

# IPVM

The background of the page is a collage of three images: a close-up of a silver dome security camera on the right, a yellow measuring tape on the left, and blue architectural blueprints in the background.

## INSTALL LABOR ESTIMATION GUIDE

# **2015 Labor Survey Results**

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## Product vs Labor Sales Breakdown

IPVM survey results reveal that 50% to 75% of the price of a surveillance project goes to product sales, with the remainder for labor. In this note, we share respondent's commentary and explain the key factors impacting this breakdown.

### Key Factors

The most common aspects affecting how costs split include:

- *Project Size Matters:* Smaller projects generally constitute higher labor percentages. While cheaper equipment is appealing, it often warrants more troubleshooting and configuration labor to install.
- *Complex Configuration:* Several responses noted that complex integration and configuring servers, software, or analytics add disproportionate amounts of labor compared to simple installation projects
- *Exact Split Varies:* Our survey takers made it clear that the breakdown between parts and labor changes by job. Nearly all responses indicated the final percentages change between projects.

## Color Commentary

Here are some excerpts from the collected responses:

- "2/3 Equipment, 1/3 Labor"
- "Usually 65 - 35 parts/labor but it changes every job"
- "Typically 75% product, 25% labor."
- "I'd say the average job is somewhere near 50/50, probably with a slight skew to materials"
- "Server and storage intensive projects may shift the cost to 75% equipment, 25% labor"
- "Simple projects are about 50-50, but complex software integration can go to 80% labor easily."
- "We find that on the small 4-8 camera installations labor can be as much as 35-40% as lower cost/quality hardware is normally required to be competitive."
- "75/25 Product/Labor Factors that would increase labor cost:  
External cameras, mounted on poles, high on buildings, difficult access  
Long cable runs, intermediate signal boosters  
Fiber Trenching/conduit  
Limited access to premises, e.g. schools, prisons,"
- "For critical infrastructure project (port, railway, airports, or other Government Projects) it varies on project to project basis. In general it is 50% products and 50%> for labor."

- "The labor and resource allocations can vary greatly depending upon the installation environment. Rarely have I found that job size will affect any economy of scale. There is always some pick ups, such as travel expenses and such but the product and labor to install/configure is relatively consistent."
- "What some might think is a simple installation in for example, a hospital, can also be expensive because of local rules including infectious controls processes, after hours work, etc."
- "Name brand plenum Cat-6 and premium 5MP cameras is going to have a much higher material cost than will generic Cat-5e and budget 1MP cameras."
- "It will depend on the job's size, on larger ones i.e over 100 cameras + servers+VMS, etc, labor could be around 20% to 30% of total, whereas in smaller but technically complicated endeavors (i.e very fine tuning) that figure could be 50% or more"
- "The main factor that causes it to vary is the type of project and how much construction related installation is needed."
- "If we sub labor that will reduce labor cost."
- "If there are many PTZ's or other expensive equip that will increase material"
- "Labour varies depending on what is asked for as an outcome. Installing a camera on a wall is simple. Configuring virtual servers, network switches, enterprise software and then complete integration takes time."

## Revenues, Not Margins

This breakdown does not illustrate how profitable each portion is. As we noted in our [Security Integrator Hourly Rates](#) update, the actual cost of labor is likely much smaller compared to the billed amount compared to the actual product cost.

In general, labor is a smaller piece of the billed project, but it generates more contribution margin. However, labor is often riskier than product sales as labor generally entails having full time employees or managing subcontractors while products can be re-sold on demand, without inventory risk.

The high percentage of overall revenue going to products but the steep [decline in markups](#) over the last decade shows a serious problem for integrators. While products still bring in a lot to the 'top line', their contribution to profits has shrank dramatically, forcing integrators to be far more careful on making profits from labor.

Here's a series of [recommendations on increasing integrator profitability](#).

## Camera Labor Estimation Standard

IPVM is proud to release the first ever surveillance camera labor estimation standards.

These standards help integrators improve the accuracy and efficiency of their installations, reducing risks and cost.

### Global Survey

We developed these standards based on a global survey of integrators who provided in-depth responses on how much time and what factors impact their installs.

### 6 Core Scenarios

The standards focus on 6 fundamental scenarios where integrators routinely install cameras:

- Low Indoor Tile / Grid Ceiling
- High Indoor Hard Panel Ceiling
- High Outdoor Commercial Building
- High Outdoor Masonry Column
- Pre-prepped Freestanding Pole
- Flat Mount Roof

## Description and Image Provided

To ascertain richer and more meaningful responses, we provided an image of the scenario and a description of the area.

For example, in the "Low Indoor Tile / Grid Ceiling", we described it as such to integrators:

"The location has 1/2" thick fiber acoustic tile suspended from grid, with no existing backing material or needed plenum rating, located 8' - 10' above the floor. Cabling has previously been run and terminated to the mounting spot. How many man-hours would you estimate for mounting a camera in the following area? Why?"

With the following image provided:



Each of the other scenarios had the same information and visuals.



## **Responses In-Depth**

Integrators provided us both a number, in terms of hours, and a description of the key factors that impacted them (tools, safety concerns, logistical limitations, etc.)

We then tabulated a range of hours estimated, an average hour estimate plus color commentary on the issues impacting their estimates.

### **Average Install Times**

For each of the six locations, we averaged the responses for each into a single 'global average' value. Those are given below:

- Low Indoor Tile / Grid Ceiling: 0.95 man-hours
- High Indoor Hard Panel Ceiling: 1.65 man-hours
- High Outdoor Commercial Building: 2.75 man-hours
- High Outdoor Masonry Column: 3.50 man-hours
- Pre-prepped Freestanding Pole: 2.50 man-hours
- Flat Mount Roof: 2.51 man-hours

In the sections that follow, we examine each location in greater detail, showing the full spread of votes and color comments from response that illustrate the results.

Our questions made no distinction between the estimate being for a sales/service call, or as part of a bidded project. However, that situation

could impact how much time is estimated purely on the logistics of moving tools, setting up, or otherwise 'making a job worthwhile'.

### **Low Indoor Tile / Grid Ceiling**

First up: an indoor acoustic tile/ grid ceiling location 'low' enough to reach by stepladder.

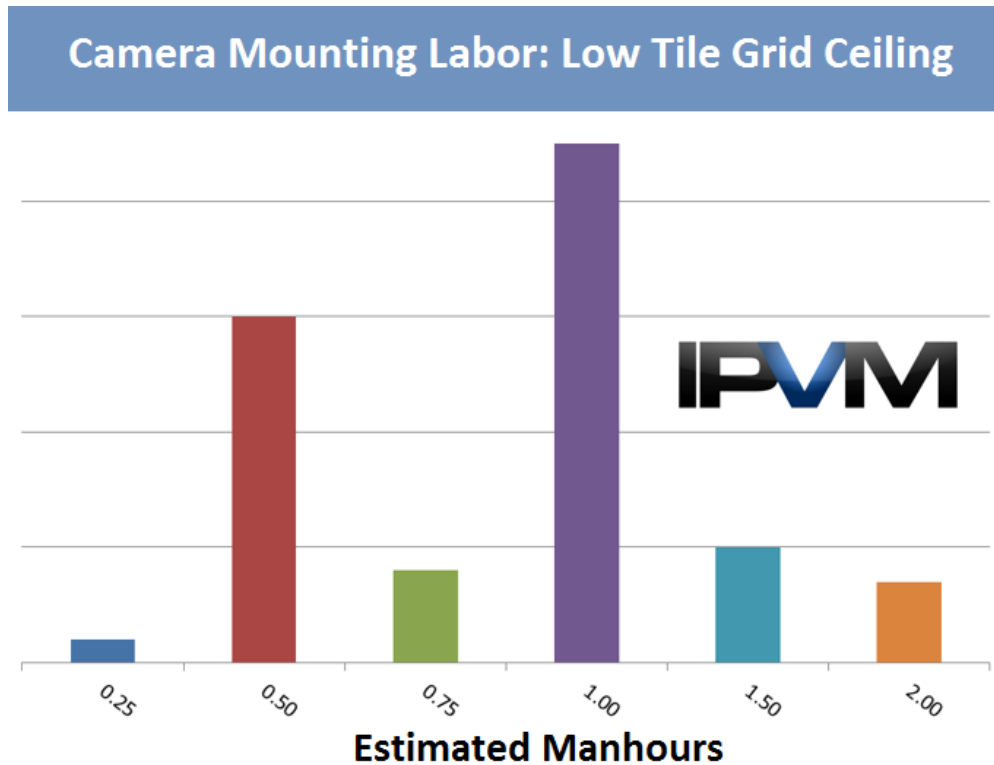
Below are excerpts from our [full update](#) on the results. The actual survey question asked was:

"The location has 1/2" thick fiber acoustic tile suspended from grid, with no existing backing material or needed plenum rating, located 8' - 10' above the floor. Cabling has previously been run and terminated to the mounting spot. How many man-hours would you estimate for mounting a camera in the following area? Why?"



*Results:* Over 75% of all responses fell between 0.5 to 1.0 man-hours.

The full spread is shown below:



### Tile Reinforcement: Biggest Cost Variable

One aspect of the install not addressed by the question was whether or not the tile needed to be reinforced first. We deliberately did not include this detail, as to avoid biasing the answers to a specific mounting approach (i.e.: Not permitting use of grid clamps, if preferred). In most cases, if installers discussed tile reinforcement, their estimates were higher.

- "About 45 min. I have to install a backbox across the bridge, cut the tile, install and adjust the camera and then clean up."

- "I would estimate the camera install to take 1.5 hours. This is due to needing a mounting bracket to be installed across t-rails and physical mounting."
- "You need about 1 hour and 30 min to mount the camera since you need to drill and catch the cables and be able to enforce the back of the camera to be hold on the ceiling."
- "1.5 hour to mount. This is allowing for mounting of a dome that has been pre-configured with the correct IP address. Technician will remove tile, make cable hole, mount camera using a wooden back-plate."
- "1 hour minimum, depending on the camera model. We will typically install a "Caddy bar" support that spans the grid, and that supports the weight of the camera, which is mounted through the tile."

The average of all answers is 0.95 man-hours for this location.

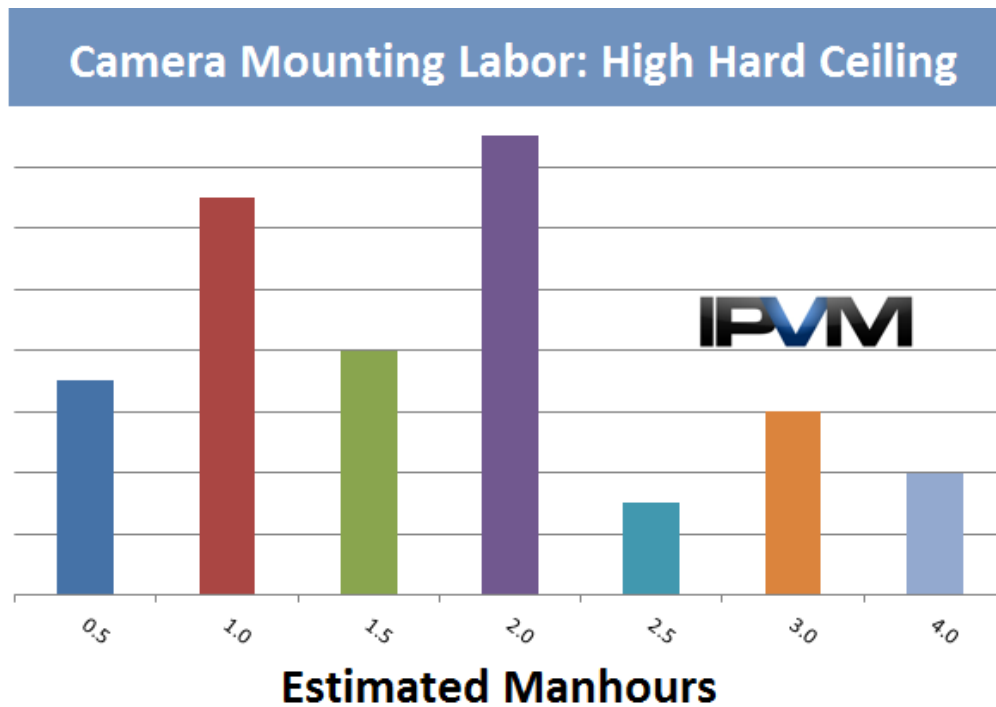
### **High Indoor Hard Panel Ceiling**

The survey question asked: "The location is hard ceiling/drywall sheathed, located 12' - 15' above the floor. Cabling has previously been run and terminated to the mounting spot. How many man-hours would you estimate for mounting a camera in the following area? Why?"



*Results:* Over 60% of all responses fell between 1.0 to 2.0 man-hours.

The full spread is shown below:



Lift or No Lift?: Biggest Cost Variable

A surprising driver of increased time was whether or not integrators estimated this location by use of a lift. In general, estimates were higher

for those responses choosing a manlift over a long stepladder. The prime factor in the increased time is needing a spotter or safety man on the floor.

- "3 hours. Expect much slower productivity because an articulated lift will be required to access the mounting location."
- "6 Hours. Hard install, lift and protective mats needed. Extra care needed due to environment."
- "1.5 man hours. May involve 2nd man for lift safety."
- "3 hours, because the man on the ground keeps the area safe around the lift."

Contrast those times using a lift, with the responses choosing a ladder. Many of these did not include a second person spotting the work from the floor:

- "I would allow 0.5 MH to move a ladder into position, drill your penetration for the wire/whip, mount the camera to the drywall using walldogs, then clean up behind."
- " 30 min., Depending on whether it is a high traffic area or not it could take longer. 25 min. to get the appropriate ladder, and mount the camera, 5 min. to clean any debris."
- "One hour, install bracket, adjust camera and clean up. I am using a bigger ladder so that comes into play."

The average of all answers is 1.65 man-hours for this location.

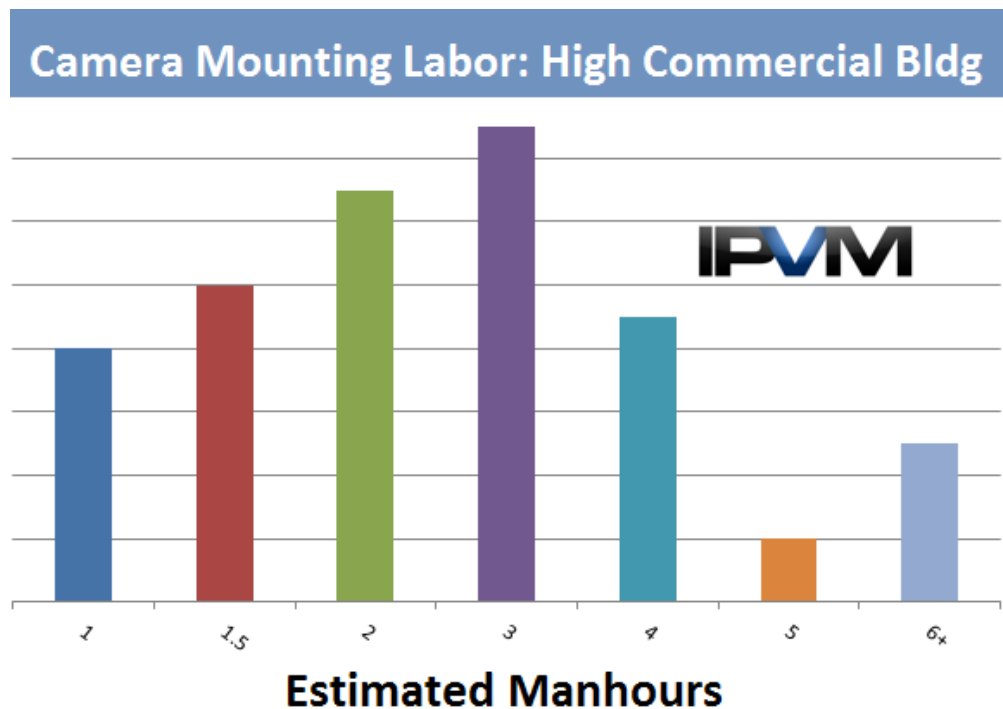
## High Outdoor Commercial Building

The survey question asked: "The location is outside, unreachable from roof, 22' -30' above ground, on corrugated steel sheathing with existing backing board. How many man-hours would you estimate for mounting a camera in the following area? Why?"



*Results:* Over 40% of all responses fell between 2.0 to 3.0 man-hours.

The full spread is shown below:



#### Lift or Ladder: Biggest Cost Variable

Again, the biggest cost differences came due to use of a manlift or ladder. Several responses noted a ladder would be the safest choice due to the close proximity of overhead power cables into the facility. In general, using a ladder for this 22' - 30' length required the use of a secondary spotter regardless, so the time difference between either option was fairly close:

- "60 minutes bringing all material and preparing area, especially a good and stable ladder. I would block the area around the ladder for protection."
- "The mounting (with previous wiring) should be close to two hours, providing a scissor lift for reaching the area."



- "If closer to 30', we would need a boom lift rental as well. -- 4hrs"
- "3 hours - this is the easiest of outside camera installs but will take a second man to foot a ladder."
- "1 hour, 0.5 hr times two persons because of safety regulations. one on the ladder, one is down under."

The average of all answers is 2.75 man-hours for this location.

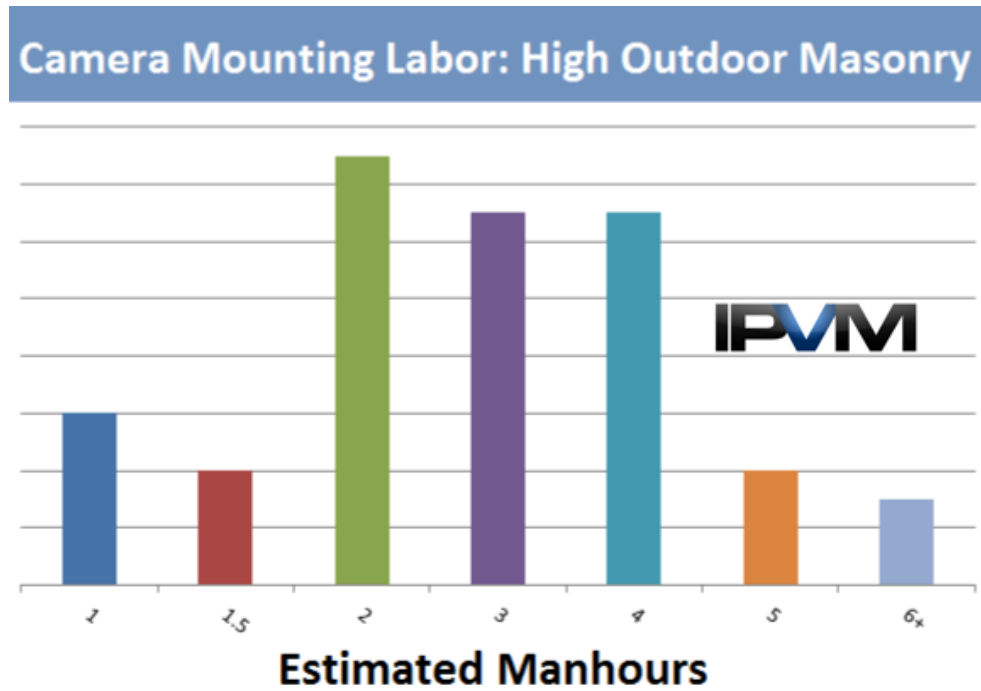
### **High Outdoor Masonry Column**

The survey question asked: "The location is on a brick column, 12' - 15' above ground. How many man-hours would you estimate for mounting a camera in the following area?"



*Results:* Over 65% of all responses fell between 2.0 to 4.0 man-hours.

The full spread is shown below:



#### Expensive Mounting Location: Biggest Cost Variable

The aspect responsible for much of the cost was the location of the camera, both in terms of being brick mounted and in the front of a pedestrian-trafficked retail center. Several responses noted the extra manpower needed to keep the area around mounting operation safe for nearby public customers.

- "We would estimate with a second installer due to the location in a public area for the installers safety on the ladder. If the install was in a private area, we would lean toward a single installer."

- "3 hours. 1.5 for the guy on the ladder, 1.5 for the safety man on the ground to keep shoppers and vehicles safe."
- "2 men 2 hours each. Lift or ladder regardless, need protection for pedestrians because its a retail location."
- "1 man working off lift/ safety (depends on how much traffic this business has)."
- "Logistics are more difficult. Extension ladder or Bucket truck to set up, potential foot traffic, slower and more deliberate because of height, 2 hrs labor."

Another cost driver was drilling anchors through masonry, which require extra time and additional tools. Several installers noted they would suggest alternative mounting locations to avoid lengthy installs:

- "5 man-hours, get tools and get a ladder to the location in the building. Drilling brick can take time depending on how the column is built."
- "I would estimate 3.5 hours for the install. The added labor is due to the need of a smaller type extension ladder and the use of an SDS hammer drill."
- "5 hours if you have to drill that brick. Which is stupid. There has to be a better place to mount the camera."

The average of all answers is 3.50 man-hours for this location.

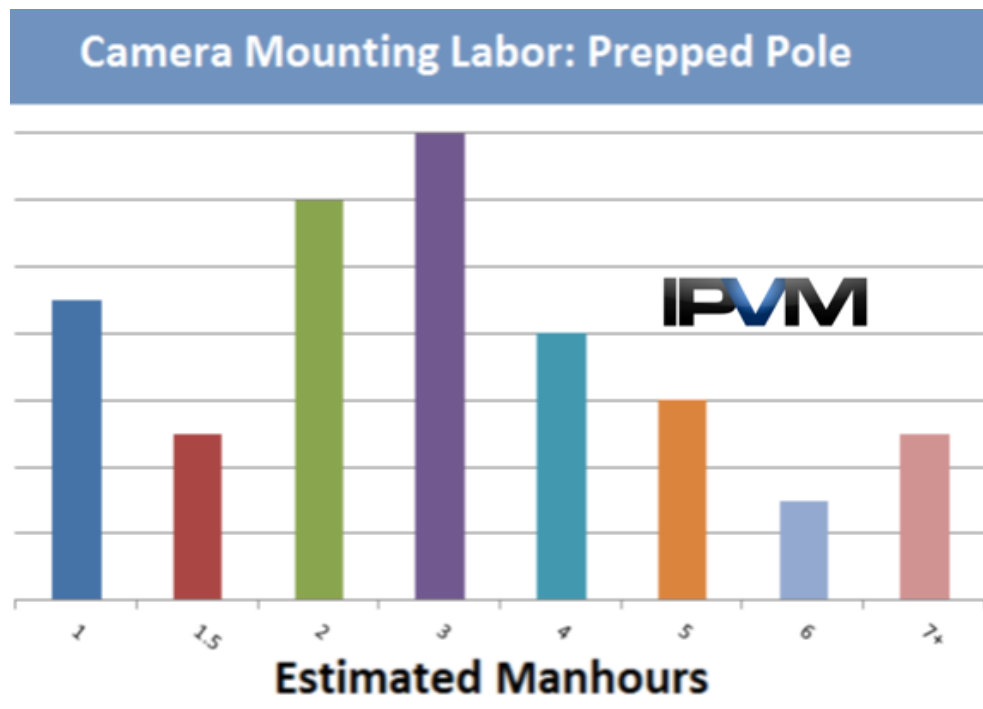
## Pre-prepped Freestanding Pole

The next survey question asked: "Assume a 25' - 35' pole is already installed/prepped for bracket mount, and all cabling/grounding is available. How many man-hours would you estimate for mounting a camera in the following area? Why?"



*Results:* Nearly 60% of all responses fell between 2.0 to 3.0 man-hours.

The full spread is shown below:



#### Cabling and Pole Accessibility: Biggest Cost Variable

While our question specifically omitted the cost of running cable to the camera, many responses noted this particular run takes time, and the overall condition and placement of cabling inside the pole is key to how fast the install happens:

- "3 hours to install camera, assumes a lift is used. Camera will require a bracket, surge suppression, possible work with liquidtite or PVC pipe and fitting."
- "1-hr hopefully you have all your hardware...considering we are just talking about hardware mounting...because you mention cabling/grounding already is there."

- "2 hours. Pole mounts take us longer. Especially when fishing the pole, working from lift, connecting to power, etc."
- "Mounting a camera on this pole would take less than two hours if it were already prepped and cabling was available. This pole exceeds our height for extension ladder use, so a bucket truck or boom lift would be used to install."

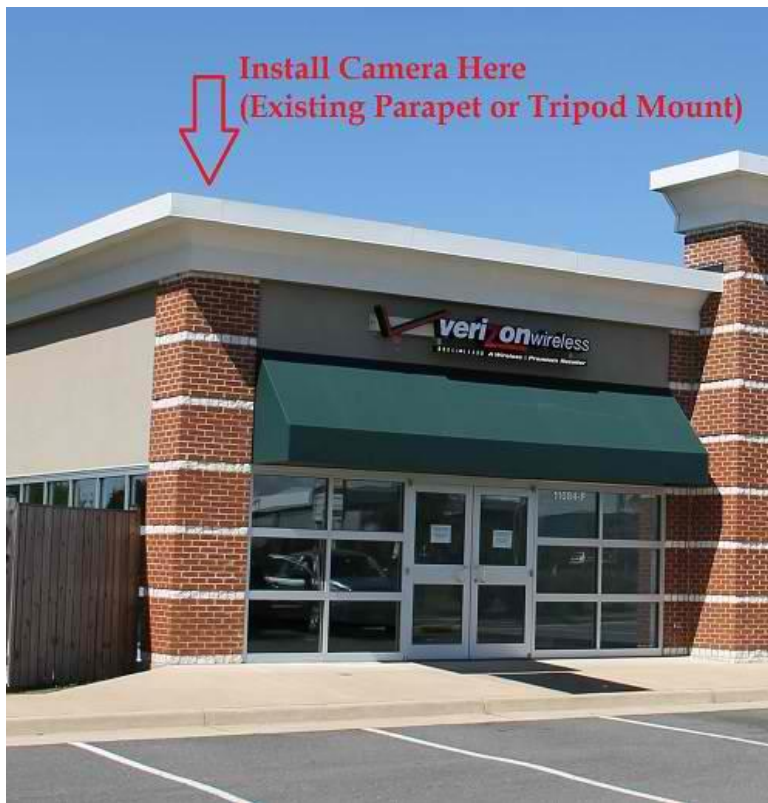
The vast majority of answers included plans to use a lift or bucket truck instead of a ladder, often calling out a specialty all-terrain type with stabilizing outriggers. Renting this lift would add cost to an install:

- "First would get an all terrain lift. As far as mounting is concerned I would estimate 3 hours."
- "2.0 man hours to mount, sans cabling. \$125 bucket truck roll charge."
- " I would account for 3 MH here to be safe, but it could take less. We would be renting a lift for this project. You need time to load all your tools and supplies into the bucket of the lift, drive it over to this location, elevate it into place, pre-drill and holes needed for mounting, mount the arm and then the camera. You need time to seal if needed."
- "Two men for two hours each should be sufficient. This will need an all-terrain lift or bucket vehicle for safety. You may need cribbing or ground protection since it appears to be spring and it may be muddy or fragile ground."

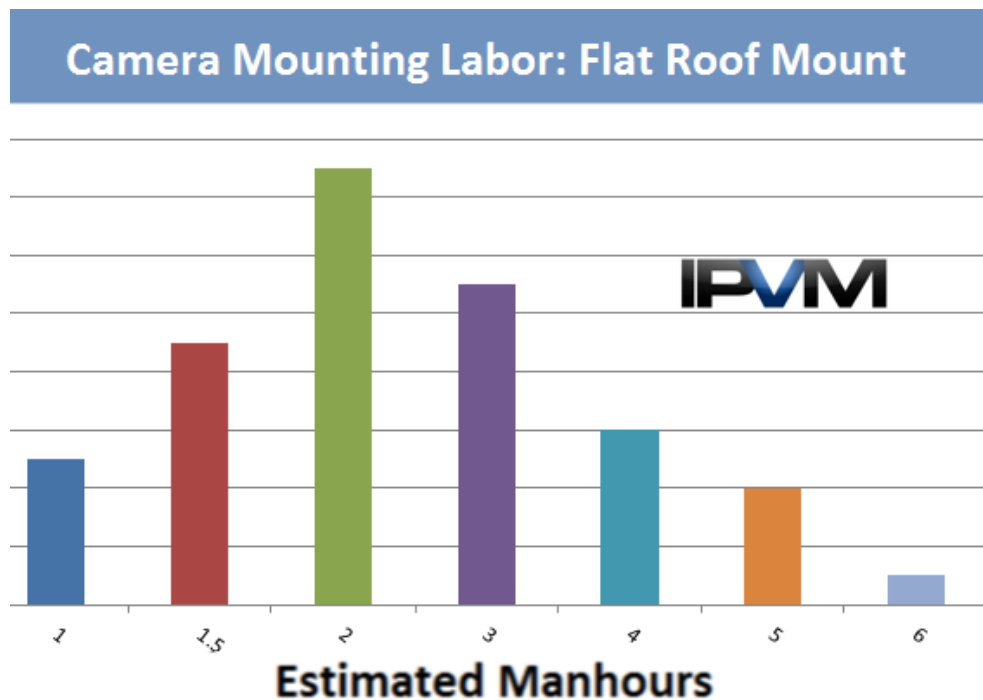
The average of all answers is 2.50 man-hours for this location.

### **Flat Mount Roof**

Our final camera mounting survey question asked: "This location offers no inside roof access, and camera is to be mounted on existing parapet or tripod mount. How many man-hours would you estimate for mounting a camera in the following area? Why?"



*Results:* Over 65% of all responses fell between 1.5 and 3.0 man-hours, with over 45% falling between 1.5 and 2.0 hours. The full spread is shown below:



#### Roof Mount Condition / Penetration: Biggest Cost Variable

The clearest theme responses noted was aversion to penetrate the roof, even to the point of recommending difference types of cameras and mounting locations to avoid it. Our question asked answers to assuming all cable had already been run and the roof mount was already available, but several installers noted that field verification of those aspect would be required regardless:

- "You would have to bring the wire out of the roof via a pitch pocket or other so it depends on the availability of that. If that is readily available then figure 60-90 minutes to mount everything."
- "2.5 hours 24 foot ladder needed, even though the mount is existing you still have to fumble with what is there."



- "Bad/ old cable penetrations cause thousands in damage. We avoid reusing them without rework at all costs."
- "I'd encourage the customer to re-think this location. 4-5 hours if they insist and the roof penetration would be excluded or written direction from the roofing contractor on how best to penetrate the roof."
- " I wouldn't be dumb enough to mount it in that fashion. I'd do a dome under the eave with conduit for less money and get the same image."
- "If it is a junk mount, I wouldn't waste my time trying to reuse it. I'd prefer to start new, it is likely cheaper."
- "This should be about four or more hours to cover the time needed to get a customer provided roof penetration, project management, lift or ladder with a two-man install team."
- "4 hours for an exterior camera. I am assuming any necessary membrane penetrations are already performed by a qualified roofing contractor and like many of the other items, cabling is already run."

The average of all answers is 2.51 man-hours for this location.

## Camera Commissioning Labor Standards

Adding to our [Camera Install Labor Standards](#), IPVM has established standards for the following two common scenarios:

- "How many man-hours would you estimate to: Configure an uninstalled camera, i.e.: IP addressing, firmware updates, basic image settings? Why? What would impact this?"
- "How many man-hours would you estimate to Aim and Focus a camera? Why? What factors impact this"

Based on global integrator survey results, we provide an average number of hours, the range of hours estimated, and the key factors impacting the time to do so. Importantly, differences in manufacturers and feature sets provided had a material impact on these results, as shown inside.

### Camera Adjustment Averages

We averaged the responses for two common camera installation activities into a 'global average' value. Those are given below:

- Preconfiguration: 0.5 man-hours per camera
- Aim & Focus: 0.6 man-hours per camera

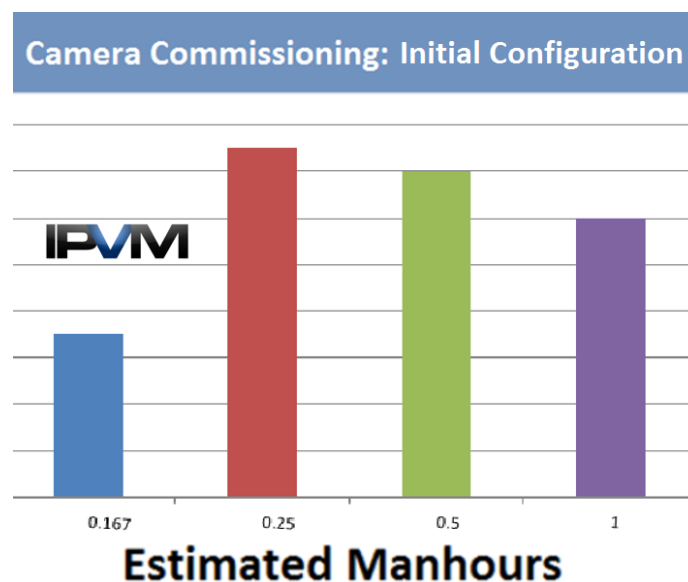
In the sections that follow, we examine each location in greater detail, showing the full spread of votes and color commentary from response that illustrate the results.

Our questions made no distinction between the estimate being for a sales/service call, or as part of a bidded project. However, that situation could impact how much time is estimated purely on the logistics of moving tools, setting up, or otherwise 'making a job worthwhile'.

### Preconfiguring Settings

For this question, we asked "How many man-hours would you estimate to: Configure an uninstalled camera, i.e.: IP addressing, firmware updates, basic image settings? Why? What would impact this?"

The average of all answers is 0.5 man-hours per camera for preconfiguration work. The full spread of answers is shown below:



## **Specific Brands Matter**

The strongest theme responses mention is that prior familiarity with a camera interface and controls layout matters. Several comments noted that familiar brands get one estimate, but less familiar get a longer value:

- "Camera make and customer needs would have the largest impact on time. Some brands are easier to configure."
- "1 hour with experience technician and if the camera is a known unit (we are using 99% JVC cameras, so with them)."
- "1-2 hours. Unless it is a brand we are unfamiliar with. Then 3-4 hours."
- "0.5 to 1 Hour each - some camera manufacturers are more difficult to get the upgrades than others."
- "Axis or Avigilon complete would be the least time. Anything else I'd add time."
- "About an hour but it depends on who gives you the camera and what they already know about it and if its a brand your familiar with."

## **Bad Quality Adds Time**

Another key driver is that cameras with a poor quality reputation take more time to install correctly. In some cases, this directly offsets any product price savings from buying a discount brand.

- "Few minutes only, unless it's Arecont as their software also not very reliable."
- "Biggest factor is the make & model of camera. Some are a real POA."
- "We have done some junk brand cameras that have taken 2 hours or more to get right."
- "With an Axis, Avigilon, Sony or Samsung, it'd be .15 of configuration time per camera before the physical install takes place. With any other brand, we will budget .25."

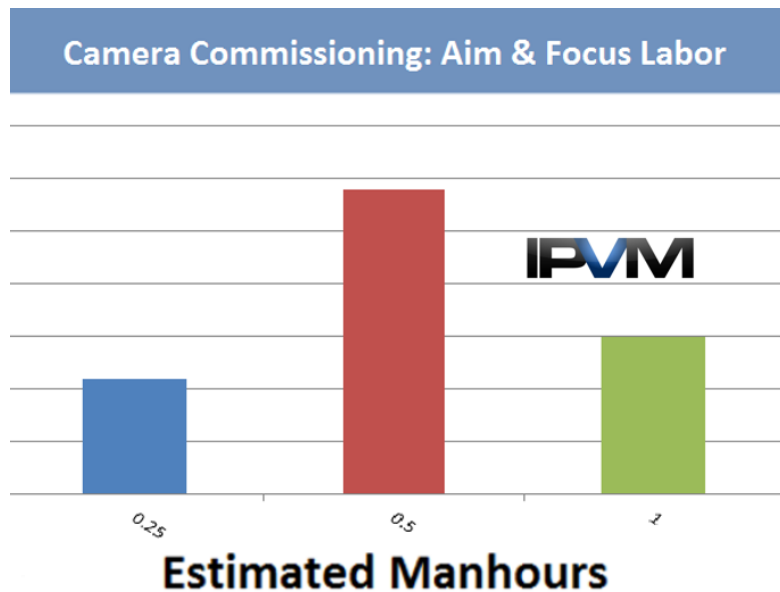
### **No Distributor Config Services**

Notably, none of our responders indicated they take advantage of 'pre configuring' services commonly promoted by distributors. Although not available from all distributors, the service is promoted by the market leaders as a key example of the 'value add' they bring to the sales chain. Just a few examples of the configuration services from prominent companies are: [ADI](#), [Anixter](#), [Scansource](#), [Norbain](#)

### **Aim & Focus**

The next question asked "How many man-hours would you estimate to Aim and Focus a camera? Why? What factors impact this", in order to nail down the time it takes to physically adjust the camera for use once mounted. For estimates of mounting labor only, see our [Camera Labor Estimation Standard](#) for those values.

The average of all answers is 0.59 man-hours per camera for aiming and focusing. The full spread of answers is shown below:



### Remote Focus

Those listing the shorter times often listed remote focus and zoom as a key element:

- "We use all cameras with remote focus and zoom so on average regardless of where the cameras are in any of the above scenarios we would average 15 minutes each."
- "Impacting factors: - Autofocus on camera (i.e. Axis):"
- "Most cameras we install are remote focus so just need to aim these days but say 1hr"
- "0.25 hours - All cameras we deploy are auto focus, aiming is only requirement"

- "Variables such as auto focus and vari-focal would impact amount of time but even worse case scenario would take less than 30 minutes."
- "0.5 hours for auto/remote focus is of course much easier."
- "0.25 for most cameras. We don't add any to the labor for P and Q series Axis cameras, which allow for remote back focus from the browser."

### **Install Monitors Valuable**

Many responses noted the efficiency benefit of equipping the installer with tools to 'see what the camera sees' at the point of install. Giving installers these tools eliminate an awkward operation, usually by radio or phone, with another installer who can see the camera at a viewing client. It also cuts out the need to climb up and down from a ladder if a single man operation:

- "If the Necessary device like handheld monitors are available we hard talk 15 Min to focus the cameras."
- "'I'd probably figure 10-15 minutes for most cameras mounted at a reasonable height (8 to 12 feet). The installer can use a test monitor or focus meter most of the time, but they're not perfect and sometimes several trips are needed."
- "No more than 1 MH per camera if accessible from a ladder. I use a veracity pinpoint and surface 2 tablet so time really isn't lost using that equipment."

- "We bid 1 hour each camera, although if the tech can see views from czan install tool on top of the ladder, it takes even less."
- "Having the proper equipment (laptop or test tool, PoE etc. is key at the camera."
- "Common factors which can impact time used to aim and focus a camera: time to boot up technician's laptop, time for camera to boot up after hooking up laptop, technician must deal with bulky computer on top of ladder."
- "Installation view monitors make a big difference here, Its faster than a tech on the ladder and another telling him by radio where to fix things."

### **Customer Approvals**

The biggest cost driver is when the customer is deciding for the first time what they would like the camera to be focused on. Multiple responses echoed the delay and frustration of re-aiming and refocusing multiple times or waiting to discussing such a major element of system design until the last minute:

- "Biggest variable is whether the customer knows what they want to see in the scene."
- "1 hour if manual focus, .5 hours if remote. This assumes pre-arranged contact ready at specified time to approve image."



- "There is additional time built into our projects to do 50% of the cameras again at 1/2 hour per camera simply because we don't do a very good job of relaying the owners wishes to our technicians."
- "This is where "decision maker" of what needs to be seen is hardly ever inline with what the your thinking is. I had them tell me "go ahead you know better than me" and go back and reposition all of them."
- "15 minutes to aim and focus plus 45 minutes to re-aim and focus after customer input."
- "Depends if everything is set, ladders, negotiated with customer where he wants camera to aim."
- "If it requires focusing then later adjustment as a mass group with other cameras with a consultant, I would double the time."

## VMS Labor Standards

We continue our industry first installation labor standards result with a look at Video Management System setup, adding to the [camera installation](#) and [cabling installation](#) entries.

These standards help integrators improve the accuracy and efficiency of their installations, reducing risks and cost.

### Global Survey

We developed these standards based on a global survey of integrators who provided in-depth responses on how much time and what factors impact their installs.

### Questions / Scenarios Asked

Two scenarios were presented:

- VMS Installation: "How many man-hours would you estimate to install and configure a VMS Server? Why? Which VMS? What impacts this?"
- VMS Commissioning: "How many man-hours would you estimate to add 10 cameras to a new VMS? Assume cameras already are installed and have IP addresses preconfigured. The effort includes

fine tuning 10 cameras for production recording and live viewing in the VMS."

## **Averages**

The overall averages were:

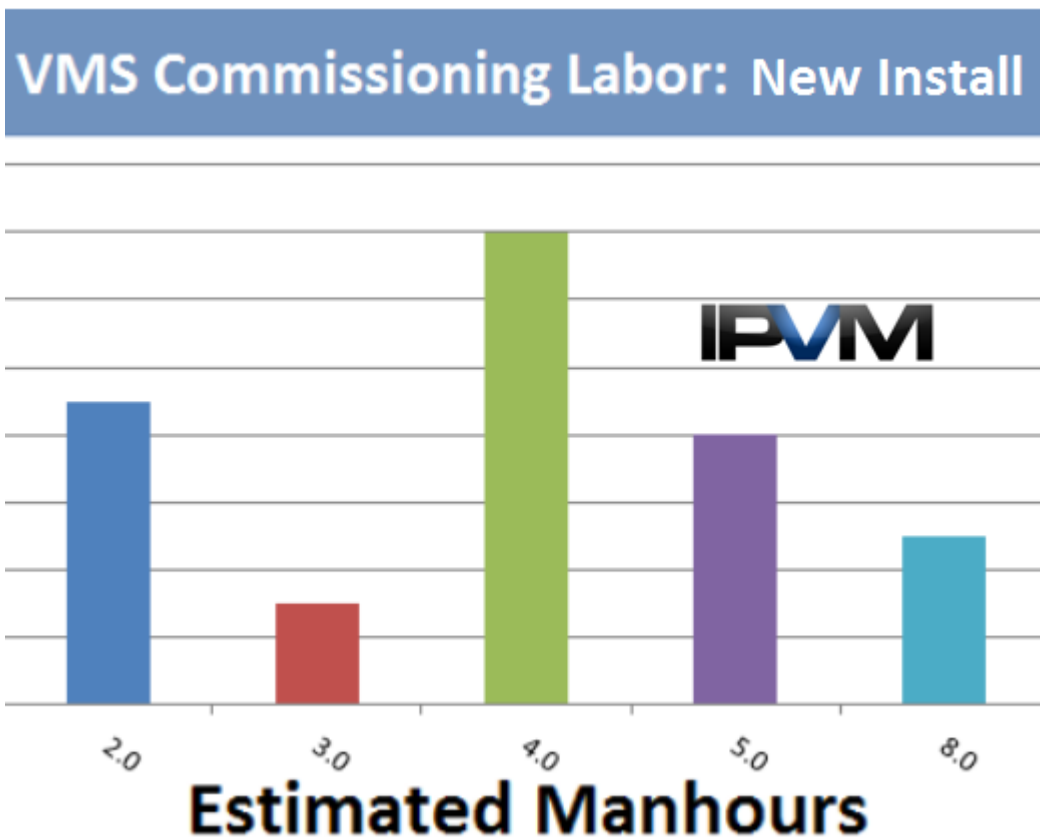
- VMS Installation: 3.1 man-hours per server
- VMS Commissioning (Adding 10 cameras): 4.9 man-hours per 10 cameras, or ~ 30 minutes per camera

## **VMS Installation**

The survey question asked: "How many man-hours would you estimate to install and configure a VMS Server? Why? Which VMS? What impacts this?"

*Results:* Over 55% of all responses fell between 4.0 to 5.0 man-hours.

The full spread is shown below:



#### *Brand Specific*

Many responses mentioned different VMS brands with varying values for each. However, there was no strong trend of one platform general taking longer than others across the board. Rather, the range of times was more related to how familiar the installer was with a given platform, with less time needed for more familiar offerings.

- "5 hours based on Genetec."
- "2 for Genetec. There's a lot of up front configuration to make everything fall in line during the rest of installation."

- "5 hours for Milestone, 4 hours for Exacq But we do alot more Exacq."
- "Avigilon VMS server I'd say 4hrs billed but would only take 1hr unless need to do windows updates the program is very light and an easy install to config."
- "ONSSI/Milestone/Exacq 4 hours for updating and setting up the OS and loading the server with software, documentation."
- "4 - 8 hours depending on how familiar we are with it. Exacq or Salient."

From the range of responses, it is clear than many installers regularly sell a number of VMS options based on customer fit.

### *IT Environment Matters*

The overall condition of the installation network and servers matters, how involved and permissive the customer's IT resources are, and how complex integrating the VMS server with other systems prove to be:

- "4-6 hours - depends on how agreeable IT dept is. If we have prearranged everything and it's going to be an easy job maybe 2-3 hours. Fighting with IT dept's can take up weeks or months."
- "4 Hrs. This is provided OS is installed and all updates are complete. Time will vary subject to network cabinet configuration- has switch been installed, cameras addressed, and so on."

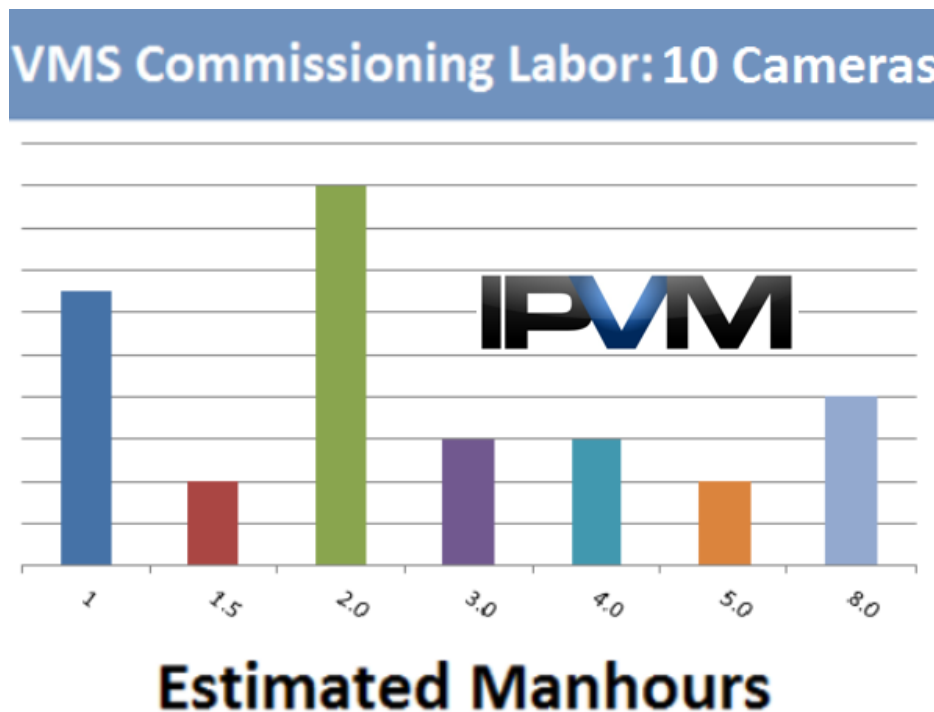
- "This depends on too many factors to have a set answer. Is the VMS preloaded? What is the licensing process? Analytic behaviors? Inputs? Integration depth between the server and the cameras? How many cameras? Management server? Video wall? Scheduled backups? Active Directory? Odd recording schedules?"
- "The least we seem to have estimated is 1 hour for a preloaded server with no frills or features and 5 cameras attached to it. The most I've seen estimated here for one server is 16 hours for a server that had to be tied into Active Directory, cameras that didn't auto-discover, and these crazy recording schedules."
- "8 man-hours for a customer provided server. Factors that can impact this time can include internet connection speed, if done remotely, incorrect server configurations from OEM or customer, downloading the installer, and pre-requisites that have to be installed. This is most of what we do, so we have automation scripts written to handle a tremendous amount of the configuration. There are simple tricks that can be done to streamline installs. From out of the box to in the box we can have a server ready to go in 30 minutes or less."

## **VMS Commissioning**

The next survey question asked: "How many man-hours would you estimate to add 10 cameras to a new VMS? Assume cameras already are

installed and have IP addresses preconfigured. The effort includes fine tuning 10 cameras for production recording and live viewing in the VMS."

*Results:* Of all 15 labor questions we asked, this one had the broadest range of answers. Half were between 2.0 to 4.0 man-hours, with the average being 4.93 across all of them. The full spread is shown below:



#### *Product Dependent*

The major variable influencing time estimated is how familiar the installer is with the platform and how well the individual cameras are supported/integrated with the VMS. In this case, the fastest values suggested direct camera support rather than ONVIF support:

- "Probably about 15 minutes per camera depending on customer requirements and the type of VMS."
- "Max. 3 hours if it is for us known type of VMS with Axis cameras."
- "We can do a 10 camera system in a max of 3 hours with Avigilon."
- "30 min each based on Genetec and supported cameras."
- "2 MH total for 10 cams. We could be checking for bitrate issues, or adjusting WDR settings. When using DW Spectrum, it will alert us if any cam isn't recording or functioning."
- "Under most of the higher end VMS with wizards and generalized drivers or ONVIF I would include 5 minutes per camera for each camera to setup everything to ensue it is recording to the proper location, named appropriately, etc. Under some of the more cumbersome VMS I might double that."
- "4-6 hours (if its a VMS we know and use) but it could be longer for no name Onvif cameras."

### *Ranges Very Common*

However, not giving a single value estimate was common, with many integrators instead listing a range and an 'it depends' condition. This indicates the variability introduced by the demands or condition of individual systems and the equipment used:

- "Depends on the user interface of the VMS really, some can be done in 5 minutes flat for all 10. Some others can take one hour."



- "5 - 10 hours. Our standard is 1 hour per camera to add to a system. New systems that we install from scratch we can usually get by with 1/2 hour."
- "2 hours ...in a perfect world."
- "We aim for 3 hours, but plan on up to 8 hours."
- "1-3hrs, bringing the cameras up and getting to record is quick, but the fine tuning of the motion and such will take longer, also if they have to be labeled and more."

## Cable Labor Estimate Standard - Ceiling Runs

Running cabling is routinely one of the biggest costs on a new project, and being able to estimate basic costs is an important first step for end users and installers alike.

In the second entry from our IPVM Install Labor Estimate Standard, we focus on the most common and time consuming aspects for running new cable.

### Two Common Scenarios

We asked survey takers to give us their typical installation manpower estimate for 50 feet of new cable run overhead, providing an image and text description:

Low Tile Grid Ceiling: "This location has no existing raceways or hooks, with no access from attic space above. How many hours would you estimate to run cabling in a 50' (~15m) length of the acoustic tile/drop grid, 9 foot high ceiling type below? Why?"



High Hard Panel Ceiling: "This location has no existing raceways or hooks, with ample access from attic space above. How many hours would you estimate to run cabling in a 50' (~15m) length of the solid panel, drywall sheathed 12 foot high ceiling type below? Why?"



Inside, we provide estimates and color commentary on the key factors impacting those estimates.

### **Low Tile Grid Ceiling**

"This location has no existing raceways or hooks, with no access from attic space above. How many man-hours would you estimate to run

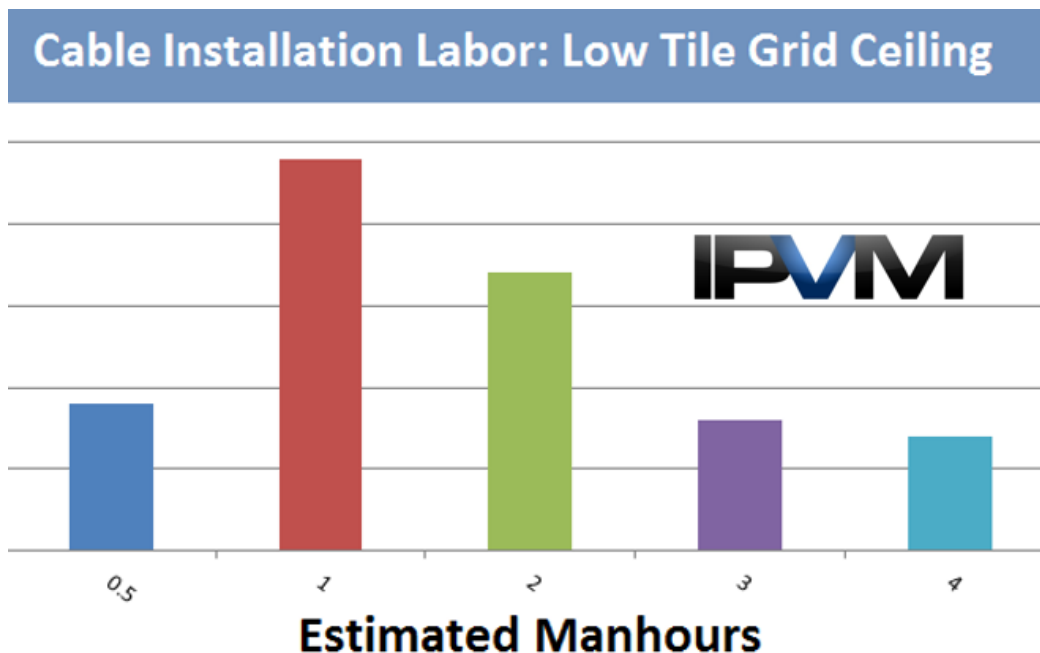
cabling in a 50' (~15m) length of the acoustic tile/drop grid, 9 foot high ceiling type below? Why?"

This picture accompanied that question to illustrate the environment:



*Results:* Over 60% of the responses fell between 1.0 to 2.0 man-hours.

The full spread is shown below:



#### *Installation of Cable Hooks/Hangers: Biggest Cost Variable*

We did not address any details regarding the methods or requirements of installing a run of cable, instead leaving details like code requirements, or cable hanging details to be illustrated by the responder. In general, the biggest driver between short and long install times was the inclusion of hangers above tiles.

In several cases, the addition of installing raceway or hooks doubled the estimate:

- "Pulling cable 50ft through drop ceiling would take approximate 2 hours. The most time will be for installing jhooks to keep wiring off of drop ceiling. Some time you run into issues where the duct work and other mechanical structure delay pulling the cable."

- "2.0 hours. a. open ceiling tiles, b. mount J-hooks or other cable management, c. run pull string, d. pull cable, e. test cable continuity, f. replace tiles & clean up."
- "We can do 50' in 1 hour with ladders and existing cable trays, but it could easily take 4 hours if we install them new."
- "3hrs possibly longer..this is tricky you possibly could run the cabling in inside offices provided they are accessible then come back out into the hallway. If not I would install plastic raceway Panduit and fittings let dry overnight and then snap in wire. I usually run clear silicone glue on the double face tape as a precaution to help support wire...been behind jobs to re-glue raceway where tape does not hold weight of wire."
- "2.0 man hours. Will provide "bat wing" clips and 1" rings on pencil rods every 8'."
- "From past experience I usually would estimate 50 ft per hour. If existing raceway or hooks 100 ft per hour."

### Hangers Not Always Used

However, several installers noted they install cables just by laying them atop tiles. In many areas, this practice is not permitted by code and can be the source of issues or a safety hazard, but in general those mentioning installation without hangers estimated smaller times:

- "0.5 hour to run as cable runs in drop ceiling are easiest. Cable can lay on grid if customer has no problem with it."

- "Not sure if I am being asked to put in the hooks in or not. In my experience, most people just say put a cable in and make it as cheap as possible. 1 hour pop ceiling tile pull cable and drop tiles back."
- "No more then 1 man hour especially if you can just leave cables laying on the dropped ceiling and not to put them in some kind of cable canal."
- "0.25 man-hours if we are running cables overhead in the shortest path. It will take more time to run it through hooks."

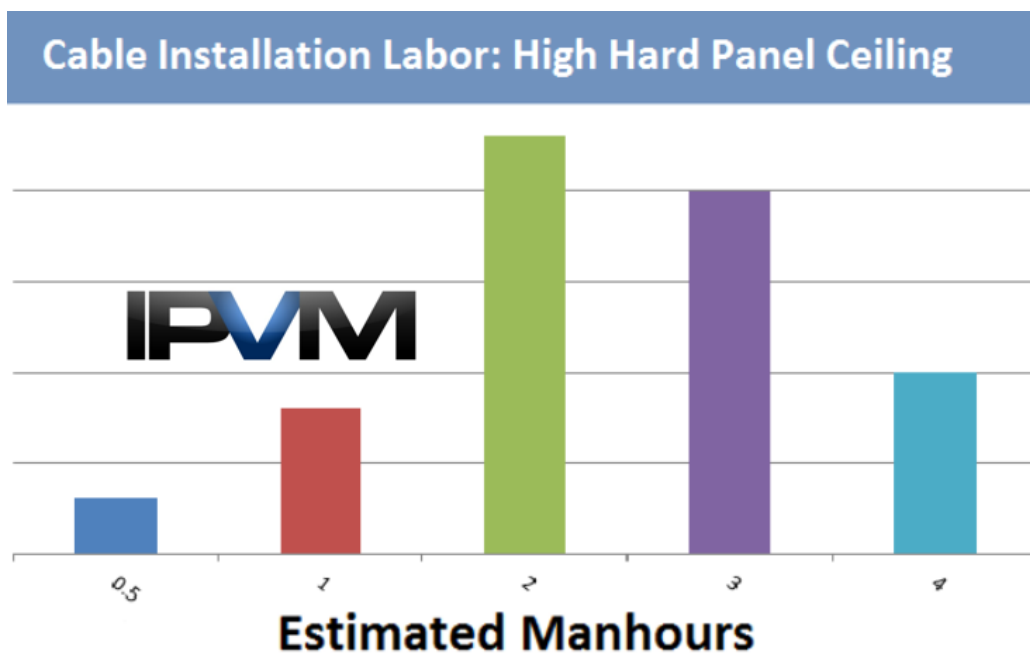
The average of all answers is 1.85 man-hours for 50' of cable run above a grid ceiling.

### **High Hard Panel Ceiling**

This location has no existing raceways or hooks, with ample access from attic space above. How many man-hours would you estimate to run cabling in a 50' (~15m) length of the solid panel, drywall sheathed 12 foot high ceiling type below? Why?



*Results:* Over 66% of the responses fell between 2.0 to 3.0 man-hours.  
The full spread is shown below:





The second scenario was answered with less certainty across the board, with 30% of the answers outright giving a range rather than a single value. In many cases, the uncertainty translated into a hesitant response without actually being able to see the site firsthand:

### *Seeing is Believing*

- "I've been climbing in attic 30yrs or so without looking first I honestly cant tell you. "
- "Probably 2 hours but would depend on what the attic space looked like and how to gain access especially between firewalls."
- "I would estimate 3 hours. Even though the attic has ample access space, it can take time to be diligent about getting holes in the right spot the first time, there is little to no forgiveness with drywall."
- "I would strongly consider changing it to 6 total man hours, depending on how hard the site is to access."
- "We need to see what's up there before giving a number. There's just too many potential obstacles to do it blind."

### *Attic Access Important*

Many answers also suggested the final estimate is subject to how easy access really would prove to be. In general, the restricted access of a hard ceiling drove estimates higher than a grid tile space of the same length:

- "1 hour, if for sure you have access from above"
- "2 men 2 hours each - pulling through attic space verses drop tile"
- "1 hour to run cable minimum. Would vary depending on access to attic is enough for tech to walk above ceiling or just pop up through hatch to fish cable across. Also depends on obstructions on the attic or in the area where the attic hatch is located. (e.g. closet full of junk)"
- "Accessing the ceiling is cumbersome, but once up there, the cable run should be fairly quick."
- "2hrs. 1 technician. With easy roof access, cable would be run very quickly and efficiently."

The average of all answers is 2.51 man-hours for 50' of cable run above a hard/ drywall sheathed ceiling.

### **Longer Lengths Scale**

We specifically asked our survey pool to estimate 50 foot runs, but the answers they gave typically scale for longer continuous lengths. For example, running 100 feet of cable in a grid/tile ceiling system reachable by ladder can be estimated at 3.5 - 3.75 man-hours.

The exception to easy scaling these estimates are when obstructions like firewalls or other overhead mechanical obstructions like ductwork pop up. Our 50 foot estimates are based on a 'clear' run with no such obstructions

## Camera Labor Estimate: Low Tile / Grid Ceiling

IPVM is launching the first surveillance labor estimate standard.

This is the first entry in that series.

Here, we report on a common scenario "Mounting a Camera in a Low Tile/Grid Ceiling." The actual survey question asked is:

"The location has 1/2" thick fiber acoustic tile suspended from grid, with no existing backing material or needed plenum rating, located 8' - 10' above the floor. Cabling has previously been run and terminated to the mounting spot. How many man-hours would you estimate for mounting a camera in the following area? Why?"



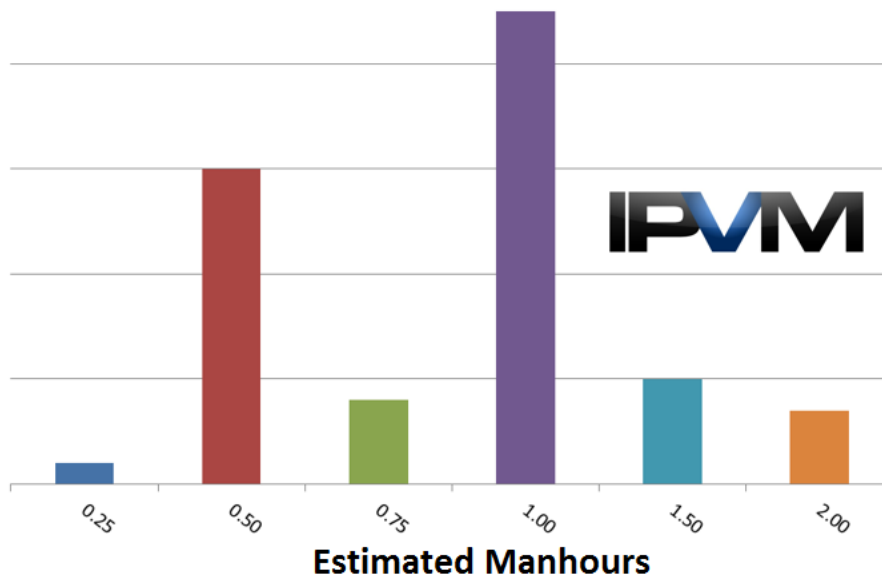
We purposely reduced the question scope to only mounting the camera, and disclaimed tasks like running cable, configuring cameras, and adjusting VMS as separate tasks addressed by followup questions.

Below, we share estimates, key issues and drivers for installing in this scenario.

## **Results**

Over 75% of all responses fell between 0.5 to 1.0 man-hours. The full spread is shown below:

## Camera Mounting Labor: Low Tile Grid Ceiling



The average of all answers is 0.94 man-hours for this location.

### Color Commentary

The majority of responses fell within 0.50 of each other, and clearly suggest that most installers estimate the task in one man-hour or less:

- "1 to 1.5 man hours, easy install very little risk"
- "1 hour for camera mounting. Easily done from a step ladder."
- "1 hour max. An experienced installer should be 0.5 to 0.75. Give yourself an 0.25/hr buffer."
- "One man hour is sufficient. This is a ground floor install needing a simple 6 ft ladder in a controlled environment with no need for dust control.."

- "I would put this at 1 man hour. Mounting the camera would not be the most time consuming part, but still need to leave time to cleanup since you never know how bad it is above one these ceilings."

Even when responses indicated more total hours, it was generally due to including additional tasks like cable termination or camera focusing that fell outside the question scope. Those results were not included in the distribution above.

#### Tile Reinforcement: Biggest Cost Variable

One aspect of the install not addressed by the question was whether or not the tile needed to be reinforced first. We deliberately did not include this detail, as to avoid biasing the answers to a specific mounting approach (i.e.: Not permitting use of grid clamps, if preferred). In most cases, if installers discussed tile reinforcement, their estimates were higher.

- "About 45 min. I have to install a backbox across the bridge, cut the tile, install and adjust the camera and then clean up."
- "I would estimate the camera install to take 1.5 hours. This is due to needing a mounting bracket to be installed across t-rails and physical mounting."

- "You need about 1 hour and 30 min to mount the camera since you need to drill and catch the cables and be able to enforce the back of the camera to be hold on the ceiling."
- "1.5 hour to mount. This is allowing for mounting of a dome that has been pre-configured with the correct IP address. Technician will remove tile, make cable hole, mount camera using a wooden back-plate."
- "1 hour minimum, depending on the camera model. We will typically install a "Caddy bar" support that spans the grid, and that supports the weight of the camera, which is mounted through the tile."

### Minimums Apply

Several integrators noted they would not estimate under a certain limit, even if the task ultimately took less time:

- " We only charge in increments of half hours. We'd estimate 0.5/hr. If the cabling is truly right on the spot this should be an install any tech can do within a half hour as long as there is nothing above the tile blocking the path."
- "It is hard to do anything in less than 1 hour. We'd estimate that for this (example camera)."
- "2 hours because it's our minimum charge."
- "We never estimate mounting under 1 man-hour, this one would probably be 2."

Our question made no distinction between the estimate being for a sales/service call, or as part of a bidded project. However, that situation could impact how much time is estimated purely on the logistics of moving tools, setting up, or otherwise 'making a job worthwhile'.

### Volumes Matter

Another condition that affects estimated task time is whether the job is hanging a single camera, or if it is one of several. In every case, the 'single camera' estimate was higher than if it were just one in a group:

- "Probably 1 hour - depends on the number of cameras being quoted like this however."
- "For (1) camera only, 3 hours. (arriving at site, getting "oriented", etc.) If say, (5) cameras on this hallway or hallways close by, I would say 1 hour orientation and then 1 hour each camera."
- "If this was a single camera installation, you're getting billed for 4 hours. However, if this was a multiple camera install, you'd get 30 total minutes for this one. "
- "1 Hour if is just a single camera installation, if more than 1 camera its going to be installed in 0.45 hours/ camera."

For larger jobs, the estimate per camera may fall according to economies of scale.