CHAPTER

10

Bathrooms

Designing a highly functional tiny house bathroom is perhaps the biggest challenge you'll have to solve. So many components need to fit into a miniscule space that it might take every bit of your creativity to make it all come together. You'll need to consider appearance, storage capacity, fixtures, cost, and—most importantly—function.

In this chapter, we cover all the components you'll need to consider for your tiny house bathroom ranging from design to toilet options, and waste water management and appropriate venting solutions for protecting your house from potential mold issues. With that in mind, let's get started!

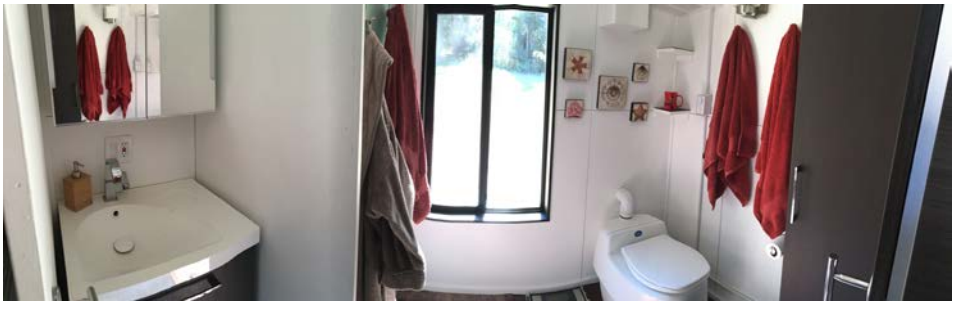
In This Chapter

- Discovering design strategies for highly functional tiny house bathrooms
- Knowing the best bathroom layouts to use
- Finding the best toilet option for your needs
- Ensuring your tiny house stays clear of moisture issues

Design Considerations

Design is one of the keys to a well-functioning tiny house bathroom. Do it well and you'll be rewarded with years of enjoyment; do it wrong and you'll be plotting your remodel just weeks after moving in. As in all situations related to tiny houses, you'll need to fully understand your actual needs. Maybe you love the idea of a bathtub (which requires a lot of space) but in reality, you only use one a few times each year. Perhaps you believe that you need six kinds of shampoos in your shower, but in actuality just one will keep your fl wing locks looking gorgeous.

Bathrooms are typically used for only a small portion of time in day-to-day life, so some tiny housers aren't willing to sacrifice too much extra space for them. Quite a few tiny houses don't even have bathroom sinks as the occupants opt to use the kitchen one instead. Your bathroom's design will depend on your specific needs and wants.



Our bathroom in hOMe is plenty big for full-time use by four adults.

A common misconception plaguing our generation is that a family of four (especially one with teens) *needs* at least two bathrooms. Well that's simply not true. Our family shares just one 8' × 5' bathroom and a mutiny hasn't yet occurred. Our 20-year-old son and our 16-year-old daughter both lead active lives, shower daily at home, and have a collection of primping products. Between the medicine cabinet, sink vanity, and fl or-to-ceiling storage, there's plenty of space for it all.

There are design tricks you should use to your advantage if you're trying to make your space look larger. Pocket and sliding doors provide visual and sound protection without all the square footage that a swinging door consumes. A large mirror works magic in opening up a space, though don't add more than one in a tiny bathroom or you'll feel like you're in a carnival fun house.

To further expand the feel of the space, use neutral- and light-colored finishes to make your tiny bathroom feel bright and roomy. Only keep things out in view that serve a specific function. Nothing closes up a space visually more than a bunch of knick-knacks scattered about. Lastly, a glass shower door really opens up a bathroom dramatically.

One important factor that's often overlooked in tiny design is weight distribution on the trailer. Often, bathrooms are placed on the tongue side of a tiny house trailer. They can be heavy, so this can put an undue burden on the weight ratio, which can lead to dangerous trailer sway while towing. To be clear, we're not saying that you shouldn't put a bathroom there. After all, this is where our bathroom is in hOMe. But you need to consider this important factor when creating your design and ensure the weight is balanced across your tiny house.

If you plan on towing your tiny house more than once or twice in its lifetime, the materials you choose need to be lightweight and able to withstand road rattle. Tile might not be a great option for those reasons. Solid surface materials such as granite are also not ideal because of their weight. Look instead for lightweight products that can handle a little bit of flex.

Bathroom Layouts

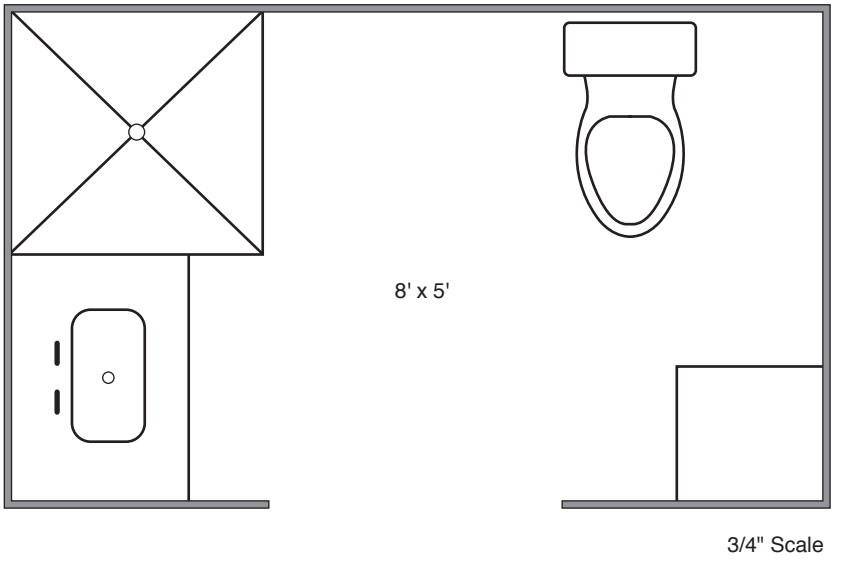
An 8' × 5' dimension is the most common size in conventional construction. This is good news for us in the tiny house movement because the vast majority of tiny homes on wheels are about 8' wide in interior dimension. As such, a lot of the same design principles, solutions, and products that work in a standard house will work in a tiny home, too.

There are typically two places where you'll find the bathroom located in THOWs:

- On the end of the tiny house running along the 8' interior width
- Sharing the end of a tiny house with a kitchen or entryway vestibule

Let's go over design options for each situation.

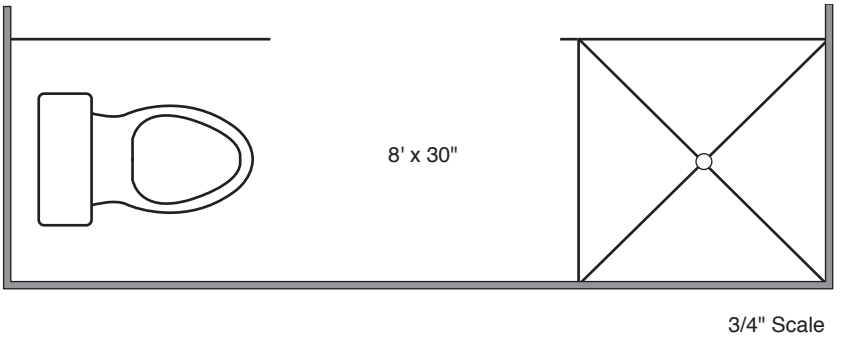
An 8' × 5' configuration is the Rolls Royce of tiny house bathroom luxury. In that space, you can fit a full-size bathtub, a washer/dryer combo, toilet, and large sink. There's ample storage for toiletries, towels, and cleaning supplies. If you're not much of a soaker, install a corner shower instead of a tub to create even more space for storing bathroom items. All fixtures and appliances can be standard, saving you time and money.



An 8' × 5' bathroom is the most common size in a small conventionally sized house. A space this big will provide a very comfortable bathroom for a family of four.

If that bathroom layout seems unnecessarily large, you can certainly shrink it down to an 8' × 30" width. If you intend on building your tiny house to meet IRC code, make sure this configuration accommodates those specifications. A 30" × 30" fiberglass shower stall is about the smallest you'll find off the rack at your building supply store. Anything smaller will generally need to be found at an RV supply store or need to be custom made.

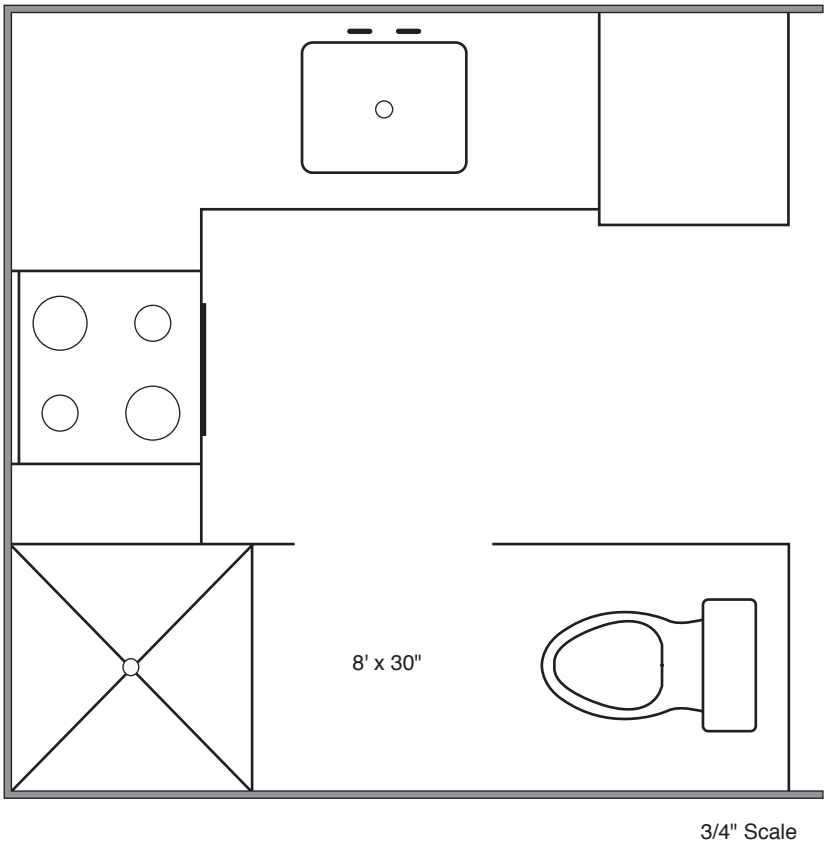
A conventionally sized sink will be hard to install in such a narrow space, so look for really small freestanding units (14" wide × 9" deep). You can increase your storage capacity in this configuration by maximizing cabinetry around your toilet. If you create a custom cabinet, it's quite likely you'll have all the storage space you need on that end of the wall.



An 8' × 30" bathroom is large enough for a toilet, a small free-standing sink, and a standard 30" × 30" shower stall.

Some people opt to keep their bathroom at the same end of their house as the kitchen or entry vestibule. There are a couple advantages to this layout, including the consolidation of plumbing/drain lines (thus minimizing material use) and a huge savings in space. If odor cross-contamination is a concern, proper ventilation and a solid door separating the spaces will eliminate any issues.

As we mentioned previously, proper weight distribution over the trailer axles is important for a safe towing experience. Coupling the kitchen and bathroom on one end presents a challenge in this regard. It's very important that you counter-weight that side of the house by installing heavier items (such as a loft, furniture, personal belongings, and so on) on the other end.



This bathroom configuration enables you to place your bathroom next to your kitchen and consolidate your plumbing.

The bathroom layout shown provides room for a standard 30" × 30" shower stall, standard toilet, and a small sink. The same storage opportunities are offered in this design as the bathroom pictured previously. If you're willing to part with the bathroom sink, which is too small for anything more than brushing teeth in anyway, you can shorten the bathroom by about two feet and create a storage closet that backs to the wall with the toilet and opens to the living area.

Another way to save space in a tiny house bathroom is by building what's called a *wet bath*. In this design, the entire fl or is lined with a custom shower pan and drain and when it comes time to bathe, the entire room turns into a shower. You can use a curtain to separate your actual shower space from your toilet so that not everything gets wet. With this configuration, you can make your bathroom really small and save space for other areas that you use a lot more in your daily living.

Everyone's Favorite Topic—Toilets

As soon as the subject of toilets comes up at our tiny house workshops, the room gets animated. The topic of going to the bathroom never gets old, no matter how many adults are in a room!

Surprisingly, various options exist when it comes to toilets and tiny houses—everything from a simple $20 bucket system to $2,000+ composting toilet. You can choose a standard flush unit, an RV toilet, and even one that incinerates waste. Which one you choose depends on your budget, usage requirements, frequency of moving, electricity access/limitations, and access to a waste disposal facility.

Composting Toilets

By far the most popular waste systems found in THOWs are composting toilets. They can range from *über*-simple buckets to imported high-tech units. Composting toilets are great solutions because they don't require septic systems or *black water* storage tanks. They also don't use any plumbing hook up and you don't have to make frequent trips to RV dump stations to discard waste.

DEFINITION

Black water is wastewater from toilets, which has come into contact with fecal matter and therefore must be disposed of properly through a septic or municipal waste system. It must not be placed on the ground surface because pathogens contained within the waste can cause harm to living organisms and create pollution in local waterways.

One important thing to mention is that in reality, there are very few composting toilets that actually compost human waste within the unit itself. Usually, the units are used too frequently

for true decomposition of the waste to occur, so the term *composting toilet* is a misnomer. It would be more appropriate to call them *holding toilets* or something along those lines.

Not all building departments allow for composting toilets. Those departments that do sometimes require a National Sanitation Foundation (NSF) or extract/transform/load (ETL) certified unit. That said, just because you buy a certified composting toilet doesn't mean you'll receive approval from your local building department. It really all depends on local codes.

Your most economical and simple composting toilet is going to be a 5-gallon bucket system. Yes, you read that right. Take a standard bucket, build a wooden box with a hinged lid around it, cut a hole in the box top to fit the bucket, attach a standard toilet seat to the hinged lid, and you've got yourself a bona fide toilet.

The bucket system is low cost and simple, has a small footprint, and is off-grid friendly. That said, you'll need to keep wood shavings, peat moss, or some other covering material on hand to sprinkle atop your waste each time you use the toilet. There are also issues with odor since urine combined with fecal matter creates a strong and unpleasant smell.

To mitigate smell, many have modified their bucket system by attaching a funnel to the front in which the urine bypasses the solids. Urine itself is sterile (though it's recommended that it be diluted at a 10:1 ratio with water before being placed on the soil surface), so it can be diverted from the toilet into a gravel-filled hole or holding tank outside the house. Further, you can install a venting stack at the back of the toilet frame and direct odors to the exterior with a small, low-voltage fan.

Another challenge with this system is that unless you own acreage and have a safe space to dump your waste, you'll need to find a way to compost it. One option is to close the buckets (or some other large storage drum) with lids and place them in a sunny spot for about 18-24 months. During that time, the pathogens will die off and leave you with compost that is safe to dispose of. At no point should you use this waste, or any composted human waste, to fertilize edibles.

If the idea of using a bucket for your toilet is more than you signed up for, you might be interested in some of the high-tech composting toilets on the market, which include the Separett, Nature's Head, Envirolet, Biolet, and SunMar. None of these units require an expensive septic system or RV holding tanks, but their benefits do vary significantly.

If you're terrified of the prospect of smelling waste-related odors in your house, you'll want to get a unit with a fan, which will require a small but steady stream of electricity. You'll also want to look at models that separate the urine from the solids. Anytime you isolate those two, you'll minimize the amount of waste that you have to deal with as well as any associated odors.

High-tech composting toilets can be quite expensive ($900-$2,000+) and represent a major financial investment, so make sure you get the right one for your needs. Unfortunately, it took us two failed investments before we found the right one for us (the Separett). You don't know just

how important a sanitary and odor-free toilet is until you don't have one! Take your time to read online reviews before sinking that kind of money into this important purchase.

We recommend you ask yourself the following questions before making any purchasing decisions:

- Are you squeamish about looking at human waste?
- Are you willing to turn a crank on the toilet after each use?
- Do you have enough electricity to power a small fan 24/7?
- Do you want your liquids and solids to be segregated?
- Would you prefer your waste to be composted inside the unit or someplace outside the unit?
- Do you have a place to easily compost the waste?
- Would you prefer the waste go into a composting bag or into a holding tank?

The following table compares composting toilet features found in some high-tech models.

High-Tech Composting Toilet Feature Comparison

	Separett	Nature's Head	Envirolet	Biolet	SunMar NE
Urine Separation	Yes	Yes	No	No	No
Turn Arm	No	Yes	Yes	Yes	Yes
NSF/ETL Certified	Yes	No	Yes	Yes	Yes
Electricity	Yes	Yes	Optional	Optional	Optional
Bagged	Yes	No	No	No	No
Visual Barrier	Yes	Yes	Yes	Yes	No

When it comes to disposing human waste in municipal trash systems, there are contradictory pieces of information out there. Many argue that because it's okay to dump baby diapers, disposing composting toilet waste must be acceptable as well. Others say that it's not a viable option. Federal laws are unclear, so we recommend you contact your local trash service company and ask them directly.

RV Toilet Systems

RV toilet options are bountiful, economical, generally odor neutral, and work well. They use only a small amount of water during the flushing process and are socially acceptable because all the contents discreetly disappear into either a black water–holding tank or a dump line at an RV site.

If you plan on living in your THOWs at an RV park, these toilets are a great option and require very little maintenance. They cost $100 and up. Even the most expensive ones cap out at $600, which is a lot less than most composting toilets out there.

Both liquid and solid waste go into a black water–holding tank where chemicals help abate odor build up. These tanks range in size from 8-40 gallons and once they're full, they need to be emptied out. A 40-gallon tank holds about 10 days' worth of waste for two people, so you'll need to plan your trip accordingly.

For comparison, we empty our Separett, which is used full-time by four adults, every three weeks or so. If there were four of us using an RV toilet, we would have to drive our tiny house down our windy mountain road and empty our 40-gallon tank every five days. You can see pretty quickly how this becomes a major consideration when designing a toilet system for your THOWs.

Water weighs 8.35 pounds per gallon, so an eight-gallon tank weighs 70 pounds when full, which isn't too bad. A 40-gallon tank on the other hand will add 325 pounds to your tiny house, which doesn't even include the weight of the tank itself. If you go with the RV toilet and black water–holding tank combo, you'll need to factor those weights into your trailer design to make sure you end up with one that can handle those weight loads.

Flush Toilets

Flush toilets don't smell, are socially acceptable, and can be quite inexpensive especially when compared to a high-tech composting toilet. The main challenge for THOWs is that they require a septic system or municipal waste line to tie into, making standard flush toilets only available for tiny houses on foundations or those that can tie into an approved waste system.

TINY TIP

On average, each person in the United States uses about 4,757 gallons of drinking water to flu h their waste down the toilet. A low-flu h toilet reduces that consumption to 1,850 gallons annually. A composting toilet requires little to no water for proper usage.

There's nothing different to consider when you're shopping for a flush toilet for a tiny house versus one for a conventionally sized home. Of course, we would recommend you go with the highest efficiency unit you can afford in order to save water.

Incinerating Toilets

Incinerating toilets employ controlled combustion within the unit to eliminate solids and liquids. They vent the fumes to the exterior and catch the waste ash in a pan below the burn chamber. No water or plumbing is required to operate them. These toilets can be powered by electricity (Incinolet) or propane (Storburn and Scanlet). If you're off-grid, the electric versions are typically not an option because they draw too much power.

Incinerating toilets are pretty pricey at $1,500+ and require a new bowl liner after each use. Not only does the cost of the liner add up over time, but they also don't smell very good when they're being burned. Lastly, some of the mechanical components are susceptible to breakage over time. Not a lot of tiny housers use these toilets, but they are certainly a good option for some.

Dry Toilets

Dry toilets on the market such as Laveo Dry Flush seal up both solids and liquid waste in a disposable liner after each use. They are reasonably priced ($400-$500), battery operated, and lightweight. Unfortunately, the waste from this toilet isn't biodegradable and the cost of the liners is high.

With this system, you never have to look at any of the waste as it all gets wrapped up in a foil liner. The only way to dispose of these liners is through a municipal trash system, so you must ensure this is allowed in your area.

Gray Water Management

Gray water is wastewater from your showers/tubs, sinks, and washing machines. It's not tainted water that's come into contact with feces, but rather is water that is gently used and a beneficial source of irrigation for landscaping. When applied to plants, gray water is a valuable fertilizer and not only reduces the burden to our fresh water supplies, but also keeps excess wastewater out of sewers and septic systems.

DEFINITION

Gray water is any wastewater sourced from sinks, shower/tub units, and washing machines. To ensure that it's safe before being used on landscaping, avoid using any cleaning products that contain: chlorine/bleach, whiteners, softeners, enzymatic components, borax, peroxygen, sodium perborate, sodium trypochlorite, boron, petroleum distillate, and alkylbenzene. Instead, use fully biodegradable options.

Some jurisdictions allow for the disposal of gray water but, unfortunately, they're few and far between. Despite an active collective of gray water activism, change at the legislative level has been slow to come. Before you use gray water from your tiny house to irrigate, you'll need to check with your local building department to learn what the regulations are. In some jurisdictions, surface use of gray water isn't allowed.

Gray water solutions can operate as simply as diverting wastewater outside from your shower, sinks, and washing machine to a vegetated area where the upper layer of soil and plants can absorb all the water. It's important that you not allow gray water to pool up and that it all is absorbed into the ground. You should also not allow gray water into any body of water because the oils and fats contained therein can be toxic to aquatic species.

It's vital that you use eco-friendly soaps when allowing gray water to contact the ground. Using chemicals can not only damage plants, but it can also cause harm to any animal that comes into contact with it.

More complex gray water systems exist and include constructed wetlands, filtration systems, underground seep systems, buckets/barrels, and design-specific gravel beds. Installation ranges from easy to complex, and the costs vary from minimal to thousands of dollars.

You can certainly collect your gray water in an RV holding tank (as you would with black water). This option is practical if you plan on living close to an RV dump or at an RV park. Whichever option you choose depends on your needs, what your soils are like, what's allowed in your area, and your budget.

From an environmental standpoint, gray water systems make a lot of sense. After all, it doesn't seem wise or responsible to discard our gray water while using perfectly clean drinking water to irrigate landscaping with.

Ventilation

Tiny houses are more prone to moisture issues than conventionally sized houses because they're so small. Excess moisture in large houses tends to easily dissipate into all the square footage, but it builds up really quickly in a well-insulated and sealed tiny house. This accumulation of moisture is problematic because in time, mold issues will develop.

Ventilation refers to any system that helps mitigate excess air moisture and helps prevent condensation issues. A good solution to this moisture build-up can be as simple as installing a bathroom fan. A good one will easily remove excess moisture from the air while you're showering and, in a tiny house, can even mitigate moisture from the entire structure.

The challenge with bathroom fans is that most people don't leave them on for nearly long enough. Fortunately, there is an inexpensive apparatus called a *moisture sensor switch* that can be programmed to turn your fan on and off depending on the humidity level you choose inside your tiny house. These switches are sold separately from most fan units and cost ranges from $25-$60.

DEFINITION

A **moisture sensor (humidity sensor) switch** is an inexpensive add-on that can be installed in conjunction with a bathroom fan. An adjustable dial can be turned to dictate the interior humidity level at which you want the fan to turn on and remove excess vapor from the air. As soon as the ambient humidity is reduced to your determined level, it turns off.

As soon as the relative moisture in your tiny house reaches your programmed level, the sensor switch activates the fan and keeps it on until the moisture level goes below the programed target level. Target humidity levels do change relative to the exterior temperature. As winter sets in and cold temperatures begin to take hold, special attention needs to be placed on maintaining low moisture levels so that condensation can't build up inside. The most common locations for condensation are windows, walls, and dark hidden areas where mold breed.

The Least You Need to Know

- Creating a good tiny house bathroom design is possible, however, it can be very challenging because so much has to fit into a small space. Stick with it and you'll be rewarded with a bathroom that meets all your needs.
- Choosing which toilet option is best for your tiny house can be tough because there are so many choices. Understand what your needs and limitations are and choose the one that best fits the bill.
- Moisture build-up can pose a significant issue for tiny houses, leading to mold growth. A moisture sensor switch may be all that's needed to rid the air of excess moisture.