates of construction consultations (i.e., construction consultations per 1000 construction employees or per 100 construction establishments).

The potential prevention of fatalities (and other serious injuries) makes it important to assess consultation programs. In addition, a substantial share of public resources goes toward the program, including about \$60 million a year (in FY 2024) from the federal government and about \$26 million from the states. In recent years, the program has funded about 8,000 consultations in construction. A few states have funded larger consultation programs, often with funding from their workers' compensation programs.

The consultation program offers free consultation services, primarily to small and medium-sized firms (defined as employing fewer than 250 workers at a site), that focus on identifying violations of OSHA standards. In return, the clients are obligated to abate the violations that have been identified. Among the motivations for employers to seek consultation services are a) prevention of injuries to employees, b) avoiding possible penalties in future OSHA enforcement inspections and c) gaining approval of employees. As one OSHA description states:¹

The On-Site Consultants Will

- Help you recognize hazards in your workplace.
- Suggest general approaches or options for solving a safety or health problem.
- Identify kinds of help available if you need further assistance.
- Provide you a written report summarizing findings.
- Assist you to develop or maintain an effective safety and health programs.
- Provide training and education for you and your employees.

The On-Site Consultants Will Not

- Issue citations or propose penalties for violations of OSHA standards.
- Report possible violations to OSHA enforcement staff.
- Guarantee that your workplace will "pass" an OSHA inspection.

¹ From What Happens During an On-Site Consultation Visit? | Occupational Safety and Health Administration (<https://www.osha.gov/consultation/getting-started>) accessed May 22, 2024.

Of course, firms may obtain information about hazards from other sources—their own in-house staff or consultants, their workers’ compensation insurance carrier, or other private firms. In any given year, only about 1% of construction firms nationwide request consultations from OSHA, although they tend to be larger than the average construction firm and a single visit to a large worksite requested by the general contractor may also involve several subcontractors.

The consultation program does not assess penalties for the hazards it finds. However, if the employer does not abate a serious or imminent danger hazards, the program must notify OSHA for a potential enforcement inspection. Such referrals to enforcement are very rare—a handful per year out of perhaps 20,000 consultation visits in all sectors. The absence of referrals to enforcement testifies mostly to firms’ compliance; however, it would also undermine employer willingness to request consultation visits if OSHA were very strict about assessing compliance. Employers have the right to require that the consultation visit be limited in scope to specific topics, but the consultant can still identify any hazards that are in plain sight. Most consultation visits were classified as “limited” and those visits tended to identify considerably fewer hazards than “full” visits.

Plan of the Research

The goal of this project is to identify differences across states in their consultation activities in the construction sector and to consider how those differences might impact the effectiveness of consultations in preventing serious injuries. We combined interviews with state Consultation Program Managers (CPMs) with analyses of OIS data concerning the programs’ consultation activities, outcomes and possible impacts on fatalities. The various emails and documents sent to the CPMs as part of the interview process are included in Appendix B along with a sample version of the interview script.

We interviewed the CPM of all 21 programs operated by “state plan” states along with a smaller sample of 10 of the 29 “federal” states. We defined state plan states as those where enforcement of OSHA regulations at private sector employers was done by a state agency approved by OSHA as being at least as effective as federal enforcement. Earlier examination of consultation activity across the different states (Mendeloff and Gray, 2023) indicated that consultation rates in construction were higher in state plan states and also showed greater variation across states, while there were generally lower activity levels and less variation among the federal states. We chose the 10 federal states for interviews by emphasizing larger states while also getting representatives from different regions.

In all states, the consultation program is operated separately from the enforcement program and the consultation program is forbidden to provide data about their activities to the enforcement program to avoid discouraging firms from requesting a consultation. Eleven of the 29 federal states have a non-profit organization, usually a university, that runs the program. In the other 39 states, the programs are located within state government. All the consultations programs are overseen by the federal government: states are required to contribute only 10% of the program cost, though many states contribute more than the minimum.

We contacted the Federal OSHA Office of Small Business Assistance at the start of the project. Its leaders expressed support for our research and agreed to provide contact information for the state CPMs as well as emailing the CPMs to introduce our project. They also provided data on the activities of the state programs, including data on the individual consultation requests, visits, and hazards found. Those data are described in more detail below in our discussion of data analyses and in Appendix C.

We gave a brief introduction to the research project at a meeting of the board of directors of The National Association of Occupational Safety and Health Consultation Programs (OSHCON), the organization of state consultation programs, who expressed support for our research. The Federal OSHA Office of Small Business Assistance sent an introductory email introducing our project and expressing support for it to the CPMs of the state programs on January 31, 2024. We then reached out to the CPMs by email on February 5-6, 2024,

requesting their agreement to participate in an interview. That email included a document describing the research and providing sample questions and a consent form for them to sign, along with instructions about signing up for an interview time. Over the next few months we sent reminders to those who hadn't responded initially, eventually getting all 31 states to participate.

The interviews themselves lasted about 45-60 minutes and were mostly conducted using Zoom. We developed a script for the interviews to ensure that we covered all relevant topics, though we allowed some leeway in the actual conversations based on the interviewee's responses. We took notes during the call and prepared a transcript of the interview, sending the draft version to the respondent to confirm that we had correctly noted their responses, in some cases with a follow up question or two. Most of the CPMs sent back the draft version with edits and responses to our questions or indicated that no edits were needed.

The interviews began by gathering information about the CPM's background in the consultation program and elsewhere, along with the size of the program staff. That led to a discussion of the state program funding, including both its funding sources and the decision by some states to contribute more than the minimum required. We asked about how the program markets its services to potential clients and the reasons for any fluctuations in program activity over time, including any connections between the state's workers' compensation system or OSHA enforcement activity and firms requesting a consultation. We reviewed the process of requesting and conducting a visit, including the confirmation of hazard abatement after the consultation. We finished with an open-ended discussion of the ways that a consultation visit would be expected to reduce serious injuries in the construction workplace.

Differences Across States Identified from Interviews

Based on the interviews with CPMs, much of the day-to-day operation of state consultation programs appears similar across states. Still, several important state program differences emerged, reflecting differences both in program strategy and in reporting about program activities in the OIS data used in our analysis.

Perhaps the best example of these differences is the approach that programs took in recording a consultation visit to a worksite where the consultant reviewed the activities of several subcontractors on the worksite as well as the general contractor who initially requested the visit. The general contractor is responsible for fixing any hazards found on the worksite, including hazards related to the operations of the subcontractors. Some states usually record a single visit to the general contractor, while other states regularly get the subcontractors to request their own visits, so one trip to the worksite could generate multiple visit records.

While the latter approach may seem like overcounting, those CPMs emphasized the value of the more in-depth interactions with the subcontractors when each was counted as a separate visit, including a review of the corporate-level safety and health plans for the subcontractor. Thus, it is an open question which strategy would be more effective in reducing workplace hazards.

Another difference arose with respect to the mix of "full" (i.e., comprehensive) and limited visits done by consultants. Firms are allowed to request that their consultation visit be limited to a specific issue or area of operations and the consultant would then focus attention accordingly, although if the consultant happens to notice another hazard in plain view during the visit, that would be added to the list of hazards to correct. Some CPMs noted that while firms had a right to limit the scope of the consultation visit, their consultants generally try to get firms to agree to a "full" visit; other states emphasize doing a greater number of limited visits.

The CPMs mentioned a variety of ways in which firms were induced to request consultations. Most CPMs attributed many of the requests to the threat of OSHA enforcement activity. Several mentioned specific cases, such as a new OSHA standard or a special emphasis plan for a particular industry (e.g. nursing homes), that led to a short-run burst of consultation requests. Some programs take advantage of this sensitivity by informing

firms of upcoming enforcement trends and encouraging them to request a consultation. Some enforcement officers provide a sales pitch for the consultation program when they are conducting inspections.

There were also some idiosyncratic connections between OSHA enforcement activity and consultation requests. An enforcement branch with insufficient resources to conduct compliance inspections in response to every worker complaint could instead encourage firms facing lower-priority complaints to request a consultation. An enforcement branch could offer discounts on settlement agreements if the firm agreed to request a consultation visit, although in some states that practice had been discontinued because those firms tended to be less committed to the program and cancelled their visit requests or were less willing to abate the hazards.

In California, the State's worker's compensation (WC) agency shares its data about high loss rate firms with OSHA. Those firms are offered the choice between requesting a consultation or being placed on a priority list for inspections by Cal-OSHA. Some state consultation programs focus heavily on "OSHA Strategic Partnerships" that OSHA has created with larger general contractors. Consultation visits at their large projects may be scheduled quarterly or even more frequently and it is common to count each subcontractor at these sites as a separate visit.

Most states engaged in program outreach to encourage requests, using a variety of methods that included emails, phone calls, conference attendance, and webinars. Word of mouth from past clients was also important in many cases. It seems common for states to go back to the same firms over time, either from having past clients request visits at new worksites or from setting up partnerships with firms on large worksites that generate a series of visits as the site transitions to new activities. Other CPMs indicated that they tried to avoid repeated visits and tried instead to generate requests from new clients.

State programs differ in how much they focused on the construction industry. The reasons for these differences are not clear. In some cases, this focus reflected efforts by program staff to target the industry. In other cases, it seemed more accidental—hiring a new consultant who happened to have a background in construction and was especially good at selling the advantages of having a consultation to firms in that industry, for example—perhaps because it was a small state and the consultant already knew many of the managers in the industry.

Finally, we asked the CPMs about their program's funding source, since we observed considerable differences across states in the overall level of resources devoted to their consultation programs. As noted earlier, states are required to provide funds to cover 10% of the cost of the program, but many states contribute more than the minimum, described as "over-matching" the federal contribution. One potential explanation for differences in overmatching is connected to the funding mechanism for the program, based on our interviews with the CPMs. Those states whose contributions to the consultation program are covered by funds connected to the state's workers' compensation program tend to spend more on consultations and more often provide an over-match than states whose contribution comes from general state revenues. Of the states we interviewed, more than 80% of states using workers' compensation funding do an over-match and their average contribution is about 30% of program costs. Only about half of states without WC funding do an over-match and their average contribution is about 20% of program costs. Over-matching is also more prevalent in state-plan states, where a state agency is responsible for carrying out the workplace enforcement activity rather than having it done by Federal OSHA. State budgetary matters can affect consultation programs in other ways, e.g. a state-wide hiring freeze even if the program has funds available to hire additional staff, or limitations on the pay range that can be offered to new hires.

Quantitative Data Source – OSHA Information System (OIS)

The federal OSHA Office of Small Business Assistance provided us with quantitative data about the state consultation program activities from the OIS database. These included four main sets of data that we used in

our analysis: requests for consultation visits, consultation visits conducted, hazards reported from the visit, and the results of test samples taken during the visit. Appendix C contains lists of the variables in these datasets.

The OIS is a relatively new database, adopted around 2015, and doesn't include the full history of consultation activity. Close examination of the dates of visits recorded for each state shows that the visits for some states did not begin to appear until the end of 2015. We received the data in September 2023, so the years for which we have complete data for all states range from 2016 to 2022, which was the time period used for most of our analyses. Note that we used calendar year rather than the federal fiscal year in the analyses presented here, except for the state financial contributions to the consultation program, for which the data was provided on a fiscal-year basis.

Our previous research (Gray and Mendeloff 2023) primarily used the number of consultation visits done in the construction industry as its measure of consultation activity. This led us to define our analysis sample based on the consultation visits that happened between January 2016 and December 2022. For example, when we examine the sources of consultation requests, we focused on requests connected to visits that happened in 2016-2022, so a request in December 2015 that led to a visit in 2016 would be included, but a request in December 2022 that didn't get a visit until 2023 wouldn't be included.

While we were given data on consultations for all industries, nearly all of our work was based on activity in the construction sector (NAICS industry codes beginning with "23"). The visit data identified NAICS codes for both the firm that requested the visit and the worksite where the visit was conducted. Most of the time, construction firms are found working at a construction worksite and vice versa. We focused on the worksite NAICS code to define our sample.

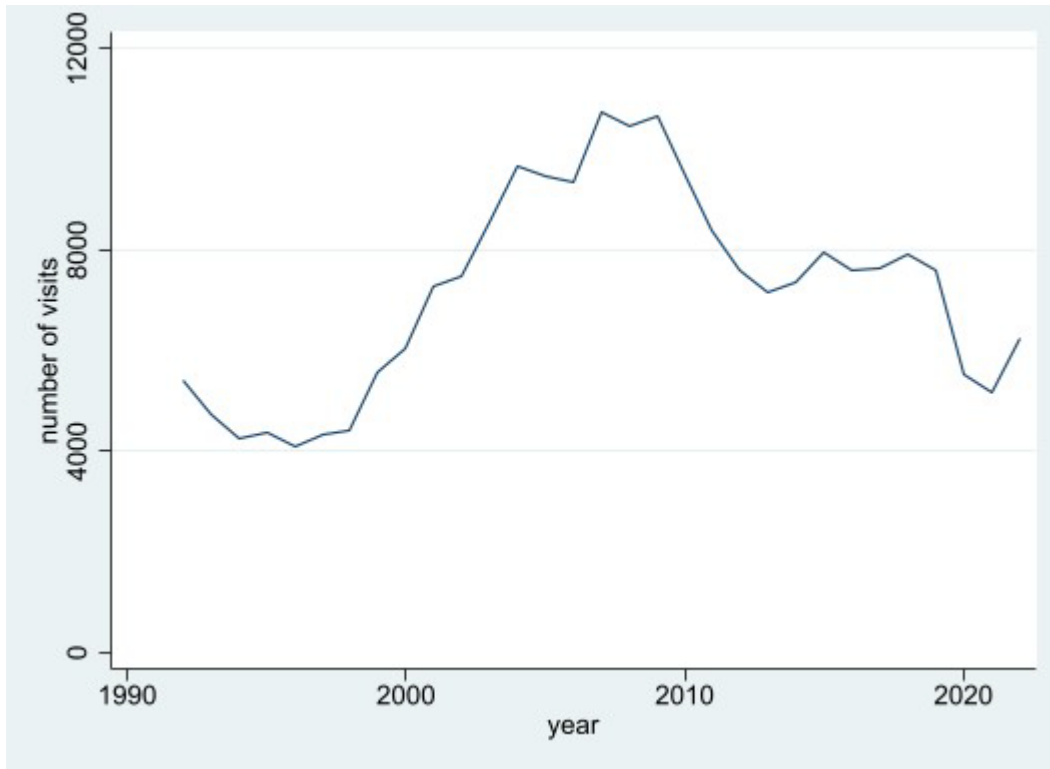
Our final OIS analysis dataset included a total of 157,178 private sector consultation visits over the 50 states from 2016 to 2022. Visits to construction worksites accounted for 47,418 visits, about 30% of the total. These construction consultation visits were based on 39,805 consultation requests, so a typical request averaged 1.2 visits. On those visits, a total of 160,541 hazards were identified, an average of 3.4 per visit, though about 30% of visits didn't have any hazard identified. The test sample data was less extensive. The most frequent substance sampled on construction visits during this time period was noise, with 3,158 samples; few substances had more than several hundred samples.

A few of our calculations involved data taken from other sources. The denominator for calculating consultation visit rates is state construction sector employment, taken from the Quarterly Census of Employment and Wages (QCEW) at the BLS website (<https://www.bls.gov/cew/home.htm>). We also used data on OSHA enforcement activity in each state, covering inspections, violations cited, penalties imposed, and workplace fatalities (https://enforcedata.dol.gov/views/data_catalogs.php), taken from the U.S. Department of Labor's Enforcement website. Additional data on construction fatalities came from CPWR's Fatality Map (https://www.cpwr.com/wp-content/uploads/DD-Fatality_Map.xlsx).

Differences in Extent of Consultation Activity in Construction

Figure 1 shows the national total of consultation visits at construction firms over the past 31 years, from 1992 to 2022. The number of visits fell from 1992 to 1998. Then it began a long climb that didn't stop until 2007-09, when the number peaked at close to 11,000. The number started a steady decline after that, falling to under 7,200 by 2013. A moderate recovery occurred after that, but it was cut short by the COVID pandemic, which limited consultation activities in many states. By 2022, our last complete year of data, the number of visits at construction firms had fallen overall by more than 40% from the 2007-2009 peak to just over 6,300.

Figure 1. OSHA Consultation Visits in Construction, 1992-2022



Appendix Table A1 displays the number of construction consultation visits in each state beginning in 1992 and for every 5 years after that: 1997, 2002, 2007, 2012, 2017, and 2022. Eight states had their maximum number at the start of the period: Colorado, Florida, Hawaii, Indiana, North Dakota, New York, Ohio and West Virginia. The increase described above was led by California, which increased its construction consultation visits by more than 1300 per year, followed by Washington State up by 740, Minnesota up by 600 and Wisconsin up by 400.

Table 1. Overview of Consultation Visits Across States, 2016-2022

State	State Plan	Total Visits over seven-year period			Annual visits per 1,000 construction employees	Average state % financial contribution
		All industries	Construction industries	Construction share		
AK	Yes	2,070	639	31%	5.57	53
AL	No	2,528	928	37%	1.42	10
AR	No	1,791	237	13%	0.64	12
AZ	Yes	3,550	2,349	66%	1.96	18
CA	Yes	11,300	3,551	31%	0.57	52
CO	No	1,681	167	10%	0.13	10
CT	No	2,559	1,070	42%	2.56	58
DE	No	771	207	27%	1.29	10
FL	No	3,510	1,124	32%	0.28	10
GA	No	2,244	417	19%	0.29	10
HI	Yes	585	162	28%	0.63	10
IA	Yes	2,257	1,364	60%	2.49	25
ID	No	906	139	15%	0.39	10
IL	No	1,706	137	8%	0.09	10
IN	Yes	2,641	382	14%	0.37	23
KS	No	2,330	261	11%	0.59	28
KY	Yes	1,778	150	8%	0.27	-
LA	No	2,752	652	24%	0.66	10
MA	No	2,044	499	24%	0.44	13
MD	Yes	2,325	1,155	50%	0.99	20
ME	No	1,890	195	10%	0.93	19
MI	Yes	2,501	588	24%	0.49	22
MN	Yes	6,195	3,568	58%	4.01	46
MO	No	3,783	340	9%	0.38	20
MS	No	1,245	75	6%	0.24	10
MT	No	1,451	196	14%	0.94	46
NC	Yes	8,902	3,787	43%	2.33	34
ND	No	1,017	279	27%	1.43	10
NE	No	1,147	67	6%	0.18	10
NH	No	1,259	450	36%	2.31	10
NJ	No	2,456	174	7%	0.16	14
NM	Yes	549	163	30%	0.46	10
NV	Yes	4,643	2,384	51%	3.55	71
NY	No	6,253	459	7%	0.16	14
OH	No	4,741	691	15%	0.44	14

Table 1. Overview of Consultation Visits Across States, 2016-2022 (cont.)

State	State Plan	All industries	Construction industries	Construction share	Annual visits per 1,000 construction employees	Average state % financial contribution
OK	No	4,289	2,163	50%	3.73	12
OR	Yes	1,395	301	22%	0.39	11
PA	No	4,470	303	6.8%	0.17	10
RI	No	445	62	13.9%	0.44	15
SC	Yes	4,146	3,234	78%	4.32	10
SD	No	1,090	193	18%	1.17	12
TN	Yes	2,386	353	15%	0.39	33
TX	No	13,224	1,265	10%	0.23	10
UT	Yes	2,664	1,678	63%	2.19	47
VA	Yes	2,650	1,253	47%	0.89	22
VT	Yes	1,144	712	62%	6.66	27
WA	Yes	14,870	6,037	41%	4.19	-
WI	No	2,552	273	11%	0.31	10
WV	No	1,470	195	13%	0.79	10
WY	Yes	1,023	390	38%	2.44	43
Median		2,328	403	24%	0.64	14

Annual visit rate = the state’s average annual construction visits over 2016-2022, divided by the state’s QCEW construction employment in 2019

State Plan states are those states which run their own OSHA enforcement program.

States are required to contribute at least 10% of the cost of the 21d consultation program.

KY and WA don’t use the 21d program whose funding numbers are listed here.

OR and OH also operate separate consultation programs that they fund on their own.

Source=OSHA Information System, authors’ calculations

Table 1 provides a broader sense of the magnitude of the consultation program in each state during the 2016-2022 period. In this period, Washington, Texas and California led in total consultations, though fewer than 10% of Texas’s consultations were in construction. Focusing much more on construction, South Carolina, Arizona, Iowa, Utah and Vermont all had more than 60% of their visits in that sector. Table 1 shows the annual average of consultation visits per 1,000 construction employees, which ranges from 6.7 in Vermont and 5.6 in Alaska to 0.1 in Illinois.

State plan states that operate their own OSHA enforcement programs have tended to devote more of their consultation resources to construction than states where enforcement is operated directly by federal OSHA. For many years, 21 states have operated their own enforcement at private sector employers.

Huber (2007) argues that state plan states tended to be ones where either labor or business power was dominant, as opposed to other states where they were more evenly matched. State plan choices were made in the 1970s. Since then only California has changed its status and it shifted back in the following year. Thus, there seems to be a “stickiness” to the state plan decision despite changes over time in political forces at the state level.

Table 1 shows that there are 2 **important** factors **contributing to the patterns we find**. First, most state plan states provide a larger financial contribution and pay for a larger total number of consultations than Federal

states. Over half (55%) of the Federal states contribute the minimum as compared to only 14% of the state plan states, and the average match rate is 25% for state plan states and 15% for Federal states. Second, most state plan states devote a higher percentage of consultations to the construction sector than federal states do. Of the 10 states with over 47% of consultations in construction, 9 are state plan states. At the low end, of the 23 states where the share of consultations in construction was less than 20%, only 3 (Hawaii, Kentucky, Tennessee) are state plan states. Only 5 of the 29 federal states had more than 30% of consultation visits in construction compared to 15 of the 21 state plan states.² At this point, we are not clear why state plan states have seen disproportionate growth in consultation requests relative to federal states.

Differences in Why Construction Firms Request Consultation Visits

In contrast to OSHA inspections, consultations do not occur unless they are requested by employers—in the case of construction, usually by the general contractor. Employers can also limit the scope of any consultation and can cancel it at any point, although hazards noted before cancellation must still be addressed. Based on our interviews, some general contractors routinely request safety or health consultations for their projects, while other employers—probably the great majority given the visit rates in Table 1—never utilize the OSHA consultation service, relying on in-house staff, workers’ compensation consultants or other private consultants.

Presumably, firms request OSHA consultations because they want to improve safety, protect the firm against OSHA penalties and enhance the firms’ reputation with their employees (US GAO 2001).³ In addition, OSHA consultations are free, except for any disruption caused by the consultation. However, abating all detected OSHA violations is rarely free and using OSHA consultants, rather than paid consultants, can limit a firm’s options about whether to comply.

It is also possible that using OSHA consultants can win more sympathetic treatment from OSHA enforcement. Employers are not required to disclose their use of OSHA consultants to OSHA enforcement, and we do not know how often they reveal it. It may be wise for them not to reveal this use if they currently do not comply; however, requests for consultation may help the firm demonstrate its good faith, which is a factor in setting the size of penalties. An ongoing consultation can defer programmed inspections; however, because the deferral lasts only until all of the hazards identified have been corrected, this is often a short-term benefit.

Consultants can develop patterns of behavior and networks of contacts that affect the requests they get. As we saw in Table 1, in some states it is fairly unusual to get a request from a construction firm; in other states most requests come from them. These patterns of industry focus tend to change slowly.

Some information about the differences across states in firms’ motivation to request a consultation is provided by the Source of Request field in the OIS data. Table 2 highlights the range of differences in responses, with some states listing reasons for a majority of their visits that some other states never mention. Appendix Table

² Oregon also had less than 30% of its consultations in construction in its OSHA-funded program. However, the State supplements that with its 100%-state funded program which sees about 3 times as many firms. Ohio also has its own program, operated through workers compensation, that provides consultations to many more firms than its OSHA-funded consultations. Michigan has a similar but smaller program. New York State has a large consultation program within its workers’ compensation program.

³ However, as discussed below, many general contractors ask consultants to review hazards at subcontractors, so it is not only their own reputation and employees who are affected by the visit.

A2 provides comparable data for all states, with some disaggregation of the OSHA-related category. A complete listing of all Source of Request values in the original OIS data is given in Appendix Table A2a.

In most states, actual or potential interactions with OSHA enforcement were not the main *stated* reason for firms’ requests for consultations. For half of the states, the OIS data show that 5% or less of the requests were OSHA-related. For 15 of those states the OSHA categories provided less than 2% of their requests.

Table 2. Variation in Source of Request Across States, 2016-2022

	OSHA-Related		Program Outreach		Client Referral		Repeat Client	
Top 5 States	MA	67.6%	CA	81.8%	WA	78.9%	VT	79.4%
	ID	50.4%	NC	77.7%	NJ	75.6%	IA	67.5%
	RI	48.9%	SC	74.9%	UT	68.3%	NH	59.0%
	IL	43.1%	WY	66.5%	AL	58.5%	OK	52.3%
	IN	37.9%	LA	56.9%	ND	48.4%	OH	46.1%
Median state		5.2%		14.2%		16.3%		19.3%
States with 0%		5		5		2		1

Source: OSHA Information System, construction firms, authors’ calculations

OSHA-Related – any connection to OSHA enforcement activity

Program Outreach – solicitation, marketing, media done by consultation program

Client Referral – hearing good things about consultation visits from other firms

Repeat Client – this firm had a previous consultation visit (not necessarily at this worksite).

Data for all 50 states is shown in Table A2; list of all Source values is shown in Table A2a.

There are some outliers within the Appendix Table A2 data. For example, 60% of Massachusetts consultations between 2016 and 2022 were requested by firms as part of a settlement agreement following an OSHA inspection that found violations, designed to ensure the firm’s continuing compliance with the standards that had been violated. Idaho’s program also had more than half of its visits connected to OSHA inspections. Other states with high shares of OSHA-related activity include Rhode Island, Illinois, Indiana, Wisconsin and Georgia. In those states, OSHA enforcement is explicitly recognized as a substantial influence on consultation requests. However, we have no doubt that concern about the possibility of an OSHA inspection motivated many requests for OSHA consultations in other states, as well as driving the utilization of other non-OSHA consultation resources.

As noted in the CPM interviews, states pursued a variety of strategies to encourage potential clients to request a consultation. Several specific terms are included in the Program Outreach category (seen in Appendix Table A2a) and five states, from California to Louisiana, attribute the majority of their requests to those efforts. Another important source of requests is word-of-mouth recommendations from past clients of the program, captured here in the Client Referral category and driving a majority of requests in four states, including Washington and Alabama.

An important issue is the extent to which consultation programs focus their limited resources on a small group of firms. Table 2 shows the percentage of consultations in each state that went to Repeat Clients. Four states had over half of their visits categorized as Repeat Client: Vermont (79%), Iowa (68%), New Hampshire (59%) and Oklahoma (52%). Repeat Client visits may be a productive strategy if regular interactions have higher payoffs than less frequent visits at a larger number of different firms. Still, a 50% Repeat Client visit rate indicates that only half as many firms were visited. Multiple visits with a firm at different sites may help monitor a largely different group of subcontractors, but visiting a new firm may be more productive.

States reporting 0% Repeat Client visits were Kentucky, Minnesota, North Carolina, South Carolina and Washington—all state plan states. Another 14 states had fewer than 10% Repeat Client visits, including 9 federal states and 5 state plan states. It is not clear what time period is used to assess whether a client counts as “Repeat,” though based on our interviews it is connected to the firm rather than the worksite and can refer to visits in past years. It seems unlikely that the reported absence of Repeat Client visits in some states really means that no firms in those states saw consultants on more than one occasion – more likely this reflects differences across states in what they choose to report in the Source of Request field.

Differences in Construction Visit Characteristics

Table 3 provides data on some key visit characteristics related to the scope and purpose of the visit. This table shows the states with the highest values on each of the characteristics. A more complete set of these data including all states are shown in Appendix Table A3.

Table 3. Variation in Construction Visit Characteristics Across States, 2016-2022

Service Type				Visit Type						Service Scope			
% full		% limited		%initial		% followup		%training		% safety		% health	
KY	97.3%	IA	97.7%	AZ	100%	ND	60.9%	ME	24.6%	SC	99.4%	CO	49.7%
SC	96.7%	OK	96.8%	ID	100%	AL	46.3%	SD	18.7%	UT	95.5%	KY	47.3%
CA	93.4%	LA	84.7%	KY	100%	IL	38.0%	WV	16.4%	MD	95.2%	NJ	43.7%
MA	92.6%	WY	83.8%	NE	100%	TN	34.0%	NY	16.1%	MI	95.1%	LA	41.0%
VT	87.8%	TX	82.6%	NV	100%	WI	29.7%	CT	13.6%	TN	94.6%	MO	40.0%
Median	35.6%		47.4%		90.4%		3.9%		2.5%		77.5%		15.8%
Zeros	0		0		0		5		10		0		0

Totals don’t add to 100% due to some data being missing and another option (% both) for Service Scope.
Source: OSHA Information System, authors’ calculations; data for all 50 states is shown in Table A3.

As noted earlier, employers are allowed to choose whether visits are “full” or “limited.” The limits refer to restrictions imposed by the firm on the scope of the visit. However, we see in Table 3 that states differ greatly in the share of their visits that are identified in OIS as full or limited, with Kentucky and South Carolina having less than 5% limited while Iowa and Oklahoma have less than 5% full.

We would expect full visits to be more complete than limited visits, but the OIS data does not report exactly what limits were imposed on the visit, making this a relatively imprecise measure of an individual visit’s intensity. In the next section we explore the number of hazards identified on a visit. Full visits find considerably more hazards on average than limited visits, helping confirm that the limited/full designation provides an indication of visit intensity.

Most consultation visits are labeled “initial” visits, indicating the first visit to the worksite from the consultation request. Forty of the fifty states have at least 80% of their visits listed as initial. The other two types of visits recorded by OSHA are “Follow-up” and “Training.”

Follow-up visits can provide continued assistance or assess whether the firm has successfully adopted whatever recommendations were made during the Initial visit. Only North Dakota had a majority of their visits be follow-ups, though 7 other states also had double digit percentages. Fourteen states had 1% or fewer “follow-up” visits, 7 state plan states and 7 Federal states.

Follow-up visits could enhance the impact of the Initial visit by emphasizing continued compliance with OSHA standards. However, if a state does follow-ups for half of its visits, then only half as many firms or sites

have been visited. One reason for follow-up visits involves firms that have “Strategic Partnership” agreements with OSHA. These tend to be large construction projects which OSHA consultants visit regularly, perhaps quarterly. It is unclear if these visits are treated as normal consultations, which are usually limited to 2 visits per year, typically one for safety and one for health, but in at least some cases they are counted as consultation visits.

Maine categorized about one-quarter of its visits as Training, with eight other states having double-digit shares, but there was no overlap with the “Follow-Up” group. Sixteen states reported less than 1% of their visits as

Training. We do not know the subject of the training that was provided, so it is difficult to say whether we should expect them to be as effective in reducing hazards as an equivalent number of Follow-Up or Initial visits.

A third visit characteristic shown in Table 3 is the fraction of visits that are focused on Safety vs Health issues. Appendix Table A3 shows those data for all states and includes an additional category of “Both” when both safety and health issues could be addressed on the visit. For construction, Safety visits are much more common than Health visits. Only Colorado has its percentage of health visits (49.7%) exceeding the percentage of safety visits during 2016-2022, but Colorado had only 167 total visits during the period. The 4 other states with over 40% health visits (Kentucky, Louisiana, Missouri, New Jersey) also had few total visits. The median share of health visits for all states was 16%. In terms of total health visits, North Carolina’s 23% share translated into the largest number (865), followed by Arizona (745) and Washington (524). The states with the largest total number of construction visits tended to have smaller shares for health though California had most of their visits labeled “Both”.

Table 4 focuses on a few additional visit characteristics that could be related to the multiple visits issue – whether a state tends to encourage subcontractors on a worksite to request their own separate visits. That could lead the state to have shorter visits, more visits in specialty trade construction rather than general building construction, and more visits per consultation request. Appendix Table A4 shows these visit characteristics for all 50 states.

Table 4. Additional Construction Visit Characteristics Across States, 2016-2022

	Avg Hours per Visit ^a		%NAICS 236 (buildings)		%NAICS 237 (heavy/civil)		%NAICS 238 (specialty)		Avg Visits per Request		%Requests with 4+ Visits	
Top 5 States	KY	25.2	MN	91.3%	WV	29.2%	SC	83.5%	ND	2.94	ND	26.3%
	ND	24.0	TN	87.3%	TX	19.1%	NV	77.0%	AL	2.79	AL	25.5%
	SD	23.6	IA	82.0%	SD	18.1%	AZ	75.6%	CO	2.53	LA	21.3%
	CO	21.6	VT	79.8%	MS	17.3%	UT	72.2%	LA	2.40	CO	15.2%
	MT	20.3	NH	78.7%	ME	15.9%	MD	71.9%	MO	2.13	MO	10.0%
Median		14.9		33.6%		5.7%		53.9%		1.24		0.9%
Zeros		0		0		0		0		0		13

a. Many states do not regularly report visit hours. The states listed here reported hours for at least 50% of their visits.

Source: OSHA Information System, authors’ calculations; data for all 50 states is shown in Table A4.

We had hoped that the hours spent by the consultant on the visit would provide a useful measure of visit intensity. Unfortunately, the hours data are often missing: in 20 states, less than half of the visits report hours (see Table A4). A second concern is that the OIS hours number includes all aspects of the visit—preparation, travel, on-site, and report writing. Rural states tend to show the most hours per visit, presumably due to longer

travel times, with South and North Dakota, Montana, and Idaho all averaging over 20 hours per visit, well above the median visit time of about 15 hours. This makes the hours number less useful as a measure of the consultation intensity as experienced by the firm – driving a longer distance to the worksite provides no additional information to the firm about hazards to be corrected. While the hours data may provide some indication of differences in visit intensity across states in some cases, the missing and uncertain data makes this information hard to interpret.

We now turn to the distribution of visits across different industries within the construction sector. As noted in the interviews, the general contractor on a worksite is responsible for fixing hazards noted for the subcontractors working on the site, but states differ in whether they record separate visits for each subcontractor. General contractors tend to be in NAICS 236 (buildings), while subcontractors tend to be in NAICS 238 (specialty trades). Thus, Minnesota’s having 91% of its visits in NAICS 236 and only 4% in NAICS 238 suggests a one-visit-per-worksites policy. In contrast, only 16% of South Carolina visits were in NAICS 236, with 84% in NAICS 238.

The final characteristic we examine is the number of visits driven by a single request. With most visits described as “Initial”, the most common pattern might be a single visit for each request, but there are some states that regularly do more than one visit per request. Several factors could influence the number of visits for a single request. One is whether the worksite is large and long-lasting. Another is whether the state does more follow-up visits to see whether firms have actually fulfilled their commitment to abate the hazards reported from the visit. Table 4 shows that both North Dakota and Alabama do four or more visits per request about one-quarter of the time, much more often than most other states, so those states’ visits cover fewer distinct worksites.

Differences in Hazards Found per Construction Visit

Table 5 shows measures of the average number of hazards found on consultation visits in construction and the average violations cited and penalized on enforcement inspections, with the data for all states available in Table A5. To the extent that reductions in hazards provide the main mechanism by which consultation visits reduce serious injuries, these average hazard numbers could provide a valuable measure of the intensity of consultation visits in each state.

The average number of serious hazards identified per consultation visit was highest in Idaho and Kentucky (both 6.7), both states with relatively low consultation rates. Thirteen other states had serious hazard rates above 4, including 9 federal states and 4 state plan states. There were distinct regional patterns, especially for New England, where all 6 states had serious hazard rates above 4. By contrast, most of the states in OSHA’s Region 6 had serious hazard rates below 2 (Oklahoma, Texas, Louisiana, Arkansas and New Mexico). Similar rankings hold when looking at the total hazard rates.

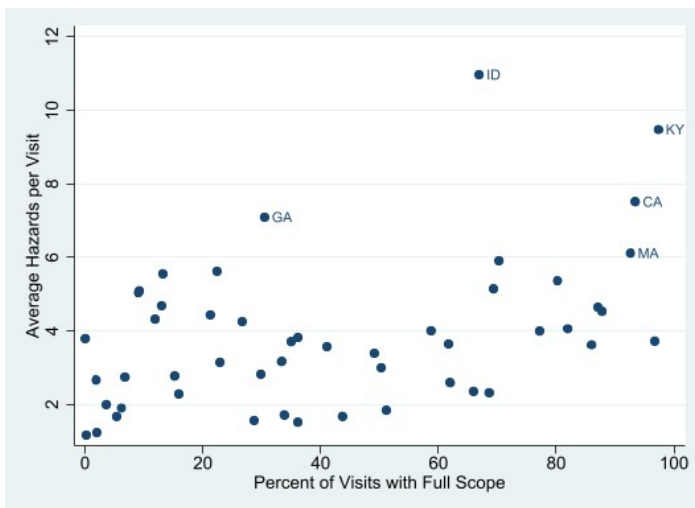
Table 5. Additional Construction Visit Characteristics Across States, 2016-2022

Consultations				Inspections					
Avg. Serious Hazards per Visit		Average Hazards per Visit		Avg. Serious Violations per Inspection		Average Violations per Inspection		Average Penalties per Inspection	
ID	6.7	ID	11	MD	3	MD	4.1	DE	\$13,896
KY	6.7	KY	9.5	DE	2.5	TN	3.1	NJ	\$11,443
MA	5.8	CA	7.5	TN	2.3	DE	2.9	OH	\$11,331
GA	5.5	GA	7.1	IN	2.2	IL	2.6	ME	\$10,184
NE	5.5	MA	6.1	IL	2.1	AK	2.4	IL	\$10,061
Median	2.9		3.7		1.5		1.9		\$5,954

Source: OSHA Information System, construction firms, authors’ calculations; data for all 50 states is shown in Table A5.

A key question is whether these differences across states in hazard rates should be thought of as measuring differences in the hazardousness of worksites in the state or differences in the intensity of the visits being done in the state, with more intensive visits expected to identify more hazards. Evidence supporting the visit intensity explanation can be seen in Figure 2 below, which compares the share of full visits in the state with the average total hazards per visit. While there is considerable variability, there is a distinct upward trend. These differences are consistent with the observation that on average across our sample, full visits average 3.3 serious hazards and 4.5 total hazards, while limited visits average only 2.2 serious hazards and 2.5 total hazards.

Figure 2. Comparing Visit Scope and Average Hazards Found, 2016-2022



Source: OSHA Information System, construction firms, authors’ calculations; state annual averages, 2016-2022

What about differences in worksite hazardousness across states? Tables 5 and A5 provide data on the average violations found on enforcement inspections in construction for each state. We see very little overlap between the states with high numbers of hazards per visit and those with high numbers of serious violations per inspection or total penalties per inspection. Correlations between the hazards per visit and the violations per inspection are low, on the order of -0.02. It is possible that inspectors would face more pressure to cite all violations observed, as compared to consultants who need to maintain a positive relationship with the firm to get requests for future visits. It seems likely that at least part of the differences across states in the numbers of hazards found are driven by differences in the intensity of their visits.

We also explored the OIS test sample data, which includes air sampling as well as noise measurements and bulk and wipe sampling, as another possible measure of hazards to identify which states have more hazardous workplaces (or more intensive visits). As noted earlier, the test sample data is relatively thin for consultation visits in the construction sector. Only the noise data provide sizable numbers of test samples for the same substance across states. Appendix Table A5 includes information from the noise sample data collected on consultation visits. There are many states that have little or no noise sample data to work with. Focusing on those states with data from at least 20 noise samples in construction, the average hazards found per visit in the state are negatively correlated (-0.26) with the state's fraction of noise samples that are in violation. That's another indication that there is not a consistent pattern across states in their worksite hazardousness using these measures.

Differences across Construction Industries

We now consider another dimension, differences in consultation activity across the 31 detailed (NAICS 6-digit) industries within the construction sector. Table 6 shows the consultation visit rate and the hazards per visit, along with comparable information from enforcement inspections in those industries. Given that the visit and inspection rates are calculated per 1000 workers in the industry, the larger size of firms in the heavy and civil engineering industries would tend to understate their rates per firm.

Table 6. Average Annual Consultations and Inspections in Construction Industries, 2016-2022

NAICS	Industry	Consultations			Inspections			
		Visits per 1000 employees	Hazards per visit	Serious hazards per visit	Inspections per 1000 employees	Violations per Inspection	Serious violations per Insp.	Penalties per Inspection
NAICS 236 - Construction of Buildings								
236115	Single-Family	0.8	4.6	3.0	4.8	1.8	1.2	\$3,646
236116	Multi-Family	7.1	6.1	5.4	25.1	1.2	0.8	\$3,824
236117	New For-Sale	0.8	4.3	3.4	4.0	1.3	0.8	\$3,620
236118	Remodelers	0.4	6.0	3.4	2.0	2.6	1.7	\$4,520
236210	Industrial Building	0.8	3.9	3.4	2.6	1.0	0.6	\$3,066
236220	Commercial	2.5	3.9	3.5	5.3	1.1	0.6	\$2,760
NAICS 237 - Heavy and Civil Engineering Construction								
237110	Sewer	0.5	3.6	2.5	4.8	1.8	1.3	\$9,136
237120	Oil & Gas	0.1	3.8	3.0	0.7	1.1	0.7	\$6,685
237130	Power	0.1	3.9	2.7	1.1	1.3	0.8	\$6,447
237210	Land-subdivision	0.1	2.5	1.8	0.8	1.6	1.1	\$3,017
237310	Highway	0.4	3.6	2.9	1.6	1.2	0.8	\$5,875
237990	Other Heavy/Civil	0.5	3.7	2.8	1.9	1.4	0.8	\$5,645
NAICS 238 - Specialty Trade Contractors								
238110	Foundation	1.0	3.0	2.2	2.8	1.7	1.1	\$5,111
238120	Steel	1.8	2.9	2.3	7.1	1.7	1.2	\$5,307
238130	Framing	4.0	3.8	2.7	44.4	2.8	2.2	\$7,552
238140	Masonry	1.6	3.2	2.5	9.7	3.0	2.5	\$6,466
238150	Glass	1.0	3.5	2.2	2.1	1.5	1.0	\$3,210
238160	Roofing	1.4	3.4	2.2	27.1	2.4	2.0	\$7,952
238170	Siding	1.6	4.6	2.9	20.1	2.9	2.5	\$5,443
238190	Other Structural	0.9	3.6	2.6	4.9	2.0	1.5	\$5,119
238210	Electric	0.4	2.6	1.9	1.3	1.2	0.7	\$3,705
238220	Plumbing	0.5	2.9	2.0	1.1	1.4	0.8	\$3,453
238290	Other Mechanical	0.3	3.8	2.8	1.0	1.5	1.0	\$4,421
238310	Drywall	1.1	2.5	1.8	2.5	1.8	1.1	\$3,512
238320	Painting	0.6	4.2	2.3	3.3	2.4	1.5	\$4,399
238330	Flooring	0.5	3.4	2.3	1.5	2.2	1.3	\$3,036
238340	Tile	0.6	5.2	3.4	1.4	2.4	1.2	\$2,900
238350	Carpentry	0.4	5.2	3.3	2.1	2.0	1.5	\$4,355
238390	Other Finishing	0.6	3.7	2.5	2.0	2.0	1.4	\$4,145
238910	Site Prep	0.5	3.4	2.6	3.0	1.8	1.2	\$5,607
238990	Other Specialty	0.6	4.7	3.1	2.5	1.7	1.1	\$4,691

Source: OSHA Information System for consultation data, DOL Enforcement website for enforcement inspection data; authors' calculations

We see a considerable agreement between the industries with a high rate of consultation visits and those with a high rate of inspections. While the ordering isn't identical, multi-family residential and framing contractors are at the top of both lists and the correlation across all 31 industries is 0.75. This is consistent with enforcement activity helping drive firms to request consultation visits. Visit rates also tend to be higher for those industries where more hazards are found per visit, with a correlation across industries of 0.61. The connection between visit rates and the average penalties or number of serious violations cited on inspections is also positive, but much weaker.

Regression Analysis of Consultations and Fatality Rates

In addition to the interviews and examination of the OIS data on state consultation activities, the project had a goal of developing and testing a model of state-level construction fatality rates that incorporated additional information about state consultation practices. Such a model could test whether the differences we see across states in their consultation program characteristics are associated with differences in their workplace fatality rates. This work built on Gray and Mendeloff (2023), which showed significantly lower construction workplace fatality rates in states which did more consultation visits. The earlier work had access to the CFOI data, which is generally considered to be the gold standard for measuring occupational fatalities in the U.S. The current project didn't have access to the CFOI data since our agreement with BLS to use those data had expired, so an alternative approach was taken that relied primarily on OSHA accident inspection data, supplemented by a dataset from CPWR that examined various media sources for workplace fatalities that might not have been captured in the OSHA inspections.

When we first planned the research, we thought we would have detailed consultation data going back to 1992, which would have allowed us to rerun the earlier analyses, including a focus on changes in state consultation practices over time. Unfortunately, OSHA's consultation database system changed around 2015 and we didn't get the detailed consultation data from earlier years. Therefore, we took the states' rate of consultation visits per construction firm that we used in our earlier paper and multiplied it by a measure of the state's average consultation visit intensity over 2016-2022. The three state-level intensity measures we used were the average number of hazards found per visit, the average number of serious hazards found per visit, and the average hours of consultant time spent per visit. Because in 10 states visit times are reported rarely or not at all, we replaced their missing visit times with 15 hours (the median value across all other states). This adjustment could weaken the coefficient on the average hours measure. If the cross-state variations in visit intensity we observe in recent years represent long-run differences, multiplying the consultation visit rate by an intensity measure could strengthen the observed connection between consultation visit rates and workplace fatalities found in our earlier work.

Table 7 describes the variables included in the dataset, which is based on the data used in Gray and Mendeloff (2023). We extend the data to 2018 in order to have a longer overlap with our 2016-2022 average measures of state consultation intensity. We use the same explanatory variables as in our earlier work, including OSHA enforcement activity, Workers Compensation program characteristics, employment growth, wage, unionization, shares of different subsectors, various construction worker demographics (age, experience, ethnicity, education), and state attitudes towards risk (smoking prevalence and seatbelt use).

Table 7. Summary Statistics for Regression Analysis (1,350 state-year observations; 50 states, 1992-2018)

Variable	Source	Mean	Std. Dev.	Description
<i>fatality rate</i>	F/Q	11.146	6.217	Fatalities per 100,000 workers
<i>log(fatality rate+1)</i>	F/Q	2.338	0.649	Log (fatality rate+1)
<i>inspection rate</i>	O/Q	0.061	0.044	Inspections/establishments
<i>consultation rate</i>	V/Q	0.012	0.015	Visits/establishments
<i>visits*serious hazards</i>	V/Q	0.036	0.043	(Vis/estabs)*serious hazards per visit
<i>visits*total hazards</i>	V/Q	0.044	0.053	(Vis/estabs)*total hazards per visit
<i>visits*average hours</i>	V/Q	0.166	0.199	(Vis/estabs)*average hours per visit
<i>total visit rate</i>	O/V/Q	0.073	0.052	Inspection rate + consultation rate
<i>log(penalty)</i>	O	7.190	0.536	Log (penalty per inspection with penalty)
<i>WC waiting period</i>	W	5.004	1.878	WC waiting period (days)
<i>WC size exemption</i>	W	0.165	0.371	Any WC firm size exemption (dummy)
<i>employment change</i>	Q	0.019	0.062	Change in log(employment)
<i>unionization</i>	U	16.087	11.053	Union membership percentage
<i>log(wage)</i>	Q	6.647	0.296	Log (average weekly wage)
<i>Employment share of:</i>				
<i>general construction</i>	Q	0.238	0.032	share in NAICS 236
<i>specialty trades</i>	Q	0.609	0.058	share in NAICS 238
<i>new workers</i>	C	0.299	0.087	workers with less than 3 years experience
<i>older workers</i>	C	0.189	0.058	workers over 50 years old
<i>total Hispanic</i>	C	0.144	0.147	Hispanic workers
<i>foreign Hispanic</i>	C	0.096	0.103	Hispanic+foreign workers
<i>HS grads</i>	C	0.804	0.078	high-school graduate workers
<i>non-production workers</i>	C	0.289	0.042	workers in non-production jobs
<i>seatbelt use</i>	B	4.318	0.204	log% of state population wearing seatbelts
<i>smoking</i>	B	3.019	0.199	log% of state population who smoke

Sources: F=combined OSHA accident/fatality data and CPWR Fatality Map Data,

Q=Quarterly Census of Employment and Wages (bls.gov/cew),

O=OSHA inspection data (developer.dol.gov/health-and-safety/dol-osha-enforcement/),

V=OSHA consultation data (provided to authors by OSHA),

W=Workers Compensation (National Academy of Social Insurance),

U=unionization data (unionstats.com),

C=Current Population Survey (cps.ipums.org/cps),

B=CDC Behavioral Risk Factor Surveillance System(cdc.gov/brfss)

See Gray and Mendeloff (2023) for additional details on regression dataset construction.

Table 8. Determinants of Workplace Fatalities in Construction (1,250 state-year observations; 50 states, 1992-2016)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CFOI fatalities							
Inspection rate	-1.187*	-0.305			-1.206**	-0.559	
	(-1.77)	(-0.42)			(-2.15)	(-0.90)	
Consultation rate		-7.097***				-5.224***	
		(-2.93)				(-2.90)	
Total visit rate			-1.789***				-1.614***
			(-3.70)				(-3.89)
Log(penalty)	-0.0183	-0.0432	-0.0493		-0.00713	-0.0258	-0.0305
	(-0.33)	(-0.77)	(-0.86)		(-0.01)	(-0.54)	(-0.61)
WC waiting period				0.0541**	0.0538***	0.0453**	0.0509**
				(2.64)	(2.69)	(2.35)	(2.58)
WC size exemption				0.428***	0.433***	0.420***	0.430***
				(4.00)	(4.16)	(4.20)	(4.17)
R-squared	0.192	0.210	0.200	0.239	0.243	0.252	0.249

Source – Gray and Mendeloff (2023).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
OSHA/CPWR							
Inspection rate	-0.772	0.0288			-0.795	-0.226	
	(-1.20)	(0.04)			(-1.44)	(-0.35)	
Consultation rate		-6.443***				-4.595**	
		(-2.76)				(-2.56)	
Total visit rate			-1.189**				-1.033**
			(-2.65)				(-2.58)
Log(penalty)	0.0486	0.0260	0.0248		0.0605	0.0441	0.0442
	(0.92)	(0.48)	(0.46)		(1.31)	(0.97)	(0.95)
WC waiting period				0.0503**	0.0499**	0.0425**	0.0482**
				(2.52)	(2.55)	(2.29)	(2.48)
WC size exemption				0.452***	0.462***	0.450***	0.460***
				(3.79)	(3.98)	(4.00)	(4.00)
N	1250	1250	1250	1250	1250	1250	1250
R-squared	0.109	0.124	0.114	0.159	0.165	0.173	0.168

Multiple regression model with year dummies and control variables included but not reported.
 Dependent variable = log (fatality rate + 1); top half=CFOI data, bottom half=OSHA+CPWR Fatality Map Data.
 T-statistics in parentheses, clustered by state; * p<0.10; ** p<0.05; *** p<0.01.

Table 9. Expanded Models of Workplace Fatalities in Construction (950 state-year observations; 50 states, 2000-2018)

	(1)	(2)	(3)	(4)
Inspection rate	-0.439 (-0.67)	-0.504 (-0.78)	-0.332 (-0.51)	-0.371 (-0.53)
Consultation rate	-3.904** (-2.20)			
Visits*serious hazards		-1.367** (-2.43)		
Visits*total hazards			-1.293** (-2.61)	
Visits*average hours				-0.351** (-2.19)
Log(penalty)	0.0625 (1.13)	0.0630 (1.14)	0.0604 (1.10)	0.0761 (1.53)
WC waiting period	0.0463** (2.40)	0.0466** (2.41)	0.0436** (2.20)	0.0474** (2.39)
WC size exemption	0.351*** (3.41)	0.358*** (3.44)	0.351*** (3.41)	0.346*** (3.45)
N	950	950	950	950
R-squared	0.207	0.208	0.210	0.209

Multiple regression model with year dummies and control variables included but not reported

Dependent variable is log(fatality rate + 1), using OSHA + CPWR Fatality Map Data.

T-statistics in parentheses, clustered by state; * p<0.10; ** p<0.05; *** p<0.01

Table 8 compares the original results for the basic model in Gray and Mendeloff (2023) with the same model run on the same time period (1992-2016), with the only difference being the measure of workplace fatality rates. The two panels of the table show the model from the earlier paper on top and the newer model on the bottom. The coefficients (not shown here) on most of the control variables are generally similar in sign and significance to those found earlier. That is also true for most of the policy variables in the model, with the exception of the OSHA enforcement inspection rate which is less significant and smaller in the lower panel. The focus of our attention in Table 8 is on the consultation variables. Those coefficients are similar in sign and significance across the two panels.

In Table 9 we look at the result of shortening the time period to 2000-2018, increasing the overlap with the consultation intensity measures from the OIS, and including the intensity measures. Model 1 uses the original consultation rate, while models 2, 3, and 4 multiply it by our three intensity measures. We see that all three intensity versions continue to show a significant negative relationship between consultation activity and the workplace fatality rate. The hazard rate intensity versions do slightly better than the original consultation visit measure and hours intensity does slightly worse, but none of those differences are significant.

Summary and Future Work

The research described here has examined OSHA's Consultation program, specifically identifying differences across states in the program activities, with a goal of understanding how consultation visits could help prevent hazards, injuries and deaths in the construction industry. This builds on earlier work that found lower construction fatality rates in states with higher rates of consultation visits in construction. We interviewed 31 state Consultation Program Managers (CPMs) about their program's activities and then analyzed OIS data on each state program's characteristics to corroborate and extend the interview results. We also ran preliminary analyses extending our earlier work to test whether incorporating measures of consultation visit intensity would strengthen the observed connection between higher visit rates and lower fatalities.

One obvious difference across states is in the size of their consultation program. While some states provide the minimum 10% contribution to match a 90% federal contribution, other states contribute considerably more. State contributions tend to be higher among state plan states, those which conduct their own OSHA enforcement, and also among states where the funding for consultations is connected to their workers' compensation program. States also differ in the share of their activities directed towards construction worksites, which can be driven by employing consultants with a background in the construction industry as well as by the degree to which construction is more hazardous.

We found considerable differences across states in their consultation activities and the way those activities are reported in the OIS data. In some states a visit to a construction worksite would typically be counted as a single visit, even if the consultant spoke with several subcontractors as well as the general contractor. In other states the visit would typically generate multiple visit records in the OIS data as the subcontractors would be encouraged to file their own visit requests. States also differ considerably in the share of their visits whose scope is limited by the employer, rather than being a full visit covering the entire workplace, and the extent to which visits are conducted at past clients or new ones. These differences suggest that simply counting up the number of visits reported in the OIS data may not fully capture the resources devoted to those visits or the likely impact on reducing hazards at the worksite. Developing a measure of the intensity of a state's consultation visits may help strengthen our models of their impact on serious injuries and fatalities.

We explored three potential measures of visit intensity which are available in the OIS data. The first was the hours that the consultant spent on the visit. That seems a convenient measure of consultant effort, but the information was regularly missing in many states and the cross-state differences seem driven by travel distances in the state, so it may not capture the intensity of time spent on site. The second was the results of health test samples taken on the visit. That could tie directly to health outcomes for affected workers, but test

samples were rarely taken during construction visits, even for common health risks like noise exposure. The third was the number of hazards listed in the final report sent to the employer. This has the advantage of being regularly reported and, since the firm is supposed to abate those hazards, could connect directly to reductions in the risk of serious injuries or fatalities.

We controlled for visit intensity by running regression models, similar to those we ran in our earlier research. These were preliminary analyses due to two limitations in our data. First, we didn't have access to the CFOI fatality data used in our earlier work, relying instead on OSHA's fatality inspection records supplemented with some additional data from CPWR. Second, our data on visit intensity covered only recent years, so we used an average intensity measure for each state rather than controlling for changes in intensity over time. Our analysis found that the significant connection between consultation visit rates and workplace fatality rates is maintained when we account for the intensity of a state's consultation visits.

We anticipate doing future research in this area that would remove these limitations. We will propose a new research project to the Bureau of Labor Statistics using the CFOI fatality data to be comparable with our earlier work. We will also work with OSHA to get consultation data from earlier years, to examine changes in a state's visit intensity over time.

This study examined the number of hazards found, but not the specific OSHA standards listed in the hazard reports. That information could be used in future research to see whether fixing a specific hazard reduced the frequency of injuries related to that hazard, especially if there turned out to be substantial differences across states in the frequency with which they mention certain hazards. Such differences could arise from local emphasis programs or greater attention to certain types of hazards in the state. Some states have also created their own standards, e.g. requiring firms to have a written plan for addressing workplace health and safety issues, providing another source of differences across states. A complication in dealing with the hazard data is that a few states, notably including Washington and California, use a state-specific set of codes to define their hazards rather than following the federal coding system. Those states are among the most active in terms of the number of consultation visits, and any comparison of hazard frequencies for those states would be difficult without a cross-walk between the federal and state hazard codes (which doesn't seem to be available).

Another significant extension of this research would involve getting access to the name of the consultation client and the address of the worksite being visited. In an earlier report on OSHA consultations (Mendeloff and Gray 2002), we did have access to those identifiers. This enabled us to link the consultation data with inspection and injury rate data. Using those linked data, we were able to document significant declines in both the number of violations cited on OSHA inspections and the workplace's injury rates around the time of the consultation. Linked data could enable more advanced analyses which might identify whether the relationship we observe between higher state consultation visit rates and lower fatality rates in construction workplaces reflects a causal connection. Linked data could also be used to examine whether repeated visits to past clients result in similar hazard reductions as visits to new clients, though the voluntary nature of consultation visits may make it difficult for a state agency to generate additional requests from new clients.

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Appendix A

Supplemental Tables

Appendix Table A1
Construction Consultations by State, 1992-2022

State	1992	1997	2002	2007	2012	2017	2022	total all yrs (1992-2022)
AK	112	98	78	89	134	88	96	3,130
AL	47	22	27	40	39	142	117	1,762
AR	83	37	28	56	41	26	11	1,635
AZ	400	126	531	695	183	319	314	10,888
CA	642	456	862	1,688	883	724	246	24,158
CO	91	51	44	77	33	26	30	1,616
CT	128	154	98	63	43	135	94	3,261
DE	25	50	94	176	58	18	55	2,026
FL	506	212	131	150	164	163	168	5,841
GA	32	35	37	71	43	52	51	1,605
HI	119	39	27	39	19	51	17	1,653
IA	25	61	106	153	168	197	208	4,702
ID	18	19	13	19	23	22	12	934
IL	38	44	37	47	73	17	27	1,112
IN	123	7	25	69	115	64	54	1,806
KS	29	24	424	260	53	68	10	4,993
KY	105	14	59	32	40	9	53	1,464
LA	8	11	30	83	33	60	156	1,676
MA	21	80	110	112	205	68	66	3,102
MD	69	59	31	54	65	202	188	2,702
ME	26	7	37	149	78	23	26	1,371
MI	13	3	81	80	73	73	141	2,332
MN	132	164	726	695	460	580	484	15,304
MO	35	19	47	49	80	51	44	1,481
MS	3	15	4	13	2	4	3	329
MT	1	14	44	51	21	42	25	887
NC	67	66	263	339	271	508	578	8,989
ND	22	9	5	19	20	19	50	708
NE	61	19	5	54	1	6	21	630
NH	5	13	84	65	38	82	65	1,583
NJ	40	38	61	77	42	39	16	1,569
NM	22	27	54	38	53	12	11	1,258
NV	204	214	177	368	227	412	286	8,846
NY	405	335	315	195	148	90	35	6,572
OH	170	73	105	160	110	136	79	3,293
OK	48	12	15	430	219	263	393	5,686
OR	0	453	511	477	490	61	20	10,894

State	1992	1997	2002	2007	2012	2017	2022	(1992-2022)
PA	31	41	55	56	53	50	26	1,519
RI	3	0	0	41	35	9	1	450
SC	636	45	43	684	775	758	389	11,667
SD	22	4	25	28	19	38	31	656
TN	15	27	47	67	54	43	41	1,344
TX	100	82	207	285	361	259	182	6,101
UT	75	91	60	190	147	275	234	4,981
VA	176	307	249	328	372	175	205	7,478
VT	33	25	30	59	99	125	86	2,208
WA	179	423	1,165	1,193	766	929	725	26,559
WI	97	46	80	506	96	27	20	3,667
WV	170	114	131	47	46	33	25	2,418
WY	10	32	64	31	14	74	24	1,745
Total	5,422	4,317	7,482	10,747	7,585	7,647	6,239	222,591

Source=OSHA Information System, authors' calculations

Appendix Table A2
Variation in Source of Request Across States, 2016-2022

State	Number of requests	OSHA Settlement	OSHA Complaint	Other OSHA connection	Repeat Client	Client Referral	Program Outreach	Other
AK	495	1.2%	1.0%	1.2%	32.1%	25.3%	20.8%	19.4%
AL	325	2.2%	0.0%	0.0%	2.8%	58.5%	31.4%	5.2%
AR	196	5.6%	2.0%	3.1%	1.5%	35.2%	39.8%	12.8%
AZ	1,702	2.5%	0.1%	1.1%	23.0%	41.9%	17.4%	14.1%
CA	2,906	0.0%	0.0%	3.9%	0.4%	9.7%	81.8%	4.4%
CO	46	2.2%	2.2%	2.2%	4.3%	30.4%	13.0%	45.7%
CT	610	4.3%	8.9%	2.5%	8.4%	40.5%	25.2%	11.0%
DE	148	10.8%	3.4%	0.0%	14.2%	30.4%	13.5%	28.4%
FL	857	2.1%	3.5%	1.5%	17.9%	39.1%	6.3%	29.6%
GA	207	4.8%	8.2%	23.7%	4.3%	5.8%	1.4%	51.7%
HI	103	14.6%	0.0%	0.0%	12.6%	9.7%	35.0%	29.1%
IA	1,112	0.0%	0.2%	0.0%	67.5%	21.1%	0.9%	10.3%
ID	115	42.6%	6.1%	1.7%	19.1%	5.2%	7.0%	19.1%
IL	72	2.8%	29.2%	11.1%	4.2%	6.9%	9.7%	36.1%
IN	335	23.6%	11.9%	2.4%	0.3%	2.7%	0.0%	59.1%
KS	166	1.8%	1.8%	0.0%	24.1%	38.6%	25.9%	7.8%
KY	150	0.0%	0.0%	0.0%	0.0%	0.0%	19.3%	80.7%
LA	248	0.0%	0.0%	0.0%	10.9%	6.5%	56.9%	25.8%
MA	380	60.0%	5.5%	2.1%	5.5%	10.0%	9.2%	9.5%
MD	970	0.2%	0.1%	0.0%	37.2%	37.8%	23.2%	3.3%
ME	136	12.5%	2.9%	1.5%	26.5%	10.3%	16.2%	30.1%
MI	517	0.0%	0.0%	0.0%	25.9%	20.5%	36.0%	17.6%
MN	3,104	0.0%	0.4%	0.0%	0.0%	27.7%	32.9%	39.0%
MO	150	2.0%	8.7%	0.0%	27.3%	20.7%	17.3%	26.0%
MS	49	0.0%	0.0%	2.0%	34.7%	16.3%	22.4%	26.5%
MT	87	0.0%	1.1%	1.1%	35.6%	3.4%	27.6%	31.0%
NC	2,769	0.0%	0.3%	1.8%	0.0%	4.0%	77.7%	16.2%
ND	91	1.1%	5.5%	1.1%	33.0%	48.4%	6.6%	4.4%
NE	43	7.0%	0.0%	0.0%	14.0%	0.0%	27.9%	51.2%
NH	368	17.9%	0.5%	1.4%	59.0%	2.2%	0.3%	18.8%
NJ	90	1.1%	1.1%	3.3%	1.1%	75.6%	13.3%	4.4%
NM	97	3.1%	0.0%	2.1%	5.2%	40.2%	44.3%	5.2%
NV	1,872	0.0%	0.2%	0.3%	38.0%	44.0%	2.9%	14.7%
NY	269	5.9%	3.0%	3.7%	15.2%	13.8%	43.1%	15.2%
OH	375	13.9%	1.3%	0.3%	46.1%	0.5%	5.3%	32.5%
OK	1,884	0.0%	0.1%	0.0%	52.3%	29.9%	7.2%	10.6%
OR	283	0.0%	0.0%	0.0%	6.0%	32.9%	3.9%	57.2%
PA	210	2.4%	2.4%	1.9%	17.1%	1.4%	16.2%	58.6%

State	Number of requests	OSHA Settlement	OSHA Complaint	Other OSHA connection	Repeat Client	Client Referral	Program Outreach	Other
RI	45	20.0%	28.9%	0.0%	2.2%	4.4%	33.3%	13.3%
SC	3,233	0.0%	0.0%	0.5%	0.0%	2.8%	74.9%	21.8%
SD	113	9.7%	3.5%	8.0%	13.3%	24.8%	15.0%	29.2%
TN	183	1.6%	1.1%	0.5%	24.0%	5.5%	46.4%	20.8%
TX	1,056	0.9%	1.0%	0.1%	27.9%	30.4%	23.7%	16.1%
UT	1,397	0.0%	0.8%	0.0%	10.5%	68.3%	10.4%	10.1%
VA	838	1.2%	0.4%	0.2%	39.4%	22.4%	22.2%	14.6%
VT	504	0.0%	0.2%	0.4%	79.4%	9.3%	1.4%	9.9%
WA	5,959	0.0%	0.0%	0.0%	0.0%	78.9%	19.7%	1.4%
WI	132	12.1%	25.0%	0.0%	16.7%	9.8%	6.1%	31.1%
WV	107	7.5%	1.9%	0.0%	30.8%	5.6%	24.3%	41.1%
WY	191	0.0%	6.3%	0.5%	8.9%	9.9%	66.5%	7.9%
Med.	259	1.9%	1.1%	0.5%	14.7%	18.4%	19.5%	18.9%

Sample: requests that resulted in a visit during 2016-2022 with some "Source of Request" identified
Requests can identify more than one source, so a row may add to more than 100%,
but the Other column counts only those requests that mention none of the others.
Program Outreach = Solicitation, Marketing, Media (see Appendix Table A2a for more details)
Source=OSHA Information System, construction firms, authors' calculations

Appendix Table A2a
Source of Request Codes for Table A2 categories
(Construction Consultation Visits, 2016-2022)

Source of Request code	Frequency	Table A2 category
Client Referral	12004	Client Referral
Repeat Client	5839	Repeat Client
Direct Solicitation Door To Door	4206	Program Outreach
Other	3671	Other
Direct Solicitation by Mail	2819	Program Outreach
Direct Solicitation by Telephone	2552	Program Outreach
Program Solicitation Door to Door	1340	Program Outreach
Client Request by Telephone	855	Other
Online	704	Other
Media (Television)	685	Program Outreach
Settlement/Litigation Referral	559	OSHA Settlement
Referral from other Discipline	408	Other
OSHA Complaint Referral	376	OSHA Complaint
Program Solicitation by Mail	248	Program Outreach
Program Solicitation by Telephone	239	Program Outreach
OSHA Standard	208	Other OSHA
OSHA Recommendation/Settlement	191	OSHA Settlement
Professional/Trade Association Meeting	182	Other
Safety/Health Conference	143	Other
High Rate Letters	120	Other OSHA
Marketing Brochures	67	Program Outreach
Program Solicitation by Email	60	Program Outreach
Professional/Trade Assoc. Publication	60	Other
Media (Consultation Website)	56	Program Outreach
Compliance Assistance	50	Other
New Standard	33	Other OSHA
State Agency Referral	32	Other
Alliances	15	Other
OSHA NEP/LEP	11	Other OSHA
SHARP Renewals	10	Other
Media (Newspaper/Magazine)	10	Program Outreach
SHARP/Pre-SHARP (OSHA Referral)	9	Other OSHA
Program Solicitation by Teleph	4	Program Outreach
SST Letter	3	Other OSHA
Insurance Carrier Referral	3	Other
Partnerships	1	Other
Referral from ot	1	Other
Media (Social Media)	1	Program Outreach
Direct Solicitation by Tele	1	Program Outreach

Source=OSHA Information System, construction firms, authors' calculations

Appendix Table A3
Variation in Visit Characteristics Across States, 2016-2022

State	# Visits	Visit Type			Visit Scope		Safety/Health		
		Initial	Followup	Training	Full	Limited	Safety	Health	Both
AK	639	93.6%	4.7%	1.7%	15.2%	78.4%	87.9%	12.1%	0.0%
AL	928	49.6%	46.3%	4.1%	0.2%	49.4%	66.2%	33.8%	0.0%
AR	237	90.7%	3.8%	5.5%	28.7%	62.0%	78.9%	21.1%	0.0%
AZ	2,349	100.0%	0.0%	0.0%	33.8%	66.2%	67.0%	31.7%	1.3%
CA	3,551	97.4%	2.1%	0.5%	93.4%	3.9%	12.2%	3.3%	84.5%
CO	167	79.6%	8.4%	12.0%	49.1%	31.1%	47.9%	49.7%	2.4%
CT	1,070	80.7%	5.7%	13.6%	13.0%	67.8%	69.9%	30.1%	0.0%
DE	207	87.9%	5.8%	6.3%	41.1%	46.9%	87.9%	11.6%	0.5%
FL	1,124	86.1%	2.6%	11.3%	65.9%	20.2%	84.8%	14.4%	0.8%
GA	417	65.9%	26.1%	7.9%	30.5%	35.5%	73.4%	26.6%	0.0%
HI	162	88.9%	8.6%	2.5%	77.2%	11.7%	73.5%	11.1%	15.4%
IA	1,364	97.7%	1.4%	0.9%	0.1%	97.7%	87.9%	12.0%	0.1%
ID	139	100.0%	0.0%	0.0%	66.9%	33.1%	2.9%	2.9%	94.2%
IL	137	60.6%	38.0%	1.5%	3.6%	56.9%	76.6%	23.4%	0.0%
IN	382	95.0%	2.9%	2.1%	36.1%	58.9%	86.6%	10.2%	3.1%
KS	261	99.2%	0.8%	0.0%	43.7%	49.4%	87.7%	12.3%	0.0%
KY	150	100.0%	0.0%	0.0%	97.3%	2.7%	52.7%	47.3%	0.0%
LA	652	90.0%	7.1%	2.9%	5.4%	84.7%	48.8%	41.0%	10.3%
MA	499	99.0%	1.0%	0.0%	92.6%	6.4%	74.5%	25.3%	0.2%
MD	1,155	96.9%	1.4%	1.7%	68.6%	28.3%	95.2%	4.7%	0.2%
ME	195	74.9%	0.5%	24.6%	9.2%	64.6%	60.5%	35.4%	4.1%
MI	588	92.5%	4.9%	2.6%	11.9%	80.6%	95.1%	4.9%	0.0%
MN	3,568	88.2%	5.2%	6.6%	87.1%	1.1%	78.6%	3.8%	17.7%
MO	340	89.4%	7.4%	3.2%	35.0%	49.4%	58.8%	40.0%	1.2%
MS	75	81.3%	6.7%	12.0%	33.3%	48.0%	78.7%	21.3%	0.0%
MT	196	96.4%	1.5%	2.0%	61.7%	34.7%	54.6%	39.8%	5.6%
NC	3,787	90.8%	3.9%	5.3%	62.0%	28.8%	76.9%	22.8%	0.2%
ND	279	36.2%	60.9%	2.9%	6.8%	29.4%	91.0%	8.6%	0.4%
NE	67	100.0%	0.0%	0.0%	22.4%	77.6%	79.1%	20.9%	0.0%
NH	450	95.1%	2.4%	2.4%	80.2%	14.9%	91.1%	7.8%	1.1%
NJ	174	88.5%	7.5%	4.0%	51.1%	37.4%	56.3%	43.7%	0.0%
NM	163	83.4%	11.7%	4.9%	50.3%	33.1%	51.5%	22.7%	25.8%
NV	2,384	100.0%	0.0%	0.0%	86.0%	13.9%	87.8%	12.2%	0.0%
NY	459	79.7%	4.1%	16.1%	36.2%	43.6%	77.1%	22.4%	0.4%
OH	691	83.1%	16.8%	0.1%	1.9%	81.2%	94.4%	5.6%	0.0%
OK	2,163	98.8%	0.7%	0.6%	2.0%	96.8%	90.8%	9.2%	0.0%
OR	301	92.7%	2.0%	5.3%	22.9%	69.8%	73.1%	26.6%	0.3%
PA	303	84.8%	4.0%	11.2%	70.3%	14.5%	36.3%	30.4%	33.3%

State	# Visits	Initial	Followup	Training	Full	Limited	Safety	Health	Both
RI	62	91.9%	4.8%	3.2%	69.4%	22.6%	43.5%	27.4%	29.0%
SC	3,234	99.9%	0.1%	0.0%	96.7%	3.2%	99.4%	0.5%	0.1%
SD	193	77.2%	4.1%	18.7%	21.2%	56.0%	70.5%	27.5%	2.1%
TN	353	65.4%	34.0%	0.6%	9.1%	56.4%	94.6%	5.4%	0.0%
TX	1,265	88.8%	4.7%	6.5%	6.2%	82.6%	88.8%	7.8%	3.4%
UT	1,678	89.9%	0.8%	9.2%	58.7%	31.2%	95.5%	2.1%	2.4%
VA	1,253	97.2%	0.7%	2.1%	29.8%	67.4%	81.1%	17.2%	1.7%
VT	712	96.6%	2.5%	0.8%	87.8%	8.8%	76.8%	8.0%	15.2%
WA	6,037	98.7%	1.3%	0.0%	82.0%	16.7%	91.3%	8.7%	0.0%
WI	273	68.1%	29.7%	2.2%	13.2%	54.9%	70.0%	30.0%	0.0%
WV	195	83.1%	0.5%	16.4%	26.7%	56.4%	87.2%	12.8%	0.0%
WY	390	99.7%	0.3%	0.0%	15.9%	83.8%	77.9%	4.6%	17.4%
Median	1,155	93.6%	2.5%	2.1%	36.2%	35.5%	84.8%	12.0%	0.2%

Source=OSHA Information System, construction firms, authors' calculations

Appendix Table A4

Additional Variation in Visit Characteristics Across States, 2016-2022

State	Hours per Visit		Types	Distribution by Industry			Visits per Request	
	Average hours	% Not reported	% Initial visit	% In NAICS 236	% In NAICS 237	% In NAICS 238	Average number	% With 4+ visits
AK		100.0%	93.6%	57.7%	4.9%	37.4%	1.22	0.38%
AL	7.9	34.3%	49.6%	28.9%	0.8%	70.4%	2.79	25.53%
AR		100.0%	90.7%	30.8%	12.2%	57.0%	1.21	1.53%
AZ	15.3	99.7%	100.0%	22.3%	2.1%	75.6%	1.33	0.00%
CA	17.8	6.3%	97.4%	26.2%	5.5%	68.2%	1.07	0.36%
CO	21.6	17.4%	79.6%	45.5%	15.0%	39.5%	2.53	15.15%
CT	4.8	99.8%	80.7%	34.1%	3.5%	62.4%	1.38	3.75%
DE	4.0	99.5%	87.9%	44.9%	8.2%	46.9%	1.38	2.67%
FL	15.3	58.8%	86.1%	38.2%	5.6%	56.2%	1.29	1.72%
GA	16.7	1.9%	65.9%	70.7%	8.2%	21.1%	1.83	9.65%
HI	25.1	77.8%	88.9%	46.9%	9.9%	43.2%	1.27	0.00%
IA	15.6	9.5%	97.7%	82.0%	6.7%	11.3%	1.14	0.08%
ID	26.8	91.4%	100.0%	42.4%	3.6%	54.0%	1.09	0.00%
IL	19.3	19.0%	60.6%	55.5%	3.6%	40.9%	1.90	8.33%
IN	14.3	9.7%	95.0%	33.0%	8.4%	58.6%	1.14	0.00%
KS	15.0	18.0%	99.2%	39.1%	3.8%	57.1%	1.21	1.86%
KY	25.2	43.3%	100.0%	22.0%	7.3%	70.7%	1.00	0.00%
LA	1.6	99.4%	90.0%	74.8%	2.9%	22.2%	2.40	21.32%
MA	14.7	97.2%	99.0%	38.3%	6.2%	55.5%	1.21	0.00%
MD	9.3	15.4%	96.9%	24.7%	3.4%	71.9%	1.12	0.58%
ME	5.0	99.5%	74.9%	39.5%	15.9%	44.6%	1.20	0.62%
MI	12.0	22.6%	92.5%	75.7%	3.1%	21.3%	1.11	0.00%
MN	11.7	6.1%	88.2%	91.3%	4.5%	4.2%	1.15	0.13%
MO	16.3	13.5%	89.4%	43.8%	6.8%	49.4%	2.13	10.00%
MS		100.0%	81.3%	25.3%	17.3%	57.3%	1.36	1.82%
MT	20.3	0.0%	96.4%	51.5%	3.6%	44.9%	1.66	2.54%
NC	10.2	2.9%	90.8%	29.7%	3.6%	66.7%	1.37	1.59%
ND	24.0	2.9%	36.2%	70.6%	15.1%	14.3%	2.94	26.32%
NE	16.3	29.9%	100.0%	29.9%	14.9%	55.2%	1.24	0.00%
NH	12.7	86.0%	95.1%	78.7%	1.1%	20.2%	1.11	0.98%
NJ	13.7	95.4%	88.5%	39.7%	2.9%	57.5%	1.81	6.25%
NM		100.0%	83.4%	44.8%	6.1%	49.1%	1.48	0.91%
NV	11.9	36.8%	100.0%	19.3%	3.7%	77.0%	1.10	0.00%
NY	15.5	45.8%	79.7%	31.2%	7.6%	61.2%	1.40	3.34%
OH	12.8	83.4%	83.1%	55.9%	10.0%	34.2%	1.25	2.17%
OK	5.2	9.1%	98.8%	23.5%	5.9%	70.6%	1.11	0.05%

State	Average hours	% Not reported	% Initial visit	% In NAICS 236	% In NAICS 237	% In NAICS 238	Average number	% With 4+ visits
OR	11.6	94.4%	92.7%	46.2%	6.0%	47.8%	1.02	0.00%
PA	15.1	4.6%	84.8%	33.7%	10.6%	55.8%	1.44	1.90%
RI	38.0	98.4%	91.9%	40.3%	3.2%	56.5%	1.24	0.00%
SC	3.8	0.7%	99.9%	15.6%	0.8%	83.5%	1.00	0.00%
SD	23.6	21.8%	77.2%	36.8%	18.1%	45.1%	1.65	6.84%
TN	15.5	83.6%	65.4%	87.3%	4.2%	8.5%	1.59	5.41%
TX	8.0	0.6%	88.8%	16.3%	19.1%	64.6%	1.16	0.46%
UT	10.7	13.9%	89.9%	25.1%	2.7%	72.2%	1.13	0.07%
VA	13.2	14.4%	97.2%	60.2%	4.1%	35.8%	1.32	1.90%
VT	1.8	33.0%	96.6%	79.8%	10.3%	10.0%	1.11	0.63%
WA	12.2	14.3%	98.7%	42.9%	5.2%	52.0%	1.01	0.02%
WI	24.6	72.5%	68.1%	42.5%	3.7%	53.8%	1.55	6.25%
WV	18.0	5.6%	83.1%	39.0%	29.2%	31.8%	1.22	1.88%
WY	15.3	44.1%	99.7%	25.1%	8.5%	66.4%	1.01	0.00%
Median	14.9	33.6%	90.4%	39.6%	5.7%	53.9%	1.24	0.9%

Source=OSHA Information System, construction firms, authors' calculations

**Appendix Table A5
Hazards found on Construction Consultations and Inspections, 2016-2022**

State	Hazards per consultation		Noise sampling on consultations		Violations per inspection		\$ Penalties per inspection	
	Serious	Total	#Samples	% Violation	Serious	Total	Serious	Total
AK	2.2	2.8			1.8	2.4	5,586	6,524
AL	1.1	1.2	10	0.0%	2.1	2.3	7,842	8,193
AR	1.5	1.6	66	42.4%	1.7	1.9	7,852	8,540
AZ	1.5	1.7	22	54.5%	0.9	1.3	1,126	1,329
CA	2.9	7.5	28	35.7%	0.5	2.2	3,989	5,619
CO	2.3	3.4			1.1	1.3	4,248	4,984
CT	4.7	4.7	80	25.0%	2.0	2.2	6,374	6,715
DE	2.5	3.6			2.5	2.9	12,178	13,896
FL	2.0	2.4	114	45.6%	1.3	1.6	8,442	8,999
GA	5.5	7.1			1.6	1.8	6,644	6,900
HI	3.9	4.0	2	100.0%	1.3	2.1	3,487	3,758
IA	3.6	3.8	32	18.8%	0.9	1.4	2,021	3,143
ID	6.7	11.0			1.6	1.8	4,877	5,278
IL	1.8	2.0	2	0.0%	2.1	2.6	9,631	10,061
IN	1.5	1.5	28	0.0%	2.2	2.3	2,347	2,498
KS	1.6	1.7	88	18.2%	1.7	2.0	6,990	7,587
KY	6.7	9.5			1.0	1.3	4,160	4,402
LA	1.7	1.7	12	0.0%	1.1	1.4	4,797	5,550
MA	5.8	6.1	40	45.0%	1.6	1.8	8,541	9,271
MD	1.6	2.3	512	49.6%	3.0	4.1	2,890	2,971
ME	4.7	5.1	4	50.0%	1.3	1.7	9,267	10,184
MI	4.2	4.3			1.0	2.0	1,046	1,140
MN	4.3	4.6			1.1	1.3	1,555	1,678
MO	3.5	3.7	200	40.0%	1.9	2.1	9,434	9,989
MS	3.0	3.2			1.4	1.7	6,049	6,291
MT	2.7	3.6	34	0.0%	0.8	1.0	2,071	2,534
NC	2.5	2.6			1.8	2.2	2,824	2,941
ND	2.4	2.7	160	55.0%	1.0	1.2	7,676	7,903
NE	5.5	5.6	29	17.2%	2.0	2.1	8,253	8,569
NH	5.1	5.4	2	0.0%	2.1	2.4	8,993	9,673
NJ	1.4	1.8	68	91.2%	1.9	2.0	11,051	11,443
NM	2.8	3.0	36	0.0%	0.7	0.9	1,446	1,651
NV	2.9	3.6	28	7.1%	0.6	1.1	3,137	3,529
NY	3.0	3.8	100	18.0%	1.5	1.7	6,364	6,886
OH	2.2	2.7	5	60.0%	2.0	2.2	10,826	11,331
OK	1.2	1.2	676	44.7%	1.1	1.2	4,170	4,737
OR	1.1	3.2			1.2	1.5	1,294	1,322
PA	4.4	5.9	44	9.1%	1.4	1.7	6,239	6,889

State	Serious hazards	Total hazards	Noise #samples	Noise % violation	Serious viols	Total viols	Serious penalty	Total penalty
RI	5.1	5.1			1.7	2.1	5,879	6,288
SC	3.4	3.7			0.9	1.4	1,582	1,727
SD	4.0	4.4	310	61.6%	1.8	2.2	6,637	7,803
TN	4.6	5.0			2.3	3.1	3,919	4,153
TX	1.6	1.9	6	0.0%	1.7	1.9	6,217	6,873
UT	3.9	4.0	18	72.2%	1.6	1.8	2,018	2,070
VA	2.6	2.8	128	56.3%	1.4	1.7	3,068	3,449
VT	4.5	4.5			1.5	1.9	3,881	4,911
WA	2.3	4.1			1.2	2.1	3,518	3,581
WI	4.4	5.6	70	11.4%	1.7	2.1	6,505	6,964
WV	3.1	4.3	20	40.0%	1.9	2.1	8,143	8,798
WY	1.8	2.3	184	32.6%	1.3	1.8	4,192	4,763
Median	2.9	3.7	35	34.2%	1.5	1.9	5,232	5,954

Source=OSHA Information System, construction firms, authors' calculations

Appendix B

Interview Process

Email Sent from OSHA to Consultation Program Managers (CPMs)

[EXT] FW: Gray/Mendeloff Consultation Construction Study - CPM Interviews

Showalter, Patrick - OSHA <Showalter.Patrick@dol.gov>

Wed 1/31/2024 3:34 PM

To: Wayne Gray <WGray@clarku.edu>; Mendeloff, John <jmen@pitt.edu> 1 attachments (17 KB)
Mendeloff - Gray Research Summary Write Up.January 2024 1-30-24.docx;

Wayne/John,

This is the email that Doug Kalinowski sent to the Consultation Program Managers today 01/31/24. Patrick

From: Kalinowski, Doug - OSHA <Kalinowski.Doug@dol.gov>

Sent: Wednesday, January 31, 2024 3:13 PM

To: zzOSHA-DCSP-CON-PROJ-MGRS <zzOSHA-DCSP-CON-PROJ-MGRS@dol.gov>

Subject: Gray/Mendeloff Consultation Construction Study - CPM Interviews

Hello Everyone,

In 2002, Dr. John Mendeloff, professor emeritus University of Pittsburgh's Graduate School of Public & International Affairs, and Dr. Wayne Gray, professor Clark University, conducted an evaluation of the OSHA On-Site Consultation Program for OSHA and have worked on several research papers on OSHA topics since then. They are currently working on a research project funded by CPWR (The Center for Construction Research and Training) that focuses on Consultation visits in the construction industry.

Recent research showed that states with higher rates of Consultation visits in the construction industry tended to have lower construction fatality rates. This project seeks to identify variations across states in their Consultation programs, particularly in construction, and the reasons for those variations. Variations to be explored include marketing efforts, types of firms visited, the number and type of hazards identified during visits, and the state's financial contribution to the program. See the attached for more detail on this research.

As part of this research, Mendeloff and Gray plan to interview the Consultation Program Manager (CPM) in all state-plans and several federal jurisdictions (AL, GA, IL, MA, NY, OH, OK, PA, TX and WI). They will be emailing the CPMs starting on February 5 to schedule the interviews. OSHA supports this project and would appreciate your participation in this research.

Thanks and please let Patrick Showalter (Showalter.Patrick@dol.gov) know if you have any questions.

Doug

Recruitment Email for
Contribution of State Consultations to Preventing Fatalities in Construction
Wayne Gray and John Mendeloff

We are writing to seek your help in an effort, funded by the Center for Construction Research and Training (CPWR) and supported by OSHA, to learn more about ways in which state consultation programs can improve workplace safety and reduce fatality rates at construction worksites. John Mendeloff and I are carrying out the study. We will be interviewing state Consultation Program Managers (CPMs) to get a better understanding of those programs and the reasons for differences among them. We discussed the project with the OSHCON Board at their June 2023 meeting and OSHA has provided us with data about the state programs for use in the project. You should have received an email last week from Doug Kalinowski, OSHA's Director of Cooperative and State Programs, describing our study and encouraging participation.

We have attached a summary of key elements of the OSHA data for your state for FY 2022 and a rough outline of the topics we will be asking about during the interview. We anticipate the interviews will last about 30-45 minutes.

Your participation in the study is, of course, voluntary, but we hope it will contribute to a better understanding of your state's consultation program and how consultations can help improve workplace safety in construction. All responses will be kept confidential and nothing will be ascribed to any individual without their permission.

Because the research is being funded by a grant through Clark University, we are required to obtain written consent from all participants. If you are willing to participate, sign the attached consent form and email it to wgray@clarku.edu or fax it to 508-793-8849. You can select a time for your interview at <https://doodle.com/meeting/participate/id/enG10Z5a>. First select a day on the calendar, then it will show you the available times for that day (this was created using Eastern Time but you can select your time zone and the available times will adjust to match).

If there are no available times that work for your schedule, let us know and we'll try to accommodate you.

If you have any questions about any of this, please feel free to contact us. We look forward to talking with you.

Sincerely,

Wayne Gray, Professor of Economics, Clark University, wgray@clarku.edu, 508-793-7693

John Mendeloff, Emeritus Professor, University of Pittsburgh, jmen@upitt.edu, 412-225-1026



Interview Consent Form

Contribution of State Consultations to Preventing Fatalities in Construction

Wayne B. Gray, Professor

John Mendeloff, Professor

Emeritus Economics Department, Clark University University of Pittsburgh

508-793-7693; wgray@clarku.edu

412-225-1026; jmen@upitt.edu

This form confirms your willingness to participate in our research study exploring differences across states in their consultation programs, with a focus on the construction sector. This study is being funded by CPWR (The Center for Construction Research and Training), which is interested in finding out more about the ways in which state consultation programs can improve workplace safety and reduce fatality rates at construction worksites. We will be talking with you to get a better understanding of your state's program and the consultation process. The interview (online via Zoom) will last about 60 minutes. We'll share our interview notes with you afterwards for any corrections you deem necessary. You are free to terminate your participation in this research at any time, or to refuse to answer any questions to which you do not want to respond.

We do not anticipate any risks to you from participating in this research. We will keep our original interview notes secure and won't share them with others. We will use your responses in conjunction with the OSHA data to develop our measures of state consultation program characteristics and our models of the reasons for differences in programs across states and the ways that consultations can improve construction workplace safety. We'll prepare a final report which we'll share with you (if you wish) and we plan to present our research results at scientific or professional meetings and publish them in scientific journals. We also plan to use the interview data we collect in our future research on the impacts of consultations. Throughout the research process we will keep your answers and your participation in the study confidential, unless you choose to waive that confidentiality – we'll ask you about waiving confidentiality when we provide you with a copy of our notes from the interview.

Signed consent forms will be printed and stored securely in Professor Gray's office at Clark University; electronic copies will not be retained. The interview transcripts will be stored in electronic form only, kept on password-protected computers and accessible only to the project researchers (Gray and Mendeloff). Information from the interviews may be used in datasets for statistical analyses, but the analysis datasets would also be kept on password-protected computers and accessible only to the project researchers. The interview transcripts and analysis datasets will be retained indefinitely by us (Gray and Mendeloff) for use in our future research,



Approved: 08/03/2023

Expired: 07/31/2024

IRB #: 502

always maintaining confidentiality of the interview data and your participation in the study, unless you waived confidentiality.

If you have questions or concerns about the study, please contact us (Wayne Gray or John Mendeloff) using the contact information above.

Signing below confirms that you have read this consent form and agree to participate in the study. Please print a copy for your records before emailing it to wgray@clarku.edu.

_____ (Signature) _____ (Date)

_____ (Printed Name)

This study has been approved by the Clark Committee for the Rights of Human Participants in Research and Training Programs (IRB). Any questions about human rights issues should be directed to the IRB Chair, Dr. Robert J. Johnston (508) 751-4619.

**Contribution of State Consultations to Preventing Fatalities in Construction Sample
State Data and Topics for Questions**

Wayne Gray and John Mendeloff

[State] Consultation Program - FY 2022 – from OSHA Consultation Database

	all sectors	construction sector
number of consultation visits in FY 2022	120	29
number of visits per 1000 establishments/firms	4.27	8.35
average visits for FY 2016 - FY 2022	146	54
median wait time (request to visit in days)	55	0
serious hazards found per visit	3.32	1.52
share of visits that found no hazards	10.8%	17.2%
average number of employees covered by visit	39	6
	Total budget	State share
Consultation budget (federal + state funds)	\$906,558	\$337,358 (37%)
	all sectors	construction sector
Source of Request for Consultation		
Client Referral	22.5%	44.8%
Repeat Client	48.3%	20.7%
Referral (OSHA, Settlement, other agency)	18.3%	3.4%
Solicitation (mail, phone, door-to-door, etc.)	1.7%	3.4%
Other	2.5%	10.3%
	all sectors	construction sector
Type of Visit		
Initial Visit	97.5%	100.0%
Followup Visit	2.5%	0.0%
Training Visit	0.0%	0.0%
	all sectors	construction sector
Scope of Visit		
Safety	23.3%	79.3%
Health	5.0%	3.4%
Both	71.7%	17.2%

Outline of Interview Topics, Sample Questions

1. State Program Characteristics and Activities. We would like feedback to confirm whether we're correctly interpreting the consultation data. In addition, we want help in understanding the reasons for the patterns we see.
 - The scale and focus of marketing efforts for consultations
 - The number of consultations conducted
 - The number and types of hazards identified
 - Changes in the program over time
2. Other Relevant State Characteristics. How should we understand the relation between the consultation program and other policies or programs operating in the State?
 - Workers' compensation incentives and related consultation programs
 - OSHA enforcement activity
 - State-mandated safety and health programs
3. Consultation Process, especially in construction. We're looking to understand the process that's followed for a consultation visit and any differences in the process between construction and other sectors.
 - Does the role of the general contractor and special trades contractors differ in requesting and conducting consultations?
 - What information does the Consultation Program use to prioritize responses to requests?
 - What is the role of Training and Follow-up consultations?
4. How Consultations Reduce Workplace Fatalities and Serious Injuries. We want to understand which factors may matter and how they might operate.
 - Relative importance of abating specific hazards vs providing information and training
 - Differences due to firm size or other characteristics of the worksite
 - Spillovers to other worksites of the same firm or to other firms
 - The temporary nature of construction worksites

All Interview meetings will be held via Zoom:

Topic: Gray-Mendeloff Consultation Study Interviews

<https://clarku.zoom.us/j/99773293628?pwd=TnRrc3EwZmV0MVZlNk5EQm5FNnlXdz09>

Meeting ID: 997 7329 3628, Passcode: 341814

If your agency requires Microsoft Teams for meetings rather than Zoom, email us at wgray@clarku.edu and we'll arrange that.

Interview Script with State Consultation Program Manager

(numbers shown here are the sample average – not for a specific state)

Individual: [State CPM name]

State: [State]

Interview time: [date, time]

Individual's background:

Response

Job Title:

How Long in Position?

How long with Current Consultation Program Work
as CN in other states?

Previously Worked in enforcement?

We'd like to start by learning more about the organizational arrangements for the consultation activity in your state. A series of questions about program size and structure – located within which agency, how many consultants, other employees, other responsibilities?

Response

Now we'd like to talk about the resources available for supporting the program. We understand that some basic funds are provided by federal OSHA with the requirement of a 10% state match, but some states provide additional funds to the program.

I. State Program Characteristics and Activities

State percentage match 2022 (state quartile cutoffs = 10, 10, 28)

1a. State Contributions = state \$ / total \$ (state+federal)

	2016	2017	2018	2019	2020	2021	2022
Percentage match	21	20	20	21	21	20	20

Response

(Consistently over 15%) – We see that your state has consistently contributed more than the minimum amount to the consultation program budget. Is the amount of that over-contribution a matter of negotiation each year? Who is involved in the negotiations? What factors led the state to decide to over-contribute?

(no over-contribution) - While some states contribute more funds, others such as your state provide the basic 10% match. Has this been a matter of controversy at some point (to your knowledge) – have there been efforts to increase the contribution? (discuss/any comments?)

(varying contribution) - We see that your state contribution towards the program budget has varied significantly over the past decade [provide details]. Who has been involved in the negotiations about the state contribution? What factors have influenced the outcomes of those negotiations – especially the years when substantial changes occurred?

Since consultations are voluntary, they must be requested by the firm. We’d like to learn more about your agency’s outreach/marketing efforts.

1b. Marketing

*What form(s) do your marketing efforts take? [open-ended; try for an extended discussion to learn about which methods are used and how extensively, maybe also how much of their resources is devoted to outreach/marketing].

Response

*In marketing your services, are you trying to target specific sectors (e.g. construction vs manufacturing)? Within the construction sector, are you targeting particular sub-industries (e.g. roofing), smaller or larger firms (within the 250 limit) or types of projects (renovations vs new construction; commercial vs industrial)? Do you (instead) focus on particular hazards?

*Has the focus of your marketing efforts changed over time? If so, how (and why)?

*Do you find some types of marketing more effective than others? Does this differ across sectors? Would putting more resources into marketing have a sizable effect on the number of requests for consultations in your state?

[If “no, ask why.”] *Why? [If “yes,” ask:]

*You mentioned that certain marketing strategies seemed more effective. What are the obstacles, if any, to expanding those strategies?

Fluctuations in recent years:

[number of CN visits in recent years 2016-2022]

All states, construction, 2022, quartiles for %construction (12, 24, 40)

	2016	2017	2018	2019	2020	2021	2022
% in Construction:	28	28	29	28	27	25	27
# in Construction:	152	155	153	149	96	108	121
Total Visits overall:	530	506	509	502	294	363	390

*The data we have indicates that you experienced a big increase or decrease in the share of consultations in construction [OR did not experience an increase in the share of consultations in construction]. Why was this? Was it based on a policy shift or did it reflect a shift in firms' preferences for consultations?

Response

Maybe also identify and ask about any large changes in overall consultation numbers (not just the share in construction).

We'd like to understand how broadly the consultation activity is spread throughout the state economy in general, and the construction sector in particular. To what degree does the number of requests reflect a large number of different firms requesting consultations or are there substantial numbers of repeat customers.

Is it common for requests for consultations to come from construction firms that:

*Have had consultations in the same year at the same project?

*At different projects?

*In previous years? (repeat customers)

*Some firms request consultations but the majority don't – what factors make a request more likely? Are there concerns that might lead firms not to request a consultation?

We have seen a study in Oregon that reported many small employers think that requesting a consultation could lead to inspections and penalties.

*Are the answers any different for construction firms than for firms in other sectors?

Now we'd like to explore some other factors in your state that might affect firm's use of your services, starting with the state's Workers Compensation system.

II. Other Relevant State Characteristics

Has generally been somewhat open-ended, usually talk about relationship to enforcement earlier in the interview.

Response

*What is your sense of the kinds of consultation services the firms you visit get from their WC insurers? Do the firms you visit often report working with a WC consultant or tell you what the WC consultant's report said? Do firms often pay for consultation services from a private consultant?

*What if anything differentiates the services you provide from the services that they would get from their WC insurer or other consultants?

We'd like to talk about how OSHA's enforcement activity interacts with your consultation program [note here whether this is a state plan or Federal OSHA state].

*After an inspection, OSHA inspectors may recommend that the firm contacts OSHA consultants to discuss how to make improvements. In your experience, how often would that sort of a recommendation occur?

Never, Rarely (A few times per year), Occasionally (5-10% of consultations), Frequently (10-30% of consultations), Usually (Over 50% of consultations)

*One thing we're curious about – we know that firms aren't required to tell inspectors that they've had a consultation – do consultants have access to information about findings of inspections (noting that the data is publicly available)?

***Highlight when we know there's something in the state – e.g. Oregon, New York, ...

*Are there any other special features of your state that have a sizable effect on the rate of requests for consultations? For example, some state plan states require firms with high ex-mods to get a consultation or an inspection. States may also mandate safety and health programs for some firms – and there could be other factors operating in the state of which we're not aware.

*Are there any unusual features of your state's construction sector that might be relevant for understanding their interactions with your programs?

III. The Consultation Process

We're looking to understand the process that's followed for a consultation visit. We're particularly interested in differences between consultations in the construction sector and those in other industries.

Response

*How are requests for consultations typically received? (start open-ended, maybe add prompts) Are they submitted with an on-line form or sent by email or letter or phone?

*What percentage of requests in construction come from a) the general contractor or b) a subcontractor?

*Do general contractors ever veto a request for consultation from a subcontractor?

*Have you had situations in which sub-contractors refused to participate in the visit? If so, how often?

*Do general contractors usually ask consultants to look at all sub-contractors on the site during their visit or is it typically only a subset of the sub-contractors?

*Do general contractors make multiple requests for visits during a large project where there may be different activities happening over time?

*Thinking about the information provided on the request – does the firm often/usually mention specific hazards? Are other hazards often identified by the consultant during the visit? Are the hazards identified always/mostly/often connected to specific OSHA standards, or are they more general? (try to get some sense of the relative frequency of the different types)

All states, construction, 2022, (quartiles for median wait time = 8, 19, 48)

	2016	2017	2018	2019	2020	2021	2022
Median wait – construction	34	36	35	46	48	49	41
Median wait – all sectors	50	49	48	54	52	62	52

Response

*What determines the priority for scheduling consultation visits? We’ve seen in the data that the time between a consultation request and the ensuing visit is considerably shorter for construction sector consultations as compared to other industries. Is that tied to the temporary nature of construction worksites or the hazardousness of the work or some other factor?

*It makes sense that consultations in the construction sector are much more likely than other industries to be described as safety rather than health visits. Do certain consultants specialize in safety vs health hazards, or do consultants specialize in terms of which industries they are assigned to work with?

*We’re a bit confused about how things are recorded when a visit addresses multiple sub-contractors at the same construction site. Would all the hazards from different sub-contractors be connected to that single visit, or would separate visits sometimes be defined for each of the sub-contractors involved in the visit (i.e. one employer per visit)?

*How much do the hazards reported at the end of a consultation visit reflect specific hazards mentioned by the firm in the initial consultation request (assuming firms mention specific hazards as part of their request) and how much comes from observations of other hazards made by the consultant during the visit?

*Construction visits generally seem to be more likely than other sectors to have no hazards identified <***not true for every state – could ask about “other states” if not true here***>, and to find fewer hazards on average when some hazards are found. Do you have any suggestions as to why that might be happening?

All states, construction 2022,
 quartiles for serious hazards (1.5, 2.4, 3.6); no hazards (16%, 29%, 44%)

construction	2016	2017	2018	2019	2020	2021	2022
serious hazard rate	2.79	2.98	3.08	3.38	2.61	2.87	2.88
no hazard rate	33.1	30.4	29.9	26.2	30.9	28.9	30.8
all sectors	2016	2017	2018	2019	2020	2021	2022
serious hazard rate	4.27	4.13	4.44	4.58	3.62	4.00	4.13
no hazard rate	28.2	27.4	28.0	26.1	30.0	25.4	26.3

[Mention if the hazards per consultation differs much from the all-state median]

States vary a good deal in the average number of hazards identified in construction visits. Some have about 1 per visit while others have 5 or 6. What factors do you think account for the differences?

In the last 3 years, construction consultations in your State have identified about x.x hazards per consultation. Compared to other states, this is a [high or low] number.

**Do you have any sense of why that difference exists?*

After the consultant's visit, firms are supposed to fix any hazards noted during the visit. How is the abatement of the hazard typically documented? Do you sometimes/often have issues with firms not abating the hazards as quickly as requested, or at all?

While most consultation visits are identified as Initial visits, some are identified as Training or Follow-up visits. How do the latter types of visits differ from the typical visit, and what determines when one of those visits occurs?

IV. How Consultations Reduce Workplace Fatalities and Serious Injuries

We don't observe the impact of consultations directly, so we need to rely on what we can learn from these interviews, trying to get a better understanding of which factors matter and how they operate to reduce workplace fatalities and serious injuries.

**Start with general question – What ways would you expect the consultation visits to reduce workplace fatalities and serious injuries? Then probe with followup questions.*

**How plausible or important are these different sources of hazard reduction from consultations:*

1. Some benefits come from abating a specific hazard found on the visit.
2. Other benefits come from providing information and training to workers and supervisors about dealing with hazards more generally.

3. There could be spillovers within the firm where a consultation visit at one worksite affects the managers or workers there, who then go on to reduce hazards at other firms or worksites.

4. There could be spillovers across firms if workers or managers go to work for other firms or if there is communication among workers or managers working for different firms.

*Are these impacts on hazards likely to differ based on the size of the firm or other characteristics of the worksite?

*How might the impacts for construction differ from other industries given its multiple firms and temporary worksites?

Wrap-up – maybe ask “Anything else? What would you like to do that you’re not doing?”

We appreciate your taking the time to discuss these points with us today. We will be organizing our notes from the talk and will share a copy of them with you, so you’ll have the chance to correct anything we may have mis-heard.

Appendix C

OSHA Information System (OIS) Consultation Datasets

Request Received – construction sector only – 66,091 records

RID, Consultant ID, Ownership Type, Site NAICS, Request #, Request Date, Requested Visit Date, Visit #, Visit Type, Service Type, Service Scope, SHARP, Source of Request, Request Reason, Other Request Reason, # Emp Cntrld, # Emp in Estab, Request Status, Request Withdrawn, Request Withdrawn Date, Reason Request Withdrawn, Request Strategic Program, Request NEP, Request LEP, Request SEP, Request Additional Code

Visit Scan Summary – all industries – 225,356 records

RID, Consultant ID, Accompanied By ID, Site State, Ownership Type, Request Date, Request #, Source of Request, Visit #, Visit Type, Open Conf Date, Close Conf Date, # Emp Cntrld, # Emp Cvrld, # Emp in Estab, Primary NAICS, Site NAICS, Site NAICS Name, Secondary NAICS, Safety Closed Date, Health Closed Date, Opt #, Service Type, Service Scope, Visit NEP, Visit LEP, Visit SEP, Visit Strategic Program, Visit Additional Code, Visit Program Assistance, Visit Training/Education, Visit Correction Assistance Cited, Visit Correction Assistance Not Cited, Visit Hours, High Hazard Type, # Imminent Hazards, # Regulatory Hazards, # Serious Hazards, # Other Hazards, Visit P 01 Codes

Hazard Detail Data – all industries – 1,129,696 records

RID, Consultant ID, Ownership Type, Request #, Request Date, Visit #, Visit Type, Open Conf Date, Visit Closed Date, Primary NAICS, Site NAICS, Written Report Date, Item/Instance, Hazard Type, Standard, # Instances, # Workers at Risk, Standard/Injury Code, Original Correction Due Date, Hazard Corrected Date, Extended Correction Due Date, Extension Approved Date, Verified/Referred Date, Verified/Referred Code, Substance

Noise Survey Sheets – all industries - 139,423 records

RID, Request #, Visit #, Open Conf Date, Site NAICS, Visit Type, Service Type, Sampling Date, exposure_num, sample_num, sample_type, Sheet Type, Substance, dose_type, dose_time, dose_readout, dose_units, dose_OEL, dose_sev, read_time, read_dba, read_dbc, Job Title, Occupation Title, Exposure Duration, Units, Exposure Frequency, Visit Strategic Program, Visit NEP, Visit LEP, Visit SEP, Visit Additional Code

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RID, Consultant ID, Ownership Type, Request #, Request Date, Visit #, Visit Type, Open Conf Date, Visit Closed Date, Primary NAICS, Site NAICS, Written Report Date, Item/Instance, Hazard Type, Standard, # Instances, # Workers at Risk, Standard/Injury Code, Original Correction Due Date, Hazard Corrected Date, Extended Correction Due Date, Extension Approved Date, Verified/Referred Date, Verified/Referred Code, Substance

Noise Survey Sheets – all industries - 139,423 records

RID, Request #, Visit #, Open Conf Date, Site NAICS, Visit Type, Service Type, Sampling Date, exposure_num, sample_num, sample_type, Sheet Type, Substance, dose_type, dose_time, dose_readout, dose_units, dose_OEL, dose_sev, read_time, read_dba, read_dbc, Job Title, Occupation Title, Exposure Duration, Units, Exposure Frequency, Visit Strategic Program, Visit NEP, Visit LEP, Visit SEP, Visit Additional Code

