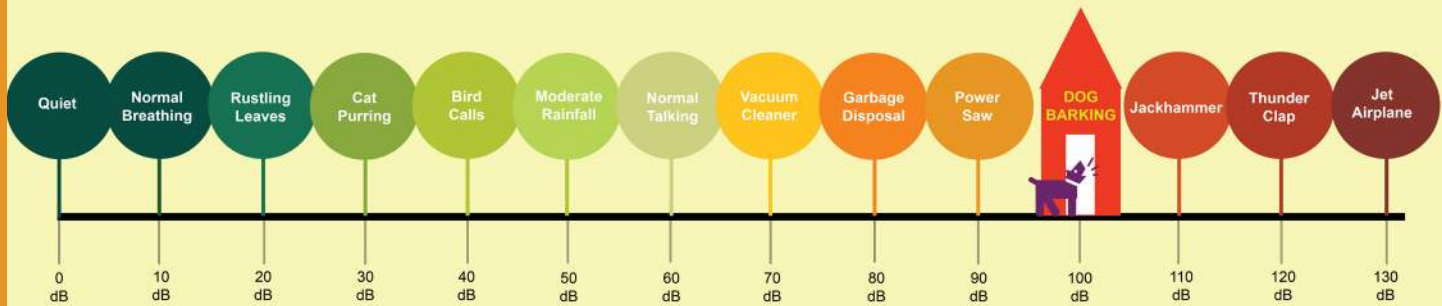




BARKITECTURE

THE BEST SHELTER PAWSIBLE

ACOUSTICAL DESIGN



The noise generated from a room full of barking dogs is the equivalent of standing next to a jackhammer! Proper acoustical design can help manage this noise. There are three basic approaches:

1. LIMIT THE NOISE

- Reduce dog stress and excitement to help reduce barking in the first place.
- House fewer dogs per room. This usually results in many small rooms which can also be beneficial for managing your dog population in terms of isolation and flexibility.
- Minimize dogs seeing other dogs. Avoid kennels facing kennels.
- Look closely at circulation patterns to avoid having to walk dogs in front of other dogs. Provide doors at both ends of kennel rows and hallways.
- Provide soothing background sound..

2. ABSORB THE NOISE

- Sound absorbing materials must be water resistant, durable, easy to clean, and made of products that cannot harbor bacteria or become an odor source.
- Materials are rated with a Noise Reduction Coefficient (NRC) that will define their ability to absorb noise. On a scale of zero to one, the higher the number, the better the product.
- Acoustical ceilings that are rated for wet conditions work well in dog housing rooms. These should always be supported with a rust proof aluminum grid instead of steel. Panels should be no greater than 2'x2' to prevent sagging.

3. BLOCK THE NOISE

- Spray applied acoustical plaster with an NRG of 0.65 works well on the upper wall surfaces of dog housing rooms.
- Avoid mineral fiber acoustical wall panels and ceiling hung baffles that block air flow and light.
- Sound should be contained inside the room with as little transmission to other rooms as possible.
- Walls, doors and ceilings are rated with a Sound Transmission Class (STC). The higher the number, the less sound is able to pass through the material. An STC of 50 is a good goal for rooms housing dogs.
- Heavy, massive walls block noise better than light frames. Concrete masonry walls work well in dog housing rooms.
- Sound will travel through ceilings. Walls should be extended past the ceiling plane to the underside of the roof surface to prevent sound from passing over the wall from one room to the next.
- Glass should be laminated or insulated to prevent as much sound transmission as possible through a window.
- Consider the types of spaces immediately adjacent to dog housing rooms. Separate dog rooms from cat rooms as much as possible throughout the shelter.



BARKITECTURE

THE BEST SHELTER PAWSIBLE

FINISH MATERIALS

Finish materials in animal shelters, especially dog environments, take a tremendous amount of abuse from the daily cleaning and the general wear and tear imposed by the animals. They need to be resilient, easy to clean, non-absorbent, and have non-microbial growth potential. Life cycle cost, or how long a product will last before it needs to be replaced, should also be a key factor in making finish selections. Another consideration should be the amount of staff time needed to clean and maintain the product. The following charts will give you a comparison of available products for high use areas that are often wet.

FLOOR PRODUCTS

	Luxury Sheet Vinyl	Porcelain Tile	Polished Concrete	Epoxy	Epoxy/Cement Urethane Hybrid
Cost	\$	\$\$\$	\$\$\$	\$\$\$\$	\$\$\$\$\$
Durability	Fair Can't withstand heavy traffic or large quantities of water.	Good Will last forever. If chipped, color goes through.	Excellent	Excellent Average life expectancy is 7 years	Excellent Life expectancy is 20 years
Maintenance	Good Requires mopping	Good Grout can get dirty, should be epoxy and a dark color.	Fair Requires frequent polishing	Excellent	Excellent
Slip-Resistance	Good Lightly textured	Good Many options with texture	Fair Slippery when wet	Excellent Can be achieved with flake broadcast	Excellent Can be achieved with flake broadcast
Comfort	Soft Good in clinics	Hard	Hard	Hard	Hard
Installation	Easy Seams should always be welded	Easy Epoxy grout will require more skill	Difficult Requires skilled labor to grind and apply resin coating.	Complex Requires low slab moisture content and skilled labor.	Complex Does not require low slab moisture content. Does require skilled labor.
Base Options	Excellent Can cove up wall	Limited Joint at base	Limited Joint at base	Excellent Can cove up wall	Excellent Can cove up wall
Appearance	Excellent Many options in color	Excellent Many options in color	Excellent Many options in color. Cracks in concrete will show.	Excellent Many options in color. Cannot span cracks in concrete, and they will show.	Excellent Many options in color. Is fluid and able to span minor concrete cracks.

JACKSON & RYAN ARCHITECTS

SHANNON FOWLER, AIA • SFOWLER@JACKSONRYAN.COM

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2370 RICE BOULEVARD, SUITE 210, HOUSTON, TEXAS, 77005



BARKITECTURE

THE BEST SHELTER PAWSIBLE

WALL PRODUCTS

	Fiberglass Reinforced Plastic (FRP)	Painted Concrete Masonry Units (CMU)	Ceramic Tile	Epoxy Coating	Structural Glazed Tile (SGT)
Cost	\$	\$\$	\$\$\$	\$\$\$\$	\$\$\$\$\$
Durability	Fair Joints are not water-tight	Fair Paint is easily scratched off	Good Edges can easily chip	Good Will scratch off over time	Excellent
Maintenance	Good	Poor Repainting frequently required	Good Joints can get dirty	Excellent	Excellent
Corners	Fair Requires batten	Good	Excellent Bullnose shapes	Good	Excellent Bullnose shapes
Joints	Battens Not water-tight	Grout Should be epoxy, tooled flat	Grout Should be epoxy	None	Grout Should be epoxy, tooled flat
Appearance	Poor Limited colors, bumpy texture	Good Unlimited paint colors	Excellent Unlimited color selection	Excellent Unlimited color selection	Excellent Has broad color range

CEILING PRODUCTS

	Exposed Structure	Painted Drywall	Regular Acoustical Tile	Water-Resistant Acoustical Tile
Cost	\$	\$\$\$	\$\$	\$\$\$
Acoustical Value	Fair Spray required on underside of deck	Poor Hard surface reflects sound, no absorption	Excellent	Excellent
Maintenance	Poor Requires cleaning of conduit, ducts, mechanical equipment	Good Requires periodic paint touch up	Fair Requires occasional replacement in wet areas	Excellent Requires occasional wiping
Grid	None	None	Fair Normal grid will rust over time	Excellent Aluminum grid will not rust
Appearance	Excellent High ceiling volume	Excellent Clean and smooth	Good White tiles in white grid	Good White tiles in white grid



BARKITECTURE

THE BEST SHELTER PAWSIBLE

DOORS AND DOOR FRAMES

	Solid Core Wood	Hollow Metal	Aluminum	Fiberglass
Cost	\$	\$\$	\$\$\$	\$\$\$\$
Durability	Poor Will chip and wear in heavy traffic	Fair Metal will rust in wet areas, will dent if hit.	Good Can scratch	Excellent
Maintenance	Poor Wood cannot withstand wet exposure. Will rot and harbor bacteria.	Fair Requires periodic painting. Requires replacement after rusting.	Excellent	Excellent
Appearance	Excellent Can be finished in plastic laminate or paint, unlimited colors.	Good Can be painted, unlimited colors. Looks industrial.	Excellent Standard aluminum colors (silver, bronze, black) or fluorocarbon paints	Fair Limited to fiberglass colors available from manufacturer

COUNTERTOPS

	Plastic Laminate	Stainless Steel	Solid Surface
Cost	\$	\$\$	\$\$\$
Durability	Fair Will chip, wear and delaminate in wet and high use areas	Excellent Extremely durable but will scratch	Good Wood substrate should be kept dry.
Maintenance	Good	Excellent	Excellent
Edge	Poor Bullnose not available. Requires hardwood edge that can scratch and delaminate.	Excellent Bullnose available	Excellent Many shapes available
Appearance	Good Unlimited colors available	Poor Institutional and noisy	Excellent Unlimited colors and patterns

DO YOU REALLY NEED A FEASIBILITY STUDY?

BY: DANIEL NEEL, PRESIDENT,
THE FUNDRAISING RESOURCE GROUP

The Millau Viaduct is the tallest bridge in the world, with one mast's summit 1,125 ft. above the base of the structure. It features the 12th highest bridge deck in the world, with 890 ft. between the road deck and the ground below.

When the decision was made to build a high crossing of the Tarn River Valley between France and Spain, the structures division of S  tra, a technical department within the French Ministry of Transport and Infrastructure, carried out preliminary studies and examined the feasibility of a structure. Five teams of architects and structural engineers were formed; each was

to conduct in-depth studies of one of the five general bridge designs. The solution of a cable-stayed bridge was declared the best. Detailed studies were carried out by the winning team, and construction was completed in 2004.

In 2006, the Millau Viaduct received the IABSE Outstanding Structure Award.

There are two kinds of people who encounter these types of crossings. The first is like my wife, who is deathly afraid of heights and convinced that there is no way the structure will actually support them. The second is like me, who gets half way across and THEN wonders if the bridge will hold. My first thought when at the point of no return is "I hope this bridge is well constructed." Rarely do I stop to think about the origins of design.



Millau Viaduct: Tarn Valley, France World's highest vehicular bridge

How do you design a successful capital campaign?

The history of bridges goes back as far as man's desire to overcome obstacles of getting from one side to the other. Today, bridges are not only practical, but wonders of architecture and design.

John Pierpont (J.P.) Morgan said, "The wise man bridges the gap by laying out the path by which he can get from where he is to where he wants to be." Non-profit organizations are continually evaluating how to traverse the obstacles preventing them from doing more of the good work they do today. Many times that planning process leads to the need for an extraordinary fundraising initiative, focused on an urgent need, with a defined timeline, and a dollar goal: In short, a capital campaign. If the capital campaign is the bridge, the feasibility and planning study is the design and engineering process.

Is it really necessary to conduct a study?

The answer is, most of the time, "yes." There are three reasons a study is so important:

1. There is no better way to gauge philanthropic priority for your project.
2. There is no other reliable indicator of capacity.
3. The campaign must be an unqualified success.

I am not an engineer, but I do understand how important it is to measure the load-bearing capacity for any bridge, particularly if I am going to be on it with others. Just as with the Millau Viaduct project, there are tests and benchmarks, along with science, art, and experience that go into determining the structure and capacity for a bridge, or a capital campaign.

The most reliable way to determine the design and fundraising capacity for a capital campaign is a well-orchestrated feasibility study, conducted by an experienced study director. No past or present giving experience is a sure indication of what an organization can raise in a capital campaign. The study is the means by which information is shared, tested, analyzed and put into an actionable plan.

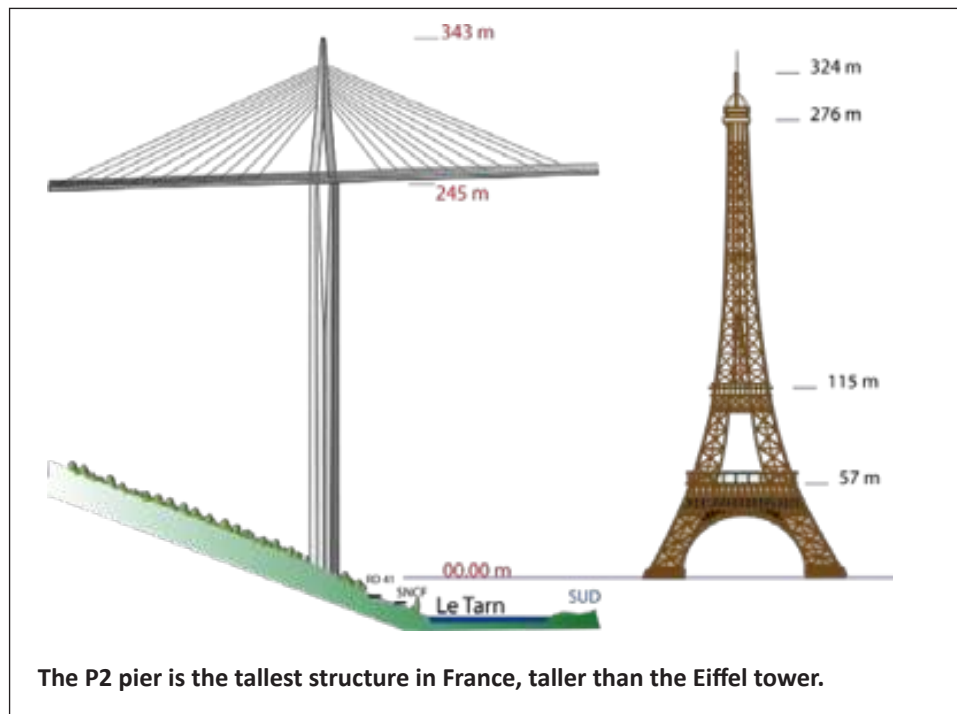
How do you define “unqualified success?”

The good news is, you get to define the terms for success, and the study is the first step in doing so. I worked with an organization, doing amazing work with inner-city families. They had a need, and a plan for a new facility that would have

No past or present giving experience is a sure indication of what an organization can raise in a capital campaign.

a profound impact on their ministry as well as the community. They needed \$15 million dollars to do so. We conducted a feasibility study and recommended, among other things, a preliminary \$10 million goal. Let me say that a recommended starting goal coming out of study is most often the floor. The objective is to set a goal that can and will be exceeded through the effective work of the campaign.

The organization was convinced that it could not scale back the project, and felt confident that it could raise the other \$5 million from sources not included in the study. They were determined to set a goal of \$15 million. Many positive outcomes happened through the course of the campaign: they attracted a fully-engaged volunteer team like no other they had experienced; they received the largest gift in the organization’s history;



they experienced an increase in annual fundraising; and they raised more money than they ever had for a single project. But, they did not raise \$15 million. The perception of many was that the organization did not experience an unqualified success because it did not reach its publicized goal.

Goals are benchmarks for success that must be surpassed, and the findings from the study should set the foundation for that success.

What makes a feasibility study successful?

The study is not the place to skimp on experience. For me it is important that it is not the rivet-drivers designing the bridges I cross. This observation is not intended to slight the importance or expertise of the construction crew. However, it gives me comfort to know that experienced bridge designers and engineers are on the job. In the same way, it is important to have that kind of experience conducting the feasibility study that will lead to the design of your campaign. It is the individual(s) conducting the study that will:

- interact with your highest levels of leadership,
- represent you and your project to your most important relationships,
- actively listen to and probe the responses in the study, and
- ultimately analyze the data and present insightful recommendations for you to make wise decisions.

If using an outside third party to conduct the feasibility study, take the time to get to know not only the firm, but those that will be meeting with your prized relationships and representing you in the process. Check references, not simply for the firm, but for those individuals. Get the most experience you can to probe the responses of study participants and provide you with substantive analysis and recommendations.

There are a number of ways to conduct a study, however the most successful approaches include:

- Developing a compelling and urgent Case for Support that concisely summarizes the needs and impact of the potential campaign,

- Conducting confidential, face-to-face interviews with individuals of influence and/or affluence whose input is critical,
- Providing thorough and insightful analysis and observations from the responses, not simply a polling process or questionnaire.
- Recommending specific and actionable steps on how best to proceed including project priorities, preliminary goals, campaign organization, timeline and activities, awareness and marketing, assessment of organizational readiness, and a clear financial path to success.

Does a study always lead to a campaign?

I am asked often if I have ever recommended an organization NOT proceed with a campaign as a result of the study. I have, but that is the exception and for extreme circumstances. Most often, if an organization has taken the appropriate steps in strategic planning that identifies realistic resources needed, the planning and feasibility study is a process of refining and defining. Because a campaign is designed to test the upper limits of reality in most cases, many times the study recommendations will require the organization to make decisions about scaling, phasing, financing or communicating before moving forward. In other words, it is more likely to get a “yellow light” than a “red light.”

A look at the world’s most fascinating bridges is instructive. The most impressive designs seem to be those



Nanpu Bridge: Shanghai, China. Circular design to save space

The most impressive designs seem to be those that incorporate the obstacles into the workable solution.

that incorporate the challenging elements and obstacles into the workable solution rather than allowing them to remain an impediment. There is a bridge where boats not only flow under, but on top of the bridge alongside cars and trucks. Another bridge is a spiraling corkscrew, designed to accommodate congested traffic in a tight urban area. Yet another features beautiful fountains where the

river flows through the bridge and comes out as colorful cascades on the other side.

A good architect and engineer conducting a thorough evaluation of the possibilities, and providing realistic solutions is always at the front end of that edifice; not just for show, but for effect.

In preparing for a successful capital campaign, the planning and feasibility study is that process to not only identify the opportunities, but also evaluate the obstacles that stand in the way of moving your organization from one side of greatness to the other side of amazing.



Daniel Neel is the founder and President of The Fundraising Resource Group. He has designed and implemented some of the most successful and comprehensive multi-level, regional, national and local fundraising programs and capital campaigns.

Consultant on Call

Development Audit Form

Organization Name:

Person Completing Form: Name and Title:

Date of Submission:

Planning and Case

We have a completed, written Mission Statement. ☐ Yes ☐ No ☐ In process
Please attach

We have a completed, written Vision Statement. ☐ Yes ☐ No ☐ In process
Please attach

We have an organizational strategic plan. ☐ Yes ☐ No ☐ In process

We have a development plan. ☐ Yes ☐ No ☐ In process

We have a completed, written Case Statement. ☐ Yes ☐ No ☐ In process

Infrastructure

We have written, approved Gift Acceptance Policies. ☐ Yes ☐ No ☐ In process

We have a Development Procedure Manual. ☐ Yes ☐ No ☐ In process

We have 501(c) 3 or other tax-exempt status. ☐ Yes ☐ No ☐ In process

We have met state registration requirements. ☐ Yes ☐ No ☐ In process

We have fundraising software. ☐ Yes ☐ No Type _____

We have staff trained to use this software to its full capacity. ☐ Yes ☐ No ☐ Somewhat

We have sufficient, up to date hardware ☐ Yes ☐ No

Staffing

Number of people in development office:
Please attach staff organizational chart if available

Number of staff with certification (CFRE, ACFRE, etc):

Number of staff who are members of Association of Fundraising Professionals (AFP):

Is the development office adequately staffed? ☐ Yes ☐ No ☐ In process

Does the chief development person report directly to the CEO? ☐ Yes ☐ No

How many years development experience does the chief development person have?
☐ 10 years or more ☐ 6 to 9 years ☐ 3 to 5 years ☐ 1 to 2 years ☐ Less than 1 year

Governance

Number on Board of Directors_____

Do board members have a position description? _____ Yes _____ No _____ In process

Are there term limits in the position description? _____ Yes _____ No

If so, are they adhered to? _____ Yes _____ No

Functioning Committees? _____ Yes _____ No _____ Not effective

Please attach board organizational chart if available

The Board understands their governance role. _____ Yes _____ No _____ Some

The Board contributes financially. _____ 100% _____ 75% _____ 50% _____ 25% or less

The Board is involved in fundraising. _____ Yes _____ No _____ Some

There is an active Development Committee that included board and non board members

_____ Yes _____ No _____ In process

We use non board volunteers in fundraising

_____ Yes _____ No _____ In process

Donor Relations

What is considered by the organization to be a Major Gift? \$_____

We do special appeals/events for major donors. _____ Yes _____ No

We have giving clubs. _____ Yes _____ No

We have donor recognition events/programs. _____ Yes _____ No

We have volunteer recognition events/programs. _____ Yes _____ No

We have a prospect research program in place. _____ Yes _____ No

We have a donor cultivation program in place. _____ Yes _____ No

Gifts are acknowledged within _____ 24-48 hrs. of receipt _____ 48 hrs.-1 wk.
_____ 1 wk. or longer _____ Only over the amount of \$_____ _____ Not at all

We have a website. _____ Yes _____ No

Please attach web address

We publish the following: _____ Annual Report _____ Brochures _____ Newsletter
_____ Press Releases _____ Other _____

Fundraising Methods & Strategies

Total Dollars Raised last year\$ _____

Funding Area	Group	Personal Visits	Phone	Mail	Events	Grants
Annual: Approximate Total Raised \$						
	Corporate	\$	\$	\$	\$	\$
	Individual	\$	\$	\$	\$	\$
	Foundations	\$	\$	\$	\$	\$
	Organizations	\$	\$	\$	\$	\$
Capital: Approximate Total Raised \$						
	Corporate	\$	\$	\$	\$	\$
	Individual	\$	\$	\$	\$	\$
	Foundations	\$	\$	\$	\$	\$
	Organizations	\$	\$	\$	\$	\$
Endowment: Approximate Total Raised \$						
	Corporate	\$	\$	\$	\$	\$
	Individual	\$	\$	\$	\$	\$
	Foundations	\$	\$	\$	\$	\$
	Organizations	\$	\$	\$	\$	\$
Other: Approximate Total Raised \$						
	Corporate	\$	\$	\$	\$	\$
	Individual	\$	\$	\$	\$	\$
	Foundations	\$	\$	\$	\$	\$
	Organizations	\$	\$	\$	\$	\$

Project Budget

- ❑ Construction costs (sometimes called hard costs, soft costs being expenses such as fees and permits).
- ❑ Land.
- ❑ Builders Risk Insurance.
- ❑ Architectural fees (usually a percentage of the project).
- ❑ Architectural renderings (the renderings need to be completed before the campaign is launched because they play an important role in building the case for support. The costs affiliated with the renderings will need to be funded upfront).
- ❑ Engineering and contractor fees.
- ❑ Fees and permits required by local municipalities.
- ❑ Environmental impact statements including historical impact studies if the building involves a historical structure.
- ❑ Possible environmental cleanup if issues are found such as asbestos removal, soil remediation, etc.
- ❑ Furniture, fixtures and equipment.
- ❑ Communication systems (telephone, internet, etc).
- ❑ Computer systems, including wiring.
- ❑ Rental for office space during construction phase (if needed).
- ❑ Legal Fees.
- ❑ Interest on loans for construction or bridge loan while pledges are being paid.
- ❑ Inflation (the longer the project is delayed, the higher expenses will be).
- ❑ Contingency for unexpected expenses.

Campaign Budget

- ❑ Dependent on many factors, such as the size of the campaign, the duration of the campaign, the geographic scope of the campaign, the amount of time required from a consultant, and the existing fundraising structure in place within the organization.
- ❑ Personnel
- ❑ Professional Services
- ❑ Marketing and Education
- ❑ Donor Recognition
- ❑ Campaign Events
- ❑ Support Systems
- ❑ Endowment Campaign for operations

Shelter Planning Visit Checklist

Checklist		
	Shelter Visit Checklist Items	Comments
<input type="checkbox"/>	Does the shelter smell good, bad or okay?	
<input type="checkbox"/>	How noisy is the shelter?	
<input type="checkbox"/>	Is it easy or difficult to clean?	
<input type="checkbox"/>	Does the shelter look like a prison, shopping mall or pet store?	
<input type="checkbox"/>	What is your first impression?	
<input type="checkbox"/>	Do the animals look safe and healthy but still in need of adoption?	
<input type="checkbox"/>	How much is the monthly electric bill? Monthly gas bill?	
<input type="checkbox"/>	What unexpected issues did you encounter when you moved in? Good and Bad?	
<input type="checkbox"/>	How many staff members does it take to operate the facility? What was the staffing increase?	
<input type="checkbox"/>	What does the monthly building maintenance involve?	
<input type="checkbox"/>	How many air changes an hour are there?	
<input type="checkbox"/>	What programs and services does the shelter offer in their facility?	
<input type="checkbox"/>	What programs and services do they wish they could offer in they had added...?	
<input type="checkbox"/>	What do they love about their facility?	
<input type="checkbox"/>	What do they hate about their facility?	
<input type="checkbox"/>	How much did it cost to build the facility? Square footage?	
<input type="checkbox"/>	What type of facility did they transition from and lessons learned?	

Cat Housing

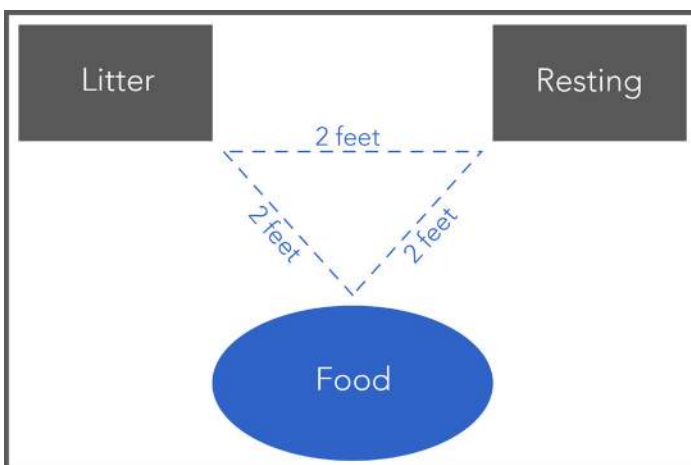


Cats deserve more respect and they are getting it.

How we think about cat housing in shelters has changed significantly since the Association of Shelter Veterinarians (ASV) published *Guidelines for Standards of Care in Animal Shelters* in 2010. The *Guidelines* recommend a minimum of 2 ft. of triangulated distance between the litterbox, resting place, and food. (Refer to the diagram below from the *Guidelines* chapter on Facility Design and Environment, p. 7.) This recommendation is based on scientific research results that are listed in the *Guidelines* document.

These spacing guidelines, along with the trend to provide greater opportunities for enrichment and socialization through group housing, has led to new caging options and greater design creativity.

The design of the space, the type of enclosure, and the configuration of cat housing will be dependent on intended use. For example, will the housing be temporary holding, recovery from medical treatment, a primary enclosure, or communal? The *Guidelines* further assert that as the length of stay increases, so should the area provided for the cats (p. 14).



The ASPCA has a resource based on the ASV *Shelter Guidelines* called *Shelter Care Checklists: Putting ASV Into Action*. Using these checklists to accompany *Guidelines* Chapter 2 (Facility Design and Environment) and Chapter 7 (Group Housing) are particularly helpful when programming and designing new or renovating both cat and dog housing spaces.

These publications cover a wide spectrum of animal housing criteria specific to cats and dogs. Study them. If you are working with an architect and/or engineer without demonstrated expertise in the design of animal care facilities and shelters, give him/her these two publications. Instruct them to read the ASV *Shelter Guidelines* and the ASPCA *Checklists*, thoroughly.

Additionally, do not forget to review any guidelines that your specific state may have regarding the size, configuration, environmental requirements, and accepted construction materials required for cat housing.

Below are some tips, suggestions, cautions, and lessons learned—

Cat Friendly: Cats like to hide, be elevated, observe what's going on around them, scratch, and climb. Provide cats with opportunities to satisfy these natural behaviors.

Trying to assess fear and anxiety in cats? Learn about the Fear, Anxiety and Stress (FAS) scale at fearfreepets.com.

Cage Construction: Materials used for housing enclosures should be hard and non-porous and able to be repeatedly sanitized. There is a wide variety of cat caging, condos, and towers available that meet this criteria. Check your state's animal welfare requirements for animal housing enclosures regarding use of what materials may be considered porous. If you are unsure, talk with your State Veterinarian.

Room Construction: Again, surfaces must be able to be easily cleaned and sanitized. Walls in rooms may be all epoxy painted block, tile, or FRP (fiberglass reinforced panel) / SPC (solid phenolic core) panel wainscoting that is at least 4 ft. high with epoxy painted drywall above that. We recommend sealed concrete or resinous floors. Concrete may also be color stained before sealing. Shy away from tile floors in animal housing, but if used, it will require more maintenance to clean grout joints. Always use epoxy grout with block and tile in animal housing and care areas!

Noisy Neighbors: Barking dogs make for stressed cats. Separate these animal populations through floor plan design and acoustical controls.

Cat Housing (cont'd)

Stacked Cages: Banks of cages, especially older configurations, may be stacked too high. As a result, the top row of three-row cat cage banks are often used for storage that must be accessed via a step ladder. However, these cages allow for additional cat housing capacity in a pinch.

Cats on the bottom may not get enough light in the cage and spend all their time in the shadows. (*Guidelines* p. 16). Plus, cats don't like being at ground level all the time. If you must use these taller cage banks, particularly if you already own them and they are in good condition, try to find a way to get more light into the lower compartments by adding more room lighting or repositioning cages.

New Lease on Life: Enlarging small compartments in existing cage banks, via retrofitted portals, enlarges living space and breathes new life into older, good quality equipment. Portals can be custom made or purchased from some cage manufacturers.

Spacing: Cages should be spaced far enough apart to allow ambient light to reflect off the ceiling and floor. Don't forget that adequate amounts of darkness are as important as light. Light and darkness should be provided to support the circadian rhythms of wakefulness and sleep. (*Guidelines* p. 16).

Orientation Facing vs. Not Facing: ASV *Guidelines* recommend a minimum of 4 ft. separation between cages to avoid disease transmission (p. 16).

Floor Drains: We caution our clients about putting floor drains in cat housing rooms. Cat litter down the drain equals plumbing problems. Floor drains in these spaces require additional dedication by staff to cleaning protocols. Natural, biodegradable litters are available and help alleviate these issues. In any case, have your plumber on speed-dial.



Two portal retrofit options: purchased (left) and custom made (right) that includes a sliding close-off panel (not shown). (Photos courtesy of Michael Barnard, AIA.)

Fresh Air, Sunshine, and Entertainment: Cat lanais or window boxes let cats go in and out as desired and provide natural light and ventilation. If you are using screening material, it must be durable (inside hardware cloth - outside claw-resistant screen about 1 inch apart) because cats will scratch it and climb it. Outdoor access spaces must be secure and offer protection from the elements.

Cat Features: Provide safe access up to and down from elevated perches. All feature areas should be accessible for cleaning purposes. The *Guidelines* recommend a minimum of 18 square ft. per cat for group housing (p. 37). No more than 8 - 10 cats per room is a good number.

Suspended Ceilings: Use hold-down clips if you must use suspended ceiling tiles in cat areas. Open and high ceilings are great for ventilation but must be designed so cats cannot escape the enclosure entirely or access ledges or beams from which they can fall and be injured.



The renovation of an existing building with high volume interior ceilings allowed these four glass-enclosed cat feature rooms to be free-standing and ceilingless. The butt glazing (frameless glass) and abundant down lighting creates a dramatic presentation. (Photo Bacon Group, Atlanta Humane Society project.)



The grate above this cat was added to the free-roaming room at Montgomery County Animal Resource Center in Dayton, OH. It prevents access to beams overhead but still allows for ventilation. (Photo MCARC Facebook.)

Construction



Ask the General Contractor and Masonry Sub-Contractor to build a "mock" kennel wall to confirm design requirements and expectations for the finished product.

PROJECT / CONSTRUCTION DELIVERY METHODS

- Design-Bid-Build
 - Design team designs and prepares documents for bidding.
 - General Contractors submit bids.
 - Selection is based primarily on price.
- Construction Manager (CM)
 - Selection is based primarily on qualifications.
 - CM manages other sub-contractors.
 - CM involved earlier in design process.
 - "Open book" accounting concept is used.
- Design-Build
 - Architect and contractor are one entity.
 - Selection based on both qualifications and price.

ROLE OF DESIGNER VS. CONTRACTOR

- Simply put, the design team creates the design and documents, then the contractor builds and warranties the project.
- The design team observes the construction to verify that the design intent has been met.
- The architect provides construction observation not "supervision".
- Contractor controls "means and methods".
- Safety is the contractor's responsibility.
- The contractor typically installs equipment. Some equipment may be owner-installed.

CONSTRUCTION SCHEDULE

- New construction
 - 12,000 – 15,000 sq. ft. building, 9 – 10 months
 - 22,000 sq. ft. building, 10 – 12 months
 - Larger sq. ft., 14+ months
- Renovation / Addition
 - 1 – 2 months less than new construction depending on complexity, occupied space, etc.

- Tenant Build-Out
 - Varies from 6 – 8 weeks to several months depending on complexity, occupied space, etc.

CONSTRUCTION DELAYS

- Communication break-down
- "Acts of God" or other legitimate weather issues
- Hidden conditions such as finding artifacts or endangered species, undocumented utilities, etc.
- Other reasons, such as owner requested changes
- Learn when a schedule extension is truly warranted.

SITE COSTS INCLUDE

- All utilities (water, sewer, power)
- Water management areas
- Site grading
- Paving and parking
- Site lighting
- Landscaping and irrigation
- Site signage

CONSTRUCTION OBSERVATION (CO)

- Understand why you need CO.
- Learn who is the gatekeeper of which documents.
- Knowledge of animal-related construction issues
- Roles of a local architect and/or shelter design architect / engineering consultant

QUALITY CONTROL DURING CONSTRUCTION

- Quality control by the design team is constant but on a "periodic observation" basis.
- What happens when unacceptable construction occurs?
- Understand the roles of the architect and the owner.

WHAT TO LOOK FOR DURING CO

- Deviations from the drawings
- Unauthorized substitutions of equipment or materials
- Building code violations and life-safety issues (NOT job site safety)
- Sloppy work

CONSTRUCTION MEETINGS

- Run by general contractor and/or architect
- Purpose is to discuss and document the following:
 - Attendees
 - Monitor / update construction progress schedule and looking ahead
 - Tasks, responsible party, and coordination
 - Request for Information (RFI) / Proposal (RFP)
 - Submittals
 - Change Orders

(Continued on back)

Construction (cont'd)

SUBMITTALS

- Purpose
- Examples
 - Shop drawings
 - Samples
 - Mock-ups
 - Test reports
- Who reviews?

FINAL REVIEW & CLOSEOUT

- Punch List
 - General Contractor
 - Owner
 - Design Team
- Training & equipment manuals
- Extra stock materials
- Close-out documents
- Financial Close-out (warranty, Release of Lien, bank reconciliation)
- Occupancy (Certificate of Occupancy or CO)
- Warranty period (1 year)

The acronym "CO" has different meanings. Context is the key.

- Construction
- Observation,
- Change Order, or
- Certificate of Occupancy

TIPS FOR SELECTING A CONTRACTOR

- Use a local contractor who will have to live in the community after the project is finished. Local reputation is everything for a contractor who makes his/her living in the community.
- Choose a contractor whose volume of business is approximately three times your project's value. This way your project will be a significant part of his/her business. On the other hand you don't want a contractor that is so small that your project represents most of his/her business. If the contractor has problems on the job he/she must have the resources to correct the problem and finish the project.
- Visit projects completed by the prospective contractors and talk with the owners. Did the contractor finish on time; did the contractor take care of the punch list in a timely manner; and did the contractor come up with a lot of extra charges? Were they difficult to work with?
- Does the contractor self-perform much of his/her own work? Contractors who self-perform more of the work simply have more control of the project.
- Choose a contractor who has experience building the type of end-use intended for your project.
(Note: This is not always an option when constructing an animal care facility. If you are not hiring a designer or contractor that specializes in animal care facilities, compare projects that are similarly complicated such as medical / hospital, institutional / laboratory, and industrial / manufacturing facilities. Knowledge of the requirements and installation of specialized clean environments, HVAC systems, floor finishes, wall finishes, and equipment are key.)
- Don't just choose the low bidder unless it is required. Many times the low bidder did not really study the plans and specifications or they desperately need a job for financial reasons. You should closely evaluate bids when there is a 7% difference between the lowest bidder and the next highest bidder.
- Verify the contractor's bonding capability.

Original Source: From *Architectural Record* forum on-line, posted 7/2/08; McGraw Hill Construction. Edits / Notes by Bacon Group, Inc.

CONTRACTOR REFERENCE CHECK QUESTIONS

1. Did the contractor meet the construction schedule? If not, was the reason due to the architect, owner, or contractor and what caused the delay?
2. Were there any change orders during construction? If so, what was the basis of the change order(s)?
3. Were there any problems with the project that the contractor was responsible for causing?
4. Were there any warranty issues that the contractor failed to take care of?
5. Would you hire the contractor again? If yes, why? If not, why not?

Cost to Build a New Animal Shelter

For planning purposes

Use \$325 to \$350 per square foot for new animal shelter building construction. Add an additional \$25 per square foot for site construction. Animal care equipment may be estimated at 5% - 8% of the building construction budget. Soft costs are not included in the cost per square foot; therefore, a total project budget must also be developed.

Why Are Animal Shelters Expensive to Build?

Factors that contribute to the high cost for this building type are—

- Shelters are commercial buildings. Facilities operate on a 24/7 basis and house animals so the construction must be durable. Long term maintenance is a major consideration, so up-front costs may be higher.
- Construction methods and quality of materials contribute to additional costs. Concrete masonry building construction is the preferred method for animal shelters. Pre-engineered metal building and tilt-up building systems are sometimes posed as alternatives to save money; however, they require design enhancements or alterations to make them more suitable.
- Floor plans must provide space for multiple activities with many functions that cannot be commingled, and a greater level of security must be provided.
- Finish materials for floors and walls in animal housing must be impervious and able to withstand rigorous cleaning.
- Building materials with acoustical control properties are required to control noise to reduce stress.
- Plumbing systems are required to accommodate animal waste, maintain cleaning protocols and prevent disease transmission.
- HVAC systems are required to provide air quality sufficient to prevent and remove odors and to control disease transmission.
- Equipment, such as kenneling systems, caging, and medical equipment, must be durable, sanitizable, and impervious to moisture.
- Meeting code requirements may increase costs.

Cost Per Square Foot

The construction cost per square foot (\$/SF) for animal shelters varies widely across the country depending on many variables. What is included or excluded from the figures may vary widely. There is no standard across the design and construction industry for stating a construction cost. Depending on the source, there may be a breakdown of the project's costs.

Typically, a building's construction cost does not include land purchase, design fees, permitting fees, or non-installed equipment. (See below for a list of "soft costs.")

The process to determine \$/SF is progressive. These costs are predictions until a complete set of permitted Construction Documents are available for pricing. Some factors that influence the \$/SF are—

- Availability of labor and materials
- Transportation costs
- Permitting regulations
- Physical design characteristics desired for a new or expanded animal shelter, such as
 - Type of construction
 - Quality of finish materials

Inflation Factor: Add an inflation percentage factor per year to budget planning for a construction project that will not start immediately. According to the U.S. Dept. of Labor, Producer Price Index, construction grew in 2018 at 4-5% over 2017 (BNi Building News, Cost Trends, posted 7/18/2018). Other sources put long term construction cost inflation at about double the consumer price inflation.

Renovations: Renovations and retrofits may cost as much, or more, than constructing a new building. Because renovations are not as predictable as new construction, it is difficult to estimate a common cost per square foot.

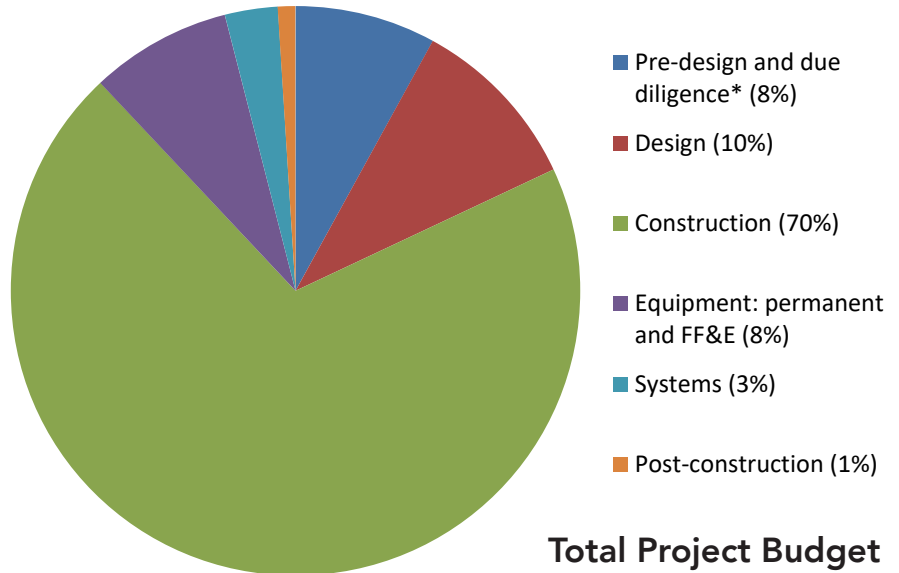
What's not included in the cost per square foot? Other costs, called "soft costs," are not included in the per square foot amount suggested previously. Examples of the project soft costs are—

- Land purchase costs
- Site improvement, parking lots, landscaping, utilities
- FF&E (furniture, fixtures and equipment)
- Financing costs and construction loan fees
- Government fees including (but not limited to) plans review and building permit fees, development fees, connection fees, environmental and water management fees
- Non-typical site preparation needs such as bringing roads and utilities to your property
- Topographic survey
- Geotechnical soils testing
- Environmental tests and studies, such as asbestos and lead-based paint
- Contractor overhead and profit (6% – 12%)
- Insurance costs
- Inflation (2.5% – 5% per year; research this figure)
- Contingency (5% – 10%)
- A/E professional design fees (9% – 12%)

Cost to Build a New Animal Shelter (cont'd)

To borrow a term from the healthcare system, you want to develop a 'global' budget for your project. The global budget is a tool that determines how much you have to spend and then divvies it out in categories. Some of these expenses are more negotiable than others.

The pie chart is the proposed allocation of funds for starting a global design and construction budget using an example of a \$4.875 million total project budget for new construction of a 15,000 sq. ft. animal shelter facility. Percentages vary by project.



(Below) Recent costs per square foot observed in different geographical locales are in the table below. The Notes column indicates project characteristics that affect the cost per square foot. Numbers are rounded and may vary slightly from actual costs and square foot sizes.

Project cost examples below are provided by Bacon Group, Jackson & Ryan Architects, and Shelter Planners of America.

Name / Location	SF Size	Cost	Per SF Cost	Year Complete	Notes
Broward County Animal Care and Adoption, Ft. Lauderdale, FL	40,000	\$16.5 M	\$412.50	2016	New construction, high quality finishes, spay/neuter services
Humane Society of Charlotte, Charlotte, NC	46,400	\$17.7 M	\$382.20	50% Design Development	New construction, metal building system
Miami-Dade County Animal Services Pet Adoption & Protection Center, Doral, FL	70,000	\$15 M	\$214 +	2016	Existing building re-purpose, high quality finishes, additional funds used for enhancements to shelter
Santa Clara County Animal Services, San Martin, CA	38,937	\$32.5 M total proj, cost \$22 M est. Shelter + Barn	\$565 for shelter + barn	Estimate at 75% Construct Documents	New construction, high quality finishes Site costs est. at \$4.843 M
Montgomery County Animal Care and Adoption Center, Christiansburg, VA	16,733	\$4.150 M	\$248	2017	Competitive public bid
Beaufort County Animal Services / Hilton Head Humane Assoc., Beaufort, SC	20,000	\$7.4 M	\$370	2019	Competitive public bid
Harris County Pets, Houston, TX	48,000	\$21.33 M	\$444	Under const 2019	Public money, Const. Mgr. at Risk, does not incl. owner furnished animal equip.
Operation Kindness, Carrollton, TX	32,000	\$10.9 M	\$340	Under const 2019	Lots of site work incl. \$500,000 bridge, 9,000 SF of 32,000 SF is remodeled area
League City Animal Care, League City, TX	17,450	\$5.5 M	\$315	In progress	Bid in 2018, new const. incl. site costs
Houston SPCA Campus Expansion, Houston, TX	84,025	\$22.7 M	\$270	2018	Bid 2017, new construction, SF portion incl. unconditioned horse arena

Simple Programming Worksheet

HSUS Animal Care Expo 2019

Heather E. Lewis, AIA, NCARB

Step 1: Tackle Operational Adjustments (if needed)

If you have concerns about your operational efficiencies, seek an operational assessment and make necessary changes prior to planning a new shelter. This is important to ensure your new building will be designed for efficiency. Once you have operations in good working order, proceed to Step 2.

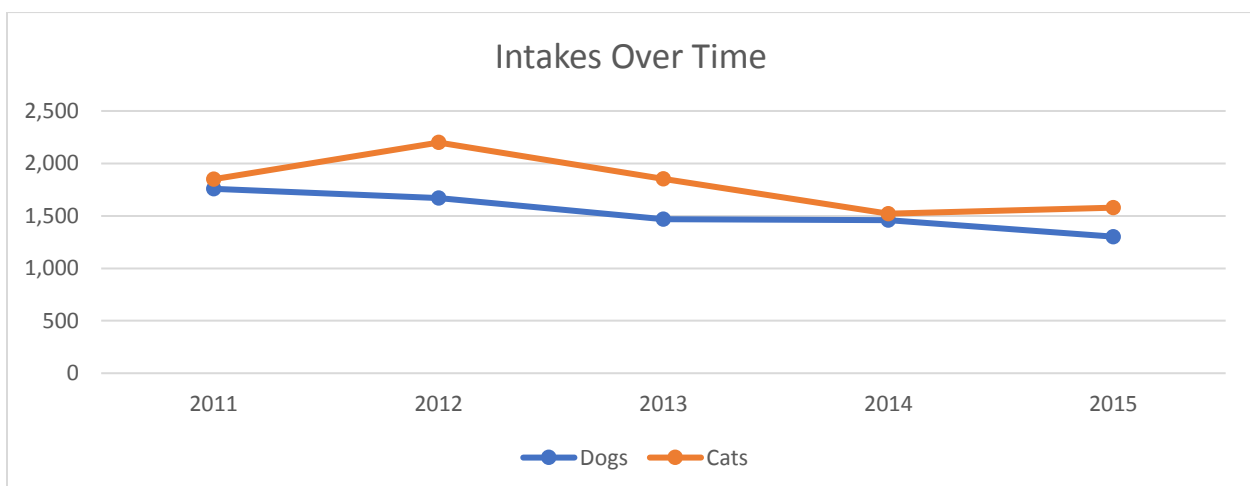
Step 2: Gather the Data

Gather the following intake data from your shelter software for the past year and preferably the past several years. Depending on your services and your mission you may not have all these intake categories, so separate them as you typically do in your software according to your normal reporting.

Type	Stray	Relinquish	Owner Req. Euthanasia	Transfer In	Court/Bite Hold
Dog					
Puppy					
Cat					
Kitten					
Other					

A Note about TNR Programs: Cats brought in for surgery and returned to their colonies should be excluded from the numbers and analyzed separately as they stay briefly while they await surgery, and are not generally housed with other populations of cats.

It is useful to plot intakes over time to look at trends. This helps predict capacity needs for the future. For example, if intakes are generally trending down, it may not make sense to increase capacities in the new shelter, unless you are expanding a program or implementing a new one. Below is an example of a plot of intakes over time:



Gather the following outcome data using the same methodology. Depending on your services and your mission you may not have all these outcome categories, so separate them as you typically do in your software according to your normal reporting. Remember to exclude TNR cats from your outcome data as well and look at these separately.

Type	Returned to Owner	Adopted	Transferred Out	Returned to Field	Euthanized for Owner	Shelter Euthanasia	Died
Dog							
Puppy							
Cat							
Kitten							
Other							

Calculate your live release percentage by adding numbers of animals in the categories **Returned to Owner, Adopted, and Transferred Out** and dividing by the total number of intakes for any given year. *Most organizations also exclude owner requested euthanasia from this live outcome calculation (and from their total intake numbers), as this is a service that you can choose to provide or not, and it should not count against your live outcomes.*

Step 3: Pull Some Specific Numbers

In order to proceed to Step 4, you must gather the following information:

1. Highest intakes for each type of animal in any given month within the last year. You will compare these to the average monthly intakes to derive a monthly peak factor. For example, if you normally receive 100 cats per month, but in the month of May last year you received 150 cats, then your peak will be 1.5 times the average for that month. *Note: If your shelter brings in transfers, these may skew the peak factors.*
2. Average Length of Stay EXCLUDING time in Foster Care for each type of animal. This is critical information that you must have to understand your current operations, the time animals spend in the shelter, and your strategies for future capacity. For example, if your average Length of Stay (LOS) is 10 days for adult dogs and 30 days for adult cats, your focus should be on programs to reduce length of stay for adult cats to prevent perpetuating long stays in the new building.

Step 4: Proceed to Current Animal Capacity Calculations

Given the above information, current average animal capacity requirements are as follows:

Number of Intakes for each type of animal (excluding TNR and Owner Requested Euthanasia) divided by 365 days in a year equals the number of animals received per day. Multiply this by the average length of stay to derive average capacity requirements. Then multiply by the peak factor to derive peak capacity.

For example:

1,780 dogs per year/365 = 5 dogs per day x 10 day average LOS = 50 average dog capacity x 1.25 peak factor = 75 peak dog capacity

Complete this for all types of animals. You can crosscheck these numbers to previous maximum animal counts for the past year to ensure your calculations are yielding relatively accurate results.

Step 5: Adjust Capacities for Future Changes

Given your current animal capacity requirements, discuss strategic adjustments prior to planning the new building. For example, length of stay reduction strategies, increasing transfers in or out, etc. Please note that length of stay has more effect on the housing requirements for your new building than does any other factor. For example, in our dog calculation on the previous page, if length of stay were seven days rather than 10 days, you would need to accommodate 53 dogs rather than 75, which can be a big savings in care costs as well as capital costs.

Strategic adjustments typically need to be developed in concert with the operational assessment described in Step 1.

Step 6: Calculate Housing Requirements

Animal capacity is not the same as housing capacity. Once you have determined your animal capacity requirements for the new shelter, you will need to reduce your peak housing numbers slightly to account for percentages of animals such as litters of kittens that are co-housed. This is important because an oversized shelter is inefficient and costs more money to operate.

Step 7: Develop a Prioritized List of Your Program Needs

Now that you have your animal capacity and housing requirements, you can combine the housing numbers and sizes with a list of other program needs to begin to develop the square footage needs for your project. An architect will likely need to help you with this step. He or she will work with you to develop a list of rooms and the square footage of those rooms, which can be added together to create net square footage. The architect will multiply the net square footage by a grossing factor to determine gross square footage. The grossing factor accounts for hallways, wall spaces, etc. *Note for your architect: Grossing factors are bigger for shelters than they are for other buildings.* To develop a rough idea, multiply your net square footage total by 1.50 to anticipate likely total gross square footage. For example, if your net square footage adds up to 10,000 square feet, it would not be unusual to discover that the shelter is 15,000 square feet when laid out in a floor plan.

Step 7: Use the Program to Develop Ballpark Costs

Given likely square footage of the project, below is a basic multiplier to predict the probable cost of the project:

Square footage x \$425 per s.f. (varies by location) = Anticipated Cost of Construction

Add 12 percent for furnishings, equipment, and miscellaneous owner provided items, 10 percent for professional fees, 10 percent for contingencies and 10 percent fundraising costs (if applicable). Thus, it is not unusual to see a total project cost of 35 to 45 percent more than the cost of construction.

For example: A 15,000 square-foot shelter could cost \$6.37 million to build and \$8.60 million overall in project costs. If you think these are shocking multipliers, you're not alone! You may need to go back to step 1, improve operations, and then proceed back through the analysis to balance your operational requirements with your construction budget.

Dog Housing Options

HSUS Animal Care Expo 2019

Heather E. Lewis, AIA, NCARB

Imagine how a dog feels in a shelter setting. There are new smells, loud noises, uncomfortable surroundings, and unnatural social situations. They will likely feel anxious or fearful, and these negative emotions can lead to negative behaviors. Let's explore five concepts for reducing a dog's stress while housed in a shelter:

1. **Size the enclosure appropriately.** A dog should be housed in such a way that allows for normal posture, turning around without touching the walls, and expressing common behaviors. If you follow this guideline, most dogs will need runs that are four-feet wide, and even wider for very large dogs. For example, "happy tail" should not occur in a properly-sized enclosure.
2. **The shape of the enclosure matters.** Dogs in long, thin enclosures are more likely to be stressed and anxious when handled by your staff than dogs in enclosures that are wider which allow for normal interactions with caretakers. Another benefit of wider housing units is that they allow for enrichments such as beds, blankets, etc. to be placed in the run with the dog, while still allowing for free floor space.
3. **Provide double-sided housing when possible.** Dogs will eliminate away from their resting places if given a choice. Double-sided housing reduces stress by providing a dog this choice, and double-sided housing is easier to clean.
4. **Reduce overstimulation.** In shelter settings where animals are housed for a short period of time, they are generally overstimulated by the new sights, smells, and sensations. The presence of other animals can be overwhelming as well. Follow these general rules:
 - a. Side-to-side barriers between dogs should be solid.
 - b. Reduce noise in a room by including a sound absorbing ceiling and baffles on the walls.
 - c. Avoid housing dogs across from each other with a narrow aisle between. If dogs are housed across from each other, providing generous room in the aisle can prevent barrier anxiety and aggression.
 - d. Design the room to have plenty of fresh air, good plumbing systems, and sanitary finishes to prevent the buildup of odors.
5. **Avoid sensory isolation.** While it is important to reduce overstimulation, it is equally important not to put dogs in sensory isolation, especially when they are trying to understand and process a new environment. The following strategies may be helpful:
 - a. Provide for plenty of other areas outside the housing unit for the dog to get exercise and socialization. Incorporate play yards for individual or group play, as well as walking paths to be used by shelter staff members and volunteers. The dogs will be calmer in their housing if they have more activities to do during the day.
 - b. Provide a section of bars on glass-fronted enclosures so the dog may use its sense of smell to explore its surroundings.

- c. While it is tempting to install visual barriers on the fronts of runs, dogs benefit from a section of unobstructed view from the floor up, so they don't try to jump to see out.
- d. Provide soft music to help mask unpleasant sounds.

Options

Indoor/Outdoor Runs

Indoor/outdoor runs have come a long way. The inside can be clean and modern while still allowing exterior spaces for the dogs.



Indoor/Indoor Runs

Traditional indoor/indoor runs may be used when it is not possible to use indoor/outdoor runs. If using an all-indoor configuration, design it to minimize the number of dogs in a single room.



Low-Stimulation Rooms or Runs

Runs can be designed to provide quieter housing arrangements, either for dogs needing help with behavior modification or as an arrangement for long-term housing. These enclosures may be more “room-like” with full ceilings and walls to separate them from other dogs.



Village Housing

Village housing is a concept that incorporates the dogs’ natural social instincts. Each dog has a room or run, and dogs play together in a central play area in small play groups.

Below is an example from a boarding facility. Village housing is easier to incorporate in settings like this because the dogs are owned pets with fewer behavioral challenges.



In a shelter environment, it is easier to use play areas separated from animal housing areas, as this allows staff to more easily accommodate a variety of canine groups.



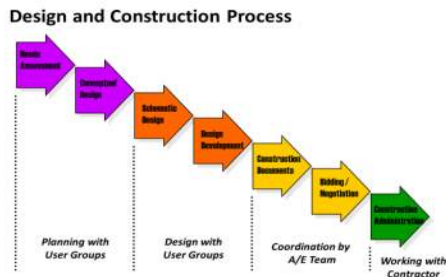


There is value in good planning.

Design and Construction Process

Design Process 101

Needs Assessment > Conceptual Design >
Schematic Design > Design Development >
Construction Documents > Bidding/ Negotiation
> Construction Administration



The value of good planning



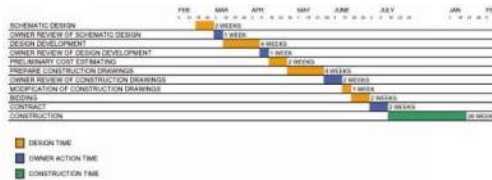
Needs Assessment

Purpose - Establish Requirements of the project

Activities - Work Sessions with Designated Staff
- Representatives to Identify Operational and Space Needs

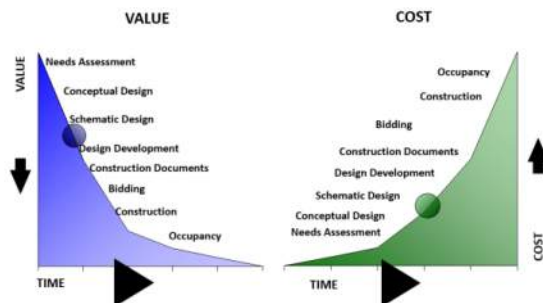
Product - Building Space Program Indicating Size of Facility, Site Requirements, and Estimated Cost

Project Schedule



Project Management Approach

The value of any decision decreases over time while the cost increases.



Needs Assessment Study:

1. Purpose and Scope of Study
2. Review of Existing Facilities
3. Building Space Program
4. Site Considerations
5. Recommended Features
6. People and Animal Levels
7. Staffing
8. Operating Cost
9. Estimated Construction Cost
10. Operation

Conceptual Design

Purpose - Study very preliminary Design of Site Plan and Floor Plan to enable promotion of project and fundraising.



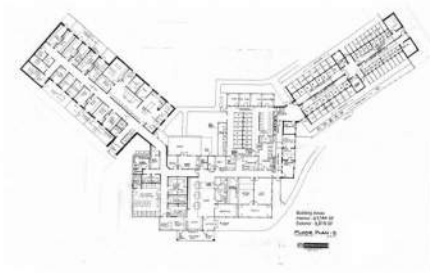
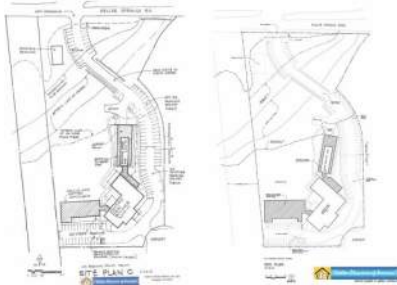
Activities - Representatives to review layouts.

Product - Preliminary Site Plan and Floor Plan to show general arrangement of the features of the project.

Design Process 101

Employ an independent cost estimating Firm to prepare a detailed estimate also based on actual take-off quantities.

The two independent opinions of probable cost will be evaluated and compared and, if necessary, a proposed list of cost control options will be offered for the Clients consideration. In this way, informed decisions can be made at the appropriate time to incorporate cost control measures before the bid date.



Cost Control Measures

Conceptual Design and Schematic Design - Establish realistic cost per Square Foot for construction based similar projects.

Design Development - Utilize a two-fold system of estimating.

Solicit estimates from the contracting community based on actual take-off quantities

Project Delivery Systems



Systems vary some around the Country, but generally fit into these categories:

- **Competitive Bidding "CB":**

DESIGN

SELECT

CONSTRUCT

- Traditional – most familiar approach.
- Owner selects the Architect to design the project.
- After documents are fully complete, lump sum prices from General Contractors are requested.



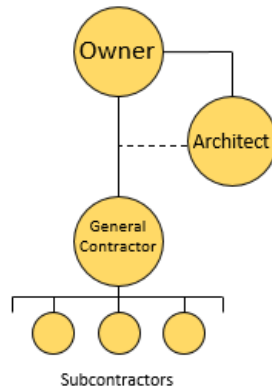
- Selection of General Contractor is based on the lowest price and made to single contractor.

- Pros - Oldest and most familiar delivery method. Defined project scope. Single point of responsibility for construction. Open, aggressive bid competition

- Cons - No design phase teaming. Longer overall duration. Lack of flexibility for change.

- Possibility of adversarial relations.

- Best Suited - New projects that are not schedule sensitive nor subject to potential change.



Design Process 10

- **Construction Management at Risk "CMAR":**

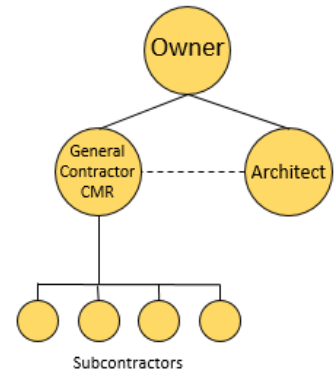
DESIGN

BID

CONSTRUCT

- Construction Manager serves as the General Contractor assuming the risk for construction at contracted price or Guaranteed Maximum Price (GMP).
- CM provides design phase service in elevating cost, schedule, materials & alternatives.
- Selection is based on criteria that combines qualifications, experience & fee.
- Pros - Selection flexibility. Design phase assistance. Single point of responsibility for construction. Change flexibility. Team Concept. Faster schedule delivery
- Cons - Removes some competitive nature of bidding. Difficult for Owner to evaluate validity of GMP.

- Best Suited - New and renovation projects that are schedule sensitive, difficult to define or subject to change.



- **Competitive Sealed Proposal "CSP":**

DESIGN

SELECT

CONSTRUCT

Similar to Competitive Bid - combination of price & other factors established by the Owner:

- Owner selects the Architect to design the project.
- After documents are fully complete, lump sum proposals are accepted.
- Selection of General Contractor not based only on low price but factors such as firm reputation, proposed project personnel, similar project experience, schedule.
- Pros - Selection flexibility. Defined project scope. Single point of responsibility for construction. Aggressive bidding – opportunity to select more qualified team.
- Cons - No design phase teaming. Longer overall duration. Lack of flexibility for change. Longer bid process with several required steps.

- Best Suited - New projects that are not schedule sensitive and simple facility additions.

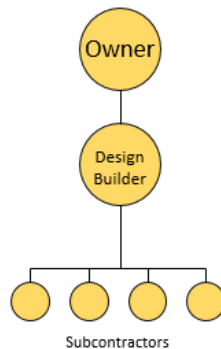
- **Design/Build "DB":**

DESIGN - BID - CONSTRUCT

- A single entity is contracted to provide both design and construction.



- Complex delivery approach that requires Owner to be knowledgeable & very involved.
- Selection is based on proposal offering the best overall value to the Owner.
- Pros - Selection flexibility. Single point of responsibility for design and construction
- Team concept. Faster schedule delivery.
- Cons - Loss of checks and balances. Difficult for owner to manage. Key element is trust. Trust hard to demonstrate to taxpayers.
- Best Suited - New and renovation projects that are schedule sensitive, but very defined.



Design Process 101

Activities - User Group Design Work Sessions.

Products - More refined Floor Plan, Site Plan, Exterior



Elevations and Outline Specifications.

Design Development

Purpose - Detail Outfitting of each Individual Space.

- Finishes, Millwork, Door Types and Hardware, Equipment, Electrical Devices Located, Lighting, Furniture layout.

Activities - Documentation of Needs and Responses through Independent Work and Work sessions with staff.

Products - Large Scale Floor Plans, Exterior 3-Dimensional Design, Design Development Specifications, and Drawings of Architectural, Structural, Mechanical, Electrical, Plumbing, Civil Engineering.



Schematic Design

Purpose - Confirm Site Plan with Building and Parking Lots Located.

- Initiate conversations with the City on a wide variety of subjects.
- Confirm Configuration of Floor Plan and Spaces within Building.
- Preliminary review of Mechanical and Electrical Systems, Structural System, and Materials for Project.
- Develop Preliminary 3-dimensional massing model.
- Develop Phasing Strategy if appropriate.

Construction Documents



Purpose - Prepare Construction Documents sufficient to communicate to the Contractor the information necessary for construction

Design Process 101

Activities - Design Team Working Together to Reconcile Design/Technical Issues, Finalize Systems and Materials, Achieve Governing Agency Approval and Confirm Budget Compliance

Products - Contract Documents, Drawings and Specifications

Bidding Phase

- Issue the Construction Documents to Bidders
- Conduct pre-bid conference
- Submit Construction Documents to City for review for permitting
- Answer questions from Bidders
- Respond to City plan review comments
- Conduct Bid Opening
- Prepare Construction Contract

