

Bathroom History, Research, and Trends



Although the bathroom has changed throughout history, it has always reflected the prevailing cultural attitudes toward hygiene, cleanliness, privacy, relaxation, socializing, and even morality and religion. The development of our modern bath has also been dependent upon evolution in public infrastructure, technology, codes, and other policies.

Today the bathroom is not only the center for personal hygiene, but also a place for relaxation. Research continues to contribute important knowledge related to designing bathrooms for function and safety. Since many bathrooms are being downsized because homes are shrinking in size, the efficient use of space becomes more important than ever. Today's bathrooms emphasize quality and function, and they make use of a variety of materials and designs to produce a unique and personalized room for a household.

The changing demographic makeup of North American households will continue to alter the way our bathrooms look and how they serve users, especially in light of the growing number of older people in our population. This chapter examines the history of the bath, reviews important research in bathroom design, and provides an overview of key demographic and psychographic trends that are now affecting bathroom design.

Learning Objective 1: Describe how evolving lifestyles and technologies have impacted bathroom trends over time.

Learning Objective 2: Describe new trends in present-day bathroom design.

A BRIEF HISTORY OF THE BATHROOM

The typical North American bathroom, as we know it today, has a relatively short history. The early "bath room" or "bath house" was strictly for bathing. It was not until the mid-nineteenth century that one room in the home included all personal hygiene activities in one place. However, some of the activities and rituals currently enjoyed in our baths had their origins centuries ago.

Early Civilizations and the Bath

Although evidence indicates that ancient Egyptians and the residents of Crete had bathing facilities, the bath was taken to new levels by early Greek, Minoan, and Roman civilizations,

which embraced it as a way to escape the stresses of everyday life. Most people found the experience so soothing that they typically bathed daily in public bath houses. The baths were not just for cleaning but were a way of life, and in many societies the baths were enjoyed by all social classes of people.

The Greeks developed the “gymnasium,” which means “the naked place.” After working up a sweat while exercising, the Greek participants would then take a very brief splash of water to cool down but did not really experience what we would consider a thorough cleaning.

The Romans were more serious about their bathing. The early Roman bath houses were often highly decorated with paintings, statues, and elaborate architectural details to add to the pleasure. Because aqueducts could deliver large amounts of water to cities, numerous and large public baths appeared. In addition to both hot and cold tubs, filled from pipes or aqueducts, these ancient bath houses may have included steam chambers, showers, and rooms with dry heat. These efficient systems would not be matched for another 1500 years. The Roman bathing ritual involved many steps. After soaking, bathers were covered with ointments and oils. The ointments and oils were then scraped off of the bather’s skin and along with them came the dirt.

The public bath house was also the center of social activities and a form of recreation (see Figure 1.1). For example, baths in the Roman City of Herculaneum included courts for playing ball and a gymnasium. Other baths incorporated libraries, shops, tennis courts, and snack bars. Because of the bath house’s significance in society, these cultures found no need to incorporate baths into private homes.

FIGURE 1.1 The Roman bath was a place frequented by Romans of all classes. The baths were often large and ornately decorated, such as the Great Bath in Bath, England.

Steve Cadman on Flickr



In addition to making bathing an enjoyable experience and a prominent part of their lives, the Greeks' and Romans' understanding and practice of good sanitation were extraordinary for the time. The Greek and Roman concept of the "bath" and their belief in the power of water has come full circle to the pools, hot tubs, soaking tubs, mineral baths, and spas we enjoy today.

Public baths were a part of other cultures as well. The "Turkish bath," a steam bath that is followed by a shower and massage, developed when Roman bathing customs were combined with those of nomadic people such as the Byzantines. The early Japanese culture also embraced communal public baths.

Latrines

Just as baths were public facilities in early Roman and Greek civilizations, so were latrines. Although, some early evidence of the home chamber pot was also recorded, Roman water closets and latrines were actually flushed by water. In addition to a public water supply achieved through aqueducts, the Roman Empire also established quite sophisticated sewer systems, which did not appear again until the nineteenth century.

The Middle Ages

With the fall of the Roman Empire, the bath was no longer an important part of daily life and disappeared for centuries. Through the Middle Ages, the fifth to fifteenth centuries, bathing was not a common activity and little attention was given to personal hygiene. Much of the decline was due to physicians who thought bathing was harmful to health, and clerics—in particular the Puritans—who thought nakedness and bathing to be indecent and sinful. The spread of diseases and the tightening of church doctrine eventually closed down communal baths in Europe.

Sanitation in general suffered during the Middle Ages. Few, if any, advances were made in devices to collect waste. Without a sewer system or other disposal methods, chamber pots were usually emptied out the windows. Sometimes that meant pouring waste onto the streets below and often onto people using the streets. Water for home use was drawn from the closest water supply, which could easily be contaminated by free-flowing waste. During the Middle Ages, there was an awareness of the link between sanitation and disease, but no real effort was made to improve the conditions.

Seventeenth and Eighteenth Centuries

The European immigrants brought similar beliefs about indecency and the harmful effects of bathing to America. During the seventeenth and much of the eighteenth centuries in America, little attention was given to body care. Pioneers who desired to bathe did so infrequently because it was so difficult. They first needed to find a container large enough to bathe in, and then carry in water and heat it. These obstacles also meant that clothes were washed infrequently.

The Bathtub

Bathing for the middle class during this time usually involved a portable bathtub placed in the kitchen (see Figure 1.2)—typically the warmest room in the house with a nearby heat source for water. The fireplace used to cook the family meals also heated water for the bath. Eventually fireplaces were built with a water reservoir, making hot water more accessible. Once the bathtub was filled, it usually served the entire family, with the dirtiest family member going last. These tubs were also used for other purposes such as laundry.

Bathing in private was very limited at this time. Wealthy households, who generally used servants to carry water for the bath and dispose of it afterward, had the luxury of locating bathtubs in the privacy of their bedroom. Over time, bathtubs changed in size, shape, and materials. The earliest tubs were basically wooden barrels and then became wooden boxes lined with metal. Later tubs were made of all metal, porcelain crockery, and cast iron with porcelain enamel. More elaborate bathtubs in the bedroom incorporated a hinged cover that helped keep the warmth in the tub.



FIGURE 1.2 The kitchen of early colonial homes was multifunctional, including a space for the family bathtub near the fireplace, the source of heat and hot water.

JoJan/CC-BY-SA-3.0

For families who did not have the luxury of a bathtub in the home, or if someone wanted to freshen up between infrequent baths, a bowl was used for a sponge bath that could take place in the privacy of the bedroom. The idea of incorporating a bathtub of any type into the home evolved very slowly. Even in seventeenth- and eighteenth-century Europe, these facilities were only present in homes of royalty and the very wealthy.

Hot Water

The task of supplying hot water to the bath became easier with new innovations, one of which was the cast iron stove. A water vat was located at the back of the stove. As the family baked and prepared meals, the stove heated water for baths and other uses.

Heaters were eventually attached to the portable tub so that hot water did not need to be carried. They were later attached to the permanently installed tub, and eventually the hot water came from a single source in the home, the water heating system most homes use today.

The Privy

Facilities for toileting have also changed over time. The seventeenth- and eighteenth-century American homes made use of the privy (an English word derived from the Latin word *privatus*, meaning secret, not publicly known) or outhouse installed outside the house. Indoors, the chamber



FIGURE 1.3 The chamber pot was used for indoor toileting and was often very decorative, especially if it was to be visible in the room.

Peter Reed

pot (see Figure 1.3) was used during bad weather or at night, and the waste was disposed of as quickly as possible. Made of ceramic or metal, the small pot could be stored under a bed, in a cabinet, or in a stool often called a commode. To be more discrete, the chamber pot was later designed into a piece of furniture like a chair called a *closestool*, or night chair, which had the bottom enclosed to hide the pot. Other chamber pots were allowed to sit out in the room, and these were usually highly decorated.

Sanitation

Colonial America also did not have the luxury of a public water supply or sewer system, so the disposal of waste was as primitive as it had been for centuries. Outdoor privies were built over large pits. In some cases, the pit was deep enough to reach the water table, which allowed waste to gradually dissolve and wash away, possibly into a stream or the well next door. Other families emptied their chamber pots into the backyard. When the accumulation became large enough, it needed to be hauled away. As in earlier times, for some lazier households in cities, the streets became the collection area.

Water Closet

The first modern water closets in America most likely came from England. The term “water closet” developed as water was used in the waste disposal process. Although there is evidence of some type of built-in water closet existing in the palaces of Crete, the first attempt at the modern water closet was made by Sir John Harington, around 1596 in England, who designed the device for his home and also installed one in the home of his godmother, Queen Elizabeth I. The device did not live up to expectations, so the idea was deemed too undependable to duplicate. Although a patent was filed in 1617 for a newer version of the water closet, a more successful flushing water closet appeared in 1775.

The American Bathroom Takes Shape—Nineteenth Century and Beyond

As American cities became more congested and as the number of backyard privies near water supplies increased, the issue of sanitation grew more acute. Yellow fever epidemics erupted in the United States, particularly in New York, in the mid-nineteenth century, prompting physicians to declare publicly that unsanitary conditions were the root of the disease, and they asked that taxes be levied to develop a sewer system to remedy the problem. Many larger U.S. cities began to look

into developing safe water supplies and disposal systems. As a result of this awareness, the nineteenth century brought many changes in how people viewed personal hygiene, as well as changes in the infrastructure and technologies that made the home bathroom a reality for the masses. One important step toward improving personal hygiene was primarily due to the medical profession. The medical field now supported the idea of hydrotherapy and also publicized the importance of personal and public hygiene, especially as cities grew larger and more congested. Increased awareness of the germ theory in the 1880s, and the connection between disease, germs, and personal hygiene, led to a preoccupation with personal cleanliness and sanitation. “Housewives” began to take this task very seriously and became hygiene experts.

Water and Sewer Systems

To deliver the necessary fresh water for personal hygiene in the home, a safe and reliable water supply had to be developed. Prompted by a series of cholera epidemics, city officials took a closer look at public sanitation. As cholera was linked to drinking water, officials now realized the entire population was at risk, not just those living in less sanitary neighborhoods. This realization had a dramatic impact on the establishment of sewer systems and the sanitation movement began.

The prison system was actually a pioneer in the provision of toilet facilities. However, the idea of a permanent water closet indoors was slow in coming to most homes. People were accustomed to using the outdoor privy, and they were well aware of the odors produced there and did not want them inside the house. There was also the issue of where the water closet could be placed in the home. In addition, the development of the indoor toilet was dependent on the advances made in public water supply and sewer systems, which were slow in coming to many areas.

The earliest indoor water closets were disguised as furniture, much like the chamber pot. They were located in a separate unvented room or “closet” without running water, which was often located at the end of the hall, under the stairs, or on the stair landing. Thomas Jefferson is said to have had the first indoor privies with a vent to remove unwanted odors. These privies were not high tech, however, as waste fell into a pit that was emptied by slaves. For the first flushing privies, water had to be carried to the water closet for the flushing. One variation of the water closet was the “earth closet,” but it too required much work and added waste materials to the backyard.

Earth Closet

The earth closet was like a water closet, but instead of washing waste away, dry soil was added after each use to absorb moisture and cover offensive odors. Periodically the contents were removed and the soil with the decomposing organic matter was used as compost. The earth closet, popular in the 1860s because of the undependable water supplies, was quite labor intensive. It was not widely used unless the household had servants to haul soil in and out of the home.

City sanitation began with moving the waste out of neighborhoods. Improvements in sanitation began as some cities incorporated drainage systems that carried waste through canals or pipes to the nearest river or stream. Although these systems cleaned up the neighborhoods to some extent, they basically just moved the problem from one place to another. Chicago built its first sewer system around 1856. In about 1880, municipalities began to pay more attention to city plumbing problems, and health departments in New York City, Washington, DC, and Brooklyn, New York established some of the first plumbing codes.

Sanitation problems continued to increase as populations grew larger and more concentrated in metropolitan areas. City officials recommended that a standard of at least one water closet per family be in place before the end of the nineteenth century. This goal was not met, however. An 1893 Bureau of Labor report stated that only 2.83 percent of the people in some parts of New York City and Chicago had bathroom facilities. Running water and disposal facilities were limited to the middle class and wealthy.

Improvements to the water supply continued at a slow pace. Modern plumbing, including fresh water supplies and effective sewer systems, did not become widely used until the late nineteenth century. One improvement was replacing wooden pipes with lead pipes.

Indoor Plumbing

The bathroom did not become common in the average home until there was a reliable supply of running water and the availability of inexpensive metal pipe and ceramic fixtures that were made possible through mass production during the Industrial Revolution. Early commodes were scarce because of the high cost to produce them by hand, so many households continued to use the outdoor privies. Before public water supplies, households used a faucet or hand pump that drew water from a cistern in the attic. Water was collected from the rain or pumped up from water sources below. The introduction of running water made it both practical and economical to bring personal hygiene activities all into the same space. With the water supply in the attic, it made sense to locate the home's bathroom on the second floor, although many were also on the first floor next to the kitchen. The second floor location also provided the privacy that many people desired.

With running water available, the next generation of water closets was a "washout" or "wash down" design that used a tremendous amount of water to flush waste away completely. The water closet that incorporated running water was the first application of indoor plumbing for the middle class (see Figure 1.4). In 1895, a siphon action water closet was developed that used vacuum action

The Legend of Thomas Crapper

Although different accounts exist, perhaps the most familiar name associated with the modern toilet is Thomas Crapper. Crapper was born in England in 1836, and operated a successful plumbing business from 1861 to 1904. Although he had a number of plumbing-related patents, there is no evidence that Thomas Crapper actually invented the toilet, as many people think. Just how Crapper became so closely associated with the device is not clear. One theory is that he bought the patent for the toilet and marketed it with his name. Then, World War I doughboys passing through England brought together Crapper's name and the toilet, thus establishing the slang name "the crapper."

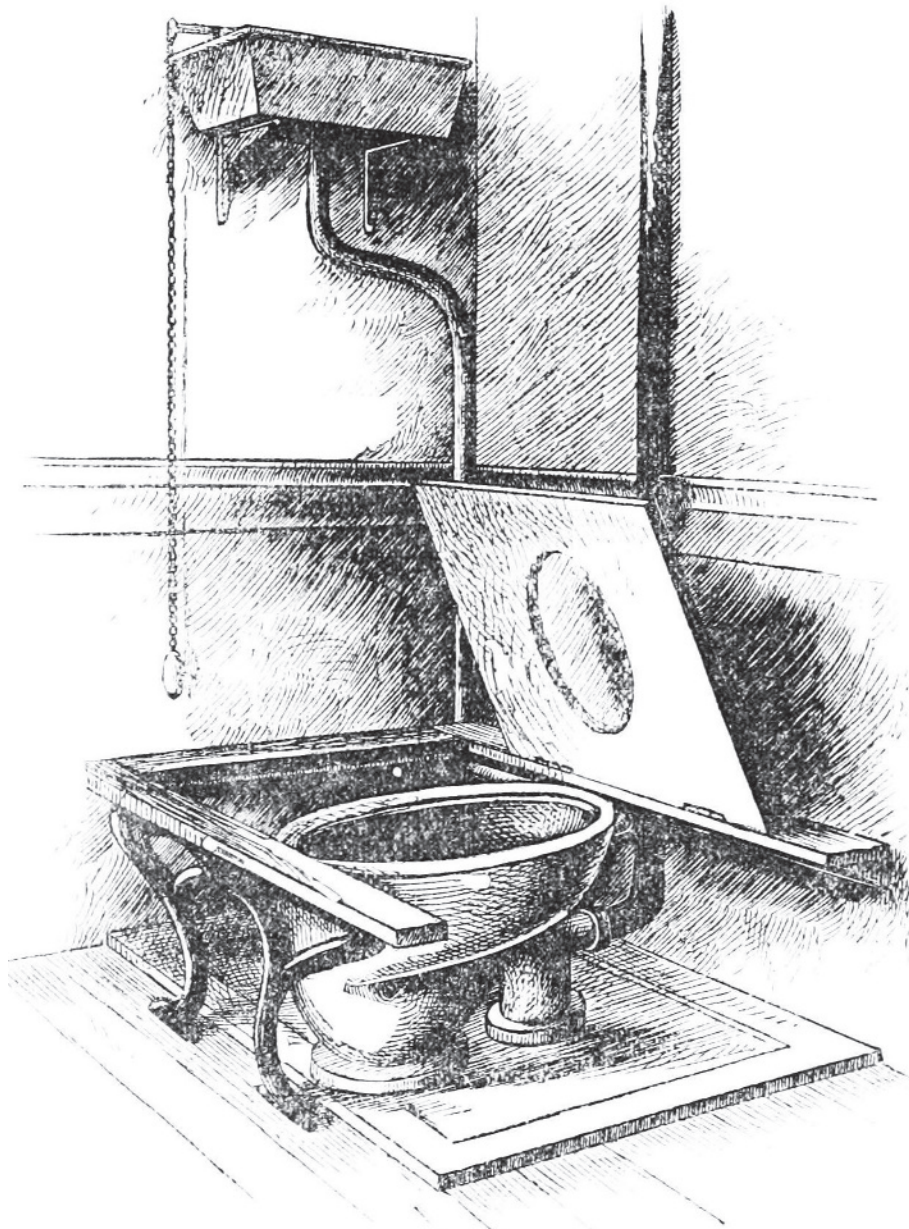


FIGURE 1.4 Early flush toilets used an overhead tank to hold the water that would be used for the flush.

Source: *Popular Science Monthly* vol. 34.

to more efficiently flush away the waste with less water. This siphonic action is used by most modern toilets. The water closet or toilet, as we know it today, did not become a common household fixture in American homes until the early twentieth century.

Bathing

Bathing methods also changed with the availability of running water. A concern about hygiene prompted people to question how someone could become clean while sitting in a tub of water that became increasingly dirty as one bathed. Such concerns led to an interest in the vapor or steam bath and the shower as superior alternatives to the tub bath.

The shower became possible when a method was found to pump hot water up a pipe for the overhead spray. The modern concept of the shower evolved from military barracks and gyms commonly used by men. It was increasingly recommended as a preferred bathing method over the bathtub in both private homes and public baths of the working class. The first shower was a simple device that used a hand pump to move water up a pipe over a portable or outdoor tub. Eventually, public water supplies included enough pressure to force the water to the showerhead.

Because of their invigorating water action, the first home showers were considered to have therapeutic value. The state-of-the-art shower at the time was a needle spray, which had a series of sprays placed around the body for various needs. It included a kidney spray, a spinal spray, a bidet spray, and so forth, each with a separate control. A crude valve for mixing hot and cold water often left the bather either scalding or chilled. At the time, the idea of water spraying the bather was considered too vigorous for the “gentle sex.” For women, it was not uncommon to contact a physician before undertaking a shower.

Most likely the last fixture to be plumbed was the lavatory. The new fixture was designed much like the former wash basin and stand, emerging as a bowl-shaped basin on a pedestal base with a drain in the middle (see Figure 1.5) It turned a china bowl *on* a marble stand into a china bowl *in* a marble stand. The first faucet used a hand pump to draw water, and later a faucet with hot and cold water controls was attached. Soon the pedestal lavatories disappeared as cabinetry entered the bathroom, and sinks were installed into vanities that contained the much desired and needed built-in storage. This design became common by the 1950s.

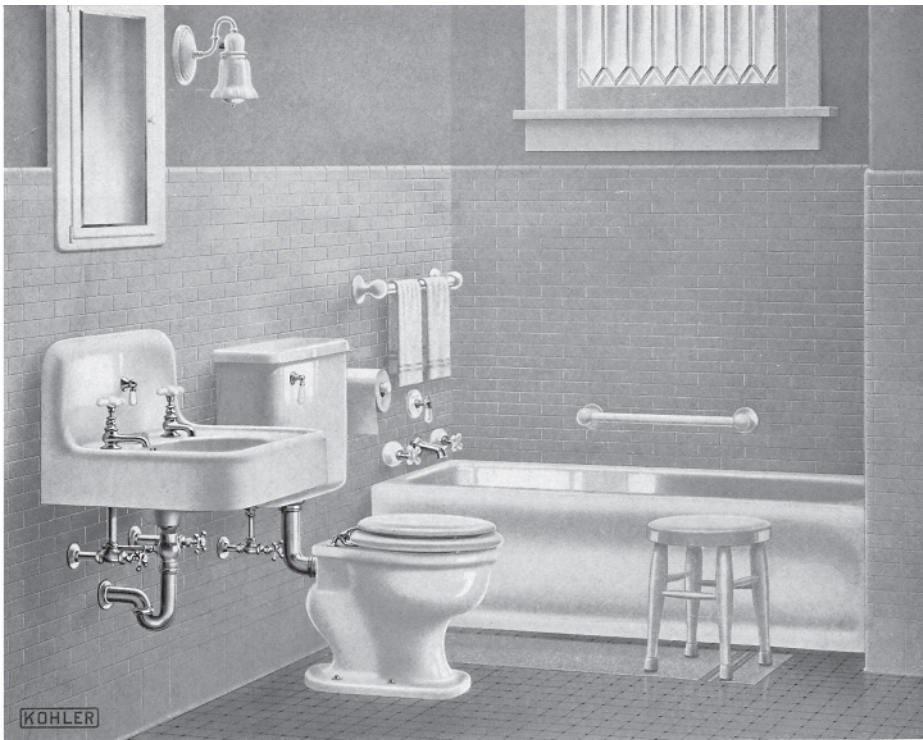
A Real Bathroom

Older homes did not have an extra space that could be devoted to a complete bathroom. It was relatively easy to add a small toilet or a lavatory, but including a bathtub required a significant amount of space. Bathrooms might be fitted into a bedroom or dressing room, but because they were thought of as a functional space, it was considered a waste to devote too much room to them.

The earliest complete bathrooms belonged to the wealthy, who usually converted a spare bedroom into a bathroom. By the mid-nineteenth century, finer homes were built with a separate bathroom. Although it was possible to have hot and cold running water by the late 1800s and early 1900s, it was still considered a luxury and only incorporated into the homes of the wealthy. The finest luxury bathrooms of the time often included a sitz bath, foot bath, bidet, pedestal lavatory, siphon-action water closet, enameled tub, and shower bath with receptor. Smaller, more functional bathrooms had fixtures crowded together for efficiency and were welcomed because servants were no longer around to carry the water and perform other duties.

During the late nineteenth and early twentieth centuries, people who did convert a room to a bathroom were not quite sure how it should appear, so the earliest bathrooms were unique in design and layout. Many styles emerged during this era, including wood encased bathrooms, with a wooden toilet tank, seat, and a wood-trimmed tub that were massive and imposing. Some luxury rooms were heavily draped, elaborately wallpapered, and carpeted. They included marble, glass, and glazed tiles.

For the middle class, however, the stark, simple, hygienic bathroom with plaster walls and hardwood floors eventually became the standard. Early in the twentieth century, the compact sanitary



Bath Room FH

- F-17-R 5 foot "Viceroy" Bath Tub with F-1785 supply and waste fixture.
- F-332-UO 18x24 inch "Emmet" Lavatory fitted with F-2156 faucets, F-2175 $\frac{3}{8}$ inch supply pipes, F-2271 lift waste with china *lever* handle, F-2220 $1\frac{1}{4}$ inch "P" trap.
- F-1349 Closet Combination.
- F-1968 Built in Cabinet.
- F-1998 18 inch Hand Rail.
- F-2004 24 inch Towel Rack.
- F-2031 Bath Room Stool.
- F-2071 Toilet Paper Holder.

Size of room 6x8 $\frac{1}{2}$ feet.



FIGURE 1.5 White was the only choice for early bathrooms, which lacked space and storage. Rectangular bathtubs included controls and spout mounted vertically on the wall.

Courtesy of Kohler Company

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bathroom with its white walls and fixtures became the model of the modern bathroom and an American symbol. Pipes were left exposed, partly to show the shiny, sanitary fixtures, but also because many people still feared the dangers of trapped gas.

The early bathroom was minimal in size and contained three standard fixtures—a toilet, a lavatory, and a bathtub/shower. The popularity of the bathroom increased, and more households found ways to convert space to accommodate a bathroom. As bathrooms became required by codes, floor plans for new homes replaced a closet or pantry with a bathroom.

To overcome space limitations, R. Buckminster Fuller designed a prefab bathroom in the 1930s that only needed assembly. In 1948, Add-a-Bath offered an already assembled bathroom ready to simply add onto the house.

Plumbing Codes

With an increasing number of bathrooms, more regulations were necessary, which led Secretary of Commerce, Herbert Hoover, to establish the 1924 Bureau of Standards for basic plumbing. Although these codes were not enforceable, they were effective and provided a technical solution to the plumbing aspects of safety and sanitation. Almost 20 years later, the 1940 Housing Census found that still only 50.9 percent of all U.S. houses were in good condition with a bath and flush toilet.

The plumbing situation improved by 1950 with more than 85 percent of urban homes having hot and cold running water, 92 percent a flush toilet, and 89 percent a bathtub or shower. In rural areas, however, more than half of farm homes lacked a bathroom. In 1951, the Department of Commerce established a National Plumbing Code, and in 1955, the American Standards Association distributed a list of basic plumbing principles that served as recommendations to municipalities.

Today, technological solutions, as well as strict plumbing codes, have made a safe water supply and sanitary disposal system available to all except a very small portion of the American population. As new innovations emerge, care is taken to make sure they continue to meet the sanitation standards necessary for good health.

Today's Bathrooms

The bathrooms of today contain many of the basic elements of earlier bathrooms, but new technologies, materials, and lifestyles have made the bathroom into a more inviting, relaxing, and comfortable room to enjoy. Awareness of the need for universal and **accessible design** has been growing since the end of World War II, with the requirements of disabled veterans, polio patients, and the aging population becoming more important.

Today the bathroom is undergoing a reinvention similar to the kitchen. No longer just a place to cleanse the body, the bathroom is also serving as a place to relax and become revitalized, a place to awaken the senses to a pleasurable experience. Much like the baths of the early Greeks and Romans, the bath is a place to relax and shower or soak away the stresses of the day.

BATHROOM-RELATED RESEARCH

Bathroom design today has also benefited from key research on anthropometrics, ergonomic design, and universal design. Designers now have a better understanding of the human body, the design and space requirements to accommodate it, and the interface between humans and their interior space. The result has been fixtures and spaces that are more convenient, easier to use, and more versatile. Following is a summary of some major research that has impacted bathroom design.

Center for Housing and Environmental Studies

Perhaps the first extensive research into bathroom use began in 1958 by Alexander Kira at the Center for Housing and Environmental Studies located at Cornell University in Ithaca, New York. The research was sponsored jointly by the Cornell University Agricultural Experiment Station and the Plumbing and Heating Division of the American Radiator and Standard Sanitary Corporation.

The aim of the research was to thoroughly investigate what was then the unexplored area of personal hygiene, and establish basic criteria and parameters for design of facilities to accommodate these activities. The study included a laboratory investigation of the problems and needs posed by the principal personal hygiene activities.

The report covered such topics as the purpose of personal hygiene and the concept of dirt, attitudes about body cleaning, the anatomy and physiology of cleaning, and design considerations related to personal hygiene activities. The report described each activity in much detail, including the motion and position of the body before and after, as well as during, the activity. It was this study that developed a rationalization for ergonomic design in bathrooms.

Space Standards for Household Activities

Another study, conducted from 1956 to 1957 by the University of Illinois Agriculture Experiment Station, in cooperation with four other state Experiment Stations, involved taking and recording basic body measurements, as well as the human measurements for body activities. The primary objective was to determine the floor space needed by people to perform various activities in the home. Measurements were taken to establish clearances needed for activities, as well as the basic movements involved in fundamental activities, such as reaching and bending, that are a part of many other activities. This study set some very basic parameters for human space needs in the home.

Human Engineering

In the field of human engineering, which is the application of knowledge about human beings to design, Henry Dreyfuss and Associates are pioneers. This group was perhaps the first to take anthropometric measurements gathered through military and civilian studies and transform them into a form that could be used by designers. The first documents presenting these ideas were the innovative work of Alvin Tilley, *Measures of Man* (1960) and *Humanscale* (1974 and 1981); these were followed by a more recent book, *The Measure of Man and Woman: Human Factors in Design*, published in 1993.

This most recent book presents human body dimensions from birth to adulthood. For adult dimensions, it applies the concept of the percentile person to provide not only average body dimensions, but also the extremes. Sections of the book address the needs of the elderly and people with mobility aids, as well as space requirements for the home and other locations.

The Human Body and Interior Spaces

The next major work that impacted bathroom design was assembled by Julius Panero and Martin Zelnik into a sourcebook titled, *Human Dimension & Interior Space: A Source Book of Design Reference Standards*, published in 1979. The purpose of their book was to focus on the anthropometric aspects of ergonomic fit, or *ergofitting*, and applying the data to the design of interior spaces where people work, play, or live.

Early in their study of the relationships between the user and his or her space, the authors realized that most references for professionals dealt with general planning and design criteria. They found that very little information addressed the physical fit between the human body and the different components of interior space.

In their search for anthropometric data, the measuring of humans and their relationship to objects and spaces, they discovered that most of the previous human engineering had taken place in industry and the military sectors. An enormous boost to the database came during World War II, when the need arose to match human capabilities with new technologically advanced equipment such as airplanes. These sectors continue to generate anthropometric research today. One important civilian study prepared by the U.S. Department of Health, Education and Welfare contributed to their database as well.

In their sourcebook, the authors presented numerous diagrams for human structural and functional dimensions. Structural dimensions are the static dimensions of the head, torso, and limbs in a standing or seated position. The functional dimension is the measurement of a working position or the movement associated with a task. As they continued their research, the authors found that it continually reinforced the need to use anthropometric data in the design process. This meant bath designers would now have a basis for design considerations related to fixture and storage use.

A 1995 version of this work by DeChiara, Panero, and Zelnik titled *Time-Saver Standards for Housing and Residential Development*, includes much of the same anthropometric measures and information as the earlier document, with additional planning guidelines, including dimensions for such spaces as exercise areas and hydrotherapy pools. This reference remains perhaps the most comprehensive and primary reference for anthropometric measures.

Additional Human Factors Research

Human factors research is also being conducted at other universities, but with the focus on universal design and accessible design related to specific populations. Three major programs conducting research in these areas include the Center for Inclusive Design and Environmental Access (IDeA) at the State University of New York (SUNY) Buffalo, the Trace Research and Development Center at the University of Wisconsin–Madison, and the North Carolina State University Center for Universal Design. All three have conducted extensive research in the areas of universal design and are involved with projects specifically addressing accessible design. Major funding for these programs comes through the Department of Education and the National Institute on Disability and Rehabilitation Research (NIDRR).

The mission of the IDeA Center in the Buffalo School of Architecture and Planning program at SUNY Buffalo, which started in 1984 and received major NIDRR funding in 1999, is twofold:

- To use research, product development, and information dissemination to create new resources for universal design practice
- To facilitate a dialogue on the practice and delivery of universal design in order to build a national and international universal design community

Three projects they have undertaken specifically addressed accessible design in the bathroom. The first was a Prototype Anthropometric Database project that gathered anthropometric measurements of 500 wheelchair users. Information from this study was used to develop a prototype database specifically for bathrooms and bathing facilities. The second was the Visit-ability Project, which examined how to make homes more visit-able for people with disabilities, including bathroom entry and access. The third involved assessing the bathing needs and preferences of older persons with disabilities who lived at home. Data from this study was also used to design bathing facilities.

The Trace Research and Development Center, part of the College of Engineering at the University of Wisconsin–Madison, was started in 1971 and has primarily focused on finding ways to make information technologies and telecommunications systems more accessible and usable by people with disabilities. An additional research program was designed to gain an understanding of why and how companies adopt universal design, what factors are most important in making this decision, and what factors discourage or impede the adoption and successful practice of universal design.

Research activities at The Center for Universal Design in the College of Design at North Carolina State University began in 1989 and include applied research studies on human factors and user needs, usability of accessible and universally designed products and environments, and the impact of universal design. The bathroom is an important focus in this research.

As changes take place in bathroom use and products, ongoing research is needed to ensure the bathroom is a comfortable, safe, and efficient space. Universities and other institutions will continue to contribute to the body of knowledge that can assist bathroom designers.

Further explanation and application of the research findings from these various sources is examined in chapter 4, “Human Factors and Universal Design Foundation.”

MAJOR BATHROOM TRENDS

After becoming an integral part of the home early in the twentieth century, the bathroom has undergone many changes and experienced many design trends. Some reflect changes in lifestyles, while others came about with the development of new materials, products, and processes. Knowledge of these trends would be useful when renovating a bathroom in an older/historic home where keeping to the period design is important. Following is a summary, by decade, of select bathroom design trends.

Bathroom Design Trends by Decade

Early 1900s

- Bathroom design was moving away from the lavish toward the convenient, family-style bathroom.
- A concern for sanitation and hygiene was paramount in bathroom design.
- An emphasis on maintenance and safety emerged, with consumers demanding products and materials that were easy to clean.
- Everything came in white, presenting the “antiseptic” look.
- Cabinetry was not popular because exposed pipes were considered more sanitary and easier to repair.
- A claw-foot tub (see Figure 1.6), pedestal lavatory, and water closet with an elevated tank made up the standard three-piece bathroom.

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KOHLER

"Column" Bath, Plate No. K-64 This trade-mark appears on every piece of KOHLER enameled plumbing ware. It is incorporated in faint blue in the enamel, at the joints indicated by the arrows, and corresponds in size to the same "KOHLER" shown in the illustration. "Bracket" Lavatory, Plate No. K-550

KOHLER OF KOHLER

And the permanent trade-mark incorporated in the easy-to-clean enamel

You prospective builders—you who contemplate remodeling—you who are building homes and apartments—have the opportunity to select enameled plumbing ware which bears the permanent trade-mark KOHLER as a guarantee of its superior quality.

It is your right to be able to identify Kohler Enameled Ware

We have adopted this permanent trade-mark for KOHLER easy-to-clean enameled plumbing ware, so that you will always be able to identify it. The word "KOHLER" in faint blue is permanently incorporated in the enamel of every KOHLER bathtub, lavatory, sink or other easy-to-clean enameled fixture. This trade-mark is inconspicuous, but is easily found.

It is your guarantee of superior quality and evidence of our confidence in the excellence of our products. You should look for it. Your plumber will show it to you, because it means as much to him as it does to you. KOHLER is the only enameled plumbing ware that has the trade-mark incorporated permanently in the enamel. All KOHLER fixtures are of one quality, the highest—and of uniform color.

"It's in the Kohler Enamel"

Write for our descriptive booklet — KOHLER OF KOHLER

Originators of ONE-PIECE construction

KOHLER CO. originated one-piece enameled bathtubs, lavatories and sinks. The KOHLER factory is the largest in the world devoted exclusively to the manufacture of enameled plumbing ware. KOHLER bathtubs, whether built-in or other styles, are easy-to-clean and hygienic in design.

Every Kohler design modern and artistic

No antiquated patterns are made by KOHLER. Your architect will tell you that this is a KOHLER characteristic. Your plumber is glad to install KOHLER easy-to-clean enameled plumbing ware, because it costs no more to put in than cheap, inferior fixtures, and its many superiorities satisfy his customers.

"Viceroy" ONE-PIECE Bath, Plate No. V-16-D.
(From catalog 1917)

MAKERS OF
Enameled Bathtubs,
Lavatories, Sinks, Etc.

"It's in the Kohler Enamel"

KOHLER CO.
Founded 1873
Kohler, Wis., U.S.A.

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Boston New York Chicago
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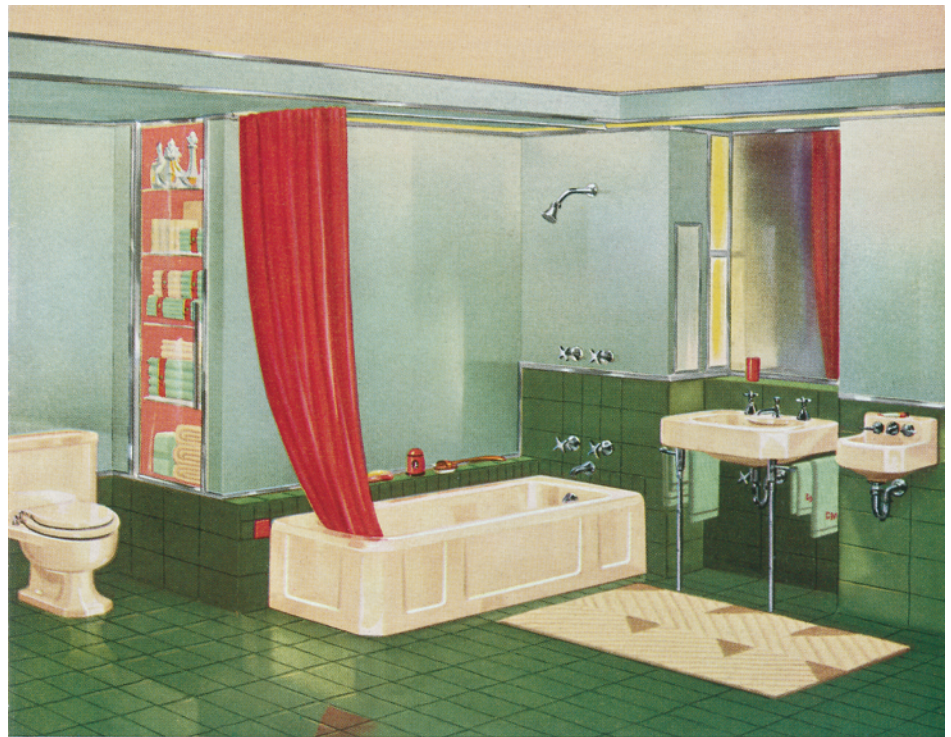
FIGURE 1.6 The claw-foot tub had legs with claws on its feet to allow cleaning beneath the tub.

Courtesy of Kohler Company

- If the home had electricity, lighting most likely consisted of a shadeless, clear bulb, usually hanging from the center ceiling on a cloth-covered cord.
- The cage shower was introduced as a single shower fixture.

1920s

- Sanitary plumbing was so widespread among the middle and upper class that attention turned to aesthetic considerations.
- The shower became common in the home.
- The closed-in, rectangular porcelain tub replaced the claw-foot tub (see Figure 1.7).
- Faucets and shower controls lined up vertically under the showerhead.
- Pedestal lavatories were popular, as well as console lavatories supported by metal legs.



A FOUR-FIXTURE BATHROOM BUILT AROUND THE NEW *Cosmopolitan* BATH

One of the most interesting details of this colorful room is the new Kohler Cosmopolitan . . . the bath with flatter bottom, wider rim, lower sides, K-554-CV. Other matched fixtures which make up the foursome are the Claridge vitreous china lavatory, K-4946-F; Walcot vitreous china dental lavatory, K-5360-BA; quiet-performing siphon jet Integra closet, K-5580-A. The Kohler color is Tuscan.

The bathroom above measures 12'x11' 4". Floor and wainscot are 6"x12" glazed tile. Upper walls are sand blasted plate glass. Glass linen cabinet doors. Indirect lighting above the tub and in lavatory recess. Plaster ceiling is painted.



The dental lavatory should be in every home, especially one with children, as it encourages regular brushing of teeth. Relieves bathroom congestion. Shelf at back. Hot-and-cold water. K-5360-BA.

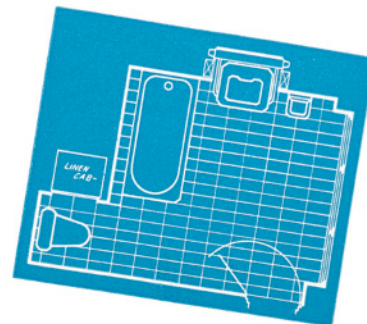
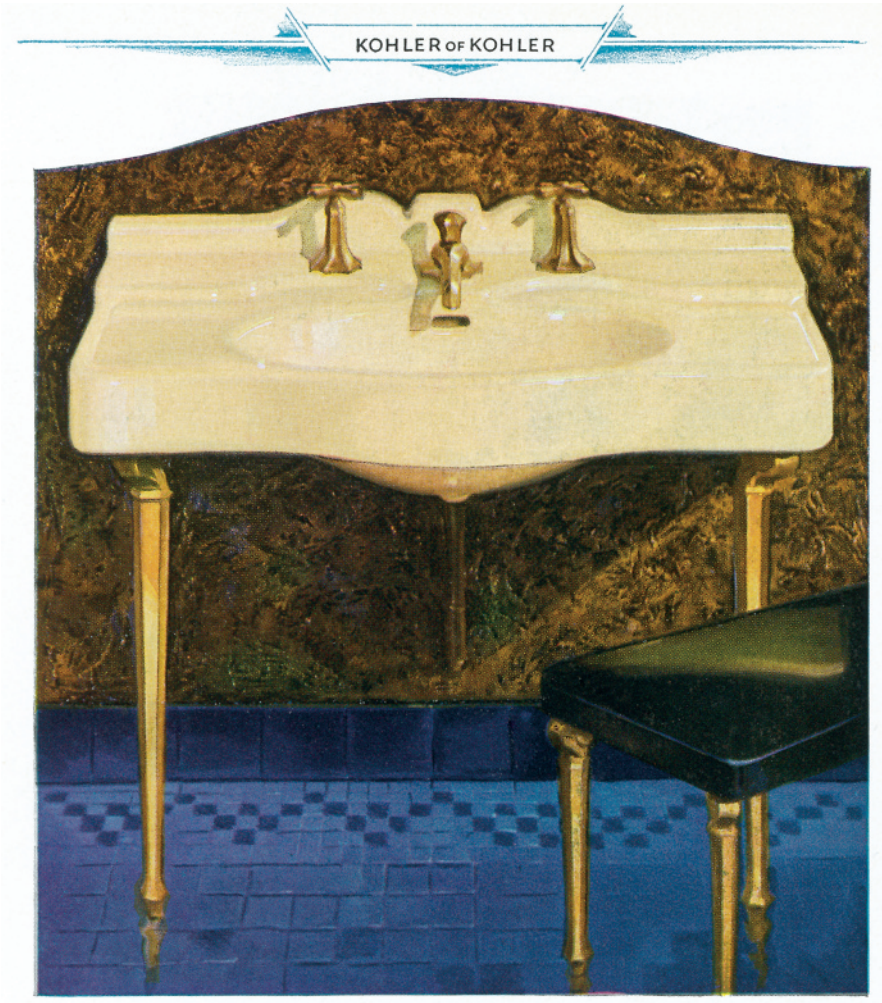


FIGURE 1.7 Rectangular tubs replaced the claw-foot tubs, and new colors, like this soft yellow, emerged on the market.

Courtesy of Kohler Company

- Lavatories were often made of Monel, a corrosive-resistant, light-weight, white metal containing a mix of copper and nickel.
- Nickel was used for bright work on faucets.
- Hand-painted murals, mirrors, and cloth were common surface coverings for walls.
- White was still popular, but porcelain made it possible to add color.
 - The color matching of vitreous china glazes and cast iron enamels was perfected.
 - Although black fixtures appeared, they would not be popular on the market for four decades.
 - Colors included blue, green, ivory, yellow (see Figure 1.7), brown, lavender, and gray.
- Dressing table vanities were featured as more activities moved into the bathroom space (see Figure 1.8).



Kohler Bellaires Lavatory K-4915

AN artistic triumph in vitreous china is the Kohler Bellaires lavatory. A monument to the skill and craftsmanship of the Kohler artisans. The broad, massive slab is cast in one piece. The graceful curving back, the slightly raised shelf, the spacious tablelike end portions and generous bowl combine to give this boudoir lavatory a beauty, utility, and appeal never before approached.

The fittings, like two shining obelisks, are dainty and lovely with their coating of shining gold. Yet they are sturdy, and efficient as well.

The finely sculptured legs are cast of fine metal. They have all the grace found in fine furniture. Placed far apart, they allow the use of a dressing table bench such as is shown in the above illustration.

Fixture	Prices	Size		Chromium	Gold
				Plated Fittings	Plated Fittings
Bellaires K-4915		20 x 36 inches	White	\$540.00	\$700.00
Bellaires K-4915		20 x 36 inches	Colored	630.00	790.00

FIGURE 1.8 This console “boudoir” lavatory, supported by two cast metal legs, included a raised shelf and room for a dressing table bench under it.

Courtesy of Kohler Company

- The bathroom continued to be viewed as a functional space, not for relaxation.
- Lighting consisted of a center ceiling lamp surrounded by milk-glass diffusers of various shapes.
- The first copper plumbing systems were installed late in the decade.

1930s

- The bathroom began to resemble the rest of the house with comfort emphasized.
- Small lavatories called dental lavatories were marketed as a means to help children practice dental hygiene.
- The four-fixture bathroom was now common—tub/shower, lavatory, dental lavatory, and toilet.
- Wall-hung lavatories were shown, along with lavatories supported by metal posts that included towel bars on the sides.
- Disappearing steps were incorporated to help children reach the lavatory.
- The leak-proof, one-piece shower was developed.
- Pedestal lavatories were common.
- Late in the decade, plumbing was hidden and fixtures were compartmentalized.
- Ads showed Americans how to design unused space (under stairs, dormer rooms, or large closets) into small bathrooms Kohler named the “lavette.” (See Figure 1.9)
- Plans were available to show homeowners how to convert underused space to a bathroom.
- Although introduced in 1893, glass block was now heavily promoted for residential buildings.
- Bathrooms were lit by a single, flush-mounted ceiling fixture in the center of the room, which remained the norm until the 1970s.
- The influence of the Arts and Crafts Movement introduced more colors into the bathroom.

1940s

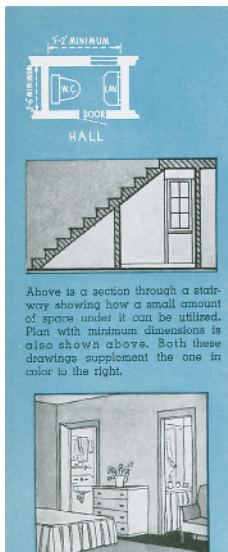
- New colors, such as rouge (burgundy), Tuscan (gold), and spring green (light green), as well as pink (see Figure 1.10) and bright blue, emerged.
- By the mid-1940s, the dental lavatory disappeared from ads.
- The single, mixing lever for showers was now available.
- The bench bath allowed parents to sit on the edge to watch children as they bathed (see Figure 1.11).
- Smaller bathtubs were designed for smaller bathrooms (see Figure 1.12).
- Laminates, mirrored walls, glass counters, and cork floors were trendy.
- Chromium experienced widespread use, followed by silver plate and gold plate.
- Linoleum replaced the white tile look and added color to the floor.
- Plastic appeared in fixtures.
- Glass block continued its popularity.
- Stainless steel became popular for lavatories and countertops.
- Small appliances, like hair dryers, entered the bathroom.

1950s

- Most new innovations came in the way of new materials.
- The 4 ft × 4 ft (1.2 m × 1.2 m) tub/shower became a solution for small spaces.
- Lavatory cabinets were common (see Figure 1.13).
- The term “powder room” was beginning to be used.
- New innovations in the bathroom included a telescoping towel bar; ceiling fixtures with a light, heater, and fan; adjustable showers; and an electric heated towel bar.
- The plastic tub with glass fibers was patented.
- Pink and gray were popular colors.
- Stainless steel remained popular for lavatories and countertops.

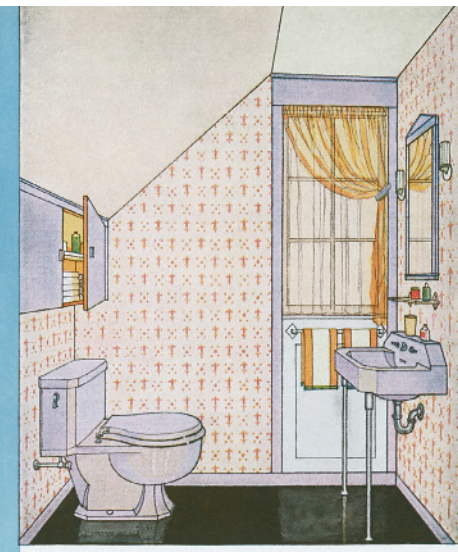
1960s

- The idea of relaxation was finally coming back to the bathroom.
- Ads portrayed hometown girls and happy moms relaxing in the bathroom.
- Bold colors emerged (see Figure 1.14), including orange, bright yellow, deep red, dark brown, and dark green, as well as the colors so distinctive of the era—avocado green and harvest gold.



Above is a section through a stairway showing how a small amount of space under it can be utilized. Plan with minimum dimensions is also shown above. Both these drawings supplement the one in color to the right.

At the end of a large bedroom a strip 3 feet wide can well be utilized, as shown by the perspective above and the plan below. In one compartment is the Lavette, in the other a dressing table and closet.



OTHER LAVATORIES FOR THE LAVETTE

Top: THE GRAMERCY. The 4½" wide shelf at back is a "natural" for the Lavette. Holds powder puff and powder, cream and soap, and other accessories used in a first-floor washroom. Vitreous china, beautifully proportioned. Hot-and-cold water fitting is not in your way. Pop-up drain. 3" back. Trap and supplies with stops. Size 22"x18", K-4964-BA.

Center: THE NAROBOL. This lavatory is meant for small Lavettes where space is at a premium. Projects only 14" from wall and is 26" long. Back is 5½" high. Glistening enameled cast iron. Hot and cold, chromium plated faucets. Supplies and trap. Roamy basin. K-804-M.


Bottom: THE HUDSON. Its modern lines, beveled corners, and flat surfaces make this lavatory look expensive. And yet it isn't. Smooth, glossy, enamel cast iron. The compact Centra hot-and-cold water fitting leaves plenty of unobstructed space on the slab. Trap and supply pipes with stops. Metal parts are chromium plated. 6-inch high back. Size 20"x18", K-226-CA.

FOR HALL Lavette


"Lavette" is the Kohler term for a wash-up room, "a small indispensable room which can often take the place of an extra bathroom." In existing houses more often than not the family desires additional bathroom facilities, especially when the morning rush takes place, when "company comes," and when guests stay overnight. If there is not room for a full-fledged bathroom, determined sleuthing will usually uncover some unused or seldom-used space off the first floor hall such as is shown above. If the first floor will not yield even a cut-off ceiling space under the stair, the second floor may have a bedroom which is larger than actually need be, and can spare a strip 2½ to 3 feet wide to be taken off at one end, as shown in the two lower parts of drawings at the left margin.

The Lavette above exhibits what can be accomplished with cramped space under a stair. The lavender of the Integra closet (K-5580-A) and the Strand lavatory (K-5320-BA with K-5471 legs) is repeated throughout the woodwork, as well as on the mirror framing, the latter having preferably a small geometric pattern in chrome orange (rather than a large sprawling design) so that the room may appear larger by contrast.

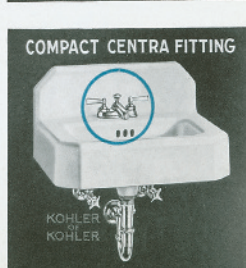
The ceiling is given warmth by being pale lemon yellow. Golden yellow complements the lavender and white by being the color of the overdrap (over a lemon yellow glass curtain), as well as in the inside of the cabinet and on the towel edging.



4½" SHELF AT BACK



EXTENDS ONLY 14" FROM WALL



COMPACT CENTRA FITTING

FIGURE 1.9 The "lavette," later called the powder room, was marketed by Kohler as a way to incorporate an extra bathroom by converting small spaces, such as bedroom closets and spaces under stairs, into a small bathroom. *Courtesy of Kohler Company*

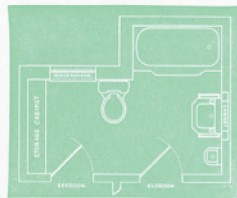
- New bathrooms were more luxurious and second bathrooms were promoted.
- The new self-rimming lavatory was incorporated into the vanity.
- The California hot tub and backyard pool were popularized.
- The claw-foot tub disappeared.

1970s

- Multiperson tubs for group soaks were popular.
- Hydromassage tubs, such as the whirlpool tub, were developed.
- New colors included sand, gray, black, and pink.
- Colored fixtures were an important part of the bathroom design.
- The double lavatory became an important selling point in new homes.
- The nostalgic look reappeared in a vintage toilet with elevated tank and chain pull, the ball-and-claw-foot tub, and pedestal lavatory.



Matched Styling AT ITS BEST



Fixtures: Cosmopolitan K-526-CP recess Bench Bath; Gramercy K-1850-BA vitreous china lavatory with "neatness shelf," metal legs and Wall-free towel bars; Waleot K-2200-BA vitreous china dental lavatory; Integra K-9610-PB one-piece closet.

The problem of the two-door bathroom is here solved by grouping the fixtures closely, with all hot water outlets on the same inside wall to save on piping and protect from freezing. A Kohler Compact radiator, recessed under the window to meet cold as it enters, keeps the bathroom comfortably warm.

A true recess with dropped ceiling, lighted from above and faced with Vitrolite to ceiling height, focuses importance on the tub. Vitrolite continues around the room as a wainscot, drawing the other fixtures into the picture. Above the wainscot the walls are wallpaper, in which is repeated the Peachblow of the fixtures.

4

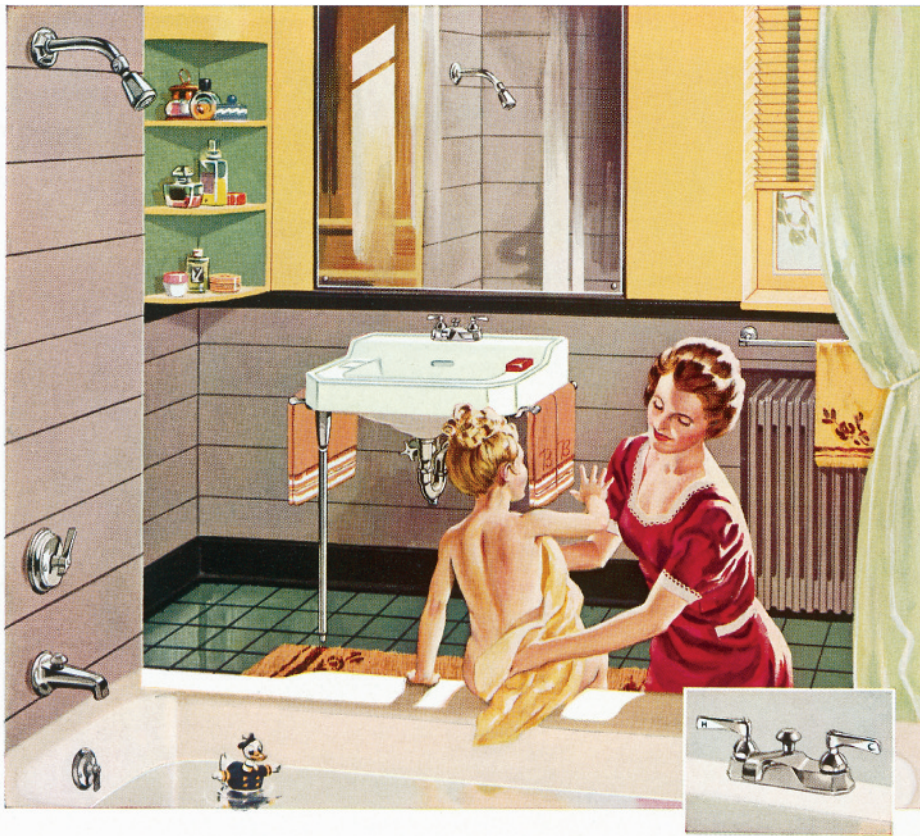
FIGURE 1.10 One of the popular bathroom colors in the 1940s was pink.

Courtesy of Kohler Company

- Theme designs were shown for the bathroom, including the patriotic, desert Southwest, and Caribbean motifs.
- Solid surface countertops with integral lavatory were developed in 1968, but were not introduced to the builder market until 1971. Four colors were available.
- Later in the decade, bathrooms were becoming a place of leisure with larger tubs for relaxation.
- Homeowners switched to fluorescent lamps to save energy, and to track lighting to increase the amount of light.

1980s

- Bathrooms increased greatly in size.
- Softer pastel colors returned.



Centra lavatory fitting.

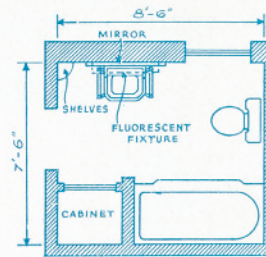
BATHROOM EFFICIENCY

In a Lively Setting

• If your bathroom is Kohler-equipped, which means that the fixtures have Kohler fittings as well, your reward is a smooth-working, matched set of which you can feel proud.

In the bathroom shown, the 5'6" Cosmopolitan Bench Bath, K-526-F, with seat at front, has a popular feature in the Triton shower and bath fitting. The dial mixer tempers the water for either the shower or the tub. After the correct temperature is obtained, raising the knob on the spout diverts the water to the shower head.

The lavatory is the K-1740-C vitreous china Chesapeake, 24 x 20", with compact Centra fitting illustrated, and the closet indicated in the floor plan is the K-3665-EB close-coupled Bolton.



3

FIGURE 1.11 A wide side on the bathtub served as a bench where parents could sit to help children during bathing.

Courtesy of Kohler Company

- Designs appeared on the surface of bathroom fixtures.
- More high-end homes incorporated hydromassage tubs.
- Large tubs that accommodated group soaks remained popular.
- Faucets and controls moved from the lavatory to the counter.
- Pedestal lavatories (see Figure 1.15) and claw-foot tubs remained popular.
- There was a significant increase in the use of small, grooming appliances in the bathroom.
- New toilet designs included models with reduced water use.
- Glass block enjoyed a resurgence.
- Recessed down lighting was part of the lighting plan.
- In 1980, the American National Standards Institute standards were revised to include residential bathroom applications.
- In 1984, the Uniform Federal Accessibility Standards were published, providing **accessibility** guidelines for federal buildings and government-funded apartment buildings

1990s

- Sculptured fixtures added softer lines and new interest to the bathroom fixtures.
- Lavatory faucets appeared on the walls, as well as on the lavatory surface and counter.
- Many new types of vessel-style lavatories were introduced in a multitude of materials.
- Whirlpool and jetted tubs were common, especially in the higher-end market.
- Spacious bathrooms incorporated room for many activities, including meditation, exercise, and relaxation.
- Clothing storage and a dressing area were incorporated into larger bathrooms.
- Metallic finishes were added to lavatory surfaces.
- Detailed designs covered the surface of vitreous china fixtures.
- His and her spaces were beginning to emerge.
- Fine furniture was used for a vanity.
- New types of lighting were incorporated, including recessed, low voltage, and compact fluorescents.
- In 1991, Fair Housing Laws required that all new multifamily buildings have adaptable units.

FIGURE 1.12 Smaller bathrooms incorporated smaller bathtubs.

Courtesy of Kohler Company



KOHLER

Lavatory Cabinets



KOHLER OF KOHLER

FIGURE 1.13 Bathrooms were now being shown with cabinets along with the lavatory, providing much needed storage.

Courtesy of Kohler Company

2000s

- Larger homes of this period brought additional bathrooms and larger bathrooms.
- Energy and water conservation features are incorporated into more eco-friendly bathrooms, some of which were required such as the new U.S. federal mandate which required 1.6-gallon (6 liters) flush toilets in all new residential applications.
- Furniture pieces are taking the place of cabinetry, and contemporary styling is emerging with its clean lines and floating cabinetry (see Figure 1.16).



FIGURE 1.14 The 1960s brought many new bold colors to the bathroom.
 Courtesy of Kohler Company

- More color is coming into the bathroom, including colored bathroom fixtures and the use of more ornamental design elements.
- The master bath suite becomes multipurpose, incorporating space for two users and activities such as dressing, laundry, and relaxation.
- Feng Shui and the Asian culture are influencing bathroom designs.
- Jetted tubs continue to be popular.
- Vessel lavatories are appearing in many styles, materials, and mounting configurations (see Figure 1.16).
- A heightened awareness of universal design is influencing bathroom design, materials, and styling.
- Showers are more popular than ever and are emerging as the preferred bathing method for most adults.
- The outpost or morning kitchen is added to the master suite
- Technology is an important part of the modern bathroom and is used for entertainment, relaxation, and grooming.



FIGURE 1.15 The pedestal lavatory reappears, especially in powder rooms.
Courtesy of Porcher

- The influence of nature appears in bathrooms through color, materials, and the use of large windows to bring the outside indoors.
- Height of vanity and/or bowls are adjusted up or down to vary with the user.

CURRENT DEMOGRAPHIC AND POPULATION TRENDS

With each era, new design trends emerge that incorporate the lifestyles and technologies of the time. In this new millennium, we see many factors influencing bathroom design, one of which is the changing demographics of North America. There are two major trends emerging in the population: an increasingly more diverse population and a larger number of older people. Another long-term trend affecting bath design is changing household composition, namely a large number of multigenerational households.

U.S. Population Growth

The general population of the United States continues to increase and according to the 2010 Census it now exceeds 300 million. The population increase from 2000 to 2010 was the third largest in U.S. history, adding 27.3 million people—a 9.7 percent increase. Historically, the highest increase in population was during the “baby boom” years of the 1950s when the population increased 19 percent, adding 17.5 million people.

FIGURE 1.16 The vessel sink with a wall-mounted faucet adds to the contemporary look of floating, straight-lined cabinets.

Courtesy of Duravit



Household Growth

Although the general population has increased, household growth has slowed, averaging only 1.12 million households during the 2000s, a full 17 percent below the 1990s according to the 2010 U.S. Census. The portion of young adults age 20 to 24 heading independent households has also dropped by 2.6 percent and for those ages 25 to 29 by 2.8 percent since 2007. This trend could be very different over the next 15 years, however, as immigration continues and a large percentage of the echo-boom generation (born 1986 to 2005), numbering around 80.8 million, approach young adulthood. Even with immigration at only half that rate, their numbers will grow to 86.5 million by 2020, and added to the echo boomers will produce a higher demand for apartments and smaller “starter homes” during the next 15 years.

The future of household formation is uncertain. On one hand, the recent drop in home prices and a favorable rental market may encourage more employed individuals to form households of their own. In addition, those doubling up to save expenses are typically in a temporary situation and will eventually seek their own place. On the other hand, the rate of household formation among young adults may continue to decline due to sustained unemployment, home foreclosures, delayed marriage and childbearing, the increased importance of higher education, and the rising cost of going away to college. These young adults will continue to double up or live with their parents.

Not only have the economic and housing situations in 2010 decreased household growth, they have also led to lower mobility. Between 2005 and 2008, overall mobility fell about 12.6 percent with the deepest decline among homeowners. This trend may continue as financially stressed households find it easier to stay in their current residence rather than experience a financial loss.

Household Composition

Other demographic changes that could impact the design market include changes in household composition as summarized in the 2010 U.S. Census. Households are becoming smaller. In 2010, one- and two-person households accounted for more than 63 percent of all households. The share of single-person households rose to 28 percent, with a higher percentage being 65 and older. Married couples, for the first time, represented less than 50 percent of the households (48 percent) and unrelated adults living together made up 6.2 percent. Married couples with children were fewer than 20 percent of all households. The largest change in household composition was an increase in households headed by women without husbands—up 18 percent since 2000.

One other prominent change in households is the return of the multigenerational family household as reported by the Pew Research Center in 2010. A record 49 million Americans, or 16.1 percent of the population, in 2008 lived in a household that included at least two adult generations or a grandparent. The rate was only 12 percent in 1980. Multigenerational trends include:

- In 2010, 44.7 percent of the 20 to 24 year olds who do not live on their own are living with their parents, along with 18.0 percent of the 25 to 29 year olds. Since 2005, an additional 1.6 million young adults live at home. Many reasons could account for this increase in adult children living at home, including difficulty with finding a job or launching a career, or marrying at an older age. In the 25 to 34 age group, more men than women are likely to live in multigenerational family households.
- The high rate of immigration since 1970 was dominated by Latin Americans and Asians, who are far more inclined to be part of a multigenerational household. Hispanics (22 percent), blacks (23 percent), and Asians (25 percent) are all more likely than whites (13 percent) to be a multigenerational household.
- A significant change in multigenerational composition involves older adults. Once more likely to live in such situations (57 percent of adults 65 and older in 1900), only 17 percent of older adults today live in multigenerational family households because of better health, better financial situations, and better social safety net programs. This number has been increasing some in recent years due to the availability of more grown children who are informed caregivers and recent cuts in Medicare programs. More likely to outlive their spouse, a higher percentage of women are part of this type of household.

- Some 49 million Americans live in a multigenerational family household. Of those, 47 percent are made up of two adult generations of the same family with the youngest adult at least 25 years of age, 47 percent live with three or more generations of family members, and 6 percent belong to a “skipped” generation household with a grandparent and grandchild and no parent.

Population Diversity

According to the 2010 U.S. Census and the State of the Nation’s Housing 2011, a publication of the Joint Center for Housing Studies of Harvard University, we continue to see demographic changes due to changes in immigration and the minority populations. Minorities account for 92 percent of the total U.S. population growth between 2000 and 2010, and the growth of the population under the age of 18 was at 1.9 million, driven mostly by racial/ethnic minorities. Immigrants and minorities also account for a large percentage of the household growth in the past decade. The Echo Boom generation is already 42 percent minority and over the next 15 years this diverse generation, along with other minority households, will increase the demand for smaller starter homes, apartments, and remodeling projects. Statistics Canada places the percentage of visible minority residents in Canada at 16.2 percent (about 5 million people) in 2006, up from 13.4 percent in 2001.

The largest increases for the United States are among Hispanics. Since 2000, the Hispanic population in the United States has increased 43 percent and has doubled since 1990. According to the 2010 U.S. Census, there are 50 million Hispanics in the United States, or one in every six residents and about 16 percent of the population. The U.S. Asian American population increased 43 percent since 2000, but Asians still make up less than 5 percent of the total population.

Immigration also had a key role in the slowdown in household growth. During the 2000s, not only did the growth of the foreign-born population slow, but the growth of foreign-born households stalled due to the recession. Although the number of households headed by foreign-born citizens increased by about 200,000 from 2004 to 2010, the number of foreign-born noncitizen households declined by the same amount from 2007 to 2010.

An Aging Population

The 2010 U.S. Census places the 65 and older population at 38.6 million, up from 34.9 million in 2000. The U.S. population between ages 65 and 74 is expected to increase 6.5 million over the next decade, a rise as more “baby boomers” reach retirement. The 55 to 64 age group is expected to grow by 3.7 million. Over the next 20 years, the share of 65 and older will rise from 13 percent of the population to 19 percent. Estimates of the Canadian 2011 Census by Statistics Canada places their 65 and older age group at 14.1 percent of the overall 2011 population number of 34,600,346, with a large portion of the over 65 group living in more rural areas.

Increased life expectancy is credited with some of the increase in this older age group. When the United States was founded, the average American was expected to live to the age of 35, but according to the World Bank, the 2009 life expectancy of U.S. citizens is 78.1 years of age and for Canadian citizens it is 80.66 years of age.

The State of the Nation’s Housing 2010 states that this increasing number of “baby boomer” retirees has dominated housing market trends for decades and will continue to have a significant impact. As they purchased their first homes and then traded up to bigger, better homes, the sheer numbers of individuals in this group has shaped the housing market. Now, as they reach retirement, many are seeking housing to meet their current needs, either by making changes to their current home or by moving to a smaller home.

The number of older homeowners able to move from their current residence has declined sharply in recent years due to the nation’s financial crisis that depressed home equity and reduced retirement income. This trend will open the market for remodeling projects that allow people to “age in place.” Those boomers who can relocate tend to downsize to smaller homes with fewer rooms and one-level living.

For both the remodeling market and new, smaller retirement home market, there will be an increased interest in bathrooms that are safe, comfortable, and ergonomically designed. Of course, accessible design will be critical for those aged individuals with disabilities. See chapter 8, “Accessibility in Practice,” for additional characteristics of this population and design applications appropriate for them.

BATHROOM TRENDS

These changing demographic characteristics also impact how consumers use their baths, the products they demand, and the looks and styles they favor. The retail markets of today offer the consumer and designer an unlimited array of choices for bathroom design. Although certain styles may go in and out of fashion, today’s selection of colors, materials, styles, sizes, and textures allows the designer to create a room to fit every preference and situation. As new trends are incorporated into the bathroom, you, as the designer, must always keep in mind that the bathroom is a very complex space to plan, and the fundamental characteristics of sanitation, ergonomics, and safety should always be considered.

In addition to population and demographic changes that may affect bathroom design, specific consumer preferences can greatly impact the bathroom projects your clients request. Surveys conducted by national trade magazines, associations, and manufacturers can give designers an idea of what consumers prefer in their bathroom. Just remember, tastes change quickly today.

Housing and Consumer Buying Trends

Design trends begin with general home trends. Surveys by the National Association of Home Builders (NAHB) and Better Homes and Gardens provide a profile of home trends and what people want in their homes. The average home size shrank to 2,480 square feet in 2009 as reported by NAHB, but the U.S. Census found the average home size to be at about 2,100 square feet. Builders expect homes to continue at this smaller size, averaging about 2,152 square feet in 2015. These smaller homes are not only desired by individuals 65 and older looking to downsize, but by the echo boomers interested in smaller, more affordable starter homes.

NAHB survey findings also show that the number of homes with three or more bathrooms declined for the first time since 1992. More builders plan to incorporate luxury features like master baths with multiple showerheads, and they will focus on energy-saving features. Many new homes of the future expected to have a master bedroom and bath on the first floor of two-story homes.

Nevertheless, surveys consistently show that bath remodeling remains one of the most popular remodeling projects. The primary goals of households who are remodeling a bathroom vary somewhat from survey to survey, but generally include updating the appearance, adding new fixtures, and often, making the bath larger if possible.

A large percentage (65 percent) of the consumers surveyed wanted an additional bedroom with bath to accommodate the multigenerational household. Consumers would rather downplay the master bedroom suite and put more money into rooms like the bathroom. Consumers are also becoming more savvy buyers, taking a lot longer researching purchases and projects. Many consumers (58 percent) are “extremely reluctant” to spend money they do not have.

As a professional designer, you will find it beneficial to stay up to date on ever-changing consumer preferences, as well as style, material, and color trends, by reading consumer and trade magazines, visiting industry-related websites, and attending trade shows.

Design Trends

Following are some of the key design trends in bathrooms today. Many of these trends are visible in both the U.S. and Canadian bathroom projects, but some specific regional trends are highlighted in later sections.

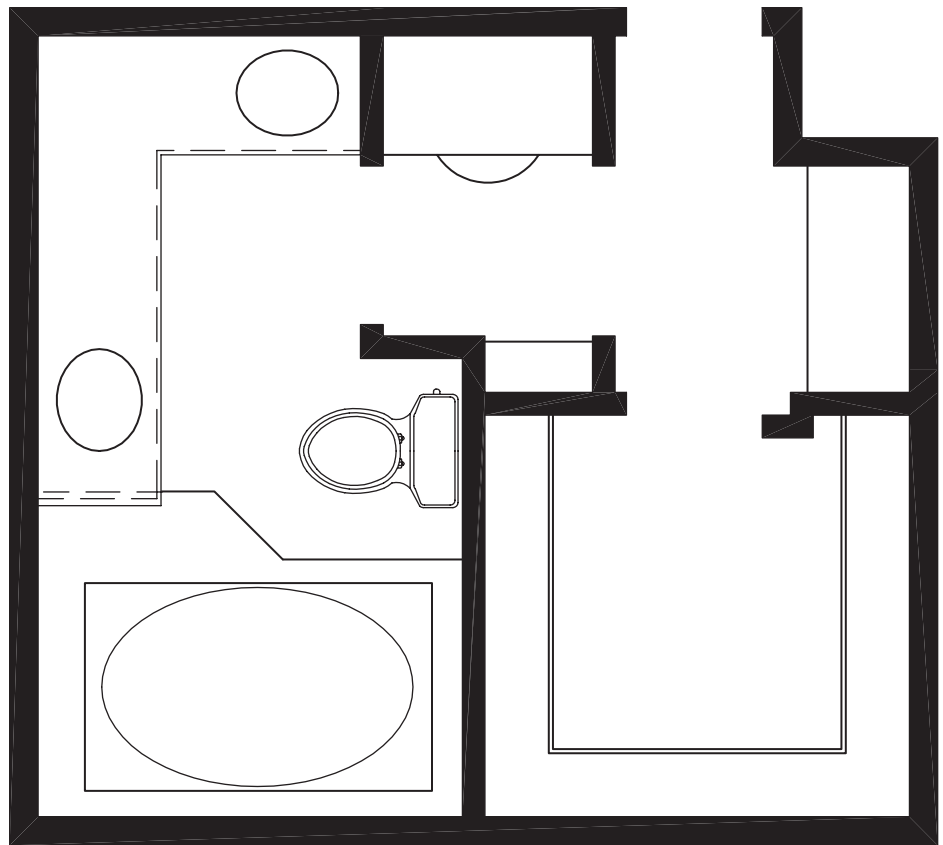


FIGURE 1.17 Closets in the bathroom area form a dressing area that is convenient to the grooming area in the bath.

NKBA

Space Use Trends

- **Open spaces.** Most bathrooms of the past were minimal in size and looked upon as very private and somewhat hidden spaces. Although some homeowners and builders are downsizing the bathroom in the current economy, consumers still desire space, and there are many ways in which designers can incorporate a feeling of openness. Designers can expand the bathroom space both visually and physically by carefully selecting the appropriate size and style of fixtures, using mirrors and large windows, and incorporating higher ceilings.
- **Outdoor access.** Today's consumers have a love for nature, the outdoors, sunshine, and fresh air, so this feeling can be created in the bathroom by physically opening the space to the outside through access to a private deck or patio and incorporating large windows.
- **Suites.** A popular idea is merging the bedroom and the bathroom or providing access through a dressing area to create the bathroom suite. Bathroom designs are moving away from the bathroom as a confined area into one that is a fluid living space.
- **Dressing.** Dressing areas and closets are moving into the bathroom (see Figure 1.17) from the actual bedroom space. The closet may include hanging and drawer space, as well as a cedar-lined compartment. You will find additional information on closet design in chapter 9, "More than a Bathroom."
- **Two users.** Designing a bathroom with two simultaneous users in mind is essential for many households. The double lavatory has been used for some time as a means of eliminating the morning wait, and it is in even higher demand today. Compartmentalized areas (see Figure 1.18) have also helped provide privacy for one individual while another is using the space.

Color and Theme Trends

- **Nature.** The natural look with colors and textures to match the surrounding outdoor environment is gaining favor among designers and consumers. The nature-inspired designs might include natural stone or warm woods for a soft natural beauty. Nature is also brought indoors through the use of large windows (see Figure 1.19).

- **Neutral colors dominate.** Whites and off-whites, beiges, and browns are the most common used colors in bathrooms.
- **Abundance of light.** Designers are not only incorporating light for general and task purposes, but are using it to add interest in other places. Products in today's market allow designers to illuminate almost everything in the bathroom including, toilets, faucets, showers, and mirrors, as well as shower, wall, and floor tiles.
- **Green bathrooms.** The "green bathroom" is not only an eco-friendly theme but also a color theme that has recently grown in popularity. Green color palettes are used by an increasing number of designers. Blues (see Figure 1.20) and warm gray neutrals are also popular colors in Canada as well as the United States, creating a relaxing and spa-like environment. Gray is the new black!
- **Utility-chic.** Some designers see a continuation of what they call "utility-chic," a mix of wood and stainless steel, exposed light bulbs, and art that references old signage.
- **Art.** Once absent from most bathrooms, artwork and art objects are finding their way into the bath, helping to create a certain theme or adding to the feeling of relaxation in the room, especially for the spa experience.
- **Traditional styling.** Traditional styling is clearly dominating U.S. bathroom projects (see Figure 1.21).
- **Contemporary.** Also popular is contemporary styling with its clean lines (see Figure 1.22). Designers emphasize this theme through floating (wall-hung) vanities and toilets, clean lines, and contemporary materials like glass. Even traditional designs are including contemporary elements like the vessel bowl lavatory and stone.

FIGURE 1.18 A compartmentalized bathroom will more easily allow multiple users at one time.

Courtesy of Porcher





FIGURE 1.19 A feel of the outdoors and nature are created with the use of stone, warm woods, and a view outdoors.

*Design by NKBA member: Holly Rickert,
Co-Designer: Julia Kleyman*

- **Shaker styling.** A style incorporated by about one-third of the designers is the Shaker style.
- **Zen- or spa-like theme.** Designers are creating individualist and personalized spaces in bathrooms that recreate the spa or Zen-like feel. Fireplaces, music, sleek designs, and comfort-fit fixtures all help provide the homeowner with a spa-like experience at home. Glass tiles, clean lines, and floating vanities add to the feel.
- **Japanese and Asian influence.** Although Asian influences have been a part of home design schemes for some time, some designers see the Japanese influence as a major design statement in U.S. bathrooms and no longer just incorporated into a few accessories (see Figure 1.23). The feel is subtle and achieved with clean lines, open spaces and neutral colors with a bold splash of color for an accent. Japanese furniture may be used as a vanity to add to the theme.



FIGURE 1.20 This blue bathroom with traditional styling includes double vessel sinks and a grooming area.

Design by NKBA member: Kenneth Kelly, CKD, CBD, CR

Multicultural Influences

- **Multiple generations.** For many cultures, one home may accommodate many generations. Therefore, designers may need to plan spaces that will accommodate this multigenerational family. This typically means more bathrooms and perhaps separate suites with a private bath.
- **Folk and ethnic patterns.** Designers are using more folk- and ethnic-inspired patterns in their bathrooms. Incorporating hand-sewn trims on towels and the use of birds and flowers in accessories help create what they call the “folkloric” look.

Fixtures

- **Luxury bathrooms.** Despite the fact that some people are cutting out some of the extravagant features in their bathroom, people still enjoy space and luxury if they can afford it. In today’s luxury bathrooms, fixtures make a statement. They can dominate, through the use of large tubs and massive stone pieces, or they can present a softened look by using sculptured fixtures with delicate lines.
- **Lavatory choices.** New trends are emerging in fixture design. The undermount lavatory dominates newly remodeled bathrooms with the vessel or bowl lavatory as a clear second. These vessels, which can be made of many different types of materials, often sit on a flat, wall-hung base with plumbing exposed below, but can be placed on a vanity cabinet as well. Counter- and wall-mounted spouts and controls are commonly used with these fixtures. Integrated, pedestal and drop-in lavatories are still popular, but were specified less often by designers.



FIGURE 1.21 The popular traditional styling of this bathroom incorporates dark woods, the look of furniture in the bookcases used for storage, and the graceful lines of the vanity area.

Design by NKBA member: J. David Ulrich, CKD

- **Reevaluating the jetted tub.** In the past number of years, more households are finding that they are not using their large whirlpool or jetted tubs, once a must in most luxury master baths. Designers report that if jetted tubs are incorporated they are becoming more therapeutic with gentler hydrotherapy bubbles, as well as integral support, lighting, sound, and scents to provide more of the spa experience.
- **Freestanding tubs.** Whether jetted or just used for soaking, large tubs that are incorporated into larger master baths are freestanding and take a central and prominent place in the room. The tub's styling may be rounded or angled, depending on the styling of the room.
- **Fewer tubs.** Whether remodeling or designing a new home, a trend among more homeowners is to install only showers in most of the home's bathrooms and perhaps have a standard tub in only one location. In general, households are using showers instead of tubs and many times a shower can be installed in a smaller space and perhaps at less expense. At least one tub may be needed in the home, however, for bathing children and for those who prefer tub bathing.
- **Large, open showers.** Although some homeowners are hanging onto tubs to preserve resale value, others are eliminating the tub altogether in the master bath and replacing it with a large shower stall, especially where space is limited and the room cannot accommodate both. For daily uses, the shower is becoming the preferred method of bathing instead of a tub for that quick morning getaway. These larger showers are often designed to accommodate more than one person and have a surround enclosure design with an open entrance (see Figure 1.24). Steam, lights, multiple showerheads and body sprays (see Figure 1.25), rain showerheads, aromatherapy, chromatherapy, and music are also becoming part of the showering experience.



FIGURE 1.22 The contemporary style with its simple lines is displayed here in the increasingly popular gray hues.

Design by NKBA member: Jan E. Regis, CMKBD

- **Universal design.** Universal design considerations are incorporated into bathroom fixture selection and placement. Vanities with knee space, single-lever plumbing fixtures, hand spray fixtures, comfort-height toilets, larger showers with illuminated thresholds and doors or a zero entry shower, eliminating the threshold all make the bathroom a place that accommodates everyone's needs. Grab bars no longer look institutional, and tubs have doors and soft, contoured seats. More information on universal design is included in chapter 4.
- **Faucet finishes.** The most popular finish for faucets in 2010 was satin nickel, with brushed nickel also being a favorite. Other popular faucet finishes are bronze and oil-rubbed bronze, polished chrome, and polished nickel.
- **White fixtures dominate.** The most common color of bathroom fixture is white. Bisque and off-white were used in far fewer projects by designers.
- **Countertops.** Quartz is gaining ground on granite as a popular bathroom vanity top material, but granite still dominates the market.
- **Tile still trendy.** Ceramic and porcelain tiles on the floor continue to dominate the projects with natural stone also proving to be popular. Variations of inlay floors are also appearing, especially in many traditional themes like those that carry a French chateau feel. Faux hardwood porcelain tiles shaped in planks give the hardwood look to the floor without actually using wood, which can be easily damaged by moisture, a major concern in a bathroom.
- **New tile trends.** Nontraditional materials are showing up in tiles for the bathroom including copper, bronze, stainless steel, and glass. Glass tiles, in particular, are being incorporated into



FIGURE 1.23 Asian influences with earthy color tones create a warm feel in this contemporary bathroom.

Design by NKBA member: Cheryl Kees Clendenon, Co-Designer: Stacy Miller

floors, backsplashes, and shower walls to create a luxury spa-like atmosphere. Many of the glass tiles are made from recycled glass. Designers are incorporating textured metallic floor and wall tiles that incorporate what they see as a “Russian” influence. The newer 3D wall tiles add texture to rooms.

- **Natural materials.** A prevalent design element is the use of natural materials. The natural or organic feel includes the use of wooden bathtubs and sinks, and rich wood grains in cabinetry. In places where water is a concern, the “wood look” tiles may be used, and they even come in “log cut” styles for the log cabin feel. New waterproof wood coverings can be used for floors or walls to create that nature-inspired room. The use of natural stone (see Figure 1.26) adds to the earthy look, but porcelain tiles laser printed with natural stone patterns are also emerging, having the added benefits of scratch resistance, durability, suitability to wet areas, cost efficiency, and no need of sealing.



FIGURE 1.24 The luxury bathroom often includes an oversized shower without a door, shown here in this neutral-colored decor.

Design by NKBA member: John Sylvestre, CKD

Furniture

- **Furniture replaces cabinetry.** Furniture is being introduced into the bathroom much as it has been in the kitchen. There is a trend toward less use of cabinetry and more furniture items, such as the console lavatory, to create a look that is unified with the bedroom.
- **Contemporary look.** Contemporary lines are echoed in the freestanding furniture pieces.
- **Floating cabinets.** Many cabinets are taking on the “floating look,” whereby they are attached to a wall instead of grounded on the floor.

Sustainable Design

- **Environmentally friendly products.** Clients are continually becoming more pro-environment and looking for environmentally friendly products, including those made of recycled and renewable materials, to use in their homes.
- **Water and energy saving fixtures.** In addition to water and energy saving features, consumers want products that are low maintenance to reduce cleaning and the use of chemicals. They also want durable materials so they will not need to be replaced frequently.
- **Chemical sensitivity.** Many people are very sensitive to chemicals, so selecting products with low or no chemical emissions is important in these cases.
- **Efficient lighting.** People in general desire bright spaces and the use of daylighting is bringing in an abundance of natural light for daytime use. Energy-efficient LED lighting is also becoming the lamp of choice for many purposes. You will find more information on sustainable design in chapter 3, “Environmental and Sustainability Considerations.”



FIGURE 1.25 Larger, spacious showers may incorporate multiple showerheads.
Courtesy of Danze, Inc.

Activity Trends

Grooming

Providing a place for applying makeup no longer means just an open space with a stool at the lavatory counter. Larger, more luxurious bathrooms include a special vanity area designed with adequate lighting, storage, and multiple mirrors for special grooming activities.

Relaxation

The idea of using the bathroom as a retreat for relaxation has hit new heights in American homes. The reemerging interest in health and spirituality has brought new attention to the “bath.” Spurred by the popularity of the hot tub and hydrotherapy, the home spa concept (see Figure 1.27) has evolved into a spa bathroom that includes multiple ways to slow down the pace of life, relax, and soothe away the stresses of the day. Spa bathrooms might include a spa tub, whirlpool/jetted tub, sauna, and steam shower. You can find tips for designing a spa bathroom in chapter 9, “More Than a Bathroom.”



FIGURE 1.26 The look of natural stone is prominent in the wall tile of this bathroom.
Design by NKBA member Victoria Shaw

In addition to using water for relaxation, the bathroom can be an intimate and private space that has an emotional and mental feel like no other in the home. Linking the bedroom, library, and bath creates a space to relax and read. A fireplace brings back the intimate sitting room of the past, where the tub was brought into the bedroom and placed near the fireplace for warmth.

Comfort Station

In creating an inviting and relaxing space, comfort is a top priority, and new materials and technologies are used to design these elements of comfort.

- Tubs not only contour to the body, but are made of a soft, resilient material to cushion the body as the bather enjoys the relaxing hydrotherapy.
- Cushioned and heated toilet seats have been available in other parts of the world and have made a fairly recent appearance in the North American market. These high-tech toilets also warm your feet, play music, light up, and raise and lower the cover as you approach and leave.
- Additional comfort is added through heated floors so people no longer step out of the tub onto an icy, cold surface.
- Warm towels are very comforting to people as they step out of the shower, or used to warm up muscles before beginning exercise. Towel warmers and warming drawers make warm towels available.

Meditation

Meditation rooms or spaces provide a quiet place to relax and reflect. Japanese rock and sand gardens allow the user to create a peaceful setting. A space devoted to exercises like yoga, helps create a relaxing end to a busy day.



FIGURE 1.27 Larger bathrooms can turn into a spa with the inclusion of a whirlpool and deluxe shower.

Design by NKBA member: John A. Petrie, CMKBD

Health and Wellness

An interest in healthy routines and health monitoring among an aging population has made its way into the design concept of more luxury bathrooms. Designers are including massage tables for treatments at home, as well as room for a gym or exercise studio.

With the newest technologies, consumers can also use the bathroom for health monitoring. Fixture companies are marketing toilets that monitor waste for various health-related indicators. Bidet features on toilets add to the feeling of cleanliness after toilet use. A concern for health has also fostered the development of antimicrobial finishes to deter bacterial growth. Touchless or hands-free faucets and toilets increase the emphasis on hygiene.

Technology and Electronic Devices

The modern bathroom is not lacking in technology and electronic devices. Equipped with radio, CD/DVD players, televisions, and speaker systems, consumers can stay abreast of the current world news while dressing, or listen to music while relaxing in the tub or sauna. Not only are flat screen televisions incorporated into some jetted tubs and vanity mirrors (see Figure 1.28), but showers also can have a waterproof television screen blended into the tile wall, controlled by a waterproof remote, and heard on ceiling speakers.

Location Trends

Outpost Kitchen Area

As part of the master bathroom suite, many households are incorporating what might be referred to as a mini kitchen, outpost kitchen, or morning kitchen to handle food, drink, and health needs



FIGURE 1.28 No need to miss the morning news when you can have a television panel as part of your bathroom mirror.
Courtesy of Seura, Inc.

(see Figure 1.29). Households are finding these outposts a very convenient solution to the morning rush and an enhancement for evening relaxation. Often included in these kitchens are a coffee-maker, a small refrigerator or refrigerator drawers, and a small microwave oven.

Once thought of as a luxury, these auxiliary kitchens can also serve as support stations when a family member is injured or ill, or when a caregiver is involved. Medications may need to be refrigerated, or baby bottles may need to be stored and warmed for a baby in the family. The bedroom suite does not need to be extremely large to accommodate a few of these appliances.

Multipurpose Space

Just as the kitchen has evolved into the “hub” of family activities, the bathroom is now taking on a similar role in some homes, with parts of the bathroom space providing a place for family members to gather, share time together, and communicate about the day’s activities. Compartmentalization provides the privacy needed, so that open spaces can be enjoyed by many.

- **Massage space.** Some luxury bathrooms are incorporating space for a massage table.
- **Exercise room.** A room devoted to exercise may adjoin some large luxury bathrooms.
- **Spa room.** Large bathrooms may have a room devoted to spa features such as a sauna, whirlpool or steam room.
- **Multiple entries.** A second bathroom with more than one entrance (see Figure 1.30) provides a means for establishing a guest suite without adding another bathroom. Examples include an entrance from one bedroom and the hall, or a bathroom between two bedrooms.



FIGURE 1.29 Coffee and a quick morning breakfast can be served up as you prepare for the day with this morning kitchen located in the master bathroom.

Courtesy of Wellborn Cabinet, Inc.

- **Laundry area.** Because most laundry is produced in bedrooms and bathrooms, designers and builders are incorporating a laundry area, or even a second laundry area, into or near the bathroom and bedroom area. Chapter 9, “More Than a Bathroom,” contains more details on planning a laundry area.

Storage Trends

- **Multiple types.** Once almost devoid of storage, the bathroom now contains multiple types of storage (see Figure 1.31) to handle items for the variety of activities that take place there.
- **Clothes storage.** In larger bathrooms, there is now more clothing storage, both folded and hanging, as part of a dressing area. These dressing areas can be entire rooms, taking all clothes storage out of the bedroom space. See chapter 9, “More Than a Bathroom,” for additional information on clothes storage.
- **Open storage.** In the form of open shelves, open cabinets, or poles with wire baskets attached, these provide visual appeal as well as convenience.
- **Barn door closures.** A door hanging from and sliding along a rail, much like the mechanism used on animal barns, is used as a closet door and even the door for entering the bathroom from the master suite. This type of closure allows the user to slide the door along an adjacent wall, allowing 100 percent access to the door opening.
- **Appliance storage.** An increase in the use of portable electric appliances/devices in the bathroom calls for more storage for these items, as well as consideration for utility connections. These appliances/devices require storage space not only in cabinets and drawers, but on the counter as well. Built-in appliances, such as refrigeration units, may need special circuits and electrical connections incorporated into the plan.

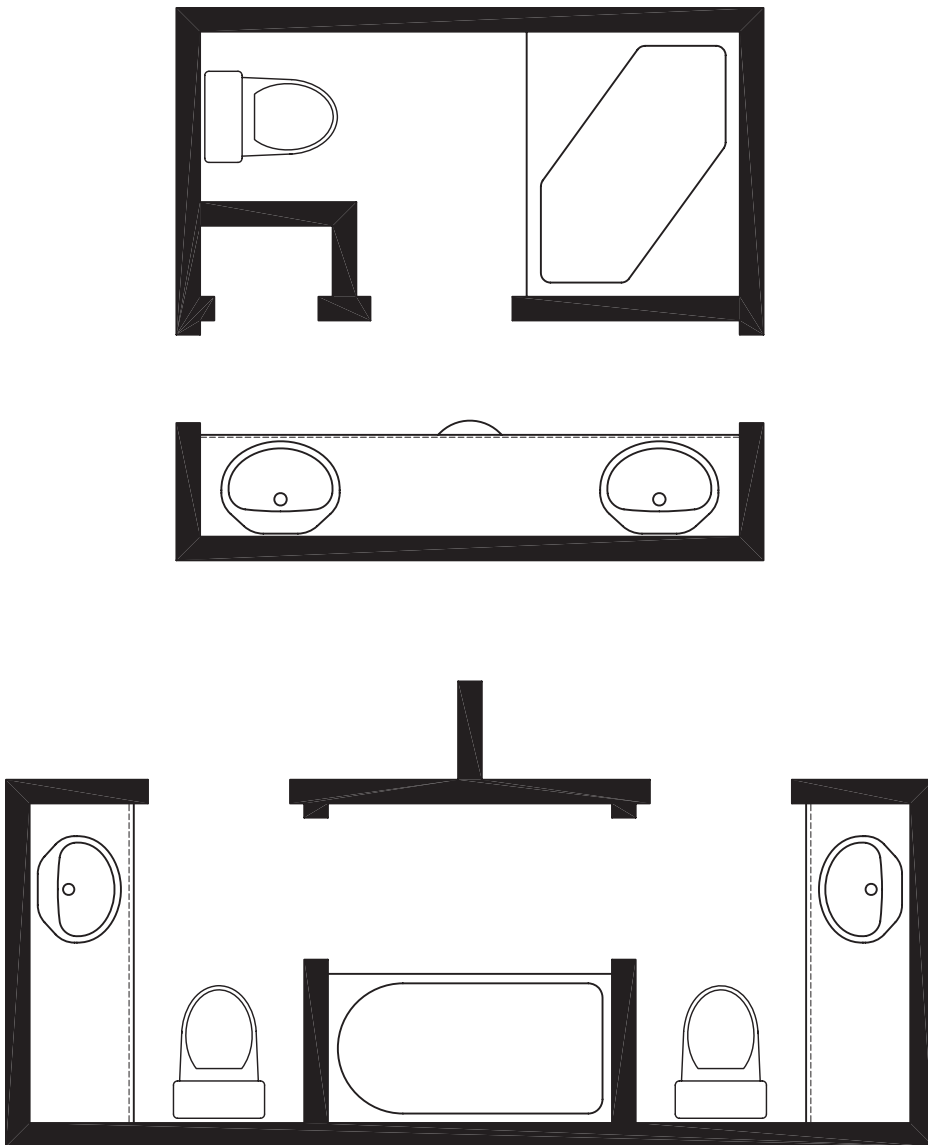


FIGURE 1.30 Double-entry bathrooms make the room available from two different areas, such as two bedrooms or a bedroom and a hall.

- **Electronics.** Designers are also providing storage for electronic equipment incorporated into the bathroom. A television, DVD equipment for the exercise room, a radio, a CD player, and speakers all need space out of the traffic pattern, yet positioned so they can easily be used during bathroom activities.

SUMMARY

The bathroom space, as we know it today, has evolved through time, starting with the early Greek and Roman bathing concepts, but taking its current shape during the seventeenth and eighteenth centuries in North America. Concern for sanitation and health, changes in lifestyles, the development of new materials and technologies, and the installation of a dependable infrastructure for water and waste have all fostered the design of today's bathroom. Lifestyle changes and technological developments continue to influence the design of our bathrooms, incorporating not only function and accessibility, but also the element of relaxation fostered by the early Greek and Roman civilizations. Designers need to stay informed about demographic and lifestyle changes as well as trends in order to design bathrooms that meet the needs and desires of their clients.



FIGURE 1.31 To assist with the ever-growing need for storage in the bathroom, this large bathroom includes a wall of cabinets.

Design by NKBA member John A. Granato II, CKD

REVIEW QUESTIONS

1. What role did bathing play in the life of early Roman civilizations and what elements of these baths do we have in modern bathrooms? (See “Early Civilizations and the Bath” pages 1–3)
2. Why did bathing disappear during the Middle Ages and what events prompted an increased awareness of sanitation in the eighteenth century? (See “The Middle Ages” page 3)
3. Describe how space used for bathroom activities has changed from Colonial times to the current day. (See “The American Bathroom Takes Shape” through “Design Trends” pages 5–27)
4. What is human factors research and how does this research benefit bathroom design for consumers? (See “Bathroom-Related Research” pages 10–12)
5. What are some current demographic trends related to household size, diversity, and composition in the United States and Canada? How do they impact bathroom design considerations? (See “Current Demographic and Population Trends” pages 24–27)
6. What are the general trends that have impacted the look and function of today’s luxury bathrooms? (See “Bathroom Trends” pages 27–41)