



FEATHERLITE TRAILERS AUSTRALIA
MOBILE MARKETING TRAILER BASICS

2007

FOREWARD

“Whoa,” you say. “It’s 29 pages! I just wanted something simple.” Well, don’t panic. You don’t need to read the whole thing. There’s a table of contents on the next page. You can go straight to the topic you want, using this paper as a reference, or, if you like, take a comprehensive approach and read through it beginning to end – your choice.

This is written for the person who is shopping for a specialty trailer for the first time. You don’t need to be an engineer or an experienced truck driver to understand it. But, even if you’ve bought mobile marketing trailers before, you may find it useful as a reference. A custom-made mobile marketing trailer is not an off the shelf, mass-produced product, like a car. It is a project, more like building a custom home. As with any project, many decisions will be made. Making decisions will likely be your biggest challenge. But, don’t worry, your specialty trailer salesperson can assist you. The purpose here is to provide you with information so that you are aware of what the major points are. Then you can start thinking about them and get a head start on your decision making.

I’d recommend reading the one-page introduction (p.3) and scanning the table of contents (p.2) to get started.



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INTRODUCTION

Why Mobile Marketing?

Time after time we hear marketing executives talk about the ever-increasing costs to reach targeted customers, such as production costs and airtime, and declining ad and brand recall. Production costs for broadcast ads have increased because they have to be more and more entertaining in order to be remembered. Sometimes they are almost like a 30-second sitcom. Unfortunately, the entertainment value can overshadow the brand recall. Try this: Make a list of some recent television ads you can remember. Now, do you recall the product brand for all those memorable ads? What's driving this? One major factor is that consumers are less and less tolerant of uninvited messages. More and more of them are tuning out broadcast ads. They are even spending money on digital recording devices like TiVo to help them do it.

A huge advantage of mobile marketing lies in this one thing; the customers choose you. Whether you call it mobile marketing, event marketing or experiential marketing, you go to them, not through the airwaves or a cable, but physically. When you do, they choose to experience your display. You're not an uninvited message they want to tune out. Because of that, you might get 10 or 15 minutes of their dedicated attention. Think they'll remember that? Well, probably a heck of a lot more than a TV ad. For example, DeWalt did a great job of taking its brand to a leadership position, primarily through mobile marketing. Now, I'm not saying that mobile marketing will replace mass media ads, but more and more brands are adding it to their marketing mix.

In order to add mobile marketing to your marketing efforts, you need a tour – one that goes to many places where your targeted consumers are likely to show up. When they show up, they will choose to give you some of their undivided attention, experiencing your marketing message. To do a tour, you'll need a mobile display. That's the focus of this writing – the mobile display trailer.

A Project Approach

Creating a mobile display is a project, similar to building a custom home or an office building, but it has another special element. It is an on-road vehicle that must withstand the rigors of the road and be legal to tow down the highway.

As with any project, the greatest challenge up front is making decisions. What is your objective, budget, design, price and schedule? The marketing objective and budget are things that you or your client will determine. The manufacturer can help determine your alternatives with the rest. Ever heard the old saying "Good, Fast, Cheap – Pick any two"? It's a colloquial way of describing the three major elements of any project: scope (i.e., design), time, and cost. These are known as the project triangle.

All three legs of the triangle are *interdependent*. Each one affects the other two. The first thing to do is to define your *objective* and an initial *budget*.

The Project Triangle

COST – TIME – SCOPE

GETTING STARTED

Objective

The first and most important thing about an objective is to have one - not a general one but one that is thought through so that you know specifically what deliverables you expect.

The answer to three questions will drive everything:

1. What do you or your client want to accomplish with this project?
2. How much are you or your client planning to invest for the project?
3. When do you need it?

Sometimes legitimate deliverables can be very specific and very relevant to what you want, yet difficult to quantify. That doesn't mean they are any less real. It just means that existing technology cannot easily put a finite number on them. For example, I can tell you with absolute certainty that I love my spouse very much - but I can't measure it with a number. That doesn't mean it's any less real. If you think you can convince my spouse otherwise, well, good luck, but you're on your own.

Objectives should be specific and relevant even if they are hard to measure. Some examples might be to build brand awareness, build product demand, build public acceptance, provide a point of sale to complete transactions, etc.

Everything in the project should contribute to achieving the objective. Otherwise it's not giving you a return on the investment. Ask yourself this question: how does this contribute to achieving the objective? If you're stuck for an answer, it probably doesn't belong in the project or you may need to reconsider the objective.

Initial Budget

Sometimes we're asked what a display trailer costs. That's like asking what does a car cost or how much does a house cost? It depends on what kind you want. In order to determine a specific price, the specific design must be known.

But what do you do if the first thing you need to do is establish a budget – before you have determined a specific design? If cost, schedule and design all affect each other, where do you start?

Until the actual design details are known, you could start with an estimate. Before we go further, it's important to distinguish between estimates and quotes. An *estimate* is an expectation made before the final design is known. This can be used for budgeting. It is an expected value based on information provided and from past experience from similar projects. If the actual final design differs from the initial information and expectations, then the actual price could also vary proportionately, but it's a starting point. A *quote* is an offer to build a specific design for a specific price, once the final design is known. It is based on a specific design documented by a drawing and/or written specifications.

Caution: If a manufacturer provides you with a quote, without knowing the final design, you can be assured that either they are increasing the price sufficiently to offset the risk or they may fall short on design.

If you have a general idea of what the finished product might look like, you can use an estimate to get started. This is usually expressed as a range, like \$250,000 to \$300,000. The manufacturer's salesperson can also provide specific examples of similar projects done in the past and prices for those. You can then adjust for how similar or different your project will be compared to a past project and for inflation since past projects were priced.

"But what if we determine that we can accomplish more if we spend more?" you may ask. Or, the reverse, what if you have the perfect design to get the job done, but you need to compromise to meet budget? Well, those are good questions.. Should we spend more to get a better results? If we do, will the increased benefit exceed that additional cost? Or, should we settle for a little less trailer for a lot less money. And that's the key point. Just like the three elements of the project triangle, objective and budget are also interdependent. It's

the value equation of how much you get vs. how much you spend that drives it. It may not be just one scenario but a function of several scenarios that each have a positive value equation, i.e., expected benefits exceed cost. The manufacturer can help you estimate your equipment cost. But the decision on the benefits you expect from a given design ultimately lies with you. Here are a few ideas on estimating the benefits.

Estimating the Benefits

No one can guarantee the future. But there are ways to determine reasonable expectations. I'll write about three of them: past results, comparative and confidence-level methods. Past Results - Look at the results from similar things that have been done in the past, either by you or someone else. If you do not have a source for this, the manufacturer may have some ideas or be able to recommend someone to talk to, as long as it's not a conflict of interest or breach of confidentiality.

It would be ideal to have a data set of past results for exactly the same thing that you want to do. But how likely is that? Things just don't seem to work out quite that easily in the real world, do they? So now comes the subjective part. How similar are these past results to your plan? What are the differences? You can adjust from those benchmarks to develop expectations for your project. Most often there won't be a hard set of statistics available that will make a decision for you. So it's going to be a judgment call, based on the best logic and assumptions you can make.

The Comparative Approach - Ever play that game where you're asked to pick a number between one and ten? What happens? After your first response, the other person says too high or too low. You guess again within a narrower range and finally hone in on the number. This is exactly how computers process information, except they do the sampling and comparing with lightning speed. Try this – pick a best-case scenario. For example, maybe you think that even in your wildest dreams you wouldn't get more than 600 people per day through your display because it can't hold more than ten people at a time and people are likely to stay for ten minutes. An average turnover of ten people every ten minutes for ten hours defines your capacity limit at 600. But that assumes you have an unlimited amount of people in line waiting to get in. How likely do you think that is to happen? Now pick a worst-case scenario. Let's say you are confident you'd get at least a third of that, no matter what. That would be 200. Now you have an expectation of between 200 and 600. With a little more information and deduction, maybe you can narrow that down some more.

The Confidence-Level Approach - Define the lower limit by the minimum results you'd need to make the project feasible. Now determine a best-case scenario, maybe a multiple of that, say 4 or 5 times or maybe the display's maximum capacity. Then add some scenarios in between. Now, for each scenario, determine all the reasons for why they are likely to be true or not true. From that, determine how confident you are of each possibility. The ones with highest confidence level define your expectation.

Caution: if your best-case scenario is below your lower limit to make the project feasible, there's a problem. Maybe you need to go back to review your strategy, budget or objectives. A thought on confidence levels – If you are like most people, you cannot determine the difference between being 85% or 90% confident about something or between 10% or 20% confident. But you do know the difference between something you think is a sure bet vs. something that's almost impossible. These could be 90% and 10% confidence levels. You probably know if you're indifferent, that is, you think something is about equally likely to be true or not. That's 50/50. You might also know if you think something is twice as likely to be true as not true. That's 67% and 33%. So you can use this logic to define 10%, 33%, 50%, 67% and 90% confidence levels. Subjective? Yes, but in the absence of hard data, that's ideally matched to your situation, some logic and reasoning is the next best thing.



Where Do I Start?

First of all--KNOW THE OBJECTIVE. Once that's done, you may intuitively know, from past experience of purchasing hundreds of display trailers, what designs would be a good solution and about what prices to expect. But, if that's the case, you don't need to read this paper and probably have not read this far.

For everyone else, a good place to start is to review a specialty trailer DVD or brochure that provides a graphic overview of different types of trailer configurations, including slide-out expandables, drop-down stages, canopies, lifts, etc. You can get this from manufacturers like Featherlite (800-800-1230). You can also research manufacturers' websites (Featherlite's website is www.featherlitetrailers.com.au/specialty-trailers.aspx). Then call us. Talk to a specialty trailer salesperson about your objective and some very general budget ranges.

A note about budgets - this is not price negotiation. It just helps to orient the salesperson. Manufacturers can provide a wide range of designs from \$30,000 to \$1,000,000. It will be a waste of time if your salesperson is thinking \$500,000 to \$800,000 when you're thinking \$50,000 to \$80,000. Your trailer salesperson needs to get a general idea about what resources you are thinking about for the project.

Sometimes you may not know enough about what's available to get started. Your trailer salesperson can provide a book of drawings and pictures of completed trailers that might be similar to what you could use. Your salesperson can tell you approximate prices that past trailers have sold for. This will give you some ideas to start with as well as some examples to show and discuss with others.

WHO ARE THE PLAYERS?

Before we get into the design, let's consider who else might be involved in the purchase. Sometimes these decisions will not be made until later, but if possible, it's best to get anyone who will be involved in the project involved from the start. Of course, you'll be intimately involved in the budget design and schedule issues with the manufacturer.

The Trailer Manufacturer

Specialty trailer manufacturers produce custom-made trailers that take your product or service and put it on the road. Some trailer manufacturers modify an existing trailer and others build it from the ground up.

Those that modify typically start with an existing mass-produced steel freight trailer. They build mostly with steel components because they started with an existing steel trailer. Others, like Featherlite, design the whole trailer first, and then build it from scratch with aluminum, except key structures, like axle sub-frames and framing of expandable openings where steel is used for added strength.

Some manufacturers are very vertical and do virtually everything in house. In contrast, some subcontract almost all of the work to others, acting as a general contractor for the project.

Others are somewhere in between.

In addition to the trailer manufacturer, there are other services you may need.

Painting and Graphics

Typically manufacturers will paint and graphic the trailer according to the customer's design. There are also some independent companies that do this, but not many. To do it well, you need special skills and well-ventilated paint booths big enough to house a complete tractor/trailer rig with expandables fully deployed. For example, Featherlite Graphics has six paint booths that can hold an entire tractor/trailer rig. More on this in the design section.

Exterior Paint and Graphic Design

Generally, the creative design for exterior paint and graphics is provided digitally, via CD or e-mail, to the manufacturer or an outside paint and graphics vendor who does the work. Someone has to come up with the creative design. Trailer manufacturer's paint and graphic operations typically have basic design capabilities. More creativity is typically available from an ad agency or a creative graphics design company. It can also be done in house, if you have that expertise available.

Interior Designers

Interior design architects can often provide design creativity that is beyond the skills of trailer manufacturers. But some of these firms can be very expensive. Whether you need one depends how elaborate the interior design is and how comfortable you are with doing it yourself along with the trailer manufacturer. If your interior uses basic elements of floor, ceiling and wall coverings, cabinets, counter tops, furniture, lighting and display kiosks, you probably do not need an interior designer. But if you do choose to use one, you should make sure that the designs actually fit and are functional and durable in addition to looking great. To do that, you should make sure that the creative design firm has a proven track record in mobile applications. If not, they should work closely with the trailer manufacturer's designers.

Most things have to be built in a special way to withstand the rigors of the road. Imagine if you put your living room, just as it is, in a trailer, turning left and right, starting and stopping, and rolling over the inevitable bumps in the road for ten hours. What would happen? Things have to be beefed up and tied down to handle the inertia and temperature changes associated with mobility.

In summary, creative design must be coordinated with functional design to give you the best value. You don't want to find your interior build-out all in a heap on the floor after the first trip.

Tour Companies

These are the people that actually operate the tour. This takes a lot of know-how to be done reliably. They can help you to select events that are best matched to your objective. Look for companies that have a person who is, first, a professional tour operator and, second, a truck driver, rather than the reverse. The people that drive your rig around need to do way more than just get it from point A to point B. They have to set it up, maintain it, stock it, clean it and take total responsibility for the operation of your equipment. Many times they will also operate the event, interacting with prospects and taking traffic counts as well. It will usually be a crew of more than one person. I'd say spend the extra money to engage someone who has a proven track record in this very special service. Check references. I'd avoid going with just a trucking company or doing it yourself, unless you truly have this expertise in-house. Consider the risk if you missed an event.

The next steps are to determine the design, schedule and price. Many decisions will have to be made.

THE DESIGN

Before we go further, let's look at some basic choices available.

Four Basic Types

What size trailer will you need? For starters, here are three basic types of trailers. Custom bodies that can be mounted on a truck chassis are also available. Here are some examples



Approximate	Bumper Pull	Goose Neck	Truck Body	Semi
Length	14' to 32 ft.	20' to 45 ft.	14' to 30 ft.	40' to 53 ft.
Width	7 to 8.5 ft.	7 to 8.5 ft.	7 to 8.5 ft.	8.5 ft.
GVWR	7,000 to 10,400 lbs.	14,000 to 30,000 lbs	Depends on truck chassis	65,000 lbs

Design Criteria and Type of Use

Occasional vs. Commercial Use - There are a lot of mass-produced small trailers on the market. Most of these are designed for occasional use and their price reflects that. If you

are the local Boy Scout troop and need a trailer to haul camping equipment for a half dozen weekends per year, they'll do just fine. But if you need to run your equipment hard for a 40-week tour, you'll need commercial-duty equipment.

Freight Trailers vs. Specialty - Think of the last time you saw a semi tractor rig going down the highway with an enclosed freight trailer. They are built for the needs of the freight-hauling industry. That calls for a very strong floor capable of carrying about 40,000 pounds. But they need to be inexpensive to purchase and have the lightest weight construction possible above the floor to cover the payload. These have heavy steel frames, but the side wall and roof construction may not be nearly strong enough to support things you may need in your design.

Specialty trailers need to be custom made to accommodate your design - light weight and strong all over, to make sure it's still going strong 10 years after your first tour.

Objective, Strategy and Tactics

I'll emphasize this again - you must KNOW YOUR OBJECTIVE. If that has not yet been clearly established, stop and get it done. When that's done, the next step is to develop a strategy and some tactics to accomplish your objective. Here's an example:

Objective:

Increase game attendance of college football.

Strategy:

Mobile Tour to appeal to all five senses and get potential fans excited about the at-game experience. Reach 1,000 targeted prospects per day for 15 min./person average.

Tactics:

Simulate the excitement of the at-game experience with:

- Viewing exciting replays on big screen from simulated at-game seats. Include side screens to bring in marching band and crowd response visuals and sound
- Interactive displays where fans answer trivia questions
- "You make the call" questions
- Point of sale logo merchandise
- Point of sale ticket purchase

So, how much trailer do you really need to get the result you want? How do we convert the above to a design solution?

"What Does Done Look Like?"

When your trailer is done, what will it look like? That's the end deliverable for design decisions. And it's key to all the remaining steps.

In order to know how long it will take to build it, the manufacturer needs to know what material and how much labor will go into the trailer. In order to determine price, the manufacturer needs to know what material and how much labor will go into the trailer

- all determined by design. First let's take a look at what's available.

The design is described with two documents: a drawing and written specifications. The written specifications provide detailed descriptions of material, e.g., a diesel powered 20KW generator set. But where is the generator set? Inside the front wall? In back? In a box outside of the front wall? The drawing shows where it is placed as well as all critical dimensions. Together, the drawing and specifications describe what “done” looks like. You will be asked to sign both the written specs and drawing in order to complete the order. Take the time to check them both very carefully. After this point, design changes will be done with a change order. Change orders contain three elements: description of the change, effect on price and effect on schedule.

Design Limits

Usually, as long you can imagine it and it’s technically possible, it can be built. But there are a few regulatory parameters you should know about.

Size - Critical dimensions for trailers that travel on public highways are regulated by each state. For the national highway network (U.S. interstate and U.S. designated highways), the states have adopted the federal size regulations and limitations shown below. This is to make sure that the tractor and trailer fits on U.S. roads, can turn corners and will fit under bridges. The key items for this are:

- Length – overall length of the trailer may not be more than 53 feet. Certain equipment mounted on the front or rear of the trailer, such as air conditioners, generators and lifts, are excepted from this measurement. The distance from the king pin coupler to the center of rear axles cannot exceed 40 feet unless the trailer is used for motorsports, for which it can be 46 feet.
- Width – Overall width of the trailer cannot exceed 102 inches (8.5 feet).
- Height – Overall height cannot exceed 13.5 feet.

On state highways, each state may have limitations that are more restrictive than the dimensions allowed by federal regulations. Federal regulations require states to allow reasonable access from the national network to fuel and delivery.

In the event that the size of a vehicle traveling through a state exceeds state limits, it is possible to obtain special permits for each trip. These are issued by the individual state and are generally easy to obtain. For example, you may have seen trailers hauling mobile homes, pre-fab houses or large construction machinery that have warning vehicles leading and following them with signs that say “Caution – Wide Load.” However, this will restrict your routes and increase cost.

Weight – Trailer axles and tires may not carry more weight than they are rated for or DOT limits, whichever is less. Bumper pull and gooseneck trailers are typically available with one to three 6,000 to 10,000 pound capacity axles. Semi trailers usually have two 25,000 pound capacity rear axles with four tires on each axle.

DOT limits the rear axles of semi trailers to 20,000 pounds each if they are placed over 10 feet apart. If two axles are placed over 8 feet apart, they can carry up to 38,000 pounds combined. If they are placed 8 feet apart or closer, they can carry 34,000 pounds combined. The weight of the total rig (i.e., tractor, trailer and payload) cannot exceed 80,000 pounds.

Sometimes semi trailers may have three 20,000 pound capacity axles with two 6,940 pound capacity tires on each axle. In this case, the limiting factor is the tires, which limit each axle to 13,880 pounds or 41,640 for the three axles. This design can be used to increase the distance between the wheel wells from 49 inches with dual wheels to 70 inches with single wheels.

Here's some axle placement and wheel nomenclature. If the trailer has two rear axles, one in front of the other, they are called tandem axles. If they are placed as close together as possible, i.e., centers are about 4 ft apart, it is called a closed tandem. If the centers of the rear axles are placed more than 4 ft apart it is referred to as a spread axle design or more specifically an 8-1 or 10-1 spread, i.e., 8-feet, 1-inch and 10 feet, 1-inch apart, respectively. If a trailer has three axles, it's called a tri-axle or triple axle.

Wheels are either single or dual. Dual wheels are where two wheels, side by side, are bolted to the end of an axle. Therefore, a dual wheel tandem axle trailer would have a total of eight wheels.

Axles permanently affixed to the trailer are called the trailer axles. The rear axles of the tow vehicle or tractor are called the driving axles. The front axle of the tow vehicle or tractor is called the steering axle.

If you have a trailer that weighs 20,000 pounds empty and a tractor that weighs 20,000 pounds, you can add 40,000 pounds of payload to the trailer before you are at the 80,000 pound limit. If you add 20,000 pounds of interior build-out to the trailer, then you have a payload capacity of 20,000 pounds.

However, weight distribution can be a problem. Most often, overweight problems are with the trailer axles - the challenge being to move the weight forward to the driving axles. So when designing, try to keep heavy things toward the front of the trailer.

Floor Plan

What's going into the trailer? You need to determine that so you can see how much room is needed. For our college football example above, I'd think you'd want a semi with two expansions, providing about 1,000 square feet of floor space. With two drop-down stages, you could get a nice, at the game, open-air feeling, but with both sides of the trailer opened up, it will not be possible to heat or cool the area. The ambient light may be too bright for the video screens, depending on what kind you use, and you will be open to the elements in the event of high wind or rain.

With two slide-out expansions, you'll have control of heating/cooling, lighting, and sound as well as protection from the elements in case of wind or rain. But then you'll be inside. There are going to be trade-offs. Your specialty trailer salesperson can show you what alternatives are available and help you get an initial drawing prepared. You may want to see some examples of past drawings or just start from scratch.

Imagine how you will use your trailer. Where will people come in and go out? It's a good idea to have separate entry and exit points for smooth traffic flow. You don't want people going out to get in the way of people who want to come in. Is that bathroom just to be used by the crew, not the public? If so, place it out of mainstream traffic flow. Where are you going to store

equipment when in transit? Is there a place for it? Do you need to accommodate people in wheelchairs (see Design Elements/ADA, Handicap Accessible and Wheelchairs)? If so, you should plan for a wheelchair access door. This can all be discussed and worked out with your specialty trailer salesperson.

After the design is costed and quoted, you may decide to go larger or smaller. Sometimes a large gooseneck can offer an effective alternative at a lower cost. A semi trailer can offer more capacity at a higher cost. You can move from one design to another to provide the best overall value for you.

Once the floor plan's done, you'll need to get down to some of the actual design elements. We'll start outside and work our way in.

Design Elements

Suspension and Tires - Bumper pull and gooseneck trailers typically have one of two tire sizes, 15-inch or 16-inch. Trailer tires are similar to automotive tires but with stiffer sidewalls. The axles have built in torsion ride suspension, a massive piece of rubber inside the axle that twists with additional weight.

On semi trailers either 22.5-inch and 17.5-inch tires are most commonly used. The 17.5-inch is used with most slide-out and stage designs where the lowest possible flat floor is required, i.e., the floor is over the fender wells. The larger tires can be used where it is acceptable to have fender wells intruding above the inside floor level. Air ride suspension should always be specified. This uses rubber air bags to provide the smoothest ride. They can be inflated or deflated (dumped) to adjust ride stiffness and height.

Exterior Walls - Exterior wall covering is most commonly aluminum riveted to vertical posts that run from the floor to the roof. The thickness of the aluminum side sheets is expressed as a decimal fraction of an inch and can vary from .050 to .090 (e.g., .090 is 9/100 of an inch thick.) If pre-painted aluminum sheets are used, there is no need for painting later, except for any additional exterior designs you wish to add. Side sheets can be attached to vertical posts in two ways, exposed rivets or smooth side, where rivets are concealed.

Example: Exposed Rivets



Example: Smooth Side



One thing about smooth side is that it's best to paint it after assembly vs. using pre-painted sheets. That's because smooth side design requires the vertical edges to be bent 90 degrees using a large press. This process usually cracks the paint on pre-painted sheets. Therefore, smooth side design is built with unpainted sheets, which must be painted later. The cost to

assemble is similar either way, except that smooth still needs to be painted after assembly, which is an extra cost. However smooth sides offer a smoother surface for applying paint and graphics.

Generator and Shore Cord - If you need more than 12-volt electrical power for your trailer, which is almost always the case, you'll need a generator or a shore cord or both. You don't need to be an electrician to deal with this, but you do need a little information to understand what people are talking about regarding your power supply.

First, the shore cord. This is an umbilical cord from your trailer to a stationary electrical box where you can plug in your trailer's electrical system to provide power, like the electric power in your house. The term "shore" is a spin-off from yachts. Yachts have an electric cord that runs from the yacht to an electrical box on the dock (i.e., shore) to provide the yacht with electric power when docked. This eliminates the need to run the yacht's generator when it is docked. In the RV industry (land yachts), a similar cord also became known as a shore cord and the term is also used for specialty trailers.

Shore cords come in different capacities measured in ampere (commonly called amps) and voltage ratings, e.g., 50 amp, 300 volt, etc. Usually the amount of insulation around the wire determines the maximum voltage rating and the diameter of the wire determines the amp rating. The shore cord should be sized according to your trailer's electrical needs. That can be done by the manufacturer. Specifications to comply with universally accepted electric codes are developed by the National Electrical Manufacturer's Association (NEMA). Each amp rating has a uniquely shaped connector (NEMA spec). This is done to protect you from plugging in to a power source that is wrong for your electrical system.

Caution: If you are at a show where your trailer is being connected to the building's power supply, with out using the appropriate NEMA plug, you need to know what the proper voltage and amp ratings are for your trailer and you must check that the ratings of the building's power supply, especially the voltage rating, match that of your trailer. If your trailer is wired to accept 240-volt power and someone connects it to a 480-volt power source, your trailer's electrical system will likely be toast within microseconds. Believe me, it's happened, and it can be expensive to repair.

But, often you may not want to or cannot plug in to a stationary power source. That's where a generator comes in handy. Many times this is called a gen set. So, what's in the set besides the generator?

The generator itself looks like a large electric motor, only instead of using electricity to turn a shaft, it produces electricity when its shaft is rotated. The electric power it produces is measured in kilowatts, or KW. You'll need something to rotate the generator shaft. That's the engine, similar to the one in your car. The engine turns the generator shaft, which then produces electricity. You also need something to control its operation, which is the control box. Finally, you need a transfer switch to connect your trailer to either the gen set or the shore cord, but **NEVER** both at once. Remember that the shore cord is connected to public utility power,

like the mammoth generators in the Hoover Dam. Your trailer gen set is no match for the Hoover Dam and if they ever get connected, I'll guarantee you who will win. The fight will be quick and ugly. The transfer switch's job is to make sure this never happens.

Typically smaller sets, say up to 7 KW, use gas engines. These are usually used in bumper pull and gooseneck trailers. Large gen sets, 10 KW and over, generally use diesel engines. These are usually used in larger goosenecks and semi trailers. They can be mounted in a box inside or on the front wall of the trailer or on a box on the tractor, called a dromedary or drome box. The generator capacity needs to be matched to your trailer's needs. The manufacturer can determine that as long as the design specifies what electrical equipment will be powered by the generator. Controls to start/stop the gen set can be found on the control box on the gen set. For convenience, a second set of controls can be mounted anywhere it will fit. This second set of controls is usually called a remote start/stop, or a remote panel and is typically mounted on an inside wall near the door that would first be used during set up. That way they are conveniently at hand when deploying the trailer.

Transfer switches can be either manual or automatic. With manual, usually associated with higher capacity gen sets such as 40 KW to 100 KW, a switch is mounted on an inside wall and is manually switched to generator or shore power or off. Most 20 KW and smaller gen sets have automatic transfer switches. They automatically switch to shore power if electric power is detected from the shore cord. If there is no power coming from the shore cord and power is coming from the gen set, they switch to generator. If the generator is off and there is no power in the shore cord, it switches to off.

Automatic transfer switches have a built-in delay. They do not connect to the gen set until they sense that the engine is up to speed and running normally. With an automatic transfer switch, the lights won't come on until about a minute after you hear the engine start. If you have a manual transfer switch, it is a good idea to do the same. In no circumstances should you start or stop the gen set under load. If you have a manual transfer switch, make sure it is in the off position when starting or stopping. With automatic transfer switches, it's a good idea to make sure all equipment and lights are turned off before shutting down the gen set.

Exterior Lights - But what about setting up or operating the trailer after sundown? Well, that's where some exterior lighting can help. Either 12-volt or 120-volt lights can be used to illuminate the perimeter of the trailer. You'll get more light with 120 volts, but you'll need to have the generator running or have your shore cord hooked up first. The trailer battery can power 12-volt lights. Also keep in mind that stairways, doors, etc., that will be used after dark should be lighted for safety. Your specialty trailer salesperson can advise you on this.

Running lights are the red and yellow marker lights that highlight the outline of the trailer at night as well as the brake, turn signal and tail lights. These are mandated by federal DOT regulations, and trailer manufacturers are required to install them to meet those requirements. Exterior Outlets - Exterior outlets can be installed to provide 120-volt access from outside. For safety, exterior outlets must be the ground fault interrupter type (GFI), just like the exterior outlets on your house. These provide protection from electrical shock by automatically shutting off if abnormal current flow is detected. Common mounting areas are underneath the trailer along one side, along the bottom rail of the exterior side wall and along the top rail near where the side wall and roof meet. Location of exterior outlets depends on how you will use the trailer. For example, if you plan to add an awning area to one side, you may need outlets near the bottom edge of the exterior side wall for something under that awning, such as kiosks, sound equipment, outdoor cooking equipment, coolers, etc. If you have lights suspended from the top support rafters (see Awnings section), high mounted outlets near the roof may come in handy. Outlets can also be wired through an on/off switch if desired.

Batteries, Converters and Chargers - All trailers with electric brakes or 12-volt electrical systems must have 12-volt batteries, similar to your car. These provide power for all 12-volt equipment on your trailer, such as 12-volt load lights, 12-volt audio equipment, water pumps and hydraulic leveling systems. A power converter converts 120-volt power

from the generator or shore power to 12-volt power to relieve the batteries when other power is available. Most converters also have a battery charger built into them to charge the batteries when other power is available. A stand alone battery charger, which does the same thing, is also possible. It's also possible to have the trailer wired so that the trailer batteries can be charged by the tractor while underway.

Example: Trailer with Marquee



Marquees - A marquee is a roof-mounted flat panel that makes the trailer appear to be taller than it is, similar to a false front on a store building.

The marquee can be folded down during transport to avoid over height problems. It can be either manually or electrically actuated to fold up or down. Manual is the most simple and most reliable, but requires that someone go up on the roof to do it. That in turn means the roof must have a place to walk on as well as ladder access to it. If the access is from inside the trailer, a trap door in the roof will be needed. If electrically actuated, the trailer's roof will have to be lower so the height of the mechanism will not be over height or the mechanism will have to be mounted in a depression in the roof so the top of the mechanism is flush with the top of the roof. Although the depression, or pan, that it is mounted in will have a drain, there is a risk that it could be plugged by leaves or other debris, resulting in the pan filling up with rain water and submerging the actuator, which is not designed for underwater use. There are trade-offs either way.

The main uses for marquees are for signage or to provide a higher attaching point for awnings, if needed.

Awnings - Remember the part about Design Criteria and Type of Use at the beginning of this section? Well, the same thing holds true for awnings. The RV industry uses lighter duty, push-button operated awnings on motorhomes and travel trailers. These are very convenient to operate but are built to RV quality requirements and usually rated for 5-10 mph winds. The alternative for commercial use is similar to circus tent construction. Commercial duty canvas or sailcloth is supported by aluminum rafters. Eyes on the end of the aluminum rafters are placed on hooks that are permanently mounted on the side of the trailer. There are two styles, a free-standing awning and one that uses down poles. Both can be set up in about a half hour and do not require tools.

Example: Freestanding awning



Example: Awning with Down Poles



Awnings can run the entire length of the trailer, on both sides, if desired. Or they can be just enough to cover a door opening. How far the awning extends from the trailer depends on the design and the attaching point to the trailer. Free-standing awnings are limited to

15 feet, while the down pole design can go as far as 32 feet.

Some basic geometry comes into play here. The awning height, at its lowest point, which is farthest from the trailer, needs to be high enough to walk under, say 6.5 feet. The awning must also be sloped to shed rain. To provide the slope, it must attach to the trailer at a higher point than 6.5 feet. How high? It depends on the slope and how far it extends from the trailer, but it's possible that the desired attaching point might be higher than the roof of the trailer. If so, a marquee (see previous section) can be added to provide that. The commercial grade design means you'll have to store some canvass or sail cloth and poles and take a little more time to set up, but you won't have to take it down in a 10-mph wind or risk having it come down on your customers' heads.

Another advantage of the commercial grade awning is that you can add side curtains, windows and doors. Canvas or sail cloth is available in one solid color or with graphics, such as your logo, if desired. When selecting colors, remember that lighter colors reflect heat. On a hot summer day, it could get pretty warm under a black canvas.

Interior lights can be suspended from the rafter poles, if desired. Ceiling fans can also be suspended from rafters. Rafter poles can be made with electrical outlets installed near the attaching points for lights or fans, with the wire running inside of the rafter pole to the trailer where a short cord with a male plug can plug into a top-mounted outlet. You'll want to make sure that you have sufficient exterior electrical outlets to support whatever you will be doing under the awning (see Exterior Outlets section)

Paint & Graphics - What should your trailer look like when it's done? A big part of the exterior visual impact is going to be the paint and graphics. The first thing is to decide on the design. This can be done in-house or by an outside vendor (see Who Are the Players?/ Paint and Graphics). Manufacturers or third parties that do the painting can also provide some creative support.

A word about paint – if you ask car and truck body shops that paint vehicles all day long, you'll probably hear the same thing I did. First, the two leading brands of paint used are DuPont and Sikkens. Secondly, it's labor intensive. As with any paint project, proper surface preparation is key, and that takes a lot of labor hours by people who know what they are doing. In general, you get what you pay for. I would avoid selecting the lowest bidder unless you are certain of the quality. Currently, \$12,000 to \$15,000 for one color paint, covering a 53-foot trailer with no expandables is par. If existing paint must be ground off first, this could nearly double.

Somehow, you have to communicate what color you want. Major vehicle paint manufacturers, like DuPont and Sikkens, have their own numbering systems and color chips available. The way to describe your color is by the manufacturer's paint code.

A note about Pantone-- The Pantone Matching System, or PMS, describes a particular shade of any color. It is the color industry standard for inks and textiles, but it is not the industry standard for vehicle paint. That's why an ad agency or an interior designer will probably describe colors with a PMS number. Most vehicle painters can cross reference to PMS codes, but colors in ink don't always look the same in paint.

Graphics come in two versions – vinyl decals and photographic images printed on vinyl. Decals are cut to the desired shape and stuck on, over the paint, with a pressure adhesive similar to tape. These can be removed by heating and carefully pulling them off.

Photographic images can be printed on vinyl sheets and stuck on the side of your trailer, similar to hanging wall paper. If both sides of the trailer are completely covered, it is called

a full wrap. In both cases, the design detail can be sent to the installer electronically via a Vector .eps or .ai file via e-mail or on a disk.

Caution: All paint must cure. That means the entire thickness of the paint completely dries and hardens beyond the exposed surface. Paint can dry enough to become shiny, smooth and hard on the surface in a day or less, but total curing takes longer. Cure time depends on temperature, humidity and the thickness and the chemistry of the paint, but, as a rule of thumb, is about 30 days. During the curing process, the paint releases gas. That's what gives it that fresh paint smell. This is called out-gassing. "But wait a minute," you say. "I can't wait an extra month to put the vinyl on." Well, most of the time, vinyl graphics are put on as soon as the paint is dried. Out-gassing during curing does not cause bubbles in the vinyl because the vinyl is porous enough to let the gas through. However, if you have special vinyl that is not porous enough for this, like a metallic, reflective type, you may get bubbles under the vinyl due to out-gassing from the paint if it is applied before the paint is fully cured. Also, if you attempt to remove graphics before the paint is fully cured, the paint may come off with it.

Stages and Canopies - A drop-down stage is where the side of the trailer is hinged at the bottom and folds open to create an extension of the trailer floor. A double stage is where both sides open up, providing a line of sight through the trailer from side to side. Stages require support poles for the edge of the stage farthest from the trailer when deployed.



A canopy is a stage upside down. Canopies are hinged at the top, so when the side of the trailer opens, it forms a roof. Typical canopies are free standing and are held up with hydraulics and a brace.

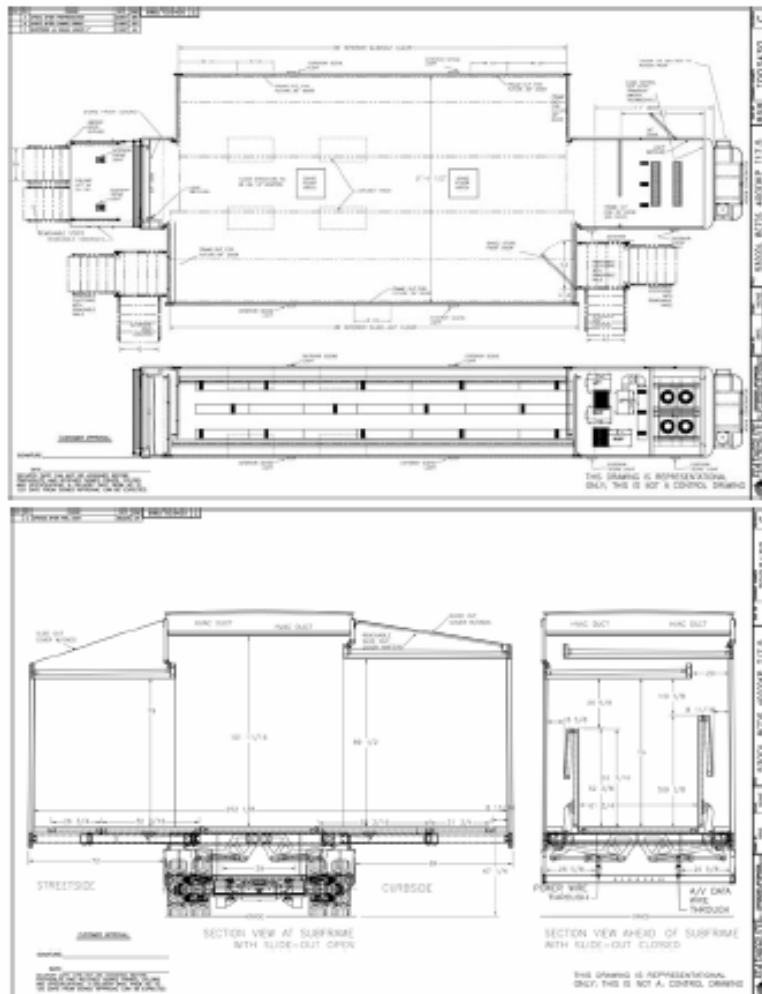
In the photograph above, this double stage/canopy trailer also has a covered observation deck on top, which can be accessed by a stairway inside the trailer. Stage and canopy construction is illustrated with 3D animation in the Featherlite

MORE! DVD.

Slide-out Expansion - The design of the double slide-out expansion is a nested box design which can provide about 1,000 square feet of floor space. One side is about a foot smaller than the other so one can nest inside the other when closed for traveling. This is shown with 3D animation on the Featherlite MORE DVD and in the drawing on page 19. This rigid box design means that the roof and all three exterior walls are permanently attached and sealed to prevent leaks and keep rain, wind and daylight out. This design offers up to a 7.5-foot extension that can be up to 37 feet long. It can be push-button actuated and does not require any exterior support when deployed, i.e., no support poles.

An alternative design is to use a stage/canopy setup and attach side walls after the stage and canopy are in place. This design will add a little more head room on one side, but the joints where the side walls are clipped to the floor (stage) and ceiling (canopy) could leak. With this design, the stage floor will require leveling and support poles, i.e., not be free standing. Also, the stage and canopy will need to be carefully positioned to be exactly parallel so the walls will fit.

Example: Slide-out expansion drawing



ADA, Handicap Accessible and Wheelchairs - ADA is an acronym for the Americans with Disabilities Act of 1990. You can go the website for complete details (<http://www.usdoj.gov/crt/ada/adahom1.htm>). Handicap accessible means that your trailer is accessible to handicapped people, such as those in wheelchairs. Handicap accessible and ADA compliant are not the same.

ADA compliant, in the strictest sense, means that it complies with all ADA regulations. For example, in addition to wheelchair accessibility, this would include extra wide hallways and 5-foot turning radiuses, and, if the trailer has a bathroom, it would have to be designed to ADA dimensions and specifications as well. In most cases, depending on the floor plan, it will not be possible to design a trailer that is 100% compliant with the ADA and 100% compliant with DOT law and be effective for you at the same time, since the trailer would have to be over-wide or over-long to provide enough room for all ADA requirements. Apparently, display trailer design and the federal DOT laws that govern their design were not considered when the ADA law was drafted.

Wheelchair accessible or handicap accessible is less strict. This means that people in wheelchairs must have a way to get in, get around and get out of the trailer. There are two ways to do this: ramps and wheelchair lifts.

You'll find that complying with slope specifications for ramps may mean that you'll need a ramp as long as the trailer, which may not be practical. Another way is to install a wheelchair lift. I'd recommend you plan for a dedicated wheelchair door. Here's why: If the lift serves the main incoming door, you'll have to pull the stairway away from it to use the lift, which would stall incoming traffic as well risk embarrassing the occupant of the wheelchair. If the wheelchair occupant realizes this will happen, he or she may avoid your display. With a dedicated entrance, the wheelchair occupant can enter the trailer without stalling other traffic and without potential embarrassment. One leading manufacturer of commercial vehicle wheelchair lifts is Braun (<http://www.braunmobility.com/products/commlif/index.asp>).

Lifts - There are two types of lifts – lift gates and cargo lifts. Both mount on the rear of the trailer.

Liftgates are where the entire rear wall of the trailer can open up to a horizontal surface, which then can be used as an elevator to go from ground level to the trailer floor level or a 2nd deck. Liftgates are made by the manufacturer as part of the trailer. Typically they are built to carry up to 6,000 pounds, but can be designed for heavier loads if needed.

Cargo lifts are smaller and manufactured by a vendor, for example, Waltco (www.waltco.com). They bolt onto the rear of the trailer and travel from ground level to about 4 feet off the ground. They come in both aluminum and steel construction and are usually rated for 2,000 or 4,000 pound capacity.

Storage - Where does everything go when you are in transit? There will be some equipment, like awning poles and canvas, free-standing kiosks and furniture, stairs, and rails that will have to be stored for transit. They can go under the floor, in belly boxes, between the roof and ceiling or be tied down to the center section of the main floor. Your trailer manufacturer should provide a drawing showing where everything will fit for storage. Make sure this is thought through ahead of time during the design stage.

If you have more equipment than will fit in the trailer, you'll need another vehicle to haul it, i.e., a chase truck. If you need a chase truck or need to change your design to avoid needing a chase truck, it's best to know that up front.

Interior Floor Covering - A variety of floor coverings are available, including linoleum, carpet, wood, etc. Just about anything that's available for a building can be installed in your trailer. But just like for a building, think about how you are going to use the surface. For example, I'd avoid using carpet on floors. Who's going to clean it?

Amtico, Nora and Lonseal all make a wide variety of very durable floor coverings that can be cleaned up easily. Also, Nora makes a raised dot rubber tile (also known as "disco tile") that is commonly used. Many flooring materials are available in both continuous sheet and tiles. Your trailer salesperson can provide flooring samples and assist with recommendations. Keep in mind any unusual needs you may have. For example, some medical and mobile morgue trailers use harsh chemicals that might damage an ordinary floor, but special floors are available that are impervious to these. Some flooring vendors will even install your logo in the flooring if desired.

Interior Wall Covering - Once the electrical and plumbing are installed, interior walls are typically insulated and then closed up with 3/8-inch plywood. A finish covering goes over that, which is glued and/or screwed to the plywood. Finish coverings are usually:

- laminate, such as Wilsonart, Formica or Pionite
- prepainted, white aluminum sheets
- commercial-grade carpet

There are a lot of materials available, but these are proven ones that have worked well for mobile applications in the past. Your trailer salesperson can provide samples. One thought, pick materials that are durable and easy to clean in addition to looking great.

Ceiling Covering – Like walls, ceilings are generally covered with plywood first, with another finish material glued and/or screwed to the plywood. Some common finish materials for ceilings are padded leather, laminate, pre-painted aluminum and carpet. Laminates, like the Wilsonart, Formica or Pionite samples you see at the home improvement stores, are available in a variety of colors and patterns. Carpet should be a low knap, industrial grade and will help to absorb sound. It is available in a variety of colors as well. Pre-painted aluminum sheets for ceilings are generally white. Other design elements such as mirrors can also be integrated.

Insulation - Typically, interior walls are insulated with one-inch or tow-inch Styrofoam. Typical side wall construction has room for up to two inches. Other insulation options are available as well. Roofs can also be insulated. Typically, this is sprayed on the interior side of the roof and helps greatly with air conditioning. These should be matched to your cost and climate control goals.

Doors and Windows - Some manufacturers use mass-produced doors, primarily designed for the RV industry. Others make their own. Featherlite offers either. Typically mass produced doors are used on bumper pull and gooseneck trailers. Custom-made doors are usually used on semi trailers. Custom made are a two-inch thick, double-wall construction with double edges for seals. The double-seal design provides a significantly better seal to keep road dirt, dust and rain out. A quick check on door quality would be to try to twist it with your hands to see how rigid it is. Then open and close it to see how well it fits and seals.

Windows of various sizes and a variety of features can be installed. They can open with a slide or hinged design or be fixed. Windows can also be tinted or clear, and a variety of coverings are available.

HVAC - HVAC is an acronym for heating, ventilating and air conditioning. The result you want from air conditioning should be expressed as the difference between the temperature inside and the temperature outside (i.e., ambient temperature). For example, if you want to be able to maintain a 75 degree F. temperature inside when it's 95 degrees F. outside, you'll need a specification that states, *sufficient to maintain up to a 20 degree F. drop from ambient*. FYI, if you're interested, cooling capacity is measured in tons. A ton of air conditioning is 12,000 BTU/hr. The effectiveness of that cooling power also depends on the insulation values and construction of the trailer.

A rule of thumb for home air conditioning is one ton for every 1,000 square feet. So a typical 2,500 s.f. home might need a 2.5 ton unit. But your trailer is not as well insulated as your home so it needs more cooling power. A 1,000 square foot double slide-out trailer would typically use two 5 ton units.

You can also choose between single area units and centrally ducted. Single area units have one output vent and one return vent in an area. You'll need separate units for separate rooms, each with its own thermostat, similar to a window air conditioner in a house, except that these are typically built into the cabinetry of the trailer, not mounted through the wall or in windows. Centrally ducted units will have one or two master units, each with its own thermostat, with duct work that distributes the air throughout the whole trailer, similar to central air in a home.

Some trade-offs are:

Attribute	Area Type Units	Central Units
Individual room control	Yes	No
Redundancy	More	Less
Space	<p>Cooling coils and fan must be built into interior cabinets for each area, taking up cabinet space</p> <p>Exterior compressor is mounted in recessed pan in the roof, lowering interior ceiling height in that area</p>	<p>Cooling coils are mounted in exterior unit, only duct work and vents take up space inside. However, main ducts and vents typically run in ceiling, thereby lowering center portion of ceiling somewhat</p> <p>Exterior compressor units are typically mounted on exterior front or rear wall</p>

Most air conditioning units are also available with some heating capacity that can keep you comfortable when ambient temperature is above about 6c degrees. Below that you'll need a propane-fired furnace. But, keep in mind that a propane furnace also means your trailer will need propane tanks as well. If you really plan to do cold weather running, you'll also need to winterise your plumbing system (see OPERATION/Cold Weather section). Heating requirements are best expressed as a temperature difference from ambient, just like air conditioning. For example, if you need the capability to have 23c degrees inside when it's 5c degrees outside you'd specify *sufficient to maintain up to a 25 degree increase from ambient*.

I'd recommend specifying the result you want, in terms of temperature difference from ambient, and let the manufacturer's engineers figure out the rest.

Interior Electrical - You'll probably want 120-volt electric outlets, like you have in your home. These can be placed where you want and wherever they will fit. You will need to work with your specialty trailer salesperson to determine number and placement. How about telephone, cable TV, computer outlets? These are all available too, but they need to be specified.

Interior Lighting - A wide variety of lighting is also available. Flush mount means that the light fixture is recessed so it is flush with the ceiling surface. Surface mount means that the rear of fixture is mounted to the ceiling surface so the fixture protrudes from the ceiling surface.

After understanding your needs, the manufacturer can make a proposed lighting plan. Appliances - Your trailer can be equipped with just about any appliance, including:

- Microwave oven
- Refrigerator/freezer
- Coffee maker
- Trash compactor
- Dishwasher
- Washer/dryer
- Range and ventilating hood

Plumbing - If your design includes a sink or bathroom, you'll need plumbing. Basic ingredients for plumbing are:

- Plumbing fixtures, like sinks, faucets and toilets
- Hot water heater
- Holding tanks - three kinds:
 - Fresh water, for drinking water supply
 - Grey water, for sink drains
 - Black water, for human waste, toilet drain
- Drain plumbing and dump valve(s) for grey and black water tanks
- Water pump
- City water hook up to access public water instead of using your fresh water holding tank.
- Water lines to connect it all - for mobile application, water lines are typically a flexible plastic type.
- Drain plugs or valves for fresh water tank, all fresh water low points and appliances; Also a fill point for the fresh water tank
- Level sensors on each holding tank and a monitor mounted inside the trailer to tell how full each tank is.

It's a good idea to design your floor plan so all of the plumbing is in the same area. I'd avoid having a sink on one end of the trailer and a bathroom on the other since that requires running water lines the entire length of the trailer.

Holding tanks should be sized to your expected use. For example, I know from personal experience with my travel trailer that a 30-gallon fresh water tank with 30-gallon grey and black water tanks will just about handle a family of four for a weekend, if we do not use the shower.

Even with a brief shower, one can easily use five or more gallons of water. This water will travel from the fresh water tank to the grey water tank. I'd think twice before adding a shower to a trailer. You'll need huge holding tanks to get much value out of it.

You might think carefully about whether you really need that bathroom for a mobile marketing application – even though any manufacturer would love to put it in for you. Public venues will be required to have public bathrooms available, which can be used by your crew as well as your customers. If a bathroom in your trailer is open to public use, it would fill up a holding tank very quickly, and you would have to keep it clean as well. If you need a bathroom, I'd place it out of the traffic flow, to be used by crew only.

Most large trailers that have holding tanks have either 50- or 100-gallon capacity. When in doubt, I'd go larger, but keep in mind that water weighs about 8 pounds per gallon. The manufacturer can advise you on this.

One thought about cold weather (see OPERATION/Cold Weather section): Plumbing will have to be drained for below freezing weather in order to avoid freeze damage. This starts with a design where it can be drained easily without tools. The water lines should have low point drains. The water heater and fresh water tank should have drains plumbed to the outside of the trailer. There should be a provision for filling the water lines and water pump with a non-toxic RV type antifreeze without going through the fresh water holding tank. The water heater should have a bypass so the water lines can be filled with antifreeze without having to fill up the heater. These features should be specified.

Electronics - The availability of electronic devices is almost endless. Some common items are:

- TVs/monitors
- Stereo FM/tape/CD players with built-in speakers
- Security systems
- Telephone systems

- Cell phone antennas
- Weather stations
- Computer networks
- Satellite dish for TV and Internet

A note on satellite dishes – there are two types. A small one for CATV and up to two-user Internet. A larger one for multi-user Internet. You'll need to determine how many users you need to support. This will drive the dish selection.

Also, the hardware does not operate without a monthly subscription. You'll need to handle that directly; otherwise your monthly bills would keep coming through the manufacturer. Once your subscription is activated, the manufacturer will make it ready to use. So the subscription must be activated at least a week or two before the trailer is done.

Cabinets and Furniture – Cabinetry includes countertops, overhead cabinets and doors, cabinets under countertops or desktops, desks, tables, closets, drawers and doors. They are custom fitted to meet the needs of trailer design.

Cabinets are first designed on computer (CAD). Then laminated wood pieces are cut to spec with a computer controlled router, edged and glued and screwed together into three-dimensional pieces. Cabinets can also be made out of other materials, like wood or aluminum, if desired, but wood covered with laminate is most common.

Counter tops can be made with laminate, aluminum, stainless steel or solid surfaces like Corian or granite.

Caution: Corian, granite and the like are great looking and very durable but also expensive and very heavy. If cost and weight are considerations, you might consider an alternative. Furniture can be either purchased or custom made. For example, a desk chair could be purchased, but a sofa would most likely be built in. Tables would typically be custom made to fit the design but could also be purchased.

Caution: If you go with purchased items, invest in the good stuff. Remember that this is a mobile, commercial application. The furniture must be durable.

Bed frames can be custom built with purchased mattresses. Beds can be hideaway or fixed.

Kiosks and Other Display Elements – Display elements can be just about anything you can imagine. Common display elements are:

- Shelves/cases/supports to hold items to be displayed, signs, literature, display lights
- Mock ups, such as a 6-ft tall beer can, or a two-dimensional life-size photo of a celebrity, etc.
- Supports for graphic elements, such as signs
- Cabinets/supports for interactive video

Nearly anything you can think of can be built. Your trailer salesperson may have some ideas from past experience. The gating factor will be the practicality of it. Is it durable, cost effective, etc?

THE SCHEDULE

Just in case you are interested in a little behind-the-scenes information, here's a summary of what happens after an order is completed.

- Detailed drawings must be made. These are expansions of the drawing you sign, showing all the detail that manufacturing needs to know in order to build the trailer and that purchasing needs to secure materials. This could be over 200 drawings and could take several weeks to produce.
- As soon as sufficient design information is available, purchasing then needs to start buying all

the materials to be delivered in time to meet the production schedule.

- Manufacturing of sub-assemblies like axle sub-frame, slide-out mechanism and doors begins.
- Start of first assembly begins at the earliest available start date or as soon as parts and drawings are available, whichever is later. Structure is completed.
- Interior build out begins. Interior is completed.
- Paint and graphics are applied
- Final quality audit and cleaning.
- Ready for delivery.

Typical schedule from the time the order is placed would be

3-4 weeks detail drawings, and purchase parts

2-4 weeks complete structure

2-5 weeks complete interior

1-2 weeks paint and graphics

1-3 days final audit, cleaning, ready for delivery

8-15 weeks total (*Note this schedule is an example, actual lead times will vary dependent on individual trailer specifications*)

Expediting

The schedule may be expedited to the extent adding more labor will help. This will most likely require overtime and will increase the price. However, if lead time for a key component is the issue and the supplier of that component cannot expedite, then additional funds will not help. An alternative would be a design change that would use less labor or materials or eliminate a long lead time component. However, if another component is substituted, then the availability of that must be considered. Also, remember that labor that has already taken place cannot be recovered.

A design change that eliminates things that are already done will not help the schedule or reduce labor costs, although it may reduce some material cost. So, timing of decisions is important. Another alternative is to use a trailer that already exists. Sometimes manufacturers produce shells of commonly used designs to balance out production schedules during a seasonal low. If a trailer that would meet your needs is already half done, the delivery time could be brought forward considerably. When searching for expediting possibilities, remember the project triangle (page 3). A change in schedule will most likely affect design and/or price. There may be some trade-offs.

Changes

Design changes made after production has started may delay completion. This depends on whether the change affects something that is already built or not, if parts are available, etc.

PRICE, TERMS & FINANCING

Once a design is finalised, a quote can be made. A price can then be mutually agreed upon. The price and terms will be documented on a sales agreement.

Down Payment and Progress Payments

A partial payment with the order is agreed to and included in the agreement. This is typically 25% of the total. Progress payments are also agreed upon with a final amount due at delivery.

Whose Trailer Is It, Anyway?

In some cases, you or your client may want to purchase the trailer directly. Another alternative is for the tour company to purchase the trailer and lease it to you or your client. Yet another is for you or your client's leasing company to purchase the trailer and lease it to you or your client. Manufacturers and tour companies can recommend places to buy towing vehicles, if needed. Deciding early on who's going to own the trailer and who's going to pay for it can save you a lot of administrative headaches and potential delays later on.

OPERATION

Insurance

Your rig will need to be insured, just as your car is. Insurance can be purchased by whoever has an insurable interest, i.e., it does not necessarily need to be the owner. You'll need to decide who is going to insure the trailer.

Leveling

When a car is supported on a hydraulic lift in a service bay, sometimes the doors no longer fit just right. But when it comes down and rests on its wheels again, the doors work perfectly. That's because the car's frame flexes a little. So does your trailer. For that reason, trailers need to be leveled for stationary use, especially if you have slide-out expansions, large doors, canopies or stages.

Leveling is the very first thing that should be done after unhitching the trailer. It will be important to include leveling legs in your design (see DESIGN section). Leveling systems come in automatic and manual versions. The automatic systems are computer operated, automatically activating the hydraulic leveling legs until the trailer is level. They also have a manual override in case you want to bring your own four-foot level and do a little fine tuning. Manual operation systems are similar but without the computer. You have pushbutton control of each leg, but you need to decide when it's level.

Caution: Leveling legs are not landing legs. Landing legs are two heavy-duty legs with pads that crank down mechanically to support the front end of the trailer when it is not resting on the tractor. When a driver backs up to the trailer to hook up, he'll move the tractor slowly backward until the king pin hits the end of the slot in the coupler on the tractor. Sometimes the impact can move the trailer back a few inches. Landing legs are designed to withstand that. Leveling legs are not. They are designed to go up and down but not to withstand sliding horizontally, i.e., forward, backward or sideways, with the weight of the trailer on them. That's a good recipe for bending the hydraulic cylinders and incurring an expensive repair bill. Coupling and uncoupling the trailer should only be done when the trailer is resting on the landing legs, not the leveling legs.

Another caution: Uncouple the tractor before leveling, even if the tractor is not moved. The hydraulic cylinder in the leveling legs can exert a lot of force, enough to lift the trailer as well as the rear of the tractor. If the driver does not uncouple the hitch before leveling, and the leveling legs travel significantly to level the front of the trailer, the trailer king pin will be lifting up the rear of the tractor along with it. This will result in the rear of the tractor partially hanging from the king pin, with its weight suspended from the front of the trailer. I have never seen a structural failure result from this, but it might flex the front of the trailer enough to cause door or slide out alignment problems. So, why push your luck? It only takes a few seconds to pull the lever to release the king pin, even if you don't move the tractor.

Air Bags

The truck driver or tour company will most likely handle this, but I thought you should be

aware. Air ride suspension is accomplished via heavy-duty bags that are inflated with air. They can be inflated by the air compressor the tractor uses for the air brakes or deflated by releasing air from the bags via dump valves. There is also a ride height adjustment that limits the inflation when the trailer is as tall as legally allowed, 13.5 ft.

The driver inflates the bags for smooth driving. How smooth? I have experienced finding a cup of coffee that was forgotten in the microwave still standing in there, unspilled, after an all-day drive in an air ride trailer. The driver dumps the bags for stationary use to lower the trailer and to help with leveling.

Caution: Make certain that the driver inflates the air bags during transit. If this is not done, or if the air bags are defective, the ride will be very rough and it will take its toll on the interior.

Cold Weather

If you have plumbing in your trailer, or anything that will be damaged if it freezes, you'll need to watch out for cold weather. For example, I recall when a trailer finished up a tour in the sunny South and then drove to the Midwest for yearly maintenance. Along the way, the weather changed to a freezing blizzard. When the trailer arrived, all the water lines, the water heater, the toilet and the water pump were frozen solid and ruined - a very expensive repair. Before going into freezing weather, it's important to drain all the water from the plumbing system (see DESIGN/Plumbing section).

If you have a gen set, remember to check the coolant for cold weather and, if you plan to run it in cold weather, use a winter blend fuel if it has a diesel engine. You might also consider lighter weight engine oil for winter use.

Batteries and Storage

Vehicle batteries are most commonly the sealed lead acid type (SLA). It's the nature of new SLA batteries to gradually discharge about 5% per month if left unused/uncharged, even if nothing is connected to them. This is called the self-discharge rate. If you want to know more about this, you can search the Internet for "self-discharge rates" and you can come up with a number of websites explaining the technology of it.

The self-discharge rate will likely be higher if the batteries are left connected, even if everything is turned off. You can do the math. Your good old reliable battery will likely be a lot weaker after six months of storage. If the charge condition was low when you put it into storage, say 50%, it could be almost dead after six months of storage.

If you plan to store the trailer over the winter, it's a good idea to disconnect the batteries. But also be prepared to recharge them, if necessary, when you want to use the trailer again. If your trailer is equipped with a charger powered by 120-volt power, you can plug it in ahead of time to let the battery(ies) charge.

Tow Vehicles

What kind of vehicle do you need to tow your trailer? Diesel? Gas? How big is big enough? Who can drive it?

The answer depends on your trailer. But first, some nomenclature about trucks. In a semi trailer rig, the tow vehicle is the tractor. The part that is being towed is the trailer. With smaller trailers that are towed by a large pickup truck, the tow vehicle is called the tow vehicle.

If your trailer is a 53-ft semi trailer, you'll need a full-size semi tractor to pull it, something with at least a 400 HP diesel engine. Some major brands of tractors are

Who Are the Players/Tours Companies), they will take care of all this for you.

SERVICE & MAINTENANCE

It's a good idea to have your trailer in for annual maintenance and inspection. This can be done best by the manufacturer who built it. The manufacturer can provide a suggested maintenance list specific to your trailer, but here are some key items:

- Service generator
- Check air conditioning
- Check plumbing
- Service lifts/liftgate
- Check brakes
- Check bearings
- Check suspension
- DOT inspection
- Check all understructure
- Check shocks
- Check roof
- Check batteries
- Check all power converters
- Check all lights - 12 volt and 110 volt

AFTER THE TOUR IS OVER

What do I do with this used trailer when the tour is done?

If the trailer is leased, the lessor may end up with the used trailer and will either remodel it and reuse it or liquidate it.

Residual Value - When the trailer is new, the initial value of it is what it's worth to you. When you are done with it, the residual value of the trailer will be determined by what it's worth to others. The more common the design, the more likely it will be that others may be able to use it, and the more valuable it's likely to be to them. So there's a trade-off. On one hand, you want it to be special and unique to maximise effectiveness for your tour. But on the other hand, you want the highest residual value you can get. Here's a possible solution. Stick with proven design for the structure, e.g., double/single slide-out expandable, single/double stage or combination slide-out/stage. Then do the magic with the interior design and graphics. No matter what you do, it's unlikely anyone else will want your interior design or graphics. So that part will probably be 100% expensed with the tour. But you, or someone else, can gut the interior and use the same shell for an all new application. For example, the trailer used for Chevrolet's Olympic torch tour was remodeled to tour again as the Chevrolet Rock and Roll tour.

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In the Introduction, thoughts in the Why Mobile Marketing section were developed from many articles on the subject in industry periodicals as well as conversations with many clients.



More information on the project triangle and project management basics, mentioned in the introduction, can be found in many of the books available on the subject.