

How to build a “ReCycle Rack”



The “ReCycle Rack” is a custom designed bike and scooter rack.

- It is made with car tyres diverted from waste.
- It is playground friendly and easy to use for all ages and types of wheels.
- Most importantly, it is easy and cheap to make!

What you need to make the rack

Material	Amount
<input type="checkbox"/> Used car tyres, similar size	5
<input type="checkbox"/> H3.2 Decking timber, 140 x 32	4m (2 x 1950mm)
<input type="checkbox"/> H3.2 decking timber, 90 x 32	3m (5 x 550mm)
<input type="checkbox"/> 50mm screws - strong exterior use	10
<input type="checkbox"/> 40mm screws - low profile, ext. use	25

Car tyres

Car tyres are rarely recycled and usually go straight to landfill. Most car tyre retailers and local garages will let you take tyres they would otherwise need to pay to dispose of. As a bike rack material, they are ideal because they are strong enough to support a bike and soft enough to lean a bike on without damaging it. The rack looks tidiest if you choose tyres that are similar in width and diameter. Check the tyres for any protruding wires or sharp objects and go for tyres that aren't too worn or flexible.

Decking timber

Decking timber is readily available from most hardware stores. Using treated timber means the rack will last well despite being exposed to the elements. Lots of decking timber has a textured grip tread on one side, you can use it either way up. If you know someone who has built a deck recently, they might have offcuts you can use, particularly for the shorter 550mm lengths.

Screws for the base

You need 10 strong 50mm screws that are suitable for an outside project. We used 50mm 16g bugle head batten screws.

Screws for the tyres

You need 25 screws to hold the tyres onto the base. We used 40mm low profile head timber screws. The wide profile on the screw acts like a washer that stops the screw from pulling back through the tyre. Similar products like roofing screws would work in place of timber screws. Again, make sure whatever you use is suitable for an outside project.

How to build the rack

The timber base

1. The first thing you need to make is the timber base.

You could paint the timber a colour or just leave it plain. It's easiest to paint or stain the timber before assembly.

Water based black fence stain is easy to apply and makes the finished racks look good.



2. Cut the long sides of the rack.

We found that 1950mm long sides gave a good space between the tyres for bikes (and scooters) – wide enough to easily fit them in but close enough to hold them upright.

Making the racks in five tyre units gave a good balance of weight and capacity but you could make longer or shorter ones to suit your needs.

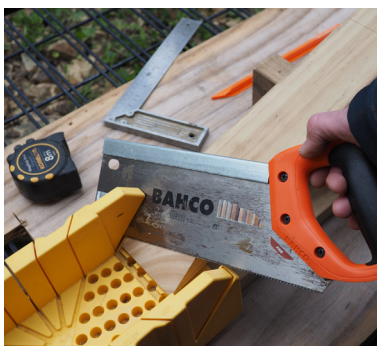


3. Cut the cross pieces to 550mm lengths then cut 30 degree chamfers, leaving a 5mm high face on the ends.

This is fairly easy with a drop saw and using 90mm wide timber means it can be done in one cut with a 235mm blade saw.



4. If you don't have a drop saw, you can set up a block to hold the timber into a mitre box at the 30 degree angle to achieve the same chamfer.



5. Get the sides parallel with their outer edges 600mm apart. Using some timber offcuts to make a jig to position each end helps with this.

Use the end cross pieces to set the sides up at the right angle.



6. Screw the sides to the end cross pieces with the 50mm bugle head screws.

The centre of the end cross pieces needs to be 75mm in from the end of the side piece.

The screws need to be put in 40mm up from the edge of the side piece.

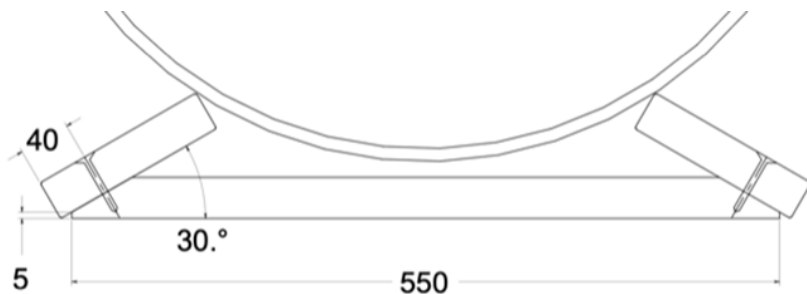


7. When the end cross pieces are in place the inner cross pieces can be positioned and screwed on.

They need to be 450mm spacing between centres and screwed in place like the end cross pieces.



Side view and dimensions



Adding the tyres

8. You'll need five tyres. Most local tyre fitting places will be happy for you to take away some of their replaced ones.

Tyres of about 600mm diameter and up to 150mm wide work well. You don't need to be too particular with width and diameter.

Check for any sharp objects or wires coming through and that they are not too worn or flexible.



9. Align the tyres with the cross pieces and fix them down with a single centred 40mm low profile head screw.



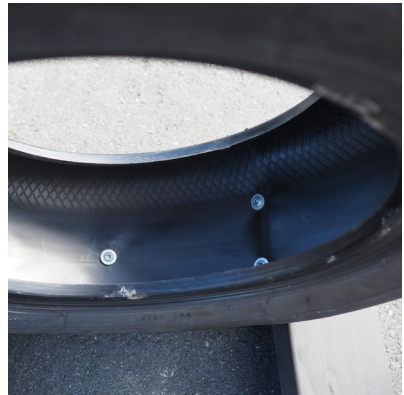
10. Then screw two 40mm low profile head screws to into each side piece. You can do this carefully by eye or measure and mark with chalk first.

For the tyres on the ends of the racks move the outer screw towards the centre of the tyre a little to avoid splitting the end of the timber side piece.

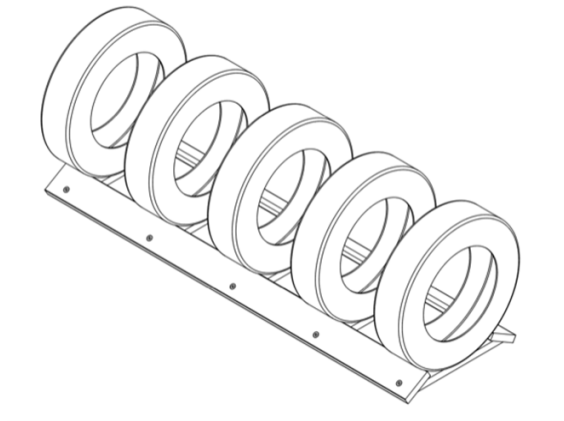
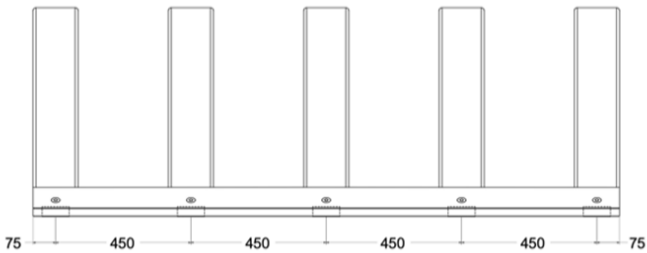


11. Using five screws in this configuration will firmly hold tyres upright.

At the lowest point, drill a 10mm drainage hole in the sidewall of the tyre just above where it meets the tread area – this makes sure water doesn't pool in them.



Front view and dimensions



How much will it cost?

In 2023 the ReCycle Rack cost around \$140 in materials to build.

Note: This figure does not take labour costs into account. It allows for timber rounded up to the nearest metre. And for fixings bought in pre-packaged amounts.

This includes a 250ml tin of black stain at about \$16. If you don't want to stain the timber, you can remove this cost from the project.

You may be able to get some, or all the materials donated by your local hardware shop.

Tools needed

Paint/stain: brush or roller, rags, stick for mixing, tray, and drop sheet. Gloves and aprons optional.

Cutting: Ruler/measuring tape, drop saw (235mm blade saw), or hand saw with mitre box.

Assembly: cordless drill. Optional: chalk.

For a 5-tyre rack we used:

- 2 x 1950mm lengths of 140 x 32 H3.2 decking timber
- 5 x 550mm lengths of 90 x 32 H3.2 decking timber
- 10 x 16g x 50mm bugle head batten screws
- 25 x low profile head 18 - 8 x 40mm timber screws

Our top tips to get the most out of your ReCycle Rack

- Put it somewhere it can be seen.
- Tell your community where it is and what it's for.
- Get people involved in making it; give your students or community a sense of ownership of the rack.
- Paint it to fit your environment; make it your own.

The ReCycle Racks can be free standing or screwed/bolted down.

To secure to the ground, remove tyres from the appropriate cross pieces and reattach after the screws or bolts appropriate to the mounting surface have been fitted and tightened.

Other ideas, (which we've not tested!) include 'yarn-bombing', or you could try planting some hardy plants in the base of the tyres.

Rubbish and leaves may collect around the tyres, so ensure this is cleared out regularly, so the rack remains appealing to use.

Check the drainage holes aren't clogged after heavy rain, as pooled water can attract pests.



Useful links

Cycle and scooter skills

Getting ready to ride? Pedal Ready provides free cycle and scooter skills training at schools. They also deliver learn to ride for adults, cycle skills and e-bike training for workplaces, private individual or group lessons.

pedalready.org.nz

BikeReady is New Zealand's national cycling education system.

bikeready.govt.nz

School travel

Greater Wellington provides tools and resources for schools to promote safe and active travel, and address safety issues at the school gate.

<https://schooltravel.gw.govt.nz/>

If you're looking for information on how to manage traffic at the school gate, check out the Ministry of Education's website.

education.govt.nz/school/

Metlink have information about how to make the most of bikes and public transport.

metlink.org.nz/getting-around/using-a-bicycle-on-public-transport

Always lock your bike!

Greater Wellington have worked with NZ Police to provide tips on how to stay safe, be seen, and keep your bike secure.

www.gw.govt.nz/safe-seen-secure/

www.youtube.com/@greaterwellington/playlists "Travel Choice"

Acknowledgements

In 2023 Greater Wellington commissioned Wellington-based designer Richard Hovey to design the “ReCycle Rack”.

The design brief was to create a bike and scooter rack that was:

- robust and suitable for a school environment,
- works well for all bike and scooter sizes and users,
- affordable, and
- made from re-purposed or low carbon materials.

Kahurangi School students helped assemble the first prototype. They named it the “ReCycle Rack” – playing on the use of recycled tyres and the word ‘cycle’.

We tested prototypes in several schools for two terms before finalising the design. We’d like to thank all the schools and control schools who participated in this project.

The build instructions are now available for anyone to use. We hope schools or community groups across the region enjoy building and using the racks.





Boost your bike confidence with Pedal Ready!

A cycle skills training course is a great way to gain confidence and skills to help you stay safe on the roads.

Pedal Ready provides free regular public courses, group sessions, school and workplace training on scooters, bikes and e-bikes.

pedalready.org.nz