

Living in a van when you have environmental illness



Vans can be used as emergency housing or for traveling by people with severe chemical or electrical sensitivities (MCS/EHS). Some live in them for years. We show how to do it.

Keywords: chemical sensitivity, MCS, electrical sensitivity, housing, emergency housing, van, cargo van, vandweller, EMF

A van as housing

People with severe environmental illness (MCS or EHS) sometimes find that their home makes them too sick and it cannot be mediated. Or living in a van is simply all the budget can hold when living on a meager disability income. Or they need to travel somewhere – perhaps to find a better place to live.

Some people are able to find a travel trailer, motor home or caravan they can live in. But these are all very toxic when new, usually moldy when offgassed, and the more durable ones cost a lot of money. Good ones are hard to find.

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Some people sleep in a car or a pickup truck. We know people who have done it for years. Of all vehicle options, living in the back of a pickup truck tends to be the most chemically safe, if there is no plastic liner and the top is metal or offgassed fiberglass.

Vans offer a third option. It offers more space than a car or truck, and also tends to be somewhat less toxic than a travel trailer (caravan). The focus of this article is how to live in a passenger van or a cargo van (camper vans are not covered here).

We do not recommend living in a van, but recognize it sometimes is the least-bad option available.

A van is a basic room on wheels with very few amenities. It can be parked long-term in someone's yard or driveway, on rented land, church parking lots and many other places.

In the American West people can camp for free on public lands, but must usually move campsite every two weeks. This is often in pristine areas with very few other campers.

If the neighborhood gets too crowded or toxic, it is simple to pack up and move somewhere else.

This may sound like an exciting and adventurous way to live, but it soon gets old. Living in a van is not a holiday, especially in cold weather.

Which van to buy?

Vans can be as toxic as any other vehicle. Carpets, plastic panels, headliner, seats and other components will offgas toxic noxious chemicals for years in a new van.

A used van is probably your better option. It may have offgassed most of the "new car smell," but other smells may have been added.

We recommend avoiding any van that smells strongly of:

- Cigarette smoke
- Mold
- Fragrance

Smoke residue is really difficult to remove. Mold is virtually impossible. A van that is heavily fragranced may be hiding some other nasty smell, such as mold. Milder fragrances can usually be cleaned away (see later).

Make sure the engine can be fully accessed from the outside, so a mechanic doesn't need to enter the van for repairs. (This is almost always the case.)

A van painted in a lighter color will be a little cooler when sitting in the sun than a dark-colored van.

You would probably want a van where the rear can be completely level, so you can sleep there. If the van has seats in the back, they should be removable. Any rails and other bolted-on items should also be removable, or at least very flat.

Consider a used cargo van. Cargo vans tend not to have interior panels and carpeting and therefore offgasses sooner than regular vans. They also tend to be taller so you can stand up inside, and there is more room.

Cargo vans also tend to have few or no windows in the back. This gives you more privacy, but also makes it darker there in the daytime.

Some people have found vans that are old enough that they have offgassed, but are still low mileage enough to be reliable. You don't want to buy something too old, as then there'll be ongoing repairs which are costly and means visits to toxic mechanic shops.

If you are not savvy on these things, get help from someone who is. If they do not have the illness, make sure they understand the special issues.

Detoxing the van

You may need to clean and offgas your van. A fast way is to steam clean the entire interior, including headliner, seats, side panels and carpeting. Use a mild and tolerable detergent. Make sure to do the cleaning on a warm and dry day, so the van can dry out fast.

If you rent or borrow the steam cleaner, you may need to clean it first from residue of toxic cleaners previously used in it.

You can install rain guards on the windows, so they can be kept open a bit to air out the interior. You'll need one in each side for cross ventilation.

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Some people remove all carpets and pads from the floor, and even plastic panels from the sides. Be aware that this also removes a lot of insulation. Some people have installed aluminized bubble wrap (Reflectix) as insulation and encapsulation.

All rear seats should probably be removed. This both eliminates a lot of toxic material and creates space for sleeping and storage. If you have a storage unit somewhere, you may want to keep the removed seats for when you sell the van again (it may be sooner than you expect).

The headliner (roof liner) is best left in place, as the insulation it provides is really important on sunny days.

Some people chose to wrap the interior instead of removing stinky parts. Popular choices are aluminized bubble wrap (Reflectix) and polyethylene plastic (Tu-Tuff), which are available in North America. Plain aluminum foil is too flimsy for this work.

Living space

The common setup is to remove all the seats in the rear and place some sort of mattress or futon on the floor.



A futon placed on the floor makes for a comfortable bed.

We recommend that you place vapor-proof insulation under the futon if you will be sleeping there on cold nights. The insulation is both for staying warm and also for preventing mold growth (see later). If you want to use a more permeable insulation (such as foam boards), cover it with a vapor barrier, such as polyethylene plastic or aluminum. Some insulation is available with a vapor barrier on one side.

Add a few offgassed plastic bins to store clothes and other necessities, a cooler for food, a battery lantern, and it is already useable space.

Privacy

If you are going to camp in public places people may look in through your windows. Even if you are not there, someone may be tempted to break in if they see something of interest. Some vans have few or no windows in the back. We've seen metallic meshes that both reflect the sun and makes it very difficult to look through. Auto supply stores sell plastic films to darken windows, but they will need time to offgas.

In a pinch you can use aluminum foil and aluminum tape, but it won't last.

Condensation and mold

Condensation is a big problem when living in a van during cold nights, even if using a space heater. You breathe out water vapors all the time, which moisturizes the air inside. You may also sweat a little during sleep.

On cold nights there will be cold surfaces inside the van. This includes the walls, floor, ceiling and perhaps other surfaces too. When the moist air touches these cold surfaces, water condenses and mold can eventually grow. This is especially a problem with porous materials such as carpeting, upholstery, wood products, bedding and many types of insulation.

The moist air can travel through tiny holes in wall panels, roof liner (headliner) and other places that are particularly cold. Inside these cavities the wetness cannot be seen, while mold can fester.

Mold can grow on any surface, if given enough time with wetness. It can even grow on bare steel plates, where it can live off tiny dust particles, but it takes a lot longer.

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A particular problem is the bedding, which also can get moist and grow mold. For this reason it is really important to keep good insulation below the bedding, including a vapor proof membrane between the bedding and the insulation below.

Ideally, you should have some openings below the bedding so moisture cannot be trapped there. It also helps to hang the bedding up during the day to fully dry out.

There are various other measures that can help prevent mold, but it is not easy.

The amount of moisture inside the van must be limited. Do not cook food or boil water for tea or coffee inside the van.

Keep the windows open a little at night, so the moist air from your breath can escape.

Heating the van to a comfortable temperature inside, while having some ventilation, also helps. No heat on a cold night is not good. Even with heat there will likely be cold spots in the walls, where moisture can condense.

Some people drive their van to a warmer climate for the winter. The low desert of Arizona is a popular choice. Here the winter days are warm and dry so the van can be dried out every day, even though many nights are cool enough for condensation inside.

Some people strip their van of paneling, carpeting and other materials that are most mold prone. Some then add insulation on the floor and walls, including under the bed. The insulation should be moisture proof, or covered with a vapor barrier, but be aware that moisture could be trapped between this vapor barrier and the outer hull (steel is a vapor barrier).

We have seen people suggest a radical overhaul, with the entire hull of the van stripped and then insulated with spray-foam so there are no cold cavities and no cold spots where condensation can happen. That will be expensive, toxic for a long time and has to be done right to work.

With good stewardship mold should not be a problem for a number of years. By then hopefully a better and more permanent living situation is available.

If you ignore this problem, expect your van to get moldy within one year (perhaps less in a humid climate).

Charging portable electronics

Portable electronics, such as mobile phone, digital book reader and laptop computer, can be charged in a variety of ways.

The simplest method is to buy 12 volt adapters and charge them through the cigarette outlet somewhere on the van's center console. This is best done when the engine is on to not stress the starting battery (unless upgraded, see later).

Another popular method is to buy a small foldable solar panel that is plugged directly into the phone or computer. These panels fold up when not in use and are soft with no breakable glass.

If you need more power, it is time to consider a solar system. But a lot of people do fine without.

Solar power

If you will be camping off the grid, and want to run more than a couple of portable devices, then consider a solar system. But even the largest solar system that can fit in and on a van will be very limited compared to what a single long extension cord from an electrical outlet can provide.

Several things that would make life comfortable in a van simply use too much electricity.

It is not possible to run these things with a van's solar system:

- Electric hot plate
- Electric space heater
- Airconditioner

What a solar system can provide power for are things like fans, lights and unlimited use of a computer (including for watching DVD movies), as well as other modest electrical devices.



A simple solar system can be installed for a few hundred dollars and little work.

There are several options for solar systems in a van, from a portable solar panel and a beefed up starter battery, to a separate battery bank charged by a roof full of solar panels.

For much more information on EI van solar systems, see the link at the bottom of this article.

Heating and cooling

If you have grid power available, you could use an electric space heater and small airconditioner, if you tolerate the EMF.

If you are off the grid, no solar system will be able to run an electric space heater or airconditioner.

The portable vent-less propane heaters some regular campers use are not safe for people with MCS. They are also banned in California.

There are 12 volt bedwarmers available. The one we've seen consumes 60 watts, which is a little much for a small solar system. It is only realistic to run it for an hour or two at night – not all night.

What people do instead is filling steel or glass bottles with hot water to warm up the bed. It can be either hot tap water or water heated on a stove.



Two one-liter steel water bottles can provide a lot of warmth in a bed. Wide mouths make them easy to fill from a cooking pot and the plastic handles prevent scalding the hands.

Make sure there is adequate bedding, such as a good warm sleeping bag (their ratings tend to be overly optimistic). And provide good insulation under the bedding, such as a closed cell camping mat.

A 12 volt electric fan or two can help on a hot day. If you camp in a dry climate consider a small 12 volt swamp cooler (evaporative cooler). A solar system can power one in the daytime, but probably not at night. Be aware that 12 volt motors send out a lot of EMF.

Moving to higher elevation can dramatically help cool things down. Even 300 meters (1000 ft) can make a real difference.

Refrigerating food

Some people have an electric refrigerator at a friend's house or even inside a commercial storage unit.

There are small refrigerators available for camping trailers. Some dual-fuel types use electric or propane. None of these can be powered by a solar system. Also we do not recommend any propane appliance inside the small space of a van.

Then there are 12 volt thermoelectric coolers, which can typically keep the contents about 36 F (18 C) below the outside temperature. That is barely adequate for keeping things cool, and you can't keep anything frozen. They use about 50 to 60 watts of electricity continuously. If you have to run it round the clock, that would require as big a solar system as would fit on a van. If you only need to run it during daylight, such a cooler is more realistic.

Much better are the 12 volt mini refrigerators, which are the size of large coolers. They use less electricity and some can even freeze foods. We have not tried them, but have heard good things about them, except their hefty price tag for durable versions.

They cycle on and off, depending on how hot the van is and whether the food is being cooled. One vendor said their nominally 60 watt model uses an average of 9 to 28 watts. For summer use, assume the high number is accurate. Our ballpark estimate is that it would need a dedicated 100 watt solar panel in a sunny climate.

Most people in the EI world use ice chests in their vans. A high-quality cooler provides much better insulation than the cheap models, so the ice lasts much longer. The "Cadillac" models are made by Yeti, but they are costly and heavy.

If you are electrically sensitive, an ice chest is your only option.

Cooking food

It is best to cook outside to avoid moisture buildup in your van. A little folding table placed on the downwind side of the van keeps the pot out of the wind, so you can cook outdoors year round, even at temperatures well below freezing.

If you have electric hookup, an electric hot plate should work well, if shielded from wind.

If you do not have grid power, your options are to cook with propane, butane or alcohol. You must do that outdoors. Even people very sensitive to gas can do it outdoors, if they are a little careful.

Stoves using "white gas," kerosene, gasoline or any solid fuels are smelly and often leaky. We do not recommend them. The two gas options are butane and propane gas. Butane is the cleanest burning, but also more costly, doesn't work in freezing weather, and has limited availability. Propane is available in refillable canisters and single-use canisters. The single-use canisters tend to leak once the seal is broken, and they cost more to use. Compact refillable propane canisters are available on the internet (we like the 2.5 gallon size).

There are little alcohol stoves available, as an alternative to gas. We have not tried them, but they have a reputation for not putting out much heat. This means they are not suited for outdoor cooking when it is windy or cold.

Cooking with the sun may be possible using a solar cooker, but only during the middle of the day in clear warm weather. Solar cookers are bulky and probably not worth the space they take up.

Cooking using electricity from solar panels is not realistic for a van-sized system. It can be done, but only under optimal conditions such as noon-time clear sun directly on 200+ watts of solar panels. A regular hot plate uses 1000 to 1400 watts, the little 12 volt versions only about 120 to 150 watts. They are painfully slow, and still hard on a solar system. We cannot recommend this.

Food

With very limited space for storing refrigerated food, or none at all, EI campers tend to eat a lot of food that require little or no refrigeration. Frozen foods are usually not realistic. Foods that do not require cooking are also popular. This means a lot of sandwiches with bread, preserved meats, cheeses, hot dogs, dry fruit and more "sturdy" fruits and vegetables, such as avocados, carrots and oranges. Canned food works too.

Shopping day you could buy hamburger meat to eat that same day. If you have a cooler you'll need to buy ice every two or three days.

Water

Some people simply buy bottled water in plastic containers, though plasticizers do leak into the water from the plastic. Purists use glass bottles instead and typically refill them at water vending machines that offer purified reverse-osmosis (RO) water.

One-liter glass bottles typically sold with premium juices are good for drinking. Stainless steel bottles of that size are also good.

One-gallon (3.8 liter) glass bottles are the best size for filling, carrying and storing drinking water. They are too big and heavy for drinking, so transfer the water to one-liter bottles as needed.

A cheap source of gallon bottles are grocery stores that sell apple juice in these bottles.

We do not recommend using larger glass bottles. They are too heavy and cumbersome, which increases the risk of breakage.

About four one-gallon bottles is a good compromise for camping with a visit to the store every two or three days. Water is bulky and heavy so you can't realistically store a lot more.

For washing hands, dishes, etc., just use a couple one-gallon plastic jugs that are refilled.

Toilet

Lack of a bathroom is one of the biggest drawbacks to living in a van. There are many ways to cope.

Some make sure to camp every night with access to a bathroom. Some go visit a public restroom once a day, such as in a store, rest area, truck stop, public library, chain restaurant, etc.

Some dig "cat holes" wherever they can.

Some buy a toilet stool in a camping store. It has a single-use plastic bag that is later thrown away, such as in a waste bin in front of a grocery store or gas station (regular people throw soiled diapers out the same way, so don't be squeamish).

Where to camp

Some people camp next to a house they can use for a bathroom and other services. If it is not your own house, be aware that the more you inconvenience the people living there, the sooner you'll wear out your welcome. (I've had multiple people camp in my yard who only asked for water, so I let them stay from spring to fall.)

We know one woman who camped for many months in a church parking lot and was allowed use of the community center's bathroom. Just ask.

Others have borrowed, rented or bought totally undeveloped land in some remote area.

Some live like nomads. They stay in the same place a day or two, or up to a couple of weeks. They stay in grocery store parking lots (check local regulations), cheap Forest Service camp grounds, undeveloped public land, etc.

The U.S. Federal government operates giant camp grounds every winter in the deserts of California and Arizona. The cost is nominal.

EMF protection

There are several possible EMF issues to consider:

- The van itself
- Poorly designed solar system
- Electronics used by you
- Radiation from outside

Any vehicle irradiates the driver when the engine is on. Sometimes that can be reduced greatly. This is a large topic that is not specific to vans. See the link at the end of this article for details.

Virtually all modern solar systems radiate a lot of EMF from their inverters, converters and pulsing charge controllers. An EMF safe system has to be designed without these problems, which means just simple plain 12 volt DC with a basic on/off controller. Unfortunately, most solar installers are clueless on this, so be

careful when talking to them. They want to make the sale, and may simply do what they are used to doing while assuring you something different. See the link at the end for how to build an EMF-free 12 volt van solar system.

A simple way to greatly reduce EMF exposure is not to use any wireless devices inside the van. The steel walls of the van reflects the radiation from the antenna back at you. At the same time the steel makes it harder for the device to connect to a tower, so it will radiate stronger. Not using a wireless device inside is probably the single most important way to limit radiation exposure. If that is too inconvenient, nothing else will matter.

Some people use an external wireless modem on their laptops and then place the antenna outside the van.

A headset with a long cord allows the mobile phone to be placed outside the van.

The steel walls of the van will provide some shielding against radiation from outside sources, such as nearby campers' wireless devices and mobile phone towers. You can make it even better by shielding the windows too. This can be done by covering them with metallic films, which are available from some auto parts stores where they are sold as heat shields. Make sure they use a metallic film, most do not, since people normally DO want wireless signals in their vehicles. An alternative is to use copper meshes made for shielding RF signals.

Note: it is not legal to cover the front windshield and forward windows with these materials, as they limit visibility.

Winter

Winters are tough in a van. It is cold outside and probably not too warm inside either. And the days are short, which makes a tremendous difference when you are camping.

If you have a solar system, it will not perform like it does in the summer, as the sun is low on the sky and it shines fewer hours.

Condensation and mold is a big issue when it is cold.

Some people spend the winter in a place with electricity, so they can have an electric heater. There is no other realistic option for space heating a van (we know

one case where an unscrupulous guy claimed he could build a solar system that could heat the van. It didn't work, of course).

Some people head for warmer climates in the winter. In North America several people spend their winters in southern Arizona, southwest Texas and elsewhere, along with many full-time campers who live in their travel trailers and motor homes.

Summer

Summer can be hot and miserable. An air conditioner is not realistic (see earlier) and fans can only help.

Van campers tend to move to the cooler high country. An alternative is to drive north, but that is a long drive.

Storage

There is not much room for storage inside a van, and it is all in your airspace. In such a small room things that do not stink up a large room may be a problem here.

People tend to have a collection of plastic storage bins with lids on. They should be offgassed for months before put into use.

Some people store clothes in sacks which they keep in the back in the daytime and move to a front seat at night to maximize the space.

A pod mounted on the roof can provide a lot of extra storage, and it is outside your airspace too.

One person we know bought a tiny trailer to pull after her van. It is only about four feet (1.3 meters) tall, with a hinged lid and still provides a lot of storage.

If there is a trailer hitch on the van, you could install a little platform on it to store some things, such as a propane tank for cooking.

Many people have some sort of storage space they visit weekly, or just a few times a year. This can be a shed in a friend's yard or it can be a commercial storage unit. Make sure to inquire about their use of pesticides.

A storage space is also handy for offgassing new purchases before they are safe enough to keep in the van. But be aware that two MCS campers lost all they had stored in a fire that started in the next-door unit.

Visits to the mechanic

Mechanic repair shops are toxic, and it's your home that you are taking there. Some shops are kept very clean, some are an oily hell. It pays to eyeball the options before you make an appointment.

Some shops are willing to work on the van outside instead of inside a bay. Or at least let you drive it in so they do not sit in your seat with their toxic clothes. In any case it can help to cover the seat with plastic or big towels, and seal up all your bedding and belongings before going to the shop.

We know one person whose van broke down and had to be towed to a mechanic. She had to camp in their lot for two nights until the van was drivable again.

EI vans on film

In the film *Homesick* a woman with MCS fixes up a van for her journey to find a place to live that does not make her sick. It is well worth watching.

The Netflix series *Afflicted* also features an EI van, but not worth viewing.

Books

The bestseller *Nomadland* by Jessica Bruder tells an upbeat story about this lifestyle. The story briefly includes one woman with MCS. The journalist lived this way herself for months at a time over three years, so it's not the usual superficial/opinionated trash (like the journalist who spent five days driving around Arizona and then wrote the shallow book *The Sensitives*).

How to Live in a Car, Van or RV by Bob Wells is an excellent book with lots of good suggestions on how to do it. It is a fast read based on ten years of full-time van living. Just be aware that many suggestions are hazardous to people with MCS/EHS.

More information

For how to install an EMF free solar system on a van, go to www.eiwellspring.org/offgrid/VehicleSolar.htm

For more information about vehicle EMF and detoxing a vehicle, go to www.eiwellspring.org/vehicle.html.

For more articles about temporary and emergency housing for the environmentally ill, go to www.eiwellspring.org/temporaryhousing.html.

For more on off-grid and solar systems, go to: www.eiwellspring.org/offgrid.html.

2021, updated 2022