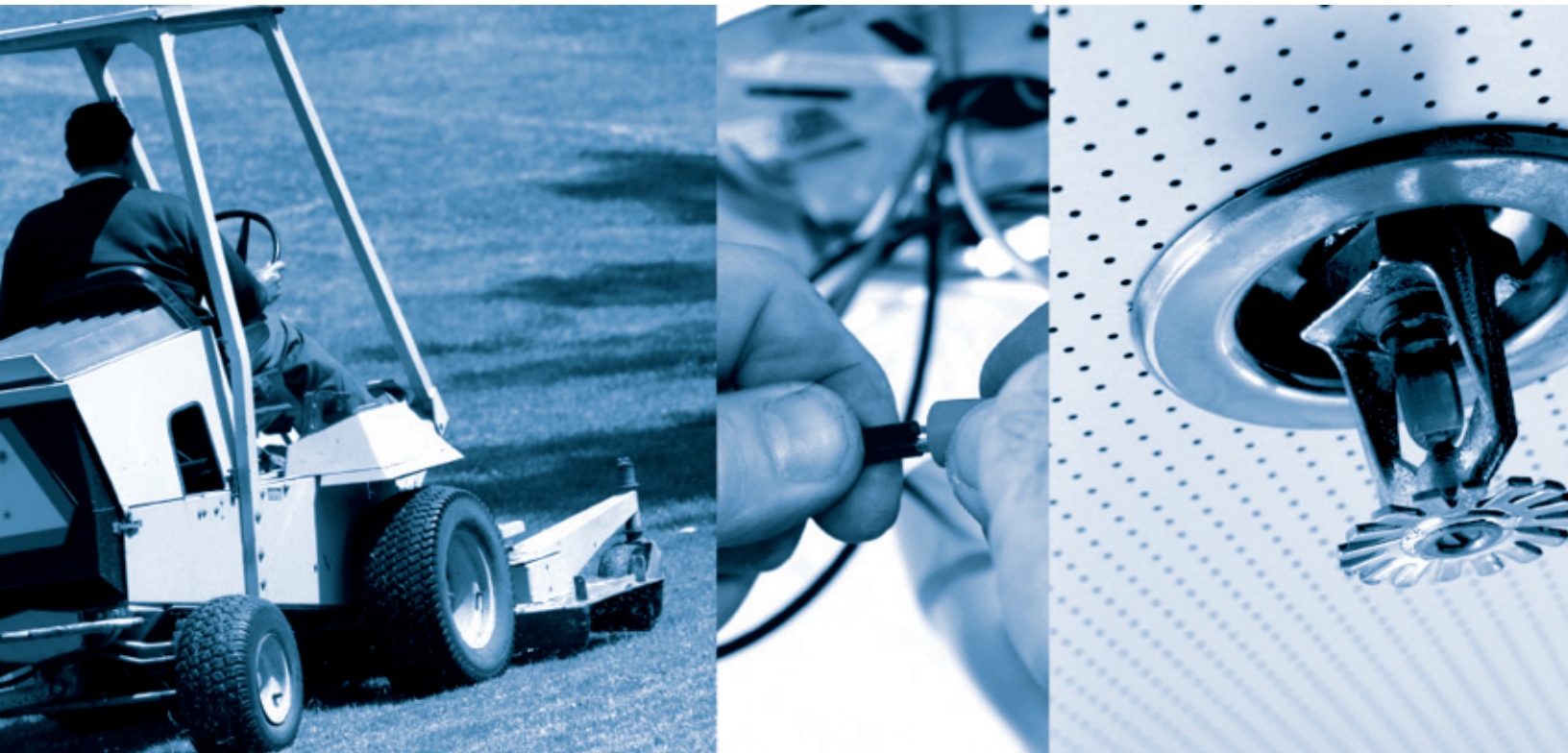


CHURCH FACILITIES MANAGEMENT: THE FACTS

(AND NOTHING BUT THE FACTS, SORT OF)



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I used to love to watch *Dragnet*, and Joe Friday:
“Nothing but the facts”.

If you are my age, which is really young (oops, if I reference *Dragnet*, then I guess I am not all that young), then I am sure you have used the “facts, and nothing but the facts” line.

Well, this document is the same kind of thing. It is the facts tied to facilities management, cost of ownership, and cost of operation associated with ministry facilities: Why should we maintain our facilities? What are the direct and indirect costs? What is the cost of deferred maintenance in lieu of preventive maintenance? How does on-site staffing compare to outsourcing? How much should be allocated for facilities management in our budgets? What kind of capital reserve account should be established? How do Life cycle costs impact our budgeting, and many other issues?

Let’s first explore some facts from people far smarter than me (doesn’t take much – most of the brain cells die with the birth of the kids).

The International Facilities Management Association (IFMA) is the world’s largest and most widely recognized interna-

tional association for professional facility managers, with more than 19,500 members in 60 countries. The association’s members, represented in 125 chapters and 15 councils worldwide, manage more than 37 billion square feet of property, and annually purchase more than \$100 billion (US) in products and services. These are some smart people with far more experience than I have on the topic of facilities management (www.ifma.org). Every year, IFMA produces a research report entitled “Operations and Maintenance Benchmarks”. For the 2008 report (available for purchase on the IFMA website) the association distributed questionnaires to over 10,000 facilities managers, and received back over 1,400 usable responses for tabulation purposes. From these tabulations, IFMA reported some very interesting statistics. The following are results directly from the report (with some commentary from myself and others):

THE FACTS...

FACT #1: CURRENT REPLACEMENT VALUE (CRV)

The CRV index represents the level of funding provided for maintaining an organization's capital assets. This percentage is derived by dividing total annual maintenance by current replacement value converted to a percentage. The concept of CRV has been explained very clearly by Kevin Folsom (<http://facilityportfolios.googlepages.com/home>) who is the Facilities Manager at Dallas Theological Seminary. His article entitled "**sustainable facilities**" vs. **Sustainable Facilities**, really makes this concept come to life. Again, he is one smart guy.

The 1990 National Research Council report "Committing to the Cost of Ownership: The Maintenance and Repair of Public Buildings" recommends a budget allocation for routine maintenance repair to be in the 2-4% range of the aggregate CRV. This is in keeping with research indicating that buildings deteriorate at a rate of about 2% per year.

According to the IFMA report, the 2008 average CRV Index was 1.55% for all the respondents. This is a decline from previous years, which may indicate one of several things:

1. Reduction in property replacement values, given the decline in real estate value and a very soft construction market
2. Scaling back on these costs due to the current economic conditions

So how much money should your ministry be allocating to your maintenance and repairs (NOTE: This does NOT include janitorial)? Let's use the 1.55% as a benchmark, per the report, but I believe that 2% is much more in line, depending on the age of the facility.

EXAMPLE:

For the purpose of this example, let's make some assumptions:

1. Facilities are 60,000 SF
2. The replacement cost for the facilities is \$150/SF (NOTE: This will vary depending on geographic location, type of structure, systems, etc.)
3. $CRV = 60,000 \text{ SF} \times \$150/\text{SF} = \$9,000,000$
4. $CRV \text{ Index} = \$9,000,000 \times 1.55\% = \$139,500$

In this example, the church should allocate at least \$139,500 for maintenance and repairs, just to remain static with the ongoing upkeep of the facilities. If your facilities are relatively new, say less than 5 years old, this may be adequate. However, if your facilities are 10+ years old, then I would suggest pushing this closer to \$180,000, which is the 2% or normal deterioration. If your facility is much older, say over 10 years old, and has not had a regular preventive maintenance regimen, then you may actually need to scale this percentage up to 3-4%, even if you do it gradually over the next several years. According to research, if you do not keep pace with the 2% deterioration of your facilities, the rate of deterioration is compounded, and can more than double the 2% rate.

How much money should your ministry be
**allocating to your maintenance
and repairs?**

FACT #2: MAINTENANCE COSTS

The IFMA report has broken this analysis down into subsections that will allow us to do some comparisons. The several categories we will look at are:

1. Geographical Region – Mid Atlantic in particular, as it includes the Carolina's (God's country)
2. Facility Use – specific to religious use (NOTE: This only represented approximately 8.5% of all respondents, so it may not be fully representative of churches, which is why we will consider the other categories)
3. Mean of the Respondents
4. Age of Facilities
5. Roads and Grounds Costs – Based on dollars spent per developed acre

NOTE: As with the CRV Index, these costs do NOT include janitorial service or utility costs.

Let's look at each of these individually to compare the data and develop some bench marking for your facilities:

1. GEOGRAPHICAL REGION: The report subdivided the respondents into 11 "regions," with Canada being one of the 11 regions, and the balance being the continental United States. The Maintenance Cost, based on dollars per square foot, ranged from \$1.75/SF to \$2.68/SF. The Mid-Atlantic represented about 13% of the total and reported a factor of \$2.21/SF

2. FACILITIES USE: As stated above, "religious" use represented about .8% of the respondents. The factor for these facilities was \$1.78/SF. Compared to other facilities, this "feels" low to me – just my gut feeling. Let's compare:

- a. **City Government:** \$2.20/SF
- b. **Education:** \$2.28/SF
- c. **Banking:** \$2.47/SF
- d. **Health Care:** \$2.85/SF

I'm sure you will agree that the \$1.78/SF may need to trend up closer to some of its "cousins", particularly as you

consider the particular use of your facilities. If you have a daycare or school, you may need to do a blended factor that takes into account the use factors above.

3. MEAN: The mean of the respondents was \$2.22/SF. As I indicated above, I think this factor may be more in line than the .8% of respondents that indicated their facilities were for "religious" use.

4. AGE: I found this section to be very interesting, but not surprising. The report indicates that the maintenance cost for facilities that are five years old compared to facilities that are 51-100 years old almost doubles. Given our discussion in the CRV section above, this supports the premise that we should be taking multiple factors into consideration as we consider our maintenance budgets. The average factor for facilities between the age of 5 and 50 years old was \$2.40/SF, with the spread being from \$2.16/SF to \$2.83/SF. Here is another interesting little tidbit from the report: of these costs, on average, 42% of the costs were for preventive maintenance, while the other 58% was allocated to "repairs."

5. GROUNDS: I had never looked at grounds (landscape, yards, sprinklers, parking lots, drives, parking lighting, sidewalks, playgrounds, etc) in this way, but it makes sense and has opened my eyes to how to consider these things. The report breaks the analysis up into several subgroups:

a. Facility Use: In this section, "single buildings" had a cost factor of \$5,233/Developed Acre. "Multiple buildings, one location" factored at \$5,262/Developed Acre.

b. Facility Setting: Facilities in "Suburban" setting had a factor of \$5,125/Developed Acre, while those in a central business district increased to \$6,853/Developed Acre.



So, what can we conclude from the above? Here are some rules of thumb that I would suggest we adopt:

1. The \$1.78/SF for “religious use” must be coupled with the overall use of your facility. With the Mean factor being \$2.22/SF and the Mid-Atlantic Region (I am truly sorry for any of you that do not live in this part of the country) at \$2.21, I would suggest that we use the wisdom of Solomon and “split the baby” – use \$2.00/SF
2. For our grounds, I would suggest that we use a factor of \$5,200 - \$5,500/Developed Acre as a bench mark, but your individual setting and preferences will dictate that rate.

So, let’s go back to the example we used in the CRV section above. If our facilities are 60,000SF, and we apply the maintenance cost factors from above, we should be allocating \$120,000 for our facilities maintenance. If this facility is located on 10 acres, you should consider budgeting \$52,000 - \$55,000 for grounds maintenance and upkeep. I’m not sure about you, but I’m seeing a trend.

FACT #3: COST OF UTILITIES

As we look at our operating budgets and the cost to keep our facilities functioning at peak performance, we must look at the gift that keeps on giving (or taking) – utilities.

As above, the report looked at several subsets for this analysis, including Geographical Location, Mean and Facilities Use. Here are their findings:

1. **Geographical Location:** Again, we will focus on the Mid-Atlantic region as it is closest to home for me. The report indicates that the cost/Square Foot for all utilities (including electricity, gas, fuel oil, steam, water and sewer) is \$2.23/SF.
2. **Mean:** The mean is \$2.56/Square Foot
3. **Facilities Use:** for the .8% of “religious” facilities, the factor is only \$1.63. That’s almost a 57% reduction from the Mean.

The factor for religious use facilities being lower than the Mean or other uses is not really a shock. It was the lowest

...the gift that keeps on giving (or taking)...

UTILITIES

of the 31 use categories with the highest being “Research” facilities which topped \$4.00/SF. I was surprised, though, that Religious use was even as high as it was. For years I have suggested to churches that they budget \$1.25/SF and, in most cases, that works well. In doing some recent research on my own, I have found that many churches – particularly ones that have facilities where large portions of the campus are only used a couple days a week – are averaging closer to \$1.00/SF. Given facts from the report, as well as my own research, I would hold firm on my suggestion that churches budget \$1.25/SF. So if you have a 60,000 SF building, it would be prudent to budget about \$75,000 for your utilities. Again, your particular use and number of days and hours used each week must be considered and accounted for appropriately, up or down.

FACT #4: JANITORIAL

I must admit that this is an area of facilities management in which I see the greatest fluctuation and the most turn over in staff/vendors. How clean is clean enough? There are so many personal preferences with cleaning and janitorial services that it may be hard to give a real definitive recommendation, but we will try.

For the sake of the report, IFMA defined janitorial costs to include wages, benefits, staff support, supervision, administration, supplies, paper goods, and non-capital equipment. Based on the report, the average janitorial cost jumped by approximately 19% from the prior year, although there were some regional and “facility use” reductions.

The report included the following subsets:

1. Geographical Location: The Mid-Atlantic factor is \$1.77/SF

2. Mean: \$1.55/SF

3. Facilities Use: Only .4% of the respondents indicated their facilities were for “religious use”. This subset reported a factor of \$1.48/SF

Given the above data – and only that data – I am inclined to recommend that your ministry budget about \$1.50/SF for janitorial costs. This is far less concrete for me than the first three “facts”, so your current track record may be a much better indicator of future costs.

FACT #5: COST OF OPERATION

We have looked at all the pieces and parts, so let’s explore the total cost factor. As we did with Maintenance Costs, above, we will look at the four primary subsets from the report. It reminds us that, due to different sample sized for the above items, the factors in this section may not total the sum of the other sections. In addition, this section takes into account the costs of maintenance, utilities and janitorial. Here are their findings:

1. Geographical Location: According to the report, the Mid-Atlantic factor is \$5.79/SF

2. Facilities Use: In this section, the religious facilities represent only .1% of the aggregate. The factor in the report is \$5.17/SF

3. Mean: \$6.54/SF

4. Age: For facilities over five years old to 50 years old, the factor is \$7.05/SF. Interesting fact: according to the report, once these facilities exceeded 10 years of life, their total operating cost jumped by about 24% from the 5-10 year old bracket. Again, this should not be

surprising when you consider the cost to maintain and operate an aging facility.

An interesting analysis the report points out is in regard to the distribution of the 3 major contributors to the total cost of operation (maintenance, utilities and janitorial). They found the breakdown to be as such:

1. Maintenance: 35%

2. Janitorial: 27%

3. Utilities: 38%

So how does this compare to the earlier “facts”? Well, first I would suggest that the \$5.17 indicated in the report for religious use is on the low side of reality, particularly when you look at the small sample group (.1%). I would suggest that given the Mean and the Geographical Location factors that \$5.50/SF would be much more in line.

If you can take that leap with me, let’s breakdown the above percentages into this adjusted factor:

1. Maintenance: $\$5.50 \times 35\% = \$1.95/\text{SF}$

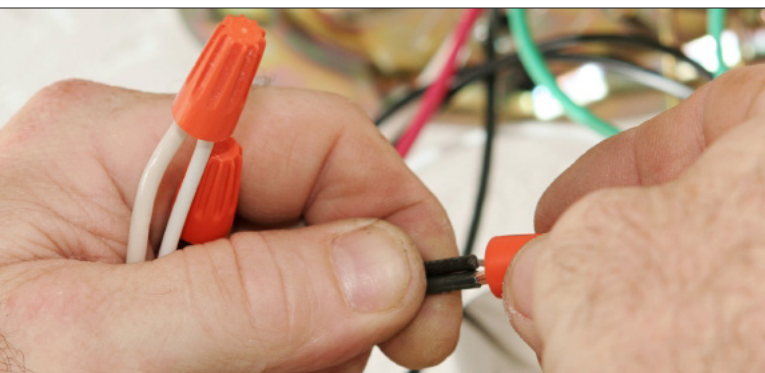
2. Janitorial: $\$5.50 \times 27\% = \$1.48/\text{SF}$

3. Utilities: $\$5.50 \times 38\% = \$2.09/\text{SF}$

Now, let’s look at how that compares to the individual assessments from above:

Based on Individual Reports	
Maintenance	\$2.00/SF
Janitorial	\$1.50/SF
Utilities	\$1.25/SF

As I look at this, it appears that our individual category projects for maintenance and janitorial hold true to the extrapolated calculations, but that the reports understanding of utilities cost may be 40% off, on the high side. Now, I also am fully aware that the janitorial number may be high depending on your means, methods and staffing for your particular situation and facility, but the maintenance costs are pretty consistent from the report to what other researchers have indicated.



FACT #6: “GREEN”/SUSTAINABLE FACILITIES IS NOT A FAD

When the term Green Building came out, I thought it was a fad. I had envisioned a bunch of tree huggers huddled in Oregon (no offense, I was born in Portland) eating granola and twigs while conjuring up ideas to make our lives miserable. Green, sustainable, and LEED are terms that are becoming vernacular to people who are associated with the development and maintenance of any facility. The idea behind these movements is far more than just “tree hugging” – it makes good business sense. Not just to take care of the planet God has entrusted to us (that is a more detailed topic for another day), but also to reduce operating costs and, in most cases, a lot of cost.

Let’s look at some examples:

EXAMPLE 1: Exit signs

Have you ever considered the cost of running power in the exit signs in your facility? Do you think it is insignificant? I did, until I read a report developed and released by US EPA and Department of Energy. I was shocked (refer to Exhibit A to see the actual report and assumptions). But here are the Cliff Notes versions for those of you waiting for the movie to come out:

1. Most existing exit signs utilize incandescent light bulbs which use about 40 watts per sign.
2. The new LED exit signs only use 2.9 watts per sign.
3. The average life of an incandescent bulb in an exit sign is just over a quarter year, so you will have to replace the bulb about four times a year.
4. There is not maintenance on the LED lights.
5. At an electricity rate of \$.103 per kWh, the LED will use about \$100/year less than its incandescent grandfather.
6. The Life cycle cost to use the LED is a savings of about \$1,000.
7. When you subtract the cost of the new fixture, which is about \$39.00, you still have a significant savings.

GREEN...SUSTAINABLE...LEED

Green, sustainable, and LEED are terms that are becoming vernacular to people who are associated with the development and maintenance of any facility.

Now, go through your building and calculate how many exit signs you have and tell me if going green is still just from tree huggers (by the way, I love trees too). We have included a Case Study Worksheet at the end of this report for your use in evaluating the potential impact of making this change. For the sake of this case study, we cut the EPA/DOE projects of savings by 70% to take into account some potential overly optimistic calculations by the government.

While we are on the topic of cost savings for light bulbs, have you looked to see if you can utilize compact fluorescent bulbs – you know, the funning looking spiral bulbs? They require about 75% less energy and last about 10 times longer (according to www.energystar.gov). I actually made the switch with about 60% of the bulbs in my house and have seen a significant electrical savings due not only to the reduced electrical load, but also the reduced heat of the bulbs, which meant the A/C did not have to work as hard.

EXAMPLE 2: Would someone please turn off the lights?

How many times have you said that at home? My kids (and my bride of 25 years) are notorious for leaving lights on. I can tell you how many church buildings and other commercial building I have been in where there is a hand written note next to the main entrance reminding people to turn off the lights. However, inevitably, someone forgets, and the lights burn for hours and sometimes days before the spaces are occupied again. This happens over and over again and it is not just a waste of electricity, but also shortens the life of the bulb and, in some cases, the fixture. It has actually become the building code that certain room classifications and building occupancies are REQUIRED to provide occupancy

sensors in the rooms to reduce this waste. It got so bad in our house that I had the sensors installed in the kitchen pantry and another room the kids are in and out of all the



time. They have worked GREAT!

According to the California Energy Commission, U.S. Department of Energy, and Electric Power Research Institute, there

are significant energy savings can be realized by installing occupancy sensors. The report indicates the following:

APPLICATION	POTENTIAL ENERGY SAVINGS
Office (private)	25-35%
Offices (open spaces)	20-25%
Rest Rooms	30-75%
Corridors	30-40%
Storage Rooms	45-65%
Meeting Rooms	45-65%
Conference Rooms	45-65%

NOTE: Figures listed represent maximum energy savings potential under optimum circumstances and based on manufacturer estimates.

OK, let's take the disclaimer from the report developer and assume you can only realize 50% of the above, that is still a significant amount of savings. It is ongoing savings, which means that the rate of return to the initial investment will continue to grow, as I am sure we all would agree the cost of electricity is not coming down any time soon.

FACT #7: PEOPLE COST MONEY

That may sound obvious to some and crass to others, but it is a true statement. Your church staff costs money. Some of it is direct costs that you can see, touch, and even budget. Others are indirect, and, as such, generally cannot be tracked or determined if the person or time being given to a task is effective or efficient.

One of the primary areas in which I believe we have indirect costs is the cost of our paid staff that serve in a "ministry" oriented position (such as Lead Pastor, Associate Pastor, Youth Pastor, etc) and the other senior level staff charged with administration (such as Business Administrator, Executive Pastor, Pastor of Operations, etc). Mid size churches, say those in the 500 – 1000+/- attendance range or that have 30-60,000 SF of facilities, will most likely have a staff member whose job description includes the administration duties of the church, either in part or whole. Yet these churches are generally not large enough to have a Facilities Manager on staff. In these cases, and in the cases where the Lead Pastor or Associate Pastor is the "administrator", we find that anything associated with facilities ends up on their desk or is pushed down to a volunteer board such as the building and grounds committee.

I recently met with a business administrator for a mid-size church. After several minutes of hearing stories of all the facilities related issues that he was involved with, I asked him "How much time do you spend on facilities-related items?" His answer: "**50%**." Then I asked him how much of that was in his job description, to which he answered "**ZERO**." I am finding this far too often, which means these paid staff people, with ministry and administrative roles, are taking care of items not in their job descriptions, and most times in their giftings or callings. These indirect costs can be staggering.

The National Association of Church Business Administrators (www.nacba.net) developed a resource for its members (of which I am one) to track the pay of ministry staff. Ministrypay.com (<http://www.ministrypay.com>) is an excellent resource for this data and has about 70 job descriptions and titles from which to analyze. The report allows the reader to look at the whole nation, a state or a metropolitan area. You can also break it down by denomination, and even benchmark your own church against the report. So, I pulled data from the report (which you have to pay for to obtain) on the role of "Church Business Administrator/Minister of

Remember the seven words of a dying church: “We have always done it that way.”

Administration”. There were 534 churches that filed data for this position on a national basis. The report shows the low, high, mean, 25th percentile and 75th percentile for salary, retirement, insurance, self-employment, as well as the value of the total compensation package. For the sake of discussion, I want to use the Mean which reported to have a total compensation value of \$77,700/Year (I am not suggesting you are not making enough or are overpaid...this is just for example). If we assume that the job description covers a 50 hour work week, we are looking at about \$30/hour (actually it is \$29.88 but \$30 is easier math for a guy that did not take calculus). If we use my example, above, with the administrator using 50% of his/her time – thus 25 hours – the administrator is “costing” the church about \$3,250.00 per month for the facilities related items. But it is actually worse than that. There is the lost opportunity cost – again, another indirect cost. Not only do you have a senior level staff person spending time in an area that is most likely not his or her gifting or job, the time is being robbed from that person’s real areas of responsibility and passion. What does that cost the church? If things don’t get accomplished, what is that cost? If volunteers are not recruited and trained, what does that cost? If ministries care is not developed and fostered, how do you put a price on that? What if you hired another administrative assistant to pick up the slack, what has that cost the church? If strategic planning is not occurring and the church is functioning on reactive process instead of proactive planning, will the church be able to sustain and grow? How long can your staff members be content performing functions outside of their gifting and passion? These real issues must be addressed because they are costly – more than you realize – and tend to “hide” and catch us by surprise.

What about those who have on-site full time Facilities Managers? I know that many upper mid-size and larger churches have staff to perform the facilities management responsibilities, which helps alleviate some of the issues associated with the indirect costs we discussed above. But are we getting our money’s worth? Please do not get me wrong, I am not recommending that churches should not have staff personnel to perform facilities management duties, janitorial or even handyman service. What I am suggesting is that we evaluate the cost of these services and make sure that if we choose to proceed with the systems and methodologies we have in place, that we understand exactly WHY we are doing that. Remember the seven words of a dying church: “We have always done it that way.” Don’t fall into that trap. Evaluate, analyze, and extrapolate facts, then make an informed decision.

I downloaded another report from MinistryPay.com. This time I selected the job classification of “Facilities Manager”. If we again use the Mean, we have a total compensation of \$54,000 for this position (again – big disclaimer – I am NOT suggesting that this is the right pay grade for you or your church, just reporting data from a third party – don’t shoot the messenger). If we also consider our earlier example of a facility with 60,000 SF, and use the maintenance factor of \$2/SF, we should have a maintenance/repair budget of \$120,000. So the question begs to be asked, is it the right ratio to spend 45% of our total maintenance/repair budget on a single staff person? Now, each case and church is different, so maybe your staff person also does janitorial or can make minor repairs. That is great; but if you look at those individual tasks on a standalone basis, what are you paying for them? I recently talked with some facilities

managers from larger churches. I had several tell me that they generally did not have enough work to consider the job a full time gig. They would “find things to do” which may or may not be essential. So what does that cost the church? Some of the people I talked to are very busy and are actually



managing the facilities and not doing the work. This is what I would call working “on” the facility vs. working “in” the facility. This is the art of staying at a level that allows you to be proactive and not reactive, but so many churches live in the world of the reactive in lieu being proactive. That state of existence costs more and must be done with limited budgets, as well as fully understanding the long-term ramifications of the decision. Not a great place to live.

FACT #8: PREVENTIVE MAINTENANCE IS LESS EXPENSIVE THAN CORRECTIVE REPAIRS (and no, you cannot perform all tasks for less money than hiring a professional service)

For many churches and ministries, this is a tough truth to grasp. When times get tough, we generally will cut or reduce what I call the “non-ministry essentials.” This may be staff positions, programs, or possibly functions. The grass may not get cut as often. The IT director is laid off. A decision is made to change your HVAC preventive maintenance from quarterly to bi-annual. Regardless of the item, these are the ones that get cut first. On the other hand, when we are in an upswing and we are ahead of budget, and have excesses

cash, most churches do not stop and think about setting up a capital reserve account or reviewing their life cycle cost projects (as if they have those anyway) or increasing the maintenance budget. We immediately think that we should add more ministry staff or look at a new building (even if our old buildings are not well maintained). Again – don’t misunderstand – we need to add staff and add facilities and the like. However, we need to balance that with the need to maintain the tools and resources God has entrusted to us.

In a previous white paper (<http://coolsolutionsgroup.com/resources?did=1>) I referenced a real-life example for how preventive maintenance is less expensive than corrective repairs. Allow me to reiterate it again.

While most people do not realize this, exterior caulking of windows, valleys, step flashing and the like should be looked at and redone every year or so. A tube of good quality caulk will cost about \$2-\$3 per tube. To re-caulk a 20,000-square-foot facility, you might need 10-15 tubes and it might take a person 8-16 hours maximum to perform this work. If that person is being paid \$20/hour, the total cost of this work may only be, on the high end, around \$365.

I am aware of a church that did not do this kind of preventive maintenance, and within 10 years, it had to replace most windows and sills due to rot, and had to make other remedial repairs in attic space due to rot and mold. The cost for this corrective maintenance was in excess of \$20,000. If preventative maintenance had been performed, the cost would have only been approximately \$3,650 (\$365/year X 10 years). This represents a difference of \$16,350 that went to corrective maintenance instead of to a ministry initiative. Is that good stewardship?

The next example explores one of the most expensive systems in your building, and one that can save you the greatest amount in life cycle cost and operational savings: the heating, ventilation, and air conditioning (HVAC) system.

“I haven’t spent any money on preventive maintenance for over two years” was a quote shared with me from an HVAC service company about a building owner. The building owner was actually very proud of this fact and was bragging about it. So, the service rep asked if he could tour the roof to do a cursory inspection of the units. Upon arriving on the roof and opening up the service door of the 10-ton unit, he discovered that the filter had never been changed and was so filthy it looked like a “shag rug.” After removing the filter (if you can call it that after it had been transformed to a shag rug), the service rep found a thick layer of filth on the coil. With these two layers of crud and filth, there was virtually no air flowing through the unit. To give you a sense of what this means, consider that you are getting ready to

GOOD STEWARDSHIP?

“I HAVEN’T SPENT ANY MONEY ON PREVENTIVE MAINTENANCE FOR OVER TWO YEARS.”

OR NOT?

drive your car on a 90-degree day and you place a piece of cardboard in front of your radiator. What do you think would happen to your engine? RIGHT, it would overheat. The same thing applies to your HVAC unit. In this case, the service company replaced the filter and cleaned the coils, but the unit was so badly worn that it still failed one month later.

In this case, the service rep told me the cost of the preventive maintenance would have been \$500-750 per year, or \$1,000-\$1,500 for the two-year period. Instead, the owner paid about \$15,000 to replace a two-year old unit. OUCH, that is poor stewardship in my book (see attached case study).

My final example on this topic has to do with painting. Many churches believe they can have “volunteers” perform painting and save tons of money. I have seen others ask their

facilities manager or janitorial staff to perform these same tasks under the pretense that it is saving the church money as the personnel are on staff and “being paid anyway.”

Let me make some assumptions from which to build on this example:

1. We want to paint a room that has 1,000 SF and 9 foot high ceilings of acoustical tiles, so no paint is needed on the ceiling.
2. All of the walls have drywall finish.
3. We are painting the walls the same color as the current color, so only one coat of premium paint will be required.
4. We have a step ladder at the church, but will need to buy a roller, brush, masking tape, drop cloths, roller pan and cleaning material.

This job will require approximately 5 gallons of paint.

I ran this same scenario past an established painting contractor who plugged the above criteria in his estimating program. He estimated the project to cost \$420 for all labor, material and insurance.

I then ran an analysis of the costs of performing this work in-house. Here is what I determined:

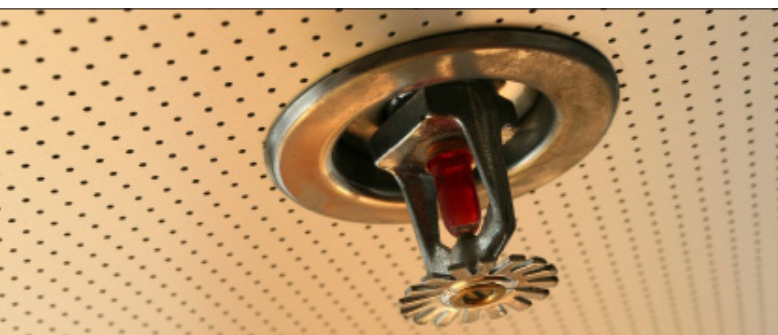
1. 5 gallons of premium paint (due to single coat) at \$30 per gallon = \$150
2. Paint accessories (brush, roller, etc, etc) = \$50

So our material cost alone is \$200 – that leaves \$220 for labor.

If we assume the church is going to have a single person perform the entire job, I estimate that it will take at least 2 full days. This includes the time to go to the paint store, buy the paint, come back to the church, set up the room, mask the room, cut in the room with the brush, roll the room, clean up the base boards from spills and runs, remove masking tape, remove drop cloths and call it complete. If you have a staff person whose time you are

trying to fill up, and that person is paid \$15.00/hour (which means he/she is not a Facilities Manager (as we say above, at \$54,000/year, the hourly wage for a 50 hour week would be about \$21/hour), your labor cost for 16 hours of work would be \$240.00. That is \$20 more than the painter's quote. On top of that, the "staff" person is working under the church's insurance – or no insurance for worker compensation or general liability. Also, the work will most likely require twice the time to complete, which means the room is not available for ministry functions. You may be asking yourself how a professional painter can do this work for less than you can pay a staff person to do it. I asked the same question and obtained a much better understanding of the facts. Here is what I learned:

1. A professional painter with a commercial account at the paint store can buy paint for about 35% less than retail price at that store – or even at Home Depot for an equivalent product.
2. The painter already owns brushes, rollers, pans, etc. that he uses on multiple jobs. If the painter buys a \$20.00 brush and uses it on 40 jobs in a year (brushes generally last 8-12 months), the painter's cost per job is only \$.50. We, as consumers, can't touch that. The only accessory costs for the painter is disposable items such as masking tape.



I believe we get lulled to sleep or end up fooling ourselves, believing we can perform certain tasks for an equivalent or lesser cost than hiring professionals who have the proper insurance and have the right tools and experience to complete the work in a timely manner. I understand that

some of you are saying "Yeah, right!" And for you, I would say that you may be right in being skeptical. I am not trying to change your mind as much as challenge your thinking to make sure you have done the homework to verify your premises are correct.

In conclusion (if I were a pastor that would be your clue that I have three more points), I want to summarize my thoughts, as well as the facts:

1. **To keep pace with the deterioration of your facilities, you should be looking at a 1.55 to 2% budget based on the "Current Replacement Value (CRV)."**
2. **\$2.00/SF is a reasonable amount to budget for maintenance and repairs.**
3. **\$1.25/SF is a reasonable amount to budget for utility costs.**
4. **\$1.50/SF may be a reasonable benchmark for janitorial services, but your own experiences may be a better judge.**
5. **While \$5.50/SF appears to be a reasonable number for total operational costs, a budget of approximately \$4.75/SF may be ample.**
6. **"Green" is far more than being ecologically prudent, it is about reducing costs in the immediate and long term.**
7. **People cost money, so re-look at the direct and indirect costs and understand how the impact your budget, your staff, and your ministry opportunities.**
8. **Preventive Maintenance, rather than corrective repairs, is a far better approach to caring for the resources God has entrusted to us. These are real dollars -- be good stewards of these dollars and resources.**

LIFE CYCLE AND ENERGY MANAGEMENT CASE STUDY: **EXIT SIGNS**

Every facility has them – it is a code and life safety requirement – and they make sense. We want to keep our facility occupants safe and able to locate the facility exits. But how much does it cost to operate those signs? **MORE THAN YOU REALIZE!**

Here are some facts:

1. Most Exit signs utilize an older incandescent technology for illumination.
2. Most of the incandescent fixtures operate on a 40 watt system.
3. The bulbs in these fixtures will need to be replaced 2-4 times a year.
4. The exit signs are required to remain illuminated 24 hours a day, 7 days a week, 356 days a year.
5. LED exit signs require less than 3 watts per fixture.
6. The LED fixtures have significantly less upkeep.

According to the US Department of Energy and the US EPA, the cost savings of the LED exit sign vs. the incandescent is \$100/year per fixture. For the sake of this case study, let's cut that by 70% to take into account some potentially over-optimistic calculations by the government.

If you also are a Duke Power/Duke Energy customer, you have the opportunity to participate in the company's **Smart Saver Incentives Program** which will pay you \$10.00 for every LED Exit Sign that you use to replace the old incandescent.

How much can we save? Let's run an example:

- A. Annual Energy Savings \$30/ Exit Sign
- B. Total Number of Exit Signs _____
1. Potential Savings (A x B) _____
- C. Duke Power Incentive \$10/Exit Sign
2. Initial Incentive (B x C) _____
- D. Initial Cost (Labor/Mat.) \$40/Exit Sign
3. Initial Cost (B x D) _____

SUMMARY:

INITIAL COST (#3 less #2) _____ (X)

ANNUAL ENERGY SAVING (#1) _____ (Y)

FIRST YEAR ANALYSIS (X less Y) _____

FUTURE YEAR SAVINGS (ONLY "Y") _____

LIFE CYCLE AND ENERGY MANAGEMENT CASE STUDY: EXIT SIGNS

LIFE CYCLE COST ESTIMATE FOR 1 EXIT SIGN(S)

This calculator was developed by the U.S. EPA and U.S. DOE and is provided for estimating purposes only. Actual savings may vary.

Enter your own values in the gray boxes or use our default values.

Number of exit signs	<input type="text" value="1"/>		
Electricity rate (\$/kWh)	<input type="text" value="\$0.103"/>		
	Option A		Option B
Type of exit sign	<input type="text" value="Incandescent"/>		<input type="text" value="LED"/>
Initial cost per unit (estimated retail price)	<input type="text" value="\$0"/>		<input type="text" value="\$39"/>
Sign wattage	<input type="text" value="40"/>		<input type="text" value="2.9"/>
Number of lamps per sign	<input type="text" value="2"/>		
Cost per replacement lamp	<input type="text" value="\$1.50"/>		

Annual and Life Cycle Costs and Savings for 1 Exit Sign(s)

	Option A	Option B	Cost Difference
Annual Operating Costs for 1 Unit(s) *			
Energy cost	\$36	\$3	\$33
Maintenance cost	\$67	\$0	\$67
Total	\$103	\$3	\$101
Life Cycle Costs *			
Operating cost (energy and maintenance)	\$1,035	\$26	\$1,009
Purchase price for 1 unit(s)	\$0	\$39	-\$39
Total	\$1,035	\$65	\$970
		Simple payback of initial additional cost for Option B (years) [†]	0.4

* Annual costs exclude the initial purchase price. All costs, except initial cost, are discounted over the products' lifetime using a real discount rate of 4%. See "Assumptions" to change factors including the discount rate. Life cycle costs are based on 10 years of operation, which is the minimum lifetime of most available product types.

[†] A simple payback period of zero years means that the payback is immediate.

Summary for 1 Exit Sign(s)

Initial incremental cost for Option B	\$39
Life cycle operating cost difference	\$1,009
Net life cycle savings (life cycle savings - additional cost)	\$970
Simple payback of additional cost for Option B (years)	0.4
Life cycle energy saved (kWh)	3,250
Life cycle air pollution reduction (lbs of CO ₂)	5,005
Life cycle air pollution reduction equivalence (number of cars removed from the road for a year)	0.42
Life cycle air pollution reduction equivalence (acres of forest)	0.52

LIFE CYCLE AND ENERGY MANAGEMENT CASE STUDY: EXIT SIGNS

ASSUMPTIONS FOR EXIT SIGN(S)

Category	Value	Data Source
Type		
<u>Incandescent</u>		
Wattage	40 W	average for available products
Initial cost per unit (estimated retail price)	\$0	incandescent exit signs are no longer sold so it is assumed they are already installed, making the default cost \$0
Replacement lamp cost	\$1.50	average for available products
Lamp lifetime	0.23 year	average for available products
<u>LED</u>		
Wattage	2.9 W	average for available products
Initial cost per unit (estimated retail price)	\$39	average for available products
<u>Photoluminescent</u>		
Wattage	0 W	this type of sign consumes no electricity
Initial cost per unit (estimated retail price)	\$82	average for available products
<u>Radioluminescent / Self-luminous</u>		
Wattage	0 W	this type of sign consumes no electricity
Initial cost per unit (estimated retail price)	\$159	average for available products
Maintenance		
Hourly labor cost	\$25 /hour	estimate
Installation time per lamp	0.25 hour	estimate
Exit sign lifetime	10 years	minimum lifetime for most available types of exit signs
Calculations for Selected Types		
<u>Option A</u>		
Annual energy consumption	350 kWh	calculated
Annual lamp replacement cost	\$13.04	calculated
Annual labor cost	\$54.35	calculated
<u>Option B</u>		
Annual energy consumption	25 kWh	calculated
Discount Rate		
Discount rate	4%	A real discount rate of 4 percent is assumed, which is roughly equivalent to the nominal discount rate of 7 percent (4 percent real discount rate + 3 percent inflation rate).
Energy Prices		
Commercial Electricity Price	\$0.103 /kWh	Energy Information Administration, Annual Energy Outlook 2009 (Early Release) edition. (converted from 2007 to 2008 dollars).
Carbon Emissions Factors		
Electricity Carbon Emission Factor	1.54 lbs CO ₂ /kWh	EPA's Climate Change Action Plan (CCAP) number for 2009.
CO₂ Equivalents		
Annual CO ₂ sequestration per forested acre	9,700 lbs CO ₂ /acre-yr	EPA's Greenhouse Gas Equivalencies Calculator. http://www.epa.gov/cleanenergy/energy-resources/calculator.html
Annual CO ₂ emissions for average passenger car	12,037 lbs CO ₂ /car-yr	EPA's Greenhouse Gas Equivalencies Calculator. http://www.epa.gov/cleanenergy/energy-resources/calculator.html

LIFE CYCLE AND ENERGY MANAGEMENT CASE STUDY: HVAC #1

“It’s too HOT” or “It’s too COLD” are comments you generally do not want to hear when you are preparing for worship. Yet the fact remains that heating, ventilation and air conditioning (HVAC) systems will fail, breakdown and just wear out. What we need to look at is how to keep them running longer and more efficiently, as well extending their normal life expectancy.

Here are some facts:

1. The effective life of most HVAC systems is 15 years.
2. To reach this life expectancy, you need to perform some level of service.
3. If a systematic Preventive Maintenance process is utilized, the effective life of the system can be extended by as much as 5 years -- maybe longer.
4. The lack of Preventive Maintenance can, and in most cases will, shorten the life of the system below the expected life cycle.
5. The HVAC systems in your facility are the most expensive to maintain and replace and the largest contributor to your energy consumption (50-75% of the utilities load)

According to the American Society of Heating, Refrigerating, and Air Conditioning Engineers (www.ashrae.org), if you do not provide regular cleaning of your condensing coils (the coils on the exterior units), you will **increase your energy consumption by as much as 39%**. In addition, if you **do not routinely clean the evaporator coil (the coil on the inside units) you will consume an additional 19%** of energy.

How much energy would we spend if we did not clean our coils? Let’s run an example:

- A. Facilities SF _____
- B. Average \$/SF of Utilities _____
(Range should be in the \$.9 - \$1.50 annually)
 - 1. Utilities Costs (A x B) _____
- C. Premium for Dirty Coils 30% Annually
(Note: The above indicates as much as 55%)
 - 2. Excesses Costs (#1 x C) _____
- D. Preventive Maintenance \$.15/SF
(This can vary depending on age of units and other variables)
 - 3. Excesses Costs (A x D) _____

SUMMARY:

PREMIUM FOR DIRTY COILS (#1) _____ (X)

PREVENTIVE MAINTENANCE COST (#3) _____ (Y)

ENERGY COST VARIANCE (X less Y) _____

FUTURE YEAR SAVINGS (ONLY “Y”) _____



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Follow us on twitter and facebook.



**“We focus on the facility
allowing you to focus on the ministry.”**

—Tim Cool, president and CSO, Cool Solutions Group, Charlotte, N.C.



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