True Stories from the Trenches: Do's and Don'ts of Quality Site Visits

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ABSTRACT

Field coordination and logistics are neither glamorous nor thought-provoking, but the data collected from these efforts forms the backbone of many evaluation studies. Without proper planning and execution, the data collected may lose integrity, cost more than anticipated, or, at a minimum, be unnecessarily stressful for all involved. This paper references years of experience planning and executing field data collection studies, and suggests a best practices framework for planning, scheduling, training, recording data, quality control, safety, and other logistics. Planning for and considering these topics prior to initiating site work will result in better data, and therefore better evaluations.

Introduction

This paper, describing best practices in field work logistics, focuses on the following topic areas:

- ***Planning:*** What are the research objectives driving the data needs? How will the information be used? What data must be collected; how and when? How many field technicians will be required? How long will it take technicians to reach a site, and how long do they need to spend at each site?
- ***Scheduling:*** How will data collection be scheduled, and how much notice is needed (for technicians and for respondents)?
- ***Training:*** What exactly needs to be collected in the field? What should field staff expect to encounter? What kind of scenarios might field staff encounter, and how should they handle those scenarios?
- ***Logistics:*** What are travel protocols and per diems? What supplies will technicians need?
- ***Recording:*** How much time is needed to record information prior to moving on to the next site? Is the recording done manually or through laptops brought to the site? If it is manual, how is data transferred to electronic format? Can any data input be simplified through the use of standardized codes? How should field staff handle unique situations?
- ***Quality Control:*** What data collection protocols are in place? How should data collection be reviewed to ensure protocols are followed? Do opportunities exist for improvement?
- ***Safety:*** What safety checks are in place to ensure that field staff remain safe?

Incorporating and thinking explicitly on these different topics can prevent many problems that can occur during field data collection.

Planning

The quality of data for use in evaluation research is directly tied to the planning and organization of field site visits. The first step in successful planning is to evaluate the *purpose* of the site visits. The project manager should start with the overall research objectives. What questions need to be answered by data collected at site visits? How will the data be analyzed to achieve those objectives? For instance, are data used to inform an engineering analysis, or a statistical analysis? Knowing how data will be used helps ensure that all necessary data are collected. Overall, unplanned or poorly planned site visits may lead the field technicians to miss key data elements or spend too much time collecting unnecessary data, impacting the overall budget.

It is tempting for researchers to collect every possible data point when conducting a site visit. However, it is better to have less data (only data that is absolutely necessary) than to have excess data that may not be as clean. Prior to the site visit activity, the project manager should thoroughly consider what data *needs* to be collected, what additional data would be *nice to have*, how each data point will contribute to the final analysis, how data will be analyzed, who will collect the data, and what end result the data willo accomplish. In short, an explicit analysis plan should be developed.

Test visits are the best way to estimate the average length of on-site time needed and how much information can be realistically collected at each site. For example, recent lighting inventories from a sample of residential homes provided us with an opportunity to collect a plethora of information regarding every socket in surveyed homes. For these homes, we collected information on lighting type (e.g., incandescent, CFL, LED); bulb shape (e.g., globe, floodlight, spiral); base type (e.g., medium screw-based, small screw-based, integrated ballast); bulb location (e.g., bedroom, kitchen); fixture type; and control type (e.g., 3-way, dimmable, on/off). Examples of information that would have been *nice to know* were lamp wattage, make, and model.

The main purpose of our study was to determine the CFL saturation in homes. Wattage and make/model information would allow us to determine the total lighting load in homes and assess whether installed bulbs were program bulbs. Spending extra time to collect and then analyze this information, however, would exceed the allotted budget without contributing to the main research objectives.

Once the data collection activities are determined, appropriate staff need to be scheduled. When choosing field staff, first evaluate what skills are needed when performing the site visits. In order to work within typically tight budgets, consider whether an engineer is required or if lower cost staff can be trained to collect the information. For the lighting inventory, we trained junior analyst staff to perform the audits, but commercial or industrial site visits may require engineering expertise or someone more familiar with complex energy systems.

The number of field staff needed depends on several factors, including how much time is available for completing the study; whether a single person can safely perform the site visits or if field staff should work in teams; the size of the geographic area to be covered and how much drive time is needed between site visits; and how long each site will take to evaluate.

Although home lighting audits could be completed more quickly using teams of two people, the cost per visit was higher with drive time compared to using one person per site. When it came to safety, however, we decided when possible to maintain the two person audit teams.

Scheduling

The process that causes the most staff headaches is scheduling. The objectives for optimum scheduling are to minimize travel time, accommodate participant schedules, recruit a high percentage of participants called, and complete the study within the available time and budget.

One technique to minimize travel time is to cluster visits in nearby locations, called cluster sampling. Cluster sampling consists of randomly selecting groups/clusters of a population, and then randomly selecting participants from within the cluster. This approach can be used when it is assumed that the clustered populations are identical to the entire area population, and that therefore data collected from a cluster would be representative of the population.

For large customer samples, such as with the lighting audits example, we schedule participants using routing software. The software groups the sample addresses by geography and allows the user to specify a maximum drive time between sites. We also allow for contingencies by factoring extra drive time between site visits and scheduling more participants than required for the study.

When calling to schedule site visits, customers can often be skeptical, expecting the visit to be a scam, a sales pitch, or another unscrupulous activity. To minimize refusals due to mistrust, we prepare a recruiting script that explains the full purpose of the study and ensures all potential participants hear the same information, containing:

- The sponsor of the study, which is preferably a ***name they trust***, such as the local utility, and ***includes a contact name and phone number*** at that organization for verification or asking additional questions. Knowing they have a specific person to call about the visit increases customer confidence.
- ***Specific information*** on why they were chosen for a visit. Did they receive a program rebate or express interest during a phone survey? We remind them of specific information, such as the date of their rebate or of the initial phone survey, and of the rebate amount they received. The more information provided, the less likely they will think the call is a scam.
- ***What the visit will entail.*** We do not minimize what is going to happen during the visit. We give them realistic expectations of how long the site visit will take and what they will experience. This requires making sure schedulers are fully versed on specifics of the site visit and study.
- ***An incentive offer.*** This tactic must be used with caution, as it can sometimes increase customer fear that the site visit is a scam. However, without the incentive, customers (especially residential) have no personal gain by participating. We are specific about when they will receive the incentive and what form it will take (check, gift card, etc.), and we make sure the incentive is something that all potential participants can use. For example, when offering a gift card for a certain store, we make sure all participants live nearby that store.

If time allows between the scheduling call and the visit, we immediately send a confirmation letter summarizing the recruiting script information. Sometimes the schedule is too

tight to allow for sending a confirmation letter which increases the risk that the participant will cancel.

It is also important to call the day prior to the visit, reminding the customer of the time and duration of the visit, and providing the name(s) and contact phone number of the field technician(s) who will conduct the audit. We also mention what the field technicians will be wearing (preferably company logo shirts) and that they will have visible identification tags.

Even with thorough scheduling, residents sometimes get nervous or change their mind about participating. Since we cannot fully avoid these incidents, we always inform our field staff of this possibility, prepare them accordingly and schedule more sites than needed.

Training

The field staff must be thoroughly trained in all aspects of the study, which include the following four components:

- ***Study overview.*** Review the purpose of the study, who is funding the study, and how this task fits into the overall evaluation. The field staff should be comfortable communicating about the study with chatty participants.
- ***Safety training.*** Review basic safety techniques and provide hazardous scenarios and their appropriate responses (more on this in the Safety section below).
- ***Data collection instrument review.*** Review each data point on the data collection instrument, providing examples of the evaluated technologies, and have the field staff practice with a theoretical visit. The trainer should also outline acceptable responses for each collection point to ensure that the data won't have to be excessively cleaned by analysis staff.
- ***On-site practice.*** The most effective training process is the on-site component. Ideally, the trainer takes field staff to one or two practice sites and allows them to collect data as if it were a participant site. Practice sites can be at a coworker's home or even the place of employment, as long as it is similar to what they will encounter in the field. After each practice site visit, the field staff should meet to ask questions and compare notes. These practice site visits and the associated question and answer sessions eliminate many of the in-field questions and ensures that field staff are collecting data uniformly.

The on-site practice can also identify inconsistencies between individual data collectors. For example, the lighting site inventories were carried out in 15 different national locations by several different firms. Key data to be collected were *when* and *where* the CFLs in a home were purchased. A number of residents initially responded that they don't know when and where they purchased a particular CFL. Some of the data collection firms allowed for a "don't know" response, while others asked the homeowner to guess when and where. As this data was used to perform a statistical regression model, the "don't know" observations were not used in the analysis, but guesses were. This created an analysis issue which was eventually resolved by creating a dummy variable in the statistical equation related to the data collection technique. Ideally, potential inconsistencies in data collection will be identified upfront with protocols for resolving the issue.

Logistics

The logistics of a site visit are completely project dependent; however, the following applies to most field work:

- ***Field staff should look professional for all site visits.*** They are representing your company *and* the clients' company. In addition, skeptical customers are less likely to allow unprofessional field staff into their establishment or home. Ideally, field staff should wear company polo shirts, picture ID badges, and professional attire.
- ***Supplies.*** Field staff should be provided with supplies or a list of supplies to purchase once they arrive in the area. Common supplies needed for lighting inventory projects, for example, might include step ladders, pens, clipboard, calculator, measuring tape, flashlight, face mask, GPS, digital cameras, and backup supplies of all metering equipment.
- ***Information letter.*** Field staff should be equipped with a letter, on company letterhead, from the sponsoring entity or utility. This validation letter and a customer service center phone number should be left with the participant in case they have further questions or comments after the visit. Even small variations from this protocol can create issues. One example of this was when a technician left a personal business card and later received an unrelated call from that resident.
- ***Inform the sponsoring agency staff.*** If the sponsoring agency has a customer call-in number or a call center, make sure those staff are aware of your field work. It is not uncommon for participants to call their utility to validate the visit. When the call center is not aware of the study, the participant may cancel the site visit or even contact the police fearing a scam.
- ***Vehicle insurance.*** Field staff should purchase full coverage on their rental vehicles, and program managers should budget for this additional expense. Even the safest drivers may get in a car accident, and field staff are usually in unfamiliar cars, unfamiliar cities, and are fully dependant on their sometimes incorrect GPS for navigation. Comprehensive rental car insurance can minimize the repercussions of unexpected mishaps.
- ***Activate gift cards.*** When offering gift cards as an incentive, ensure they are activated prior to dispersing. This avoids mass requests for activation once customers start using the cards.
- ***Cell phones.*** Each staff member should have a cell phone while in the field for safety and in case of scheduling changes. This number should only be for use by the scheduling entity and co-workers. Customers, however, should be provided with a customer service number for any follow-up issues. Ideally, customer should also be contacted by the scheduling or customer service desk for any last minute schedule changes.
- ***Unexpected.*** Have procedures in place to mitigate the unexpected. First and foremost, assign a central contact to be available at all hours to answer questions and reroute field staff. The most common occurrences are customer no-shows, and schedulers need to be available to reschedule or find another participant. Senior staff also need to be accessible in case more serious events are encountered in the field. Field staff should send nightly e-mails to their program manager describing that day's events and asking questions, if they have any.

Data Collection

Data collection forms should be set up in advance either electronically or in hard copy format. The data collection forms can be organized in a variety of different ways. Using the lighting inventory study as an example, we could organize the form by light bulb type (e.g., grouping CFLs together, then incandescent bulbs) or by room in the house. After several test visits and iterations of the instrument, our field staff determined that organizing the data collection process by room and collecting all data *by bulb* within each room provided the quickest and smoothest process. By collecting information in this manner, field staff could work their way through the home and document information for each bulb at once, reducing the number of missed data points. An example of the final instrument we used is included as Figure 1 and Figure 2.

Cadmus ID:

Room Type	Room #	All Bulbs							CFL Bulbs Only		Notes
		Fixture Group #	Fixture Type	Number of bulbs/ Socket	Bulb Type	Bulb Shape	Socket Type	Control Type	When Obtained	Where did you purchase the CFL? (store or type of store)	
(See code list; include bulbs in storage)	#		C=Ceiling-mounted L=Floor/table lamp T=Torchiere W=Wall-mounted R=Recessed S=Suspended F=Ceiling Fan K=Track Lighting HW=Hard Wired PI=Plug-in G=Garage Door U=Under counter O=Other (describe)	#	I=Incandescent CFL=CFL F=Fluorescent LED=LED H=Halogen O=Other [Specify] E=Empty ***If bulb is burned out enter "BO" next to bulb type (i.e. "CFL BO)***	T=Twist/Spiral G=Globe A=A-lamp B=Bullet/Torpedo Bug=Bug light S=Spotl/Reflctr/Flood C=Circline Tub=Tube O=Other [Specify]	S=Screw P=Pin G=GU Can=Candelabra O=Other [Specify]	OF=On-Off Dim=Dimmable 3W=3-way MSS = Motion Sensor w/ Activation Switch MS=Motion or Photo Sensor without switch O=Other [Specify]	1=2008 or earlier 2=1st half 2009 (Jan - June) 3=2nd half 2009 (July-Dec) 4=2010 8=DK	Enter in code if known Write store name if unsure of code or ask participant for store description if needed to determine code DK=Don't know	REF=Homeowner refusal to access
Ask Homeowner to show you all CFLs they have in storage. Collect this information first and label these CFLs as Storage under Room Type.											
Storage											

Figure 1. On-site Data Collection Form

A well-designed data collection instrument can minimize the time spent cleaning the data after it is collected. One approach is to limit the types of responses that field staff can record. For the residential lighting audit, the data collection form could either leave a blank space for lighting type or could provide the common lighting types and instruct field staff to circle the appropriate response. While this may seem like a minor distinction, providing the possible responses saved analysts from having to decipher the field staff scribble or from having to decode a fabricated description of bulbs, such as “round” or “screwy.” Although allowing limiting responses helps reduce data cleaning time, it is important to include a notes section that allows field staff to editorialize when their findings don’t exactly fit the response choices. We have sometimes even included protocols to have field staff take a photograph of a situation if it did not fit the limited choices.

In-Home Observation Codes

Room Types	
Bedroom	Numbered by frequency of use.
Basement	
Bathroom	Numbered by frequency of use.
Closet	Numbered by frequency of use.
Dining	Formal/separate dining room
Foyer	entry space
Garage	
Hallway	
Kitchen	Including attached dining/nook area
Office/Den	
Living space	Includes family room and living room, number in order of use
Storage	Any bulbs that are not currently installed
Outdoor	
Utility	Utility/laundry room
Other	Please specify

Store Types		
Code	Explanation	Examples
HI	Home Improvement	Home Depot, Lowes
MM	Mass Merch or discount department store	Walmart, K-Mart, Target
HW	Hardware	ACE
WH	Warehouse	Costco, Sam's Club
G	Grocery	Safeway, Kroger
D	Drugstore	Walgreen's, Rite Aid, CVS
C	Convenience store	7-Eleven, Circle K
SL	Specialty lighting or electrical store	
HF	Home furnishing store	Bed, Bath, and Beyond, Pottery Barn
U	Utility company	
B	Bargain store	Dollar Store, Family Dollar
OS	Office supply store	Office Depot, Staples
NP	Not Purchased	provided by family member
O	Other	

Control Types	
OF	On-Off
Dim	Dimmable
3W	3-way
MSS	Motion/Photo Sensor with on/off switch
MS	Motion or Photo Sensor (no switch)
O	Other

Fixture Types	
C	Ceiling-mounted
L	Floor/table lamp
T	Torchiere
W	Wall–mounted
R	Recessed
S	Suspended
F	Ceiling fan
K	Track lighting
HW	Other hard-wired
PI	Other plug-in
G	Garage door
U	Under Counter
O	Other (describe)

Socket Types	
S	Medium Screw Base
P	Pin Base
GU	GU - Base
C	Candelabra/Small Screw Base
O	Other

Bulb Shapes	
T	Twister/Spiral
G	Globe
A	A-lamp
B	Bullet/Torpedp
Bug	Bug Light
S	Spot/Reflector/Flood
C	Circline
Tub	Tube
O	Other

Bulb Types	
I	Incandescent
CFL	Compact Fluorescent Lamp
F	Fluorescent
LED	Light Emitting Diode
H	Halogen
O	Other
E	Empty Socket
BO	Burned Out

When Obtained (CFLs Only)	
1	2008 or earlier
2	1st half of 2009 (Jan - June)
3	2nd half of 2009 (July - Dec)
4	2010
8	Don't Know

Figure 2. Data Form In-home Observation Codes

Quality Control

An important and often overlooked process is having good quality control (QC) procedures. QC takes place in two areas: quality in the field and quality data input.

In the field, staff should have consistent communication with the program manager. The program manager can mitigate issues, ensure consistent data collection, and inform other field staff of issues encountered by their coworkers. Program managers should personally attend a sample of the site visits early in the process, in order to head off potential problems or inconsistencies.

Data collected should be recorded daily in a central computerized system. The field staff should be responsible for inputting their own findings, which considerably reduces data entry errors. Program managers should perform a daily in-process review of one or two sites per field staff to check for abnormalities, such as recorded lighting wattages that out of normal range, or fewer than normal fixtures being recorded. This daily in-process QC easily mitigates consistent errors, like when someone records the incandescent equivalent wattage rather than the CFL wattage during a retailer shelf study. This type of error can be caught quickly and easily rectified for current and future visits.

At the end of the field visits, a final group meeting with all the field staff can be very informative. These meetings can be invaluable in providing anecdotal evidence to explain on-site findings, and are a great way for the project manager to provide feedback and appreciation to the field staff who spent their nights and weekends traveling around the country for this effort. These discussions also provide additional insights for future process improvements.

Safety

The safety of field staff should be the foremost concern of program managers, yet this component is often rushed or overlooked. While we have managed hundreds of site visits and meter installations without injury or harmful situations, we learned the importance of safety training after a number of potentially risky situations. Below is a list of safety precautions from some of our hard-learned lessons:

- Always ***send field staff in pairs*** when collecting data in potentially unsafe neighborhoods. The budget might not support two staff going to each home, but there is safety in numbers. Perform area research where the field staff will conduct site visits and prepare accordingly.
- ***Analyze worst case scenarios*** and train field staff accordingly. When staff will be inspecting attic insulation, train them how to safely maneuver on rafters without damaging or falling through drywall. If staff will be installing meters on evaporative coolers, make sure they are versed in safely guidelines for walking on rooftops and when to declare that a roof is not reliable enough to scale. When staff will be inspecting light sockets, train them on proper CFL disposal in case a bulb breaks upon removal. Each type of site visit has its own unique hazards that field staff should be prepared to address.
- ***Test electrical sockets*** prior to plugging in hardware. We use instruments to check the socket grounding and protect our staff against dangerous electrical surges.
- ***Tell staff to trust their instincts.*** Staff may get bad feelings about a certain area, home, or participant; support them in trusting these instincts. Always encourage field staff to

cancel or leave a visit anytime they are not comfortable, and provide them with examples of situations that they should definitely leave, such as when the occupant is obviously under the influence of drugs or alcohol. Again, project managers need to over-sample site visits to plan for incidents without impacting the project results.

Conclusions

While the suggestions discussed in this paper are logical and may seem obvious to some, it is also common that an inexperienced project manager get assigned the task under a tight timeline. In that case, a ready checklist of procedures to follow, such as those described in this paper, may be the difference between a catastrophe and a high quality data collection effort. Years of site visit experience have shown that unexpected events do occur. Being prepared can prevent or at least help to quickly mitigate problems, and ensures that data collected represent the population being measured.