

Chapter Fifteen

Facility Needs and Design

Know How to Make It Go, or Know How to Ride? Get Trained

All trails start at a trailhead or other facility. Those facilities may be the first and only opportunity for the agency to interact or communicate with the riders; therefore, they serve as a welcome center for the customers. As such, they play a key role in OHV management and rider experience. Human feelings and perceptions are powerful elements in making a great trail great. When pulling into a facility, an impression will be made in the mind of the rider. First impressions are lasting impressions and they can form in less than one tenth of a second. That mental image will include feelings on several important components:

- Welcome. Do I feel welcome here?
- Accepted. Does the agency care about me and my activity?
- Care. Does this appear to be a well-managed and maintained facility and therefore trail system?
- Thoughtful. Has this been designed for my vehicle? Can I even get turned around?
- Safe. Is this a safe place for me and my equipment?

A negative answer to any one of these questions could trigger a negative impression of the site, the agency, and the experience the riders are about to have. A positive impression opens the riders' minds for receptive communication and acceptance of the rules, regulations, and expected etiquette. Being free of negativity as they start down the trail, the riders can absorb the experience without bias, which sets the stage and opens the door for a WOW experience at the end of the day.

When designing facilities, it's important to go back to the niche and vision for the project. Who are the customers? Where are they coming from? How many are there? What vehicle types will they bring? Will there be events? The answers to these questions affect the planning of the trail system as well as the design of the facilities. If the bulk of the customers travel less than 100 miles to ride, the trail will have predominantly day use. If customers travel more than 100 miles, the trail will become a destination where riders will spend a weekend, long weekend, or longer.

From day use to destination, the vehicle type may change from pickups and trailers to motorhomes and toy haulers; the composition of the customers may change from individuals, buddies, or a family to groups of families, extended families, and clubs. This affects the number of people who could be at the facility at any one time and thus the size, design, and amenities of the facility. If the trail is a destination, riders will need overnight facilities like motels, RV parks, and campgrounds.

OHV riders are not afraid to travel, and some travel long distances to explore different parts of the country and enjoy different riding experiences. Many



Outstanding design! This beautiful kiosk in this wonderful backdrop is setting the stage for the rider to have a WOW experience.



Many OHV riders travel and camp together.

travel in groups that range from a few people to 50 to more than 100. Get to know the customers and what they desire. If they have RVs, many desire a simple open area where their group can circle the wagons and camp together. These group sites often have no power, water, or sewer hookups. Others desire full hookups plus heated toilets and shower facilities. These are expensive, so don't build them if they aren't needed. Here is a key point: Most OHV riders would rather have a million dollar trail system than a million dollar campground.

Just as it is important to meet the riders' needs of quality and variety on the trails, it is important to meet their facility needs as well. Keep the design simple and basic initially, but have room and the infrastructure to allow for future development and expansion. It's a good strategy to implement the trails before the facilities, otherwise people have a place to park, but no place to ride. Then observe the use and needs of the facility and make adjustments to meet the needs of the customers.

Tip, Trick or Trap?

Tip: Most OHV riders would rather have a million dollar trail system than a million dollar campground

Trailhead and Staging Area Design Considerations

The difference between a trailhead and a staging area is that a trailhead provides trail access for casual riders and a staging area provides access to trails and other activities like MX tracks, endurocross or technical terrain tracks, training areas, and concessions. A staging area usually has a larger parking area and often is used to stage events, so there may also be a pit area, starting area, gas row, and spectator area. When not being used for events, staging areas often provide an open area for dispersed camping where there is plenty of room to circle the wagons. Most OHV parks have staging areas whereas most forest trails have trailheads.

Other than size, both can have similar components. These include site signing, the trail access point, parking area, toilets, kiosks, loading ramps, and miscellaneous structures. For the most part, general design concepts will be covered, rather than specific design criteria.

Site Signing. As obvious as this component seems, there are too many OHV recreation sites that do not have an adequate identification sign out on the main road. Even though the site may be clearly visible from the road, someone who has never been there before doesn't know if this is the intended destination or if it's several miles farther up the road. Riders could also be arriving at night when the facility can't be seen from the main road. Ensure that the sign is clearly visible, is reflective, and the text is legible and sized for the speed of the vehicles on the road.



The letter size on this guide sign is commensurate with the 75 MPH speed on the highway. However the upper portion of the sign is no longer legible.



This trailhead has a host of amenities including a gravel parking lot, kiosk, picnic tables, covered group picnic area, and accessible toilet.



This guide sign is too high and too far off the road shoulder. It's not easy to see during the day and may not be visible at night.

This recreation site sign looks professional and helps form the riders' first impression.

If the site is off the main road on a secondary road, there should be a guide sign on the main road and a site sign on the secondary road at the actual entrance to the facility.

Trail Access. This is the access point to the trail(s). It is preferable to have access to multiple trails rather than just one trail. This allows for quick dispersal, provides loop options, and reduces traffic volume and thus potential tread maintenance.

Here are some key points on the trail access area:

- When pulling into a parking lot, especially a large one, a common problem is not knowing where the trail access point is and not being able to see it. Depending on the trailhead design, it could be blocked by vegetation or other vehicles. A site map or guide sign at the trailhead entrance can help remedy this.
- A lot of vehicles go through the trail access area, so barriers are often necessary to control and direct the use.
- Entrance management signing and vehicle width restrictors should be used here.
- This is the last opportunity to grab a map before hitting the trail(s), so a map box at this point is very handy.
- If there are poor soils, trail hardening is often required in this area due to the volume of traffic.



Even with no vehicles in this trailhead parking lot, the trail access point (arrow) is barely visible. There is a sign board there but nothing is posted on it.



Well designed, this trail access gives the rider a choice of four trails. This adds variety and helps disperse the riders quickly.

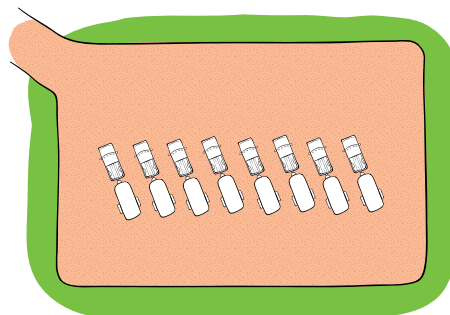


This guide sign at the trailhead entrance helps orient new visitors.

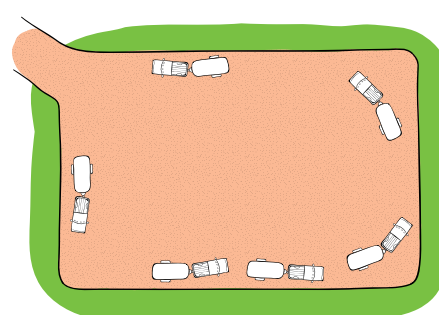
Parking. When large vehicles with trailers need to be accommodated, managing traffic flow is very important to efficiently utilize the available space. The size and configuration of the parking lot is a huge factor in determining the riders' first impression of the site. Anyone with a trailer will park so they don't have to back up to get out. Design to minimize the need for backing.

Here are some thoughts on parking:

- The design of the parking lot should clearly indicate to the visitor how to park in it.
- Square parking lots with a single ingress or egress point are common, but do not function well. They have poor traffic flow and inefficient use of space. Since the design does not indicate how to park, the first vehicle can park anywhere, and if it parks in the wrong way, it can significantly reduce parking capacity.
- A square parking lot works better with an ingress point on one end and egress point on the other.
- Though often a necessity, minimize head-in, back-out parking. It is one thing to see a pickup coming before backing up and another to see a kid on a minibike, which could be traveling at a much faster speed. If head-in parking is provided, make the spaces



How parking was planned



How people really park

With an unmarked parking lot, the first vehicle to park will determine the parking pattern for all of the other vehicles.

shorter so only vehicles without trailers can use them.

- Pull-through parking is preferred with separate ingress and egress points. This type of lot has flow, safety, and space efficiency.



This rectangular parking lot is too narrow. With vehicles parked on both sides, another vehicle with a trailer will think twice about pulling in because he may not be able to get turned around.



Drivers have done a good job parking themselves in this postage stamp lot, but vehicles are oriented four different directions and the odds are high that someone can't get out or an emergency vehicle couldn't get in.

- Many people do not use or need a loading ramp because they have their own. Provide adequate parking length for the vehicle plus trailer, its loading ramp, and room for the OHV to navigate off and on that ramp without being in the travel lane.



This one way in, one way out, pull-through design has great flow. The angle of the sides "tells" the drivers the angle to park and there is a sign at the entrance to park in the center. There is now a kiosk at the trail access point where three trails take off.

This space is significant.

- As far as capacity, bigger is usually better. However, with a small trail system, use levels can be controlled by limiting the parking lot capacity. However, this may cause riders to park



These treated timber parking delineators are expensive, inhibit parking lot maintenance, and don't work well to organize the parking. People will be driving over them and tripping over them. A Park in Center sign would help. The angle of the parking should be determined by the angle to the parking lot entrance. If it isn't, one row of timbers would be sufficient to guide the first vehicle.



Manage parking lot drainage through design. The low point of this lot is at the trail access point so all of the water flows down the trail. Attempts to harden it will be futile and the best option is to relocate the trail access point.

outside of the lot along access roads, which can create its own set of safety and impact issues. Usually, barriers or restrictions are required to manage this use.

- Depending on the length of the design vehicle, the width of pull-through parking lots should be 100 feet minimum, but 110 feet is optimum. A pickup with a fifth-wheel toy hauler or a motorhome with a trailer can easily be 60 feet long or longer.
- Flares on the ingress and egress points should have a 35- to 50-foot radius.
- An all-weather surface improves functionality throughout the seasons and reduces dust.



This pull through lot is 110' wide. When there is an event, there is room to park along both shoulders and vehicles without trailers can double park in the center.

- Asphalt is nice, but large expanses tend to crack and require maintenance. Depending on temperature extremes, a flexible pavement may work better if there is a good base. One thing nice about a hard surface is that riders won't cut cookies on it.
- Do not stripe or otherwise mark the parking spaces. Each vehicle is different and requires a different amount of space.
- When calculating parking capacity, designers should remember that this isn't a grocery store parking lot with each vehicle squeezed in with the next. Without a parking attendant, riders will not park tight. Allow room for doors on each side to be fully open and room for people, gear, and OHVs to be unloaded without scratching the next vehicle. A good average is 15 feet in width per vehicle, but at a 60 degree angle, this equates to about 18 feet on the parking lot centerline (so a 500-foot long pull-through parking lot would have a capacity of approximately 28 vehicles).

Toilets. Nothing leaves a lasting impression more than a toilet that is clean and relatively odor free. Cleanliness is a maintenance issue, but odor is mostly a design issue. Too many toilets are located where it is convenient rather than where it will function the best. The critical design element for a sweet smelling toilet is airflow, which involves not only prevailing wind currents but thermal currents as well. Become knowledgeable of the science before siting a toilet. Air should move in the vent, down the riser, and up the vent stack. When users raise the toilet seat lid and a rush of nasty air hits them in the face, the airflow has not been managed correctly.



Porta-potties have had a urinal and a riser for years. Including one in the vault toilet makes sense, but there is also more to clean.

Here are some considerations:

- Vegetation management is often required to provide and maintain proper airflow.
- To increase thermal currents, maximize sun exposure to the vent stack.
- A solar-powered fan in the vent pipe can help manage airflow.
- To prevent people from parking, riding, or racing through the entryway, an L-shaped privacy screen is recommended.
- Site the toilet so air from the vent blows away from areas where people will congregate.
- There is a tendency to locate the toilet adjacent to the kiosk. From a privacy standpoint, this is undesirable. People tend to gather at the kiosk, but who wants a gathering next to the toilet?
- A common game for kids is to lob rocks into the vent pipe. This can be prevented by installing a conical-shaped wire screen over the vent pipe. A flat piece of screen may not be visible by the kids and the cone shape deters needle and leaf build-up. The screen must have a big enough mesh so as not to impede airflow; do not use window screening. Also, the screen must be checked periodically to ensure that spider webs are not restricting the airflow.
- A tip for maintenance personnel: If they wouldn't be comfortable having their spouse and kids use the facility; clean it. No one else would want to use it either.
- Having a hand sanitizer dispenser is a welcomed amenity and shows that the agency is willing to take that extra step toward providing quality customer service.
- One of the benefits of OHV recreation is that many people with disabilities can participate in the sport and enjoy a quality outdoor experience. Because of that, the toilet and the pathway to it should be accessible. Better yet, include an accessible parking pad in front of the toilet.



This facility not only has an accessible path to the toilet, it has an accessible parking and unloading pad. Good design.

Kiosks. The kiosk is the focal point of the trailhead. As such, it can be used to help draw attention to the trail access point. Unless there is a site host, the kiosk is the place for the agency to communicate with the riders and for the riders to gather the necessary information to plan their ride. Studies have shown that the period to have the riders' attention is very short, so focus the information on what is most important to the riders, not necessarily the agency. Key messages need to be limited in number, stand out, and be brief.

Here are some key points:

- Being a focal point, the kiosk should fit architecturally with the landscape. Utilizing native materials can help with this.
- Display posters in an organized, uncluttered fashion. Focus only on the most important messages.
- A map with a You Are Here indicator should be one of those important messages. Having it laminated is even better.
- Avoid displaying a bunch of 8 ½ x 11 inch pages of agency rules and regulations. Few people will ever look at them. If it is absolutely necessary that these be “posted,” put them on the back of the kiosk, on one panel of a multi-panel kiosk, or on a separate kiosk.
- Reserve space for current condition posters like fire closure, weather closure, hunting season, and an event.
- Some kiosks have interpretive posters and messages. Due to the short attention that kiosks receive, these messages may be more useful out on the trail system where they can serve as a destination and extend recreation activity time.
- A polycarbonate cover helps protect posters from the weather and vandalism.
- On large trail systems with multiple access points, it can be helpful to have the site name on the kiosk so when riders arrive by trail from some other point, they can quickly ascertain their location.
- Be sure there is at least one map box stocked with maps.
- If there is an option, the kiosk and the posted materials will sustain less sun damage if the kiosk faces to the north or east.



This kiosk at a trailhead contains a laminated map of the trails, a quick reference of which vehicles are allowed on the trails, and other information the riders should know, all covered with a polycarbonate shield. The seasonal closure is clearly evident. This is a good example of a good looking, well-kept kiosk.



Too much stuff. There might be some good information here, but no one is going to read through all of the fine print and agency regulations to find it.



This facility has recently been constructed. There was room here to put more distance between the kiosk and the toilet.



A simple, but nicely arranged kiosk with key messages. Note the two map boxes and the name of the site.



Most agencies have kiosk height guidelines. Why have a kiosk if you can't read the information?

- A message board off to the side can be a handy feature for lost and found items and notes to help riders find others in their group. This can help reduce the proliferation of posting paper plates on trees or damaging signs and posters that are on the kiosk.



The vertical see-through slats are a nice design, but not functional. Wind and rain blowing through the slats rips and saturates posters.



This bear claw kiosk is a great design and certainly appropriate for the area: Bear Creek. The message board is a handy addition. Without it, paper plates get tacked up on the expensive kiosk panels.

- A picture is worth a thousand words, so using posters with pictures that convey the desired or undesired behavior can save space, reduce verbiage, and be quite effective at delivering the message.

Loading Ramps. Loading ramps have become almost a standard amenity at trailheads. However, when space is confined, they take up valuable real estate and can interfere with normal traffic flow. People got their vehicles loaded before they got to the trailhead, do they need a different way to unload them? Observe the use patterns and talk to the customers. This is one of those features that could be planned, but implemented at a later date if needed.



This is a neat and compact trailhead that fits architecturally with the site. Without a barrier behind the loading ramp, it could be used as a jump.



This was built as a volunteer work party project using old railroad ties. It's not fancy, but it works. The barriers prevent kids from using it as a jump.

Here are some key considerations:

- Loading ramps are relatively easy to build and make great volunteer workday projects. As such, they make good match projects for grants.



This is a nice ramp, but weather and tire action are eroding the approaches. They need to be hardened to keep it functional.



With the concrete and the railing, this ramp was expensive to construct. It is accessible, but the approaches in the gravel probably aren't. If the concrete truck is going to be there, why not pour a concrete parking pad and approach to the ramp?

- Many are constructed with two heights and this can be a nice feature.
- One of the biggest issues with loading ramps is that the kids or pit squids use them for jumps. This can be mitigated by installing a barrier behind the ramp so they can't get a run at it.
- Loading ramps and their approaches are subject to higher than normal physical forces and therefore higher levels of displacement. They should be hardened with rock or other material.
- For gravel parking lots, instead of installing a loading ramp, consider installing an accessible parking pad(s) of suitable width and length (16 x 40 feet minimum) to facilitate loading and unloading by the disabled. This should be signed for use by the disabled only.

Miscellaneous Structures.

Some amenities can be desirable depending on the climate and use patterns of the site. A good time to flush out the need for these amenities is during the planning phase of the continuum, or by monitoring use patterns and implementing them after initial facility development. Miscellaneous structures include the following:

Picnic tables are relatively inexpensive and a nice amenity. Rather than pack food, many riders will come back to the trailhead for lunch before heading out for an afternoon ride. Sitting at a table usually beats sitting in the dirt or in the back of a pickup. The more time riders are at the trailhead for other activities like an MX track or youth training area, the higher the need for picnic tables.



Concrete picnic tables are durable and they deter theft, but the shade moves and they don't. With no shade and smoke from the fire drifting toward the table, will it get used?



This metal table is also durable and could be anchored with a chain so it can be moved, but not easily stolen.



Desperate for relief from the heat, these riders sought the only shade.... Desirable? No.



This highly developed trailhead has several shaded picnic tables, accessible walkways, and interpretive signs. Great job!



Community kitchen structures like this are expensive, but provide a place for groups to get out of the sun or rain. Be sure to validate the demand before building one. The architectural design fits nicely with the industrial mining theme for this park.



This is a nicely designed trailhead with barriers to control and direct the use, a quality three-panel kiosk, two-hole toilet, and a welcome shade structure.

The same for fire rings. Trailheads are mainly for day use, but some families will build a fire mid-day so the kids can roast marshmallows. There is a need to have a safe place for a fire and to manage where fire rings occur so they don't appear on the asphalt or scattered around on the gravel parking lot. If overnight use is allowed at the trailhead, tables and fire rings become a necessity.

In the heat of the summer, just about everyone wants to take a break or eat in the shade, but there are many places that just don't have shaded picnic tables.



Above, though the Stop sign gets your attention, it tends to shout at you and aesthetically doesn't fit.

Shaded picnic tables are one of those amenities that let riders know the agency cares. One issue is that the sun moves but picnic tables don't so the shade is not always where riders want it. Another issue is that picnic tables are expensive, so how many should be built? If the parking lot is full, not everyone can have a table in the shade, but even a couple is a nice touch. A community kitchen is more costly, but can accommodate more people. As with tables, if there are other activities occurring in and around the trailhead, there could be a demand for a covered eating or meeting area. Designers should scope it out before they incorporate it. A structure like this could be harder to justify in a grant request.

In a user-pay society, fee stations are a necessity, not an amenity and a logical place for them is at the kiosk. The key point here is to not clutter the kiosk with OHV information and fee requirements. Focus the riders' attention on one, and then the other. Have a multi-panel kiosk or a separate kiosk with a panel dedicated to the fee requirements.



Good design. The fee station is separated from the information kiosk in the background. The sign: "The fee you pay here stays here" is an outstanding message that customers appreciate. Compliance tends to increase when people know that fees come back to help them.

Campground Design Considerations

Variety has been stressed throughout this book, and it is applicable to campgrounds as well as trails. Customers arrive as individuals or in groups of all sizes, so the camping facilities should be designed to accommodate a range of group sizes and a range of vehicle types and sizes from tents to RVs. Many agencies have design guides for campgrounds; unfortunately, some of those focus on sites for tents and pickup campers but not on big rigs with trailers. Driving a big rig with a trailer through recreation facilities gives one an entirely different perspective on adequate road width, clearances, and turning radii. Navigating a big rig should be mandatory training for any recreation facility designer.



This three-panel kiosk separates fee requirements from other information.

Just like a trail designer, a facility designer needs to understand: the riders and their needs, the range of transport vehicle sizes they will bring, and the group sizes possible. Keep the design considerations in mind to meet the needs of all the types of campers: the grade, turning radius, vertical and lateral clearances, back-in spurs, pull throughs, objects hidden from view, group sizes and areas, site protection, and the kiddie effect.



OHV riders often pull large toy-haulers. Campgrounds and parking areas need to consider the length of the vehicles, plus room to unload in the back.



Notice how campers tend to block themselves in for additional privacy and security. Large sites provide capacity and configuration flexibility. This site is 30 x 44' deep.



This site is 40 x 50' deep and can be used by one vehicle or several as shown here.

Mix it up. Depending on the vegetation and other site constraints, designers should try to accommodate as many combinations of vehicles and types as possible. This would include spurs and pull-through spaces for a single vehicle and for two, three, four vehicles and up. Then configure their arrangement to be intermingled and best utilize the available space. All of the pull-through spaces don't have to be together, the single sites don't have to be together, etc.



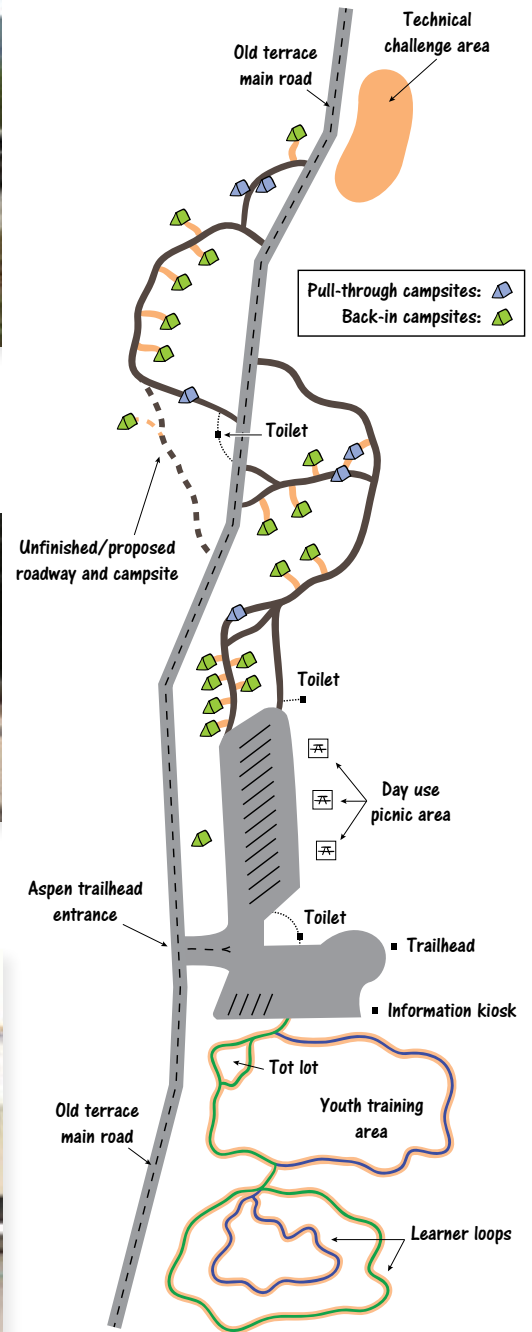
Riders with tents are using this smaller 20 x 30' native surface site. Don't pave or gravel every section of the camping area.



It took a lot of time and effort to try to level this RV. The result? An unsafe condition and negative image of the agency.

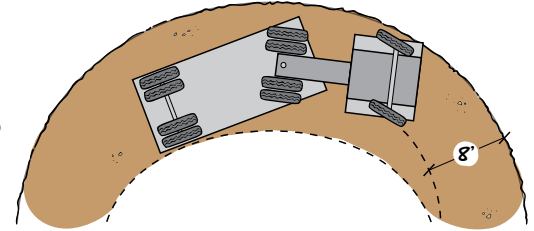
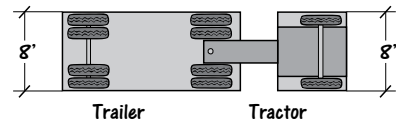
Grade. The engineers often want more grade than is necessary to drain the site. Design for the customers, not for the engineers. From a camper's perspective, there is nothing more frustrating than not being able to level up in a camp spur. RV refrigerators need to be close to level, but just as important the people want to be level. Whether riders are in a tent or RV, it is not comfortable spending the weekend off-camber.

If the spur slopes down at a 5 percent grade, a vehicle with a 200-inch wheelbase would need to raise the rear axle 10 inches. Few RVs can do that safely, and all RV manufacturers warn owners to never lift the front or rear tires off the ground since the vehicle could roll. Even on a gravel surface, water will run with a 1 to 2 percent grade.



This OHV trailhead and campground complex is only half complete, but there is a good mix of amenities and of sizes, shapes, and type of camp spurs. Site constraints forced a long and narrow design

Turning Radius. Two factors affect how sharp a curve is and how drivable it is: the curve radius and the length of the curve. The smaller the radius and the longer the curve, the sharper the curve will be. On any curve, the rear wheels of a vehicle do not follow the same path as the front wheels. The longer the vehicle (and trailer), the wider the offset between the front wheel track and the rear wheel track. This is compounded by the sharpness of the curve. Road designers compensate for this off-tracking by adding curve widening to the inside of the curve. This added lane width can be considerable (up to 20 feet), but in an effort to maintain a natural setting, road widths and clearing widths are often minimized in recreation sites. If sharp curves are designed into an OHV facility, curve widening must be factored into the road width. If it isn't, road damage, or worse yet, vehicle damage, can occur. Consult the agency road design guidelines or AASHTO Green Book guidelines.



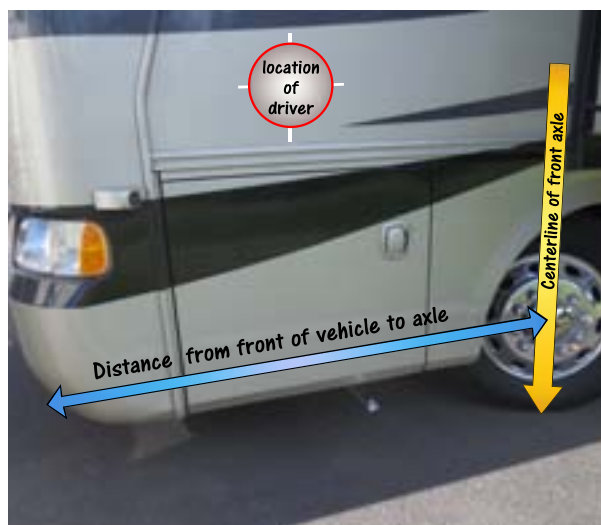
The belly dump truck makes a good test vehicle for roads and spurs in a big rig OHV facility.

During facility construction, a good way to test the design is with a belly dump truck. If it can't negotiate the turns or the pull-through spaces or if it scrapes trees horizontally or vertically, fix the design.

Vertical Clearance. It can be very disconcerting to drive through a campground road, hear limbs scrape the roof of a vehicle, and wonder if there will be damage to a clearance light, roof vent, an air conditioner unit, TV antenna, satellite dish, or the roof itself. A standard pruning height has been 14 feet, but many motorhomes are 12 feet high and fifth wheels can be 13.5 feet high. If the wind is blowing, the limbs are wet, or full of cones, a 14-foot height is not sufficient. A 15- to 16-foot pruning height is recommended.

Maintenance personnel need to be looking up when patrolling campgrounds. Broken limbs or de-barked limbs are clear indications of inadequate clearance.

Lateral Clearance. Clearing width can become a factor on both roads and camp spurs. If curve widening has not been factored into the design, lateral clearance is an issue



The front axle of this motorhome is behind the driver. The front tire could be on the edge of the pavement, but the front of the vehicle 5' off the pavement.

because the trailer is going to be off the road and scraping trees. With motorhomes and big trucks, the front wheels can be several feet behind the front corner; therefore, on a sharp curve, the front wheels could be on the road, but the front of the vehicle could be off the road. Without adequate lateral clearance, this could prevent a large vehicle from negotiating a sharp curve.



This slideout extends 36", but the storage bay door extends 52". Trees, bollards, or logs used to define the site can also restrict its use with inadequate lateral clearances.



The back of this motorhome extends 11' behind the rear wheels. If there is sufficient clearance behind the parking bumper and bollards or barriers are kept below 14", a 40' vehicle could fit into a 30' spur.

This site has good lateral clearances. Note that the rear of the 5th wheel is extended over the log barrier.

On camp spurs, there needs to be enough lateral clearance for awnings, slideouts, and slideout awnings. Storage bay doors can be 52 inches wide and extend beyond the slideouts. The total clear space required for a big rig with the patio awning out can be 22 to 25 feet.

Clearance in the back of the spur is important also. Most RVs have a rear overhang from the back axle to the rear of the vehicle. If trees are cleared and bollards or barriers are kept low enough, a long vehicle can fit into a fairly short site.

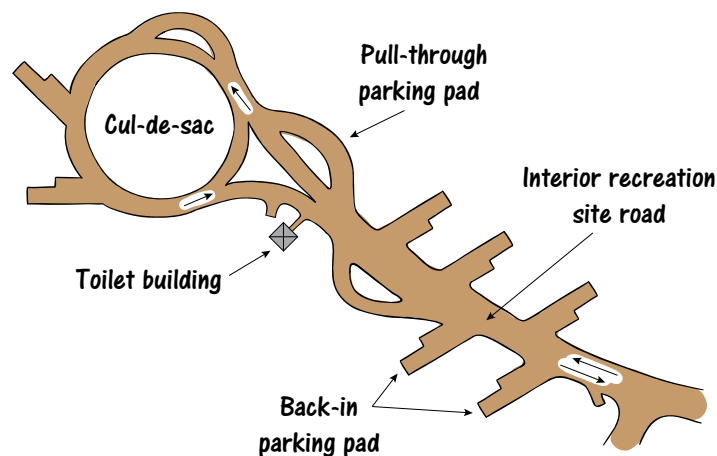
Back-in Spurs. Spurs utilize space more efficiently than pull-through sites, but big rig drivers will almost always choose a pull-through just to avoid backing up. Back-in spurs usually afford more privacy and in some ways more security because there is only one access point. The key to back-in spurs is their angle to the road. The smaller the angle, the easier the spur is to back in to. The spur angle should not exceed 60 degrees unless the road is very wide or there is another unoccupied site directly across from it. The reason for this is that without extra width, there is inadequate space for the front of the tow vehicle to swing out so the trailer can be straightened.



This spur is at a 90 degree angle to a road that is only 12' wide. Depending on the wheelbase of the vehicle combination, it is very difficult to back a trailer into this site. The first three bollards on the left side have all been hit.



Because the spur angle was sharp and the road had inadequate width, the front tire of this tow vehicle went off the road and over this culvert. This could result in damage to the road shoulder, culvert, and vehicle.



Whenever possible, avoid two-way campground roads. Traffic increases and safety decreases. With this design, every back-in spur is on the driver's blind side.

Given a choice, drivers of tow vehicles will choose a back-in spur on their left over one on their right. Why? Because the driver has a clear and close view of his mirror and a good line of sight down the tow vehicle and trailer, which makes backing up easier. Mirrors on the right are farther away and are often wide-angle, which makes the images smaller, harder to see, and harder to judge distances.

Pull-through spaces. The obvious advantage of a pull-through is that it eliminates backing in to a sometimes awkward spur. There are some vehicle combinations that cannot be backed up without unhooking, so those vehicle drivers will almost always choose a pull-through over a back-in.

A pull-through space can be designed for a single vehicle and trailer combination, the center can be widened out to accommodate two vehicles, or widened and lengthened to hold four vehicle combinations. Since pull-through spaces take up more space than spurs, designing them as mini-group sites can help make more efficient use of that space.

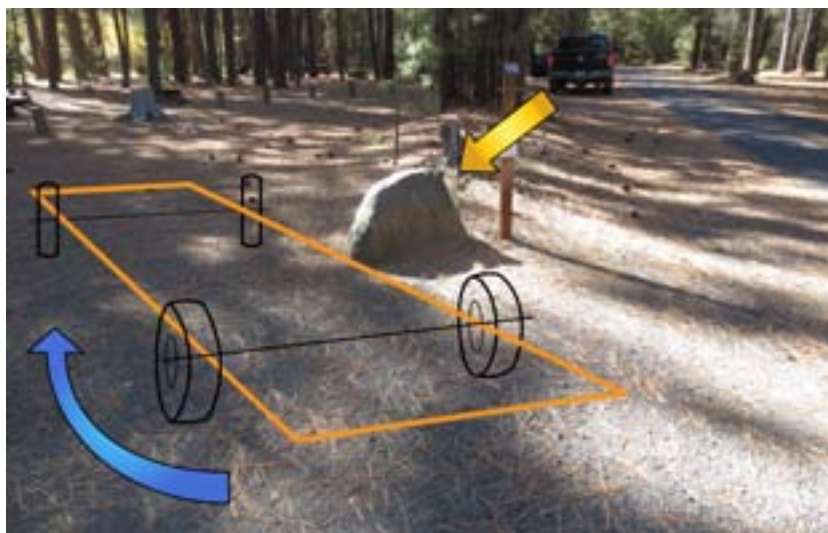
To accommodate big rigs, pull-through spaces need to flow well, so they're best designed as straight or on a long shallow curve. If the curve is too tight, a big rig with a trailer cannot pull in or pull out.

Objects Hidden from View. These are the bollards or boulders that designers place on the corners or edges of the site for enhanced aesthetics and confinement of the use. Unfortunately, when backing a trailer into a site, the drivers' eyes are focused on where the trailer is going, not on where the front of the tow vehicle is going. These objects become obstacles that are a hazard and are cursed by customers. Another factor is that the higher the drivers sit, the less visibility they have of the ground adjacent to their vehicles. Any objects placed in those locations are actually placed in the drivers' blind spots. Objects like this need to be either set back out of harm's way or be tall enough to be clearly visible by the drivers.

Group Sites and Areas. Having a group site(s) or large open area in which to circle the wagons is definitely an amenity that large families or groups will utilize. These can have utility hookups, but most groups can easily dry camp for a long weekend and would rather camp together than have utility hookups. Why do people circle the wagons? Camaraderie and just as in the old days: security; all of the OHVs, tools, and kids toys will be inside the circle.



This pull-through has poor flow that can trap drivers. When pulling in from the upper end, the drivers are hugging the bollards on the left and watching the trees on the right (not shown) to make sure their trailers clear them. Then the radius of the bollards tightens up forcing the drivers to crank the wheel some more or back up. All three of the bollards in the foreground have been hit.



How could someone not see this rock on the right? Once committed to pulling in, the rock is on the blind side of the drivers and their eyes are focused on the stump ahead which is encroaching on the width of the pull-through. While tightening up their turn to clear the stump, off-tracking could put the trailers into the rock.



The ability to circle the wagons enhances the experience of a group. Note the variety of vehicle types: toyhaulers, trailers, motorhomes, tents, and pop-up tent trailers.



This unique design allows RVs to square the wagons while still having full utility hookups. Sites can be occupied individually or a group of four can camp together. Note the single fire ring in the middle.



This cable barrier helps control the spread of this dispersed site and deter the kiddie effect.



This large circular site with multiple utility hookups can be occupied by individuals or it can be reserved for a single group.

Site Protection. A concern with any developed or dispersed camp is limiting the spread of the site and protecting vegetation. People like to camp under the trees, but doing so can damage root systems, compact the soil, and affect water absorption. Barriers are often used to confine and control the use.



There is always a need for bollards or other barriers around campgrounds and trailheads. During construction, or as vegetation needs to be managed during the life of the facility, consider cutting the stumps a little higher and chamfering the tops. It's a nice touch and it provides a great natural barrier.



Innovative parking corrals are used to control access and protect this sandy environment from vehicle impacts.



While parking and camping is still allowed in the trees, barriers have been installed around other clumps of vegetation. The beneficial effect is obvious.



The Kiddie Effect. OHV riding and camping is a family activity and it's always great to see families having fun together. The bigger kids can usually go ride with their parents on the trails, but where do the little kids ride or learn to ride? Most often, they will end up riding around the camp or riding around the campground on the roads. They will ride all day long until they run out of energy or fuel. This constant noise and dust can be annoying to other campers but it can also present some safety concerns.

Left to their own devices, unsupervised and uneducated kids can do a lot of unintentional damage. They're looking for fun and can find that by riding a closed trail, a closed area, or by creating a trail between campsites.



A father leads his son around the campground. More often than not, the child is riding unsupervised.



This kiddie track is developing next to a large, regularly used dispersed camp.

In the vicinity of most dispersed kiddie-created camps that are regularly used by families, a kiddie-created track will soon develop. The kids need a place to ride, but these contribute to the spread of dispersed camps and impacts to vegetation and soils.



It is difficult to close off a trail or road adjacent to a dispersed camp. The chopped up road provides a great challenge for the kids.

Designers can manage the kiddie effect by incorporating tot lots, kiddie tracks, and youth training areas as part of their OHV facility design. Like play areas, these give the kids (and their parents) a designated, managed place for that activity. These facilities get the kids off the roads and away from the intimidation of older riders and bigger machines. Signing these areas as tot lots, kiddie tracks, or learner loops help to keep older kids and pit squids out of the area. Riders don't get any points for showing off in a tot lot.

Skill Development Area Design Considerations

Areas to develop skills should be associated with OHV trailheads, staging areas, and campgrounds. They help manage the use by providing a designated place for training, riding, and skill development. They also extend the recreation activity time because they provide activities other than just trail riding. These should be sited quite close to the trailhead or campground, but be located to minimize noise and dust intrusion to other recreationists.

Skill development areas include learner loops, kiddie tracks, tot lots, youth training areas, and technical terrain courses. All except learner loops provide spectator activities where riders and their family or group can participate or watch.

Learner Loops. A learner loop is a one-way training trail that teaches throttle, clutch, brake, and balance control. To accomplish that,



Signed learner's loops help prevent the kiddie effect and keep pit squids out of the area.

these are often tight, technical, low-speed trails. In theory, they should prepare the rider to negotiate whatever can be expected on the trail system. If the trails have rocks and logs, the learner loop should have rocks and logs. If the area doesn't have those features, they can be imported. If the main trail has switchbacks, the learner loop should have a switchback if the terrain allows. If there are single- and double-track trails, there should be single- and double-track learner loops.

A learner loop isn't just for kids; it's for anyone who needs to develop their riding skills. They can be any length, but many are one-fourth to one-half mile long. These loops are dense so they can fit into a small area. If they are long enough, they can also serve as a warm-up loop.



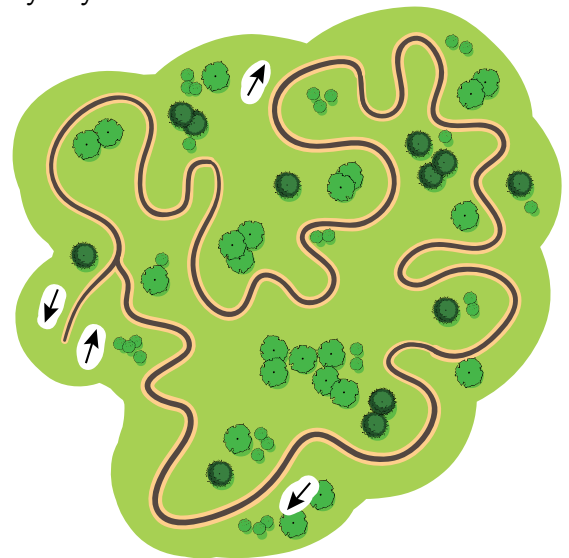
This learner loop has an ATV trail going off to the right and a single track trail going straight ahead. Both were designed to be very easy for kids to ride.



The new training area at the El Mirage OHV Recreation Area has a training area, a tot lot, and a youth training area. All areas are well signed and there are age appropriate safety messages along the fences. This area was well designed and constructed.

shaded picnic tables or bleachers so parents can watch their kids play on the track. Size depends on available space, but a nicely sized track can fit on one-half acre.

A learner loop can also be designed as a play loop. It can be open and flowing or tight and technical, but the curves are usually highly super-elevated to produce a high fun factor. Where possible, they play with the landscape to produce a roller-coaster ride. These teach skills, but the high fun factor can keep kids occupied for a long period of time.



Learner's loops teach the skills needed for the trail system.

Kiddie Tracks. These are usually a small oval track, fully enclosed with barriers or fencing, with a controlled access point. They are usually signed to limit the age and vehicle displacement (cc). The track usually has some mounds of dirt of varying heights or other obstacles, with easy-outs, to ride over. Some have

Designers should keep the kiddie effect around dispersed camps in mind and manage the impacts by selecting a couple of the high-use sites and building a small kiddie track at them.



Tread Lightly's Lightfoot has just enjoyed a ride at this kiddie track. This one is restricted to kids under 15, under 5'5" tall, they must be supervised, and speed is limited to less than 10MPH.



This kiddie track has shaded bleachers which provide a comfortable place for parents to supervise and interact with their kids.

The kiddie tracks should be shown on the map so families with small kids can find them. Then all undesignated tracks should be closed off and use directed to the designated sites.

Tot Lots. Tot lots are designed for the little kids just getting started. They are a simple oval track or may have a few easy curves. They are flat with no superelevation and no mounds so that a rider on a small 50cc bike with training wheels can easily navigate them.



A tot lot is a happy place as proud parents watch and photograph their kids. Without the intimidation of bigger bikes and kids, skills and confidence can develop quickly.



They are fully enclosed with a single access point and are signed to restrict engine displacement. Depending on soil type, a tot lot may need to be hardened since soft soils are difficult to ride with small tires and small engines, or by kids on their first ride.

A tot lot can be any size depending on available space, but 50 x 100 feet is more than enough. They don't need to be very big because the machines and riders are so small. Also, a small track makes it easier for the parents to supervise and run alongside their youngster.



Youth Training Areas. All of the previous area can be called a youth training area (YTA) or be part of a larger training area. A YTA usually provides a range of activities to accommodate a wider range of ages and skill levels. Some have a tot lot; kiddie track; an ASI or MSF training area; a learner loop; and an obstacle area with mounds, rocks, logs, or other natural or manufactured features. All of this can be provided in less than 2 acres. They are fenced, signed, and have restricted access. Picnic tables in the shade give parents a place to watch their kids.

Technical Terrain Courses. A formal technical terrain course is called an endurocross track, and it is a competitive event track that is a spectator activity like MX, rock crawl, and trials. However, they can also be designed and used for casual recreation. These are technically challenging so they provide a much higher level of skill training than the other facilities above, but they are fun and definitely extend recreation activity time. One nice thing about them is that they can occupy almost any size or shape land parcel since a lot of obstacles can be positioned into a very small space.



The El Mirage Youth Training area has several skill building stations, each with an easy-out. Educational posters are placed on the fence surrounding the area.

Manufacturing challenge features are what a technical terrain course is all about, using whatever materials are available and creatively arranging them into a fun and challenging course. Materials can be rocks, logs, stumps, tires, culverts, concrete chunks; anything that can be ridden over and be durable. Unless obstacles are intended to move to increase difficulty, like a loose log run, features must be designed to be anchored or immobile. Like everything else, having a variety of features increases the challenge and fun.

Adding skill development areas can take little space, but they add tremendous value to a trail system. However, like the trail system, the development areas need to be designed correctly from the beginning, built with quality materials, and have regular maintenance.



Endurocross courses use a variety of obstacles to create a very technical course in a small area.



Concrete pipe, a short hillclimb with angled log obstacles, or a mound of logs can provide a tremendous amount of technical challenge and fun. When others in the group watch, their recreation activity time is being extended and enhanced.



Vertical and horizontal tires of various sizes are durable, cheap, and a blast to ride. A rock garden is a fun feature and this could be followed by a sand pit. The only limits are the designer's creativity and imagination.





This triangular log feature is very simple, but between the angles and the odd spacing between them, they are quite challenging to ride.



Where appropriate, a mud pit is a popular feature. Allowing legal, designated areas helps protect the resources where it isn't appropriate.



Trails riders can do some amazing things with their motorcycles. A small space and a little ingenuity is all it takes to make a great trials riding area.

Need more? Learn more here...

AASHTO Green Book, https://bookstore.transportation.org/collection_detail.aspx?ID=110&gclid=CNDwtbDgosECFVBffgodyioAQA

Park Guidelines for OHVs, George E. Fogg, NOHVCC, 2002

SST Installation Guide, USDA Forest Service, Technology & Development Program, <http://www.fs.fed.us/t-d/pubs/pdf/03231303.pdf>

A Look Back...

Here are some of the elements discussed in this chapter:

- OHV riders aren't afraid to travel, and they often travel in groups. Facilities need to accommodate a variety of group sizes.
- OHV facilities need to be designed for a variety of vehicle types, sizes, and combinations from pickups with tents to motorhomes with trailers.
- Designers must understand OHV riders' facility needs, use patterns, and the capabilities of their travel vehicles.
- Trailheads and staging areas have seven design components: site signing, trail access, parking, toilets, kiosks, loading ramps, and miscellaneous structures.
- Educated riders are responsible riders. A well-organized kiosk with key information and education messages is an important communication tool for the agency.
- Design considerations for campgrounds include: a variety of spur sizes and configurations, grade, turning radius, vertical clearance, lateral clearance, back-in spurs, pull-through spaces, hidden objects, group sites and areas, site protection, and the kiddie effect.
- Design considerations for skill development areas include learner loops, kiddie tracks, tot lots, youth training areas, and technical terrain courses. These provide designated, managed areas for skill development, training, and challenge.
- Skill development areas extend recreation activity time, enhance the OHV experience, and help manage the use.