



## Vehicle-Mounted Bike Racks for Public Safety Cyclists

by **John Brandt**, *PCI # 204/EMSCI #055*  
*University of Maryland College Park Police Department*

At some point, every public safety cyclist is faced with the need to take their bike somewhere that requires transporting it by car. When that time comes, there are generally three options: break the bike down and stuff it in the back seat or trunk, switch to a truck and throw the bike in the bed, or buy a bike rack for your car. In most cases, assigned departmental vehicles are already full of gear, so jamming the bike in the back seat or the trunk isn't an option and getting a truck is out of the question. That leaves buying a rack for your car, a seemingly simple task that presents hundreds of options. Your choice should be based on performance needs, but budget, appearance, convenience, and durability will all be factors. The following is a discussion of various types of bicycle racks. Between my agency and my personal use I've owned or operated virtually every type of rack. Believe me, a little knowledge can save you from making a poor choice and may help you to justify the cost of a rack that will best serve your unit or agency.

The following analysis will explore the types of racks, their advantages and disadvantages, limitations, mounting systems, capacity, trunk access, possible damage to the vehicles, and cost.

### **TYPES OF BICYCLE RACKS**

There are four basic types of bicycle racks with some slight variations of style within the types:

- Roof-mounted (front wheel on or off)
- Trunk lid/bumper-mounted
- Hitch-mounted (bike supported from underneath or hung from above)
- Specialty racks (SUV interiors, truck beds, spare tire mounts, etc.)

### **Roof Racks**

This article will not address roof racks because they are not commonly used for public safety cycling. Although they can be among the strongest and most secure of racks, they interfere with the mounting and visibility of roof-mounted emergency gear and require overhead lifting of the bikes. That's fine for an 18-25 lb. personal bike, but not particularly reasonable for fully equipped public safety cycles that often weigh 40-60 pounds, fully loaded.

### **Trunk-Lid/Bumper Racks**

The second type of rack, and the most commonly used public safety bike rack, is the trunk mounted rack or trunk-lid/bumper combination rack. These are generally the least expensive racks on the market, although the nicest ones, like the Saris Bones, certainly aren't cheap. There are many styles, some of which are very adjustable, fitting many different vehicles. These racks usually mount either completely on the trunk-lid of the car or rest their bottom legs on the bumper and their top legs on the trunk-lid. They are held in place by 4-6 nylons straps that run from the rack to various places on your car, like the trunk lid lip, the bumper, and parts under the body or bumper. The racks have arms from which bicycles are hung by their top-tubes. If you



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carry more than one bike, you have to mount and remove the bikes one at a time. The bikes slide onto support arms one at a time, so the last bike onto the rack is always the first one off and vice versa. This is also true for some, but not all, hitch-mounted racks.

This rack type's greatest advantages are lower cost, flexibility of use on multiple vehicles, and the ability to fold them up and store them in a relatively small space. However, trunk racks do have their drawbacks.

Except in very rare cases, all trunk racks contact the paint on the trunk lid in two to four places, not counting the straps. The exceptions are SUVs and a few other vehicles where the rack rests on the glass (back window) and the bumper. In most cases, however, no amount of careful mounting, constant tightening, cleaning, extra waxing, or other effort will prevent the contact points from eventually moving and scratching your paint. When stressed, nylon straps will stretch and nothing can stop them. No matter how tightly you mount the rack, there will always be play; the rack and bike just weigh too much to stay perfectly fixed in place, especially during hard driving. The only cure for this is to cover the paint with something that protects it from the moving rack, like reflective tape strip, glued-on rubber patches, or something else (not Teflon; the rack would slide more). I can't offer any advice there because we've never tried this, but I have the paint scratches on numerous trunk lids to prove that you can't keep trunk/bumper mounted racks from moving. If you run priority, it just gets worse, and this applies to all vehicles. If the rack somehow loosens during a priority run or a vehicle chase, the rack can slide back and forth a great deal and leave your trunk lid or tailgate looking like a vandal got to it with a screwdriver. If a rack strap or two pops loose, you have a 50-80 pound (total) weight hanging onto your car by one or two nylon straps, while the whole contraption flies around behind you like a game of "crack the whip." We haven't had any come completely loose, but we routinely find the lower straps pop off during "exuberant" driving.

Trunk racks are also easy to vandalize and/or steal. They're only secured to the vehicle by nylon straps with nothing to prevent them from being cut or detached from the vehicle and stolen, even with a bike or two on them. You need some sort of locking device. Locking your bike to the rack isn't a good solution if the rack can be removed from the car by hand. There are some cables out there that are just a straight cable with a ball on each end; you can even make one. You run the cable through the bike and the rack and then throw the cable-ends into the trunk and close it. The cable can't be pulled out until the trunk is opened, but this can be a pain if your trunk is tightly tied down by the rack.

Lastly, trunk racks can make trunk access very difficult and very slow. Although some racks, like the Saris Bones, allow trunk access, many of the racks have straps that run under the back of the car, essentially tying your trunk lid closed. In many cases, you have to remove a couple of straps to get the trunk to open at all. This is a problem if you routinely need to access your trunk for equipment or if you carry critical emergency equipment (shotguns, etc.) in your trunk.

### **Hitch-Mounted Racks**

There are two basic designs to hitch racks, but they all mount into a towing hitch receiver that is attached to the vehicle frame. The basic rule is that the bigger the receiver (hitch mount), the heavier the gauge of metal used in the rack, and the stronger the rack. A 2" receiver will be a



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great deal stronger than a 1.25" receiver. Strong is good – remember, we need to drive our cars more radically than normal people, so we want a strong mount as well as a strong rack.

Hitch-mounted racks have huge advantages for public safety cyclists. The biggest advantage is that hitch-mount racks don't interfere with opening the trunk. They are attached at the hitch and they stand off the back of the vehicle. Some models even tilt away from an SUV (even when loaded with bikes) and allow the lift gate to swing open. Hitch-mounted racks also don't contact the painted parts of a vehicle, so damage is rare and there usually aren't any nylon straps to worry about unless you choose to add an after-market safety strap. You also generally don't have to lift the bicycle as far up to mount it on the rack; hitch racks ride at the rear of the vehicle and are usually lower than trunk racks. Hitch racks, depending on the model, can handle from one to five bikes, but the greater the weight carried, the more stress on the rack and the hitch. Driving priority or getting into a pursuit with a full bike rack, of any kind, is a recipe for disaster. I adjust my racks so that only one bike fits at a time and it stays close to the car (more on this later); this limits the strain on the rack and hitch during emergency driving. A last small advantage to hitch racks is that they can be locked to the vehicle. Most have accessory locks and those that don't can be locked with an after-market lock, just like any normal hitch-ball can.

By now it should be obvious that if you're trying to get the best rack that meets your performance needs, you're probably going to want a hitch-mounted rack. That's where the hitch (pun intended) lies. There really aren't any cheap hitch-mounted racks and they cost more because you have to buy and install the receiver on your vehicle to hold the rack. Unlike a trunk/bumper rack, the hitch rack cannot be moved to other vehicles that don't have receivers on them. If you replace the car you're using to carry bikes, you have to get the hitch transferred to the new car, if it even fits the new vehicle. Cost is usually the sticking point to purchasing hitch-mounted racks, but here are the points you can use to justify the additional expense:

- Allows for easy access to the trunk of patrol vehicle, so it can be used in conjunction with day-to-day operations (flares, files, jumper cables, spare tires, tools, etc.).
- Trunk access is an officer-safety issue (shotguns, rifles, first aid kits, etc.).
- Leaves no paint or body damage on the vehicle.
- The rack can be locked to the vehicle and the bike can be locked to the rack.
- They can be installed or removed in minutes; no rack shape adjustments are necessary and there are no nylon straps to connect and adjust.
- Better strength and security during emergency driving maneuvers.
- Generally larger, stronger and more durable (that's why they're used on the fronts of commercial buses).
- Many models fold up or down when not in use, so they aren't as much of an accident risk when not being used.
- Much less likely to detach from vehicle or lose a bike during emergency driving maneuvers.
- Low lift-on height reduces chance of injury to cyclists when putting bikes on vehicles.

Once you've made the decision to buy a hitch rack, there are two basic styles to consider. The first (most common and least expensive) holds the bikes just like a trunk rack does. The main support comes up from the receiver, and it has rods that project off to the rear of the vehicle. The



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bikes are hung over the rods, one at a time by their top-tubes, and must be removed the same way; just like bikes on a trunk rack. Of course, if you're never carrying more than one bike, this won't be a problem.

These racks, depending on the model, are designed to hold 2-5 bikes, but the more bikes you add, the greater the weight and stress if you're running priority. If the bikes aren't braced in some way, they can swing forward and back like a pendulum, causing damage to your vehicle, so look for strong "sway" supports if you buy one of these racks.

The second type supports the bike from underneath by using tire trays. A support pole swings up from the tray and attaches to the bikes over the front tire. This holds the bike securely vertical, so there is no sway. If you're going to carry more than one bike, these racks have a huge advantage. Since the bikes aren't "hung," either can be removed without touching the other. Rear tires are usually tied down with a short ratcheting strap and bikes can be placed on the rack or be removed in mere seconds.

Hitch racks do have drawbacks and the greatest of these is the cost. A good hitch rack can cost double or triple a trunk/bumper rack. A possible drawback is that these types of racks usually only hold two bikes, so if you need to carry four bikes, it'll cost you. Extensions for two more bikes cost almost as much as the original rack. This isn't a problem if you're going to set the rack up to hold only one or two bikes. Another drawback is weight and size. Although most of these racks will fold up against the back of the vehicle, they're sturdy and strongly built and they will always weigh considerably more than trunk/bumper racks. They also take up more storage space when not in use. Despite the drawbacks, hitch mounts often best meet public safety performance needs.

### **Specialty Racks**

There are many specialty bike racks for truck beds, SUV interiors, for mounting on outside spare tires (like on Jeeps) and for tandem bikes or recumbent bikes. Most interior mounts and bed mounts are a variation on a fork mount (like many roof racks). The front wheel is removed and the bike is attached to a securely mounted quick release for vertical stability. There are variations of this for outside in truck beds or for inside of SUVs (or trucks with bed covers). The inside versions keep your bike away from vandals, bad weather, and make theft a little more difficult. If you're driving a truck or SUV with some room inside it for a bike, these are worth investigating. There are also some models that bolt onto rear-mounted spare tires and spare tire carriers. A little research can help you find a rack to meet your specific specialty needs.

### **The Best Racks**

Bike rack selection is very subjective, but I've been using various racks on numerous vehicles since 1980. I've used permanent roof racks, gutter racks, clamp-on roof racks, trunk racks, truck bed racks, SUV interior racks, hitch racks, and bolt-on racks. The best racks I've found for personal use were roof racks, until I purchased my current hitch rack. Roof racks are up, out of the way, strong, easy to secure, and the bikes you attach to them are usually light and unloaded. The best detachable racks I've ever used and the best public safety cyclist racks I've ever used have been hitch-mounted. I currently use the Thule T2 both at work and at home. It may not fit your specific needs or your budget, but it's what I'd tell you to look at first for comparison. The



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T2 is similar in function to the bike racks you see on the fronts of commercial buses. It is strong, durable, easy to attach and detach, locks to the vehicle (optional), the bikes lock to the rack (optional), and it holds the bikes as securely as any rack I've ever owned. At work, I can save a little money by only mounting one bike per car. Each rack comes with two mounts, so I can then use the second bike mount on another base and save buying another entire rack. Do your research. There are other similar racks and many others may meet your performance and/or budgetary needs.

### **Bike Rack Caveats**

- Bikes left on racks can be stolen or vandalized.
- Unlocked bike racks can be stolen from unattended vehicles.
- Bikes that are hung on bike racks can swing like pendulums and damage the bikes and/or vehicles.
- Nylon attachment straps will ALWAYS stretch when stressed and will not necessarily stay attached when cars are driven hard.
- Loose nylon straps will flap and become frayed, so they must be tied down.
- Depending on the mounting method and number of bikes, some tail/brake lights or other signals may be partially or completely blocked.
- Foam padding will eventually deteriorate; it can often be covered or replaced with handlebar tape or something similar. Straps will also deteriorate and need to be replaced in time.
- The more bikes there are on a rack, the greater the stress on the rack and mounting system when you drive priority. Racks can loosen, break, and/or detach. If you drive like you're in the Baja 1000, nothing will keep a bike on your car.
- 2" hitch receivers are far superior to 1.25" receivers. They're thicker and stronger and the racks that insert in them are thicker, stronger, and heavier.
- If all you're going to use the hitch for is carrying a bike rack, you can save money by not having the electrical connections for trailer tail/brake lights installed.
- Racks that don't fold up can protrude from your car and can get damaged when you back up too close to something or the protruding arms can snag passing pedestrians when you're parked.



## **Bike and Bike Equipment Sales and Catalogs**

Performance Bike <http://www.performancebike.com/>

Bike Nashbar <http://www.nashbar.com/>

Rack Warehouse <http://www.rackwarehouse.com/>

REI <http://www.rei.com/cycling>

## **Rack Manufacturers**

Draftmaster <http://www.draftmaster.com/>

Saris <http://www.saris.com/>

Sportworks <http://www.bicycleracks.com/>

Swagman: <http://www.swagman.net>

Thule <http://www.thuleracks.com/default2.asp>

Yakima <http://www.yakima.com/>

*John, the founder of the university bike patrol, was certified as an IPMBA Police Cyclist in 1995 and as an IPMBA Instructor in 1997. While his current rank of captain means that he no longer rides routine patrol, he is frequently involved with special events, both on campus and in the community. He rides on- and off-road recreationally and has transported his bikes on a wide variety of vehicles. He can be reached at [jbrandt@umpd.umd.edu](mailto:jbrandt@umpd.umd.edu).*

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