

TOY Haulin'

TEXT and PHOTOS by TIM BAYER

Getting your aircraft around on the ground

You finally acquired your powered parachute (PPC), weight-shift trike, or folding-wing aircraft. The freedom of the sky awaits.

You proudly survey your two-bay hangar with a beautiful tarmac out front that Ts at the main runway. But your neighbors and local law enforcement see your "hangar" as a two-car garage, a driveway, and street. You snap out of your daydream with the cold realization that your new toy is confined to your garage. You need a way to transport your prized possession to open space.

If you are fortunate enough to own a large piece of land with an airstrip in your backyard, you are in the minority. For most folks, ground transportation is the first step before flying.

How can you transport your expensive toy without damaging it? There are a number of possibilities, including a pickup truck, an open trailer, an enclosed trailer, a cube van or bread truck, and a camper toy hauler.



Besides your own pickup truck, T-trailers offer the most inexpensive method of transporting a PPC or possibly a trike, but they don't offer a lot of protection for your aircraft in transit.

Some Considerations

If you have a pickup truck, you could put your PPC in the bed and strap it down. Without ramps and winches, this is typically not a one-person operation. I have seen a few setups that work pretty well. Depending on the wheelbase of your aircraft, you may have to remove the rear wheels for the machine to fit between the sidewalls of the truck bed.

Moving up the ladder of possibilities, the next rung is a trailer. There are several decision points associated with selecting an appropriate trailer, including tow vehicle (towing capacity), open or enclosed, tire size, and more.

All vehicles are rated for towing capacities by their manufacturers. Check the towing capacity of your vehicle and stay below the limits. If you are towing a heavier load and encroaching on the upper limits of its towing capacity, the need for a towing package is more pressing. A towing package will generally include a transmission cooler, different drive-train gear ratios, heavy-duty shocks, and heavy-duty springs. When considering towing capacity, be sure to take into consideration wind drag, which we'll discuss in greater detail later.

Open trailers are less costly than an enclosed trailer, but you get what you pay for. Saving cash by using a cheaply made trailer may not be a good choice. If you are pondering saving money on your trailer choice, remember Murphy's Law and picture your toy balled up in a twisted heap of bent sheet metal and aircraft parts. Skimping on the trailer may not be a wise decision.

GVWR and Tires

Trailer manufacturers usually advertise the axle capacity rated in thousands of pounds. When choosing a trailer, pay attention to the gross vehicle weight rating (GVWR), or fully loaded weight. For an ultralight aircraft weighing only a few hundred pounds, you don't need a heavy equipment trailer capable of carrying an 8,000-pound load. The ride on this platform will be stiff. The direct transfer of vibrations through the rigid trailer could affect your aircraft. A PPC is light and a trailer that is rated to carry 2,500 to 3,500 pounds will work fine and not provide too stiff of a ride.

When deciding on a trailer, don't overlook tire size. The smaller the tire diameter, the more revolutions it will make as you travel. Smaller tires wear faster and will also shorten the life of wheel bearings. Smaller-diameter tires weigh less and give the trailer a lower loading height, so there is a tradeoff to be considered. Equip the trailer with a spare tire. A spare tire is your best bet for keeping Murphy's Law in check. If you don't have a spare, you will surely get a flat tire. I would not want to leave my expensive toy on the side of the road while I go and get a new tire. Of course, a spare tire does absolutely no good unless you have a jack and lug wrench to change the tire.

Open, "T," Landscape, and Enclosed Trailers

Open trailers leave the aircraft exposed to the elements a bit more than the bed of a pickup truck. In the pickup bed, the aircraft is mostly protected by the cab. For an open trailer, you may want to consider a cover to protect your toy from rain and dirt while you travel. If you use a cover, you will want to make sure it is a snug fit to prevent slack material from flapping in the wind. A loose, flapping cover could beat up the finish on your frame, or it could tear in the wind, exposing your machine to the elements. If you don't use a cover you may have to spend time cleaning your machine after transport. I saw a PPC that was hauled without

a cover in an open trailer during the winter. On the trip the machine was coated with road spray composed of salt and dirt. The machine was not immediately washed after the trip. The frame is now corroded and in need of replacement because the aluminum was damaged by the salt left on the frame after the transport.

With any kind of open-air transport it is a good idea to keep the prop from spinning as you cruise down the road. At about 45 mph there could be enough wind force on the prop to cause it to spin, turning the crankshaft of your engine. When not running, the engine does not have proper lubrication and the turning propeller may cause damage to the internal components. Prop socks will inhibit the prop from spinning and protect it from road debris.

If you have a small car you want to use to tow your PPC, a light-weight T-trailer might work. They are easy to load and easy to store when not being used. These trailers are specific to hauling PPCs and have little use beyond that. Their open design offers your machine limited protection from stones and other road debris. A T-trailer will cost in the range of \$900 to \$1,200.

When my brother Mark first purchased a PPC, he bought a used landscape trailer. It had a mesh gate in the back that doubled as a ramp. It was easy to load and had enough room in the front for Mark to build

a lockable storage box for tools, canvas cover, windsock, gas, and oil. The storage box also helped protect the PPC from stones kicked up by tires. The bonus of the landscape trailer was that Mark used it for hauling things other than his PPC.

Because of the weight of a landscape trailer, it is best to have a tow vehicle with at least a six-cylinder engine. You may be able to tow it with a lower-powered vehicle, but the strain of hauling the extra weight will take a toll. In a relatively short period of time you could be faced with vehicle repairs related to towing. A landscape trailer will cost in the range of \$700 to \$2,000.

The next step up would be an enclosed trailer. Though considerably more expensive than an open trailer, it provides a secure place to store your PPC when not in use and protect it during transport. Generally, enclosed trailers are heavy and need a tow vehicle capable of hauling the load. Many enclosed trailers are large enough to accommodate the PPC and a bed. This toy-plus-bed configuration is desirable for attending fly-ins.

Enclosed trailers are typically built of aluminum or steel. Aluminum-frame trailers are lighter, but usually more expensive, than steel frames. You will have to decide on the tradeoffs based on your tow vehicle and budget. The cost of an enclosed trailer will vary by size but averages in the range of \$3,000 to \$8,000.



This PPC owner couldn't fit the back wheels of his machine inside the bed of his truck so he created an extension to the truck bed. Tiedown straps secure the machine to the front of the bed.



"Toy haulers are large and contain all the comforts of home: heat, air conditioning, full bathroom, comfortable beds, sink, refrigerator, microwave, and an optional generator and fuel station."



Trailer Brakes, Wind Drag, and Doors

Trailer brakes are often required if a trailer has a GVWR rating of more than 3,000 pounds. In some states, trailers with a GVWR as low as 1,000 pounds may be required to have brakes. On trailers with tandem axles, brakes may be required on both axles if the GVWR exceeds 5,000 pounds. Check your state regulations to ensure that you comply with the laws. It is a simple setup but does require you to buy a brake controller that is connected and accessible to the driver inside your tow vehicle. You will also need a fail-safe breakaway switch mounted on the tongue of the trailer. The breakaway switch is usually installed by the trailer manufacturer. The breakaway switch cable is attached to the tow vehicle so if the trailer detaches the trailer brakes will be applied automatically.

The effect of wind drag on the towing vehicle is often overlooked when considering an enclosed trailer. The rated towing capacities of a vehicle can be deceiving since these

numbers don't take into consideration wind drag. My neighbor has a V-8-powered sport utility vehicle that is rated to tow 3,500 pounds, but the vehicle does not have a towing package. His enclosed v-nosed trailer (loaded) weighs just under 2,000 pounds. He has a difficult time towing the trailer at 60 mph if there is a head wind. He has had to replace the original transmission from the wear caused by towing. Learning from the experience, the replacement transmission for the vehicle is configured for towing.

You also will need to make sure the rear door opening height and width will accommodate your aircraft. Also the internal dimension of the trailer must be at least 12 inches longer than your aircraft and have a few inches clearance on the sides and above. The extra space will give you room to easily tie your machine down and allow it to move a little during travel without rubbing on things inside the trailer. If you are considering the purchase of an enclosed trailer, I would recommend trying to load your aircraft in it *before* you purchase it. Though the dimensions look okay on paper, it is surprising how often the round peg won't fit in the square hole.

A Cube Van or Bread Truck

You could consider doing what PPC guru Rockin' John Carr did for aircraft transportation. John purchased a used, aluminum-body, single-axle, 23-foot-long, diesel-powered "bread truck" for hauling his toys. There is enough room for his PPC and motorcycle with room left over for a bed. John said it took quite a while to find exactly what he was

looking for, but it paid off. When configured for toy hauling, it is a self-contained setup. The cost of a bread van could be anywhere from hundreds to thousands of dollars depending on condition.

A "Toy Hauler"

Welcome to the high-rent district. If you want comfort and all the amenities of home, look into a "toy hauler." These are self-contained camping trailers that have ramp doors in the rear. The trailer hitch version is most common, but a fifth-wheel version is also available. The beds in the rear fold up against the walls to make room for your aircraft.

These rolling-ramp garages come equipped with tie-down loops in the floor for securing your toys. Toy haulers are large and contain all the comforts of home: heat, air conditioning, full bathroom, comfortable beds, sink, refrigerator, microwave, and an optional generator and fuel station. The onboard fuel station is usually a 35-gallon fuel tank tucked under the frame with a built-in electric pump and gas nozzle. The fuel station also provides fuel for the onboard generator.

Some toy haulers have slide-out sections and a separate "garage" for your aircraft. One top-of-the-line, fifth-wheel toy hauler is the Keystone Raptor. The Raptor has a rubber floor in the garage, power washer, fuel station, generator, air compressor, two televisions, a satellite dish, and stereo to complement the usual creature comforts. These toy haulers range in price from \$18,000 to \$45,000 depending on how much comfort and size you desire.

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There is an in-between choice for toy haulers, perhaps best described as a flatbed trailer with a pop-up camper in the front. The common configuration includes sleeping for four, a bathroom, a refrigerator, and a heater. Weighing around 3,300 pounds, these are mid-weight trailers with a price tag ranging from \$13,000 to \$18,000.

Towing the Behemoth

With food, clothes, equipment, and an aircraft inside, a toy hauler will tip the scales at approximately 9,000 pounds. A 3/4-ton pickup truck with a full tank of fuel weighs another 7,000 pounds. The height of the trailer, about 5 feet taller than a pickup truck, will create considerable wind drag on the highway. Add up the weights, roll in some wind drag, and it takes some pretty good tuggin' to get to where you want to go. A good choice for towing is a 3/4-ton, diesel-powered truck with a weight-distributing hitch to even out the tongue weight. You may even want to consider a 1-ton, dual-axle vehicle.

The correct tongue weight is important for proper trailer tracking and tow-vehicle handling. If you have a negative tongue weight (causing uplift on the towing vehicle), the trailer will wander or fishtail as you drive down the road. Too much tongue weight will pull down on the back of the tow vehicle, reducing the towing vehicle steering traction.

When selecting a hitch, make sure you have a hitch that can handle your load and what you may be towing in the future. All trailer hitches are put into one of five classes: one is the lowest rating, five the highest. The following is a list of the classes of trailer hitches and the towing capacities for each:

- Class 1: Up to 2,000-pound gross trailer weight and 200-pound tongue weight.

PPC guru Rockin' John Carr found his transportation solution in a former bread delivery truck. He uses planks to load and unload the machine, has a locked storage compartment inside, and he can roll out a mattress and sleep inside if necessary.



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- Class 2: Up to 3,500-pound gross weight and 350-pound tongue weight.
- Class 3: Up to 5,000-pound gross and 500-pound tongue weight. Class 3 also sometimes refers to a hitch with a 2-inch receiver regardless of rating.
- Class 4: Up to 10,000-pound gross trailer weight and 1,000- to 1,400-pound tongue weight. Many times any hitch with a capacity greater than 5,000-pound gross weight is referred to as a class 4.
- Class 5: Any hitch with a capacity greater than 10,000-pound gross trailer weight and 1,000- to 1,200-pound tongue weight, usually with a 2.5-inch receiver.

The tongue weight on a typical toy hauler is about 1,400 pounds. For this weight, you will need a class 4 receiver and a weight-distributing hitch. A point worth noting: Most

pickup truck factory-installed towing packages are configured with a class 3 hitch. There is more than one story about someone who bought a toy hauler and used the factory-installed class 3 hitch on his pickup truck only to have it break during towing. The rule of thumb is that the tongue weight should be at least 10 percent of the loaded trailer weight. You need to pay attention to the class of your trailer hitch and understand tongue weight as you load the trailer so you don't make a potentially dangerous mistake.

Trailer Balls

The trailer ball is what attaches the trailer to the hitch. You will need to get the correct-sized ball for your hitch. The coupler on the trailer will be stamped with the required size. Do not guess ball size. The ball size is usually 1-7/8, 2, or 2-5/16 inches. The shank is the bottom, threaded portion of the ball. You need to pay particular attention to the hardware dimensions and statistics because ball sizes

and capacities vary by manufacturer. Balls also come in different finishes. Most balls have a chrome finish. The exception is the heat-treated ball, which has a raw finish.

Common sizes are:

Ball Size	Shank Size	Shank Length	Capacity (in pounds)
1.875"	.75"	1.5"	2,000
1.875"	1"	2"	3,500
2"	.75"	1.5"	3,500
2"	1"	2"	6,000
2.3125"	1"	1"	6,000
2.3125"	1.25"	2"	10,000

Make sure you lubricate the ball from time to time with bearing grease. It keeps the hitch from binding or rusting, causing excessive wear on the components. Also make sure the safety latch is correctly adjusted and working properly. After your trailer is connected to the tow vehicle, latch it securely. Install a clevis pin so that the hitch does not open up during transport.

More Safety Precautions

Adequate lights are required by law and you should test the trailer lights before each use. You don't want some inattentive knucklehead rear-ending your trailer because its lights weren't working properly.

Safety chains are also required by law. Like hitches, chains have capacities. Make sure you have strong enough chains in the event of a hitch failure. Use a safety clip so the hook stays connected to the hitch frame and will not fall off if you hit a bump. Be sure to criss-cross the chains under the tongue of the trailer so that the trailer is supported if it becomes disconnected from the hitch.

Regardless of the type of ground-transport platform you choose, securing your machine to the platform is very important. There are lots of different types of nylon straps available. Some have webbing that cradles the tire and a ratchet mechanism to hold the wheel tight. Nylon straps have a tendency to loosen up as you travel. If you are going on a long trip, make sure to stop and check your


machine and the tiedowns every once in a while.

Be cognizant of the tiedown anchors and their strength. Tiedown anchors must be able to handle a worst-case scenario. Some anchors are bolted through the plywood floor of the trailer and then through a large metal plate underneath the plywood. The metal plate is designed to spread out the load. Though the plywood and metal plate anchor is structurally sound, the best connection point for a tiedown anchor is the trailer frame.

Maintenance and Preflight

Your hauling rig will need regular maintenance. The wear items on trailers are the wheel bearings, the brakes, and the tires. Packing the wheel bearings with grease and replacing worn brakes and tires will make your trips safer and easier. Light bulbs tend to take abuse from vibrations on a trailer and will need replacement more often than other vehicle lights. You may want to keep a spare set of trailer light bulbs in your tool box. It is a good idea to "preflight" your trailer like you do with your plane every time you use it.

No matter which platform you choose to haul your aircraft, spend time researching it. There is likely more than one option that will fit your needs and budget. Talk to folks to see what they chose and ask them why they made the choices they did. Be aware of the tradeoffs and make proactive decisions. Decisions by default will often come back to haunt you.

Once you have been successful in securing a transportation platform, you can haul your toy away from aviation house arrest and complete your escape to the open sky. Always preflight and fly safely. 

Mark Bayer also contributed to this article.

The ultimate toy hauler is a trailer with the minimum comforts of home, including a bathroom, kitchenette, and fold-down sofa bed, with a large rear door that folds down to serve as a ramp.

