

# Converting a Cargo Trailer to a Mobile Camper

## A Guide and Reflection



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# Buying the Trailer

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**Size:** Deciding on the size of your trailer is the first big decision. It all comes down to intended purpose and mobility. For me, a smaller trailer (6x14) allowed for more mobility and would still leave me space to build everything I was interested in. Cost and availability also play a role in what size may work for you. The larger the trailer, the more it will cost.

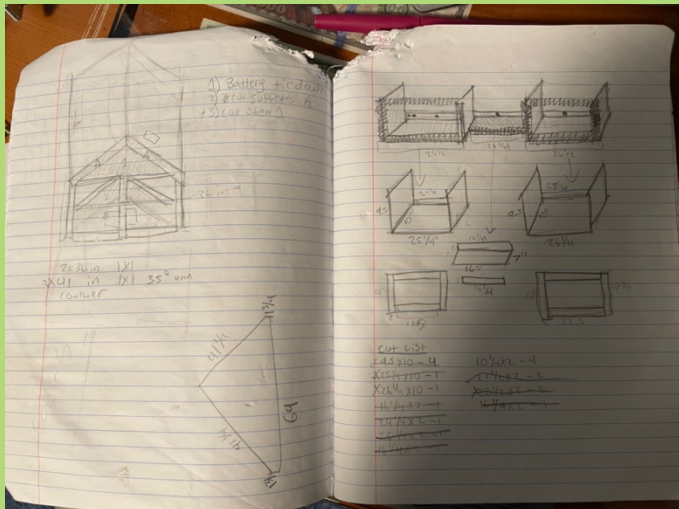


**New vs Used:** When it comes to buying the trailer, you may have options, but the writing may be on the wall. I suggest you spend some time browsing Facebook marketplace and Craigslist to see if you can find what you are looking for in good condition. This would save you some money and potentially be easier. I was not able to find what I needed used so I bought from a dealership. It was more expensive, but allowed me to have a perfect conditioned base, which will be good because I intend on having this for a long time. This step is all personal preference and budget. You can expect to spend a few thousand dollars on the trailer either way.

**Conclusion:** There are a lot of things to consider in buying the trailer. You want one with a door setup for your eventual design, leaf suspension is also nice, and something you can be confident in. If you are not confident in the base of your entire build, it will be a far more stressful process as you do the rest of the build. Though this is the most daunting and expensive part, nothing is more exciting than pulling your new trailer in to your driveway.

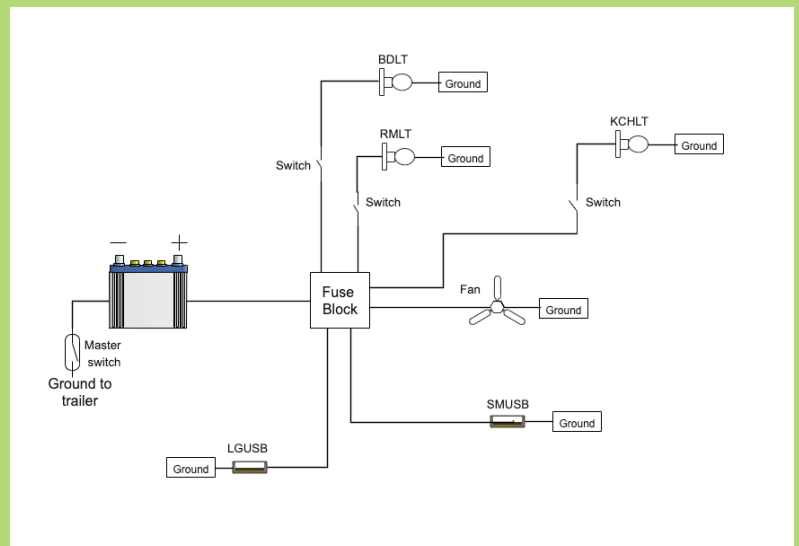
# Getting Started

**Tear out:** Tear everything out! You are going to need a clean pallet to get started. You will need bare access to the walls and floors to do all your electrical work and insulation. I suggest keeping the plywood, you can refinish and reuse it. This will not leave the perfect finish some may desire, but when plywood is 50 dollars a sheet, this will save you a few hundred dollars. Label and organize everything. It may seem like a pain but it will help with re assembly a lot.



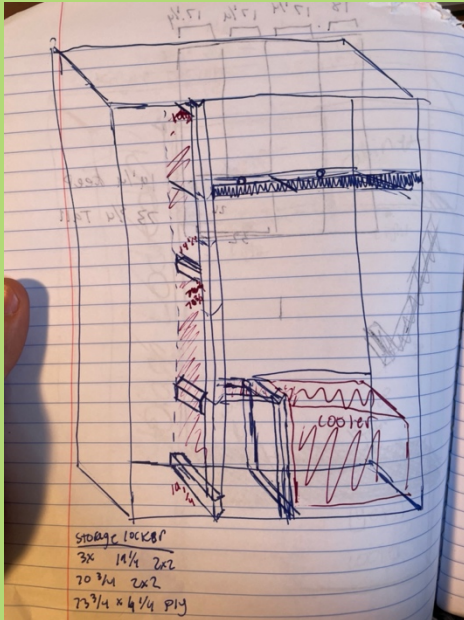
**Ideas:** YouTube and blogs are your friend here. Come up with a basic idea of what you want and what that will entail. Do not stress about having anything perfect here. The start process of wiring and insulation requires a basic plan but does not need to be perfect. This allows you to go through all the steps necessary while maintain your creative freedom. This will also allow you to start ordering and buying things like solar panels and batteries. It is a good idea to order things in advance, so you are not held up by shipping times.

**Planning:** Coming up with your basic electrical design will allow you to plan where things go, as well as order all of the necessary components. At this point you should decide on the size of battery and solar array you need based on your uses and potential expansion. I have a 200 AH battery and 400 Watts of solar, which is a large setup.



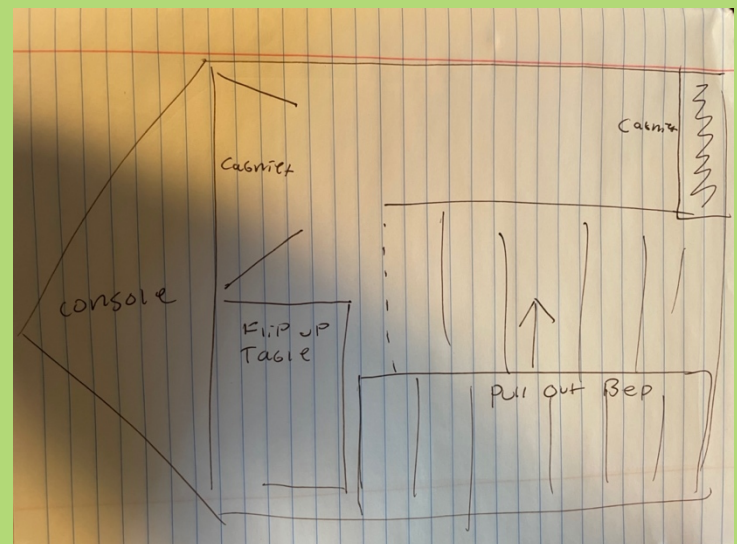


# Final Layout



**Separate areas:** I was very interested in having a separate kitchen. I did not want to feel like I was always in my living space, and worried about getting everything dirty. I also enjoy cooking outdoors a lot and wanted to incorporate that to my build. This meant I added a wall, which separated a kitchen from the living area. For the kitchen, everything is kept and used inside, but you stand outside. Having an area like this is personal preference, but knowing it is important to the final layout. Adding your own personal touches and preferences to your build is what makes it really yours.

**Plans:** Having a final sketch of exactly what you want is important. Once you think you have an idea, talk it through with someone else who has experience with this sort of project. You may hear yourself talking about it aloud and love it, or realize you need to go back to the drawing board. It may change in the future, but you need it to feel final so that you can start working. Having this final layout allows more detailed plans of specific items to be made like the



**Mental Image:** In my opinion, this is the most important part of the project. You need to be able to sit down and imagine yourself in the finished version of everything that you are planning. Having all the ideas in your head is far more important than having them on paper. Once you have a strong mental image, you know that you have done all the research and idea collecting, and it is now time to get to work, and really make something to be proud of.



# Installing Items on the Roof



**Set Up:** Create an arrangement of all your items that need to be mounted to the roof. I only had solar panels and a max air fan, which allowed me to a solid amount of flexibility. You are going to need all of your solar panels close together since you are wiring them together as you install. It is possible that you will also need to be installing an air conditioning unit, wifi booster, awning, or anything else that you choose. If I had more space, I would have liked to build a small roof deck. I think that would be an excellent touch to any conversion.

**Install:** In buying your solar panels from a kit like Renogy, all the connections clicked together, and I knew exactly where they needed to happen. Since all these connections are happening in small gaps under the panels, this ease of connection was very helpful. I suggest installing the solar panels before any other items, so that you have the most space to work and move things around. When installing the fan, you will need a 14x14 hole. It may seem like cutting and then shaving the edges to make it fit is the best approach, but that is not true. Cut as perfect as you can, the aluminum does not like to be shaved down slightly and will end up very small. A jig saw will make quick work of everything.



**Sealing:** The most important part of any hole or alteration is sealing it back up. There is no such thing as 100 % silicone. Put it in the hole before you put a screw, put it on the screw, put it on top, put it on the inside. A small leak down the road can ruin everything that you have built. With, drilling as many holes as you have, you will likely have a leak. Since you haven't done anything inside, it will be easy to find, assess and easily fix with some more silicone or potentially a patch. Be 100 % sure there are no leaks before you move on to anything else.



# Electrical Work

**Research:** Before you start working, you will want to research all the tools that you need and the best practices. This is very important since electrical failures can at best ruin your trailer or at worst set you ablaze while you sleep. I chose a relatively simple 12v system. I used crimp terminals and 14-gauge wire to do nearly all the electrical work. I then learned the importance of heat shrink and electrical tape to cover any connections. Finally, a fuse box is necessary for organization as well as safety.



**Working:** This part of the project is very time consuming and challenging. Each connection needs to be perfect and well made. Run all your wire and then start making the connections. Check your work as you go. For example, if you are creating a circuit for lights, connect a light before you move on. Using a voltmeter is a good way to check current without connecting items as well. You must be sure that each connection will last through all the bumps and shakes of the road. Do this with strong crimps, the right connections, and lots of tape.

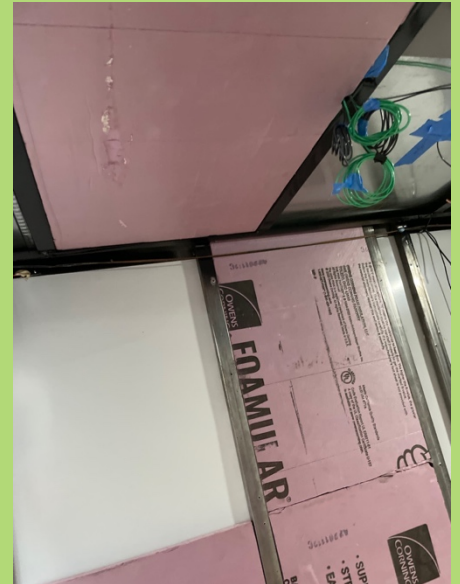
**Suggestions:** When running wire leave yourself an extra foot of wire to make connections easier. It also helps to tape all your wire and then connections to the correct wall or ceiling. This helps organizationally, and when you need to put in walls. If you have a system that could potentially expand like mine, have a fuse block large enough for that, and leave yourself room. Finally, have someone with electrical experience check your work. It's worth putting your pride to the side for this one step; it is very important. Also, carry a fire extinguisher, just in case.





# Insulation

**Types:** There are many different types of insulation that could be used. I used foam board insulation. It was more affordable, worked very well, and easy to install. I was able to buy all that I needed at Home Depot and did not need any special tools for cutting or installing. Another benefit of the foam board is it melts not burns. This means if I were to have a fire, my insulation would not serve as an ignition point. Depending on your budget and what resources you have available to you, spray foam and havelock wool are excellent solutions for insulation.



**Installation:** To install I used a box cutter and flooring tape. I measured the size I needed based on the frame, then cut it with a box cutter, and used flooring tape to hold everything in place. Occasionally I needed duct tape to solidify a connection, but often I avoided it. You will also need to cut holes for all your lights, outlets, switched, and other places that wires need to get out.

**Cracks:** It is inevitable that the boards won't fill every spot perfectly. This is where I used the small cans of foam insulation. These are commonly used around windows but I also found they work great around cracks and other areas where the foam board didn't fit in too well. Additionally, this prevents movement when you are on bumpy back roads on an adventure.





# Ceiling and Walls

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**Ceiling:** The ceiling is a challenging part of this process. You will likely need another person to help you hold everything up while you drill screws. I recommend using very thin plywood to save weight as this piece is not structural and purely to make things look nice. You will also need to carefully mark and cut all the holes for your lights. When putting in all your screws, you won't be able to counter sink since the plywood is so thin. For this reason, I put mine every 10 inches, so it looked organized and followed a pattern if someone is looking closely.

**Walls:** Since I was reusing the old plywood, I was able to avoid cutting a lot of pieces to size. I still needed to cut out precise holes for outlets and switches. In addition to reusing plywood, I also reused the same self-tapping screws. This allowed to not predrill, and just screw right through the metal. Overall, I was able to save a lot of time and money with this step. Unfortunately, the re used plywood doesn't look the best and there a lot of gaps and cracks and holes. If it wasn't for the money savings, I would suggest getting some cheap siding or shiplap for the walls. It would save a lot of finish work and look better in the long run.



**Method:** There are a lot of unique different cuts and holes that need to be made. Don't hold yourself to one tool or method. I ended up using a jigsaw, table saw, circular saw, and miter saw all in this step. Having tool proficiency and experience makes this step a lot easier and less tedious.

# Lights, Outlets, and Switches

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**Lights:** Nothing makes the space feel more livable than having lights. Installing the lights is an important step, and something that you should do as soon as your ceiling is in. It is relatively simple as all your wire is run; crimp connections just need to be added. Don't forget to tape and cover all connections. This gives you better light to work, but also makes sure that you didn't snip or mess up your wiring while working on something else. This would also be a good time to connect your truck and make sure your trailer lights didn't get messed up, mine did. If they did, you will have the skills and access to fix them now.

**Switches:** Your switches will make your lights usable and far more functional. You can make all the connections with crimp connectors and tape to cover everything. This same process is followed with outlets. Plug something in and check that you can fully charge it. I am a firm believer in checking your work as often as possible throughout this project.





# Windows and Vents

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**Cutting:** This is the step that is hardest to undo. Use your window to create a perfect template of the cut that you need to make. It is ideal for your window to not interfere with the metal frame. Use tape and a marker to create the perfect outline of the window to be cut. Use a drill and then jig saw to make the cut. It will be hard to shave down the metal, insulation, and wood all once again, so make the cut perfect the first time. No pressure. Using some sort of lubricant can help with the metal cutting so that you are not creating a ton of heat.



**Install:** This is another step where a helper is needed. Someone will need to push the window in from the outside while you add the inner part, creating a pinch. You will want silicone inside of the connection, as well as surrounding the whole window. You will also want to make sure that the window is oriented correctly. You want the bottom half to slide up. I suggest having at least 2 windows. It allows there to be a cross breeze, as well as lots of natural light.

**Vents:** Air flow is very important in a small space. Things smell very quickly, and you don't always want a window open. Your fan is more effective when paired with open windows for ventilation. When you are running a propane heater, you will also need these vents. Many trailers come with vents already installed so it is just a matter of keeping them and re-installing.



# Prep Work and Paint

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**Prep:** Since I reused the plywood there was a lot of prep needed. I used a spackle/wood filler mix to fill all the screw holes and other crack. I also used caulking to fill larger gaps. It was important to remember that I was going to have trim to cover up a lot of imperfections as well. The final step was sanding everything to be smooth for paint.

**Paint:** Painting was a relatively simple process but patience was key. Everything needed at least one coat of primer, ideally two. This covered the wood and allowed whatever color you wanted to show very well. If you choose dark colors the space will feel very small, so use light colors. I went with a white ceiling and light blue walls. This is a simple pallet that I thought would allow a lot of freedom in decorating and would not be overwhelming





# Flooring

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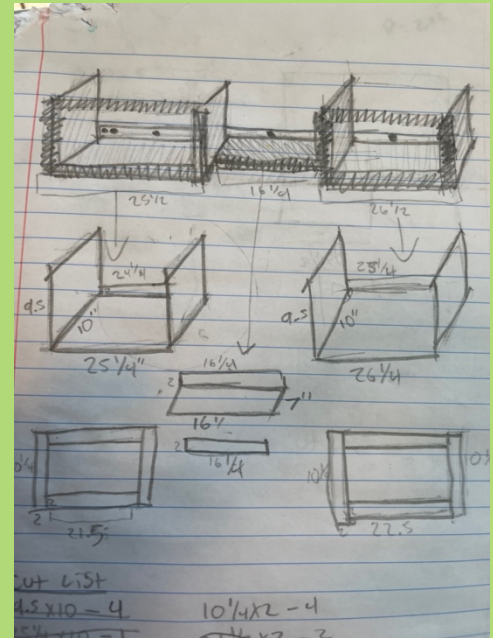
**Types:** Vinyl flooring is the best option for a trailer conversion. It is light, durable, waterproof, cheap, and relatively easy to install. Go with the planks, not glue down as you want the ability for slight shifts while driving and in different climates. An installation kit will also make the installation much easier. A lighter color will help make the space feel larger, but also could look dirty. I went with a light wood that won't appear dirty but will fit the space well.



**Install:** Since everything clicks together, this process is relatively simple. It is important to go slow, and not use too much force. If you crack or break a piece, it becomes un-usable in many cases. When you need to cut, use a box cutter on the back side to score it, then snap along that line. It is important to vary the lengths and starting points of the boards, so the design looks randomized. There will also be cases of two identical boards, so you want those to be far apart. Once everything is finished there should be a small gap around the edges. This flooring is very durable, and not to be worried about when the build continues.

# Cabinets

**Plans:** When creating your cabinets, you are going to want detailed plans. I had two sets of cabinets-- a large one in the front and some small ones in the back. The large one had a countertop as well as shelves and storage. The back one had a center shelf and then two cabinets with drawers. Creating detailed build plans allows you to put things together well and track any issues if they arise. It is important to include as many measurements and other details as possible in these plans. It also serves as a good organization technique.

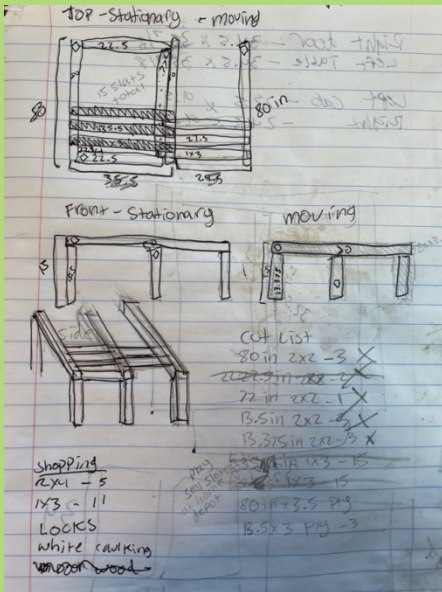


**Assembly:** When building, remember you are building this for yourself. If you want your table a little taller, make it taller. Build to your preferences and styles. I used a variety of materials, but primarily used plywood, 2x4s and 2x2s. This was effective for me and had a look that I liked a lot. Since cabinetry is so complicated, I tried to keep it as simple as possible. I would suggest only working within your skill level since everything has to be well made. Once you finish a piece, you will need a way to fasten it when driving. I used magnets and child locks, but there are a lot of options.





# Futon Bed



**Idea:** Since the area is so small, I recommend a bed that folds to be smaller than it is. I chose to have a queen-sized futon bed, which allowed two people to sleep, as well as have a larger couch when closed. I utilized the wall of the trailer as the back of the couch and a sliding slat design for the compacting bed. I then got a large mattress as I felt it was important for me to have a comfortable sleeping set up. This set up involves some manipulating of the mattress between arrangements which is not ideal.

**Assembly:** The assembly is not too complicated. I suggest cutting everything to size, and then assembling in the trailer. Once part way together, bolt to the frame of the trailer for stability. The slats should be as equally spaced as possible. Once the mattress is on top, everything feels much more solid. I recommend adding a handle to the slide to make that part easier.



# Trim and Finish Work

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**Trim:** Trim is a very necessary step in my opinion. Since I reused so much plywood, and am not a professional, there were a lot of gaps and imperfections to cover. I used all different trims to cover the gaps and cracks. I think the trim came out very well and I like the look a lot. There a lot of different types of trims depending on your style and preferences.

**Finish:** All the cabinetry needed to be finished for two reasons. Appearance and durability. A polyurethane finish, after sanding, will make the grain and pattern pop. Additionally, there is an added water resistance and protection. Be sure to put a thick coat in high traffic areas, like a countertop, as that needs the most protection.



**Touch up:** Once you have done pretty much everything, spend an hour touching up paint and trim. This will make everything look a lot better. There are a lot of places that got bumped with a drill, or a nail went through, that can be easily covered with paint. Don't get sloppy and hit your cabinetry or anything else.



# Make it Yours

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**Functionality:** Add whatever you want to your build. If you think an extra hook would be nice, add it, if you don't want a big bed, make a small one. The beauty of having your own custom build is making it exactly what you want. I added some posters and my friend, Justin Rios, painted a mural on the side of the trailer. These were a few of the things that I did to make my trailer unique to me. I think this is one of the most fun parts. All the hard stuff is done.





# Finished Product

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