

COVID19

QR scanning for SARCC.

- All SARCC groups have a QR code.
- You must QR scan and register your attendance at each ride/event. SARCC only use ride card system for exemptions.
- **RIDE LEADERS:** Please go to [SARCC website](#), select your ride group, select your Covid Safe plan and print QR code for scanning. If you forget to print QR code, with smart phone get the QR image from web - participants can scan from your smart phone image.
- If you are unable to QR scan, notify the Ride Leader – the Leader will email sarccexec@gmail.com with the exceptions.
- Only QR Exceptions are: *1. electricity or internet connection prevents its proper use 2. the person does not have a smartphone.*
- IF YOU ARE OVER 50 you are eligible for Covid -19 vaccination go to [COVID-19 Vaccine | SA Health](#) select a clinic near you, book your Roll up moment and **get vaccinated PLEASE.**

Download the mySA GOV app

What are the most common symptoms of COVID-19

Get tested as soon as symptoms appear

PLEASE WASH YOUR HANDS

1.5m

the total number of persons present at a place must not exceed 3 persons per 4 square metres

**DON'T WAIT...
VACCINATE.**

SARCC RECOMMEND YOU CHECK THE WEB PRIOR TO ATTENDING ANY RIDE OR EVENT

The Following is correct at time of Print there are many reasons why changes may be necessary.

Sunday Rides:

July 4th Up the Creek

Starting at [Victoria Square](#) at 10am, out through the Eastern suburbs to Brownhill Creek, 40 km, some hills. Robyn D 0401 364 019

July 18th Semaphore ride

Meet [Victoria Square](#) 10am. Easy ride to Semaphore for BYO lunch, return via Linear Park, Coffee at Troppo's in Whitmore square. 40km Angela R 0418 852 659

Thursday Rides:

| | | | | |
|-----------------------|---------|--------------|---|---------------------|
| July 1st | Kevin D | 0411 203 893 | 10am Davenport Square, Macclesfield | Some unsealed roads |
| July 8 th | TBA | | 10am Woodside Pool car park | Some unsealed roads |
| July 15 th | Kevin B | 8388 1852 | 10 a.m. Woodside Pool car park | Some unsealed roads |
| July 22 nd | TBA | | 10 a.m. Woodside Pool car park | Some unsealed roads |
| July 29 th | Trevor | 0401 717 031 | 10 a.m TBA refer SARCC Web site | Some unsealed roads |

PERFECT Ride: July 11th Meet at 9 AM at [Harrogate Tennis Club](#) Approximately 60km of mainly gravel roads. There are no facilities available on this ride. BYO food, water, tools and spares. Sven 0410 271 717

NEXT CLUB MEETING Wednesday 25th August 2021, 7.30pm, at [The Minor Works Building](#), 22 Stamford Court, Adelaide (at the southern end of Stamford Court off Wright Street or behind *The Donburi House* restaurant on Sturt Street). During Covid we are restricted to 30 attendees, we can boil the water provide tea and coffee only, bring your mobile phone for QR.

TOURS 2021:

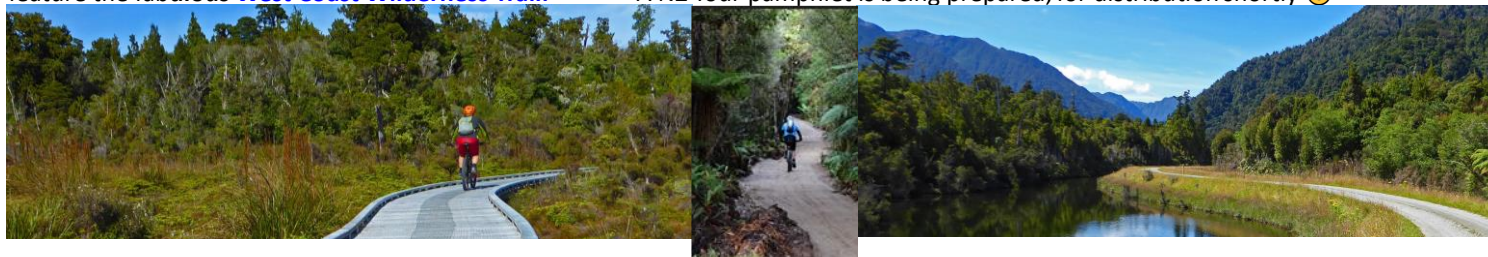
Ride the Barossa Trail Weekend plus Friday 16th July. (It will clash with Semaphore Sunday ride)

Weekend plus Friday & probably Monday - because the trains are not working. Friday start at [Showgrounds Railway Station](#) Adelaide at 9am Friday Ride Cycle trail Northern connector to Stuart O'Grady trail to [Gawler caravan park](#). Saturday, we ride the whole Barossa Trail all the way to Angaston. We can bunk in at 6 per unit Friday must squeeze in 5 rooms of [Brauhaus](#). (3 rooms double bed and a single, 2 rooms double bed). Suggest use [Big 4 Barossa](#) (Nuriootpa) for overflow. Then return via Barossa Trail. Please let Eric know AGAIN numbers may have varied with date changes: 0402 356 796. eric@outlook.com.au

A CRAZY FUN FILLED IDEA: To all keen participants the **Houseboat concept is deferred to 2022.**

NEW ZEALAND 2022 TOUR -update 2021 (register interest by email to sarccclub@gmail.com)

Tour starts Monday 14th February 2022 for 16 nights and will cover the north and central regions of the South Island of New Zealand. Members participating in the 2022 NZ tour will have the opportunity to complete some of New Zealand's iconic rides. This month we feature the fabulous [West Coast Wilderness Trail](#). A NZ Tour pamphlet is being prepared, for distribution shortly 😊



↓ Please link and read ↓

OCTOBER FORTNIGHT IN VICTORIA + DETAILED RIDE PROGRAMME Sun 17th to Sun 31st OCTOBER 2021

BIG4 Castlemaine Gardens Holiday Park, Arrive Sun 17th October depart Fri 22nd October (5 nights) *travel 638km 6½hours*

- ① to Mt Tarrengower via Newstead & return, ② to Harcourt/Muckleford Road loop, Mt Alexander picnic area & return,
③ to [Castlemaine Maldon Rail Trail](#) ④ to Castlemaine to Fryerstown and Vaughan Springs & return

BIG4 Park Lane Bendigo, Arrive Fri 22nd October depart Tue 26th October (4 nights) *travel 45km 1hour*

- ① PM Bendigo Cycle Club Road Ride ② to Axdale and return on [OKeeffe Rail Trail](#)
③ Bendigo Creek trail ④ Axdale to Heathcote return to Axdale

Colac Otway Caravan Park, Arrive Tue 26th October, depart Sun 31st October (5 nights) *travel 235km 3 hours*

- ① Day lost in transfer ② Lake Colac and Lake Beeac visiting the town of Beeac for lunch.
③ part [Old Beechy Rail Trail](#) ④ [Timboon Rail Trail](#) from Lake Purrumbete ⑤ [Timboon Rail Trail](#) from Cobden

Tree hugger message 🌳: The Victorian journey is 1800km 18hours driving. Please be environment and safety conscious, fill your vehicle seats with passengers, and share the driving. SARCC Trailer will be available (if you have car seats or beds to share there is carriage for eight bikes and luggage); sharing accommodation makes for more fun and is significantly more economical.

OTHER CLUB NEWS:

SUBSCRIPTIONS for year 1 July 2021 to 30 June 2022 are \$20 and can be paid now.

Pay to: SARCC Everyday Account, Westpac, BSB 035-048 Account 301670

Please advise sarccexec@gmail.com when paid (members who first joined in 2021 exempt)

Thank you to all who have paid next year's subscriptions

➤ **TAIL END CHARLIE** – Our trial with Hi-Viz yellow vest (Thanks to RAA) **ALERTS** motorists that there are cyclists ahead and notifies walkers that the last rider has passed; but it fails to easily identify the tailender for the Leader because, in the cooler weather, approximately half our riders have sensibly chosen to ride with Hi-Viz vests, windbreakers, and jackets. Ideas for making the either vest front even more readily identified by the leader will be appreciated. Meantime our committee each have a vest that we will bring to rides to be worn by the sweeper/tailender- its worth it to know we are safer and to hear the sound of vehicle engine revs dropping in recognition of riders ahead, plus the courtesy of identifying the last rider in the group has passed the walkers.



➤ **WEARING A HELMET** – Thanks to Jilden this Link you should not miss. The video reinforces SARCC's June helmet article [Danish Road Safety Council / Helmet has always been a good idea](#) watch and laugh at a serious promotion of wearing a helmet.

Another [smart helmet has entered the contest](#) it has the ability to video your ride and provide you with data and dangers ahead via a connected camera on your forehead, you can get it for **\$500** in two colours. There is a 'be safe be seen' white or 'conceal me' black i.e., why bother being seen when you can record the accident.



The information gathering and potential warning systems are a technical triumph (is it a start of driverless Bikes?). This helmet only offers a video camera and brilliant connectivity to 5G (you may be safer in the city CBD). Alternative smart helmets have concentrated on lights built in the helmet for safety and microphones and speakers for connectivity plus sensors to alert when you take that involuntary dismount i.e., crash. Lights, Blue tooth, Connectivity, GPS, Googles, Visors, MIPS, Be Safe Be Seen colours come with price tags of under \$250. Unsure where the expensive [Arenberg video camera with helmet attached](#) will fit in the smart helmet group but it is a technical advancement pending nationwide 5G rollout- smart maybe – but surely, safety comes first! Herewith a video of the potential future of our helmet structure - [3D printed helmets](#).

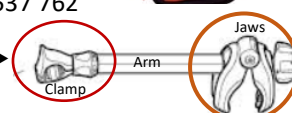
➤ **WALKIE TALKIE** communication leader to tailender. After observing Tuesday Traverse's limited success experience with Walkie Talkies, at least they are trying, it confirms the **line-of-sight only** broadcast of basic Walkie Talkies. If you can see the whole group, you should not need it, albeit the Walkie Talkie does aid communication without relayed shouting. When you do need it, getting lost or lagging behind amongst buildings in a city or suburb it does not work because the transmission is interrupted by the buildings, also true in hilly country. The Walkie Talkie would be better if it was handsfree. Mobile phones for communication do work in the urban environment and in many country areas. One solution is mobile phones handsfree or single ear buds (the other ear for hearing traffic and group talk) used by leader and tailender and "Hey SIRI call Bill Anker – we have a puncture ..." on the mobile phone network. Another cheap \$10 alternative is a [referee's whistle](#) one long [loud blast](#) and the group stops.

➤ Richard (from Oxford!) is selling his orange Ground Effect Frosty Boy winter top:

<https://www.groundeffect.co.nz/products/frosty-boy-winter-long-sleeve-bike-top> Bought a few weeks ago and worn just 4 or 5 times, it is indistinguishable from new. It is medium size and fits me perfectly. I am 1m.75 (on a good day), chest 98/99cm, waist a well-kept secret. Happy to sell for half price. I really need something with side pockets so I can get my camera out more easily. Email rcpmorris76@gmail.com or text 0433 537 762



➤ To all members with **THULE BICYCLE RACKS** particularly with convenient removable arms like this: ➤ Please ensure the end clamp (circled) is always fully seated inside the arm tube. It is possible to have a false tightening with the clamp pressing its partially open shoulder against the end of the arm tube. With the clamp then not closed and locked on the Thule support pipe frame – one bump can release the clamp which in turn releases the **jaws** that hold your bike.



"You Tube" Entertainment Segment (not 2 extras 2 prior errors)

- ① [The Worlds Steepest Bike Path in Adelaide South Australia! - Wrong link last Month](#)
- ② [A Stunning Cycle Around Adelaide Park Lands in South Australia! - Wrong link last Month](#)
- ③ [Pleasure in Pain - A Cycling Movie filmed in South Australia - Bing video](#)
- ④ [Are Chainless Shaft Drive Bicycles a GENIUS or TERRIBLE Idea? - YouTube](#)
- ⑤ [Why Suspension Seatposts Are The ULTIMATE Comfort Upgrade! - YouTube](#)
- ⑥ [Flinders Ranges - 150km Cycling Adventure in REAL South Australia! - Bing video](#)
- ⑦ [5 Reasons You Should Switch To Tubeless MTB Tyres | Mountain Bike Maintenance -](#)
- ⑧ [Ten Common MTB Chain Maintenance Mistakes & How to Avoid Them - YouTube](#)



📍 Our SARCC regular photographer normally behind the camera. Paul Davill was a volunteer Marshal on Bicycle SA's Mawson tour 2021 and somebody else had a camera this time.

SARCC take this opportunity to sincerely thank Paul Davill for his many fabulous photographs.

Gifts for a cyclist – (SARCC would like a member to produce a list every second month – volunteer? - Notify – eric@utlook.com.au)



[Chain Maintenance kit](#)
\$29



[Tyre lever/chain tool](#)
\$4



[bike cleaning kit](#)
\$45



[Bike Maintenance tool kit](#)
\$90



[Cyclist wrist/arm mirror](#)
\$14



[Bike taillight & alarm](#)
\$73

TECHNICAL ARTICLE: 1X VS 2X DRIVETRAIN: PROS AND CONS

In the years since 2012, 1x drivetrains have increased in popularity to a point that the majority of all new mountain bikes, bikepacking bikes, and gravel bikes and Ebikes feature them. Most manufactures still offer 2x and 3x options.

What is a 1X Drivetrain? (*1x is pronounced 'one by'*)

The number in 1x, 2x, or 3x refers to the number of chainrings the bike has. The chainrings attach to the cranks. A 1x drivetrain has one chainring up front and all of the gears in the back on the cassette. The chain always stays on the same chainring. This eliminates the need for a front derailleur and shifter. To make up for the lost gears, 1x drivetrains utilize wide-range cassettes. 1x drivetrains have a 10, 11, or 12 speed cassettes. E.g., a bike with a 1x12 drivetrain has 1 chainring in the front and 12 cogs on the cassette in the back for a total of 12 gears. A bike with a 2x10 drivetrain has 2 gears in the front and 10 in the back with a total of 20 gears.

1x Vs 2x Gear Range

Gear range is the difference between the lowest and highest gear. It is determined by the number of teeth on the smallest and largest chainring(s) and cassette cogs as well as the wheel diameter. Gear range is measured as a percentage. lower low gear and a higher high gear is preferable for riding on varied terrain. You can gear down to climb steep hills more easily then shift into your highest gear to travel faster on flat and downhill sections. A bike with a larger gear range typically has a higher top speed as well.

2x offer a wider gear range v 1x drivetrains. E.g., a couple of popular multi-chainring drivetrains and their gear ranges include:

- 2X10 Shimano XT- 567% gear range 38/28 with 11-46T
- 2X11 Shimano Deore- 615% gear range 50/34 with 11-46T
- 2X12 Shimano XT- 692% gear range 38/28 with 10-51T
- 1X12 Shimano Deore- **510%** gear range with a **10-51 T** cassette
- 1X12 SRAM GX- **520%** gear range with a **10-52 T** cassette
- Wide Range [Cassette list that has already been superseded.](#)

For most recreational/touring and commuting cyclists a wide range of gears is the most desired feature with reliability and cost high on the list, light weight and close ratio is critical for road peloton riders and racing MTB Enthusiasts. A range of 510% allows us to crawl up an undulation at 60 cadence (RPM) at 5.6kph and in top gear at 60 cadence to coast along at 29kph albeit a 2X12 range of 615% achieves 5.6kph to a speedy 35kph at 60 cadence (those calculations depend on wheel diameters and chain ring teeth).

Gear Steps or Jumps

2x drivetrains have smaller steps between gears than 1x drivetrains. In other words, the difference from one gear to the next is smaller. This is because 2x and 3x drivetrains have more gears within the gear range than 1x drivetrains. This way, the percentage change from one gear to the next can be lower. The percentage change between gears is determined by the number of teeth on the cassette cogs and chainring(s).

For example, a 2x drivetrain might have a 12% difference from one gear to the next on average but a third of those gears overlap. A comparable 1x drivetrain might have a 15% difference from one gear to the next on average.

Having smaller steps between gears is preferable because it helps you maintain your cadence while shifting through the gear range. For mountain biking and gravel riding, the larger jumps between gears are not as noticeable. Probably because you are stopping and starting pedalling more often while navigating obstacles off-road. For road riding, the smaller and more consistent the gear steps, the better. For this reason, road riders prefer tight gearing.

Efficiency of 1x Vs 2x Drivetrains

2x drivetrains operate more efficiently than 1x drivetrains because there is less friction in the system. VeloNews and CeramicSpeed proved this by performing [lab tests on the frictional loss of a 1x and 2x drivetrain.](#) ^{←Link}

The test showed that 2x drivetrains lost less energy to friction throughout the entire gear range than 1x drivetrains. On average the 1x drivetrain lost 12.24 watts of power to friction while the 2x drivetrain only lost 9.45 watts of power to friction. That's a difference of almost 3 watts. This means that 1x drivetrains are about 1% less efficient than 2x drivetrains, on average.

The extra resistance in 1x drivetrains is caused by 4 factors:

Surprisingly this 2-page article is a summary of the 35 pages on this subject that Eric read on the web; for an even briefer summary go to:

1X Drivetrain Pros and Cons ← Top of last page

1. Chain Angle (Chainline)

Ideally, you want your chain to run as straight as possible to minimize friction. 1x drivetrains tend to run the chain at a greater lateral angle from the chainring to the cassette than 2x drivetrains. The greater the angle the chain runs at, the less efficient it becomes. This is the main reason that 1x drivetrains are less efficient than 2x. When the chain runs at an angle, the chain plates rub against the teeth of the cassette cog and chainring. This creates friction which costs you energy. The chain itself also creates more friction when running at an angle because the plates rub against each other. 1x drivetrains also tend to use slightly wider cassettes. The chainline problem is the reason that 1x drivetrains only recently became popular. Modern technology allowed manufacturers to design extra narrow 11 and 12 speed chains that can run at an angle. These chains are also narrower. This allows the cassette cogs to be narrower because they can sit closer together. Without these advanced chains, wide range 1x drivetrains wouldn't be possible.

2. Chain Tension

1x drivetrains run the chain at a higher tension than 2x drivetrains. The main reason is that the chainring is typically smaller. Running the chain at a higher tension helps to prevent chain drops. When the chain runs at a higher tension, the chain plates pull harder on the pins where they pivot. This creates more friction. Additionally, the higher tension on the chain pushes the rollers against the teeth of the cogs and chainring harder. This also causes more friction. The additional friction costs you energy.

3. Link Articulation

1x drivetrains use smaller chainrings and cogs than 2x drivetrains. This results in more chain articulation or folding. Chain articulation is the number of degrees the chain hinges to contact each tooth on the cog and chainring. I.e., the chain must bend more to move around smaller gears. When the chain articulates, energy is lost to friction. The more the chain articulates, the more energy is lost.

4. Chain Speed

Whenever the chain interacts with the gear teeth, it causes friction. Because 1x drivetrains tend to use a smaller chainrings and cogs, the chain must run at a higher speed. When the chain moves faster, it has more tooth interactions per minute. The more tooth interactions that occur, the more friction is introduced into the system.

A Few More Drivetrain Efficiency Factors to Consider.

- **The quality of the chain-** Higher end chains create less friction. In general, Shimano chains tend to create less friction.
- **Jockey wheel size-** Larger jockey wheels cause less resistance because the chain does not have to articulate as much. The jockey wheel bearings can also cause friction if they are not properly lubed.
- **Aerodynamics-** 1x drivetrains are more aerodynamic because they do not have a front derailleur, shifter, and one less chainring. Wind tunnel testing showed that this saved about 3 watts at 30 mph. Even with the aerodynamic gain, the extra friction of riding in a high gear still makes 1x drivetrains less efficient than 2x.
- **Weight-** 1x drivetrains are lighter because they do not have a front derailleur, shifter, shifter cable, and one less chainring. This does help improve efficiency. Even with the extra weight factored in, 2x drivetrains are more efficient.

A Note About Cross Chaining

On some 2x and 3x drivetrains, you do have to be careful not to cross chain. Cross chaining means using the big chainring and big cassette cog or the small chainring and small cassette cog. This puts your chain at an extreme angle which creates friction. It is also hard on components. During testing, it was found that the 2x drivetrain became less efficient than the 1x when using the inner chainring and either of the smallest three cassette cogs. Cross chaining is not possible on 1x drivetrains.

For more info, check out [this article about cross chaining](#) ←Link from wickwerks.com.

Drivetrain Weight

1x drivetrains are lighter than 2x drivetrains. 1x drivetrains are lighter because there are simply fewer components. For example, running a single chainring eliminates the need for a front derailleur, front shifter, shifter cable, and the extra chainring. The heaviest components that you are eliminating are the front derailleur and extra chainring. On average, a 1x drivetrain weighs 250-450 grams less than a comparable 2x drivetrain. For most riders, it is probably not worth getting a new drivetrain to save 250 grams or so. The weight difference is insignificant. For a comparison, a 500ml bottle of water weighs 500 grams.

Shifting and Ease of Use

Maybe the biggest advantage of 1x drivetrains is the simplicity. A single chainring makes shifting easier because you do not have to think about where you are in the gear range. You also do not have to think about which chainring you are using. When you want to speed up, you shift up. When you want to slow down, you shift down. It takes less thought. This way, you spend less time worrying about shifting or choosing the correct gear and more time focusing on riding and enjoying the view. There are also fewer controls on the handlebars. You just use one hand for shifting. This is great for new riders who have not mastered shifting yet. It is one less thing to think about while riding. You do not have to remember which shifter to use or which chainring you are on. Another benefit of 1x drivetrains is that they free up some space on your handlebars. Realistically a 2x drivetrain gets you only 4-6 extra gears. These extra gears help to expand the gear range and reduce the difference between gears but the difference isn't as substantial as it may seem when you initially compare 1x vs 2x drivetrains. 2x drivetrains usually offer a wider gear range with a lower low or a higher high gear than 1x. A wider gear range allows you to efficiently ride a wider variety of terrain and inclines. In addition, 2x usually offers smaller steps between gears. When you have 20-30 gears, the next gear down might be just a few gear inches different. You can shift almost seamlessly when the difference between gears is small. This helps you maintain your pedalling rhythm while cycling at a high cadence. This way, you don't waste energy regaining your cadence after shifting. There is also less friction in the drive system. Because the chain runs at a less extreme angle, it creates less friction. This allows the chain to transfer power more efficiently.

1X Drivetrain Pros

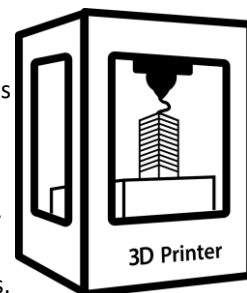
- **Easier to use-** There is only one shifter to work. When you want to speed up, you shift up. or to slow down, you shift down.
- **Lighter-** Because 1x drivetrains do not have a front derailleur, front shifter, and one less chainring, they weigh 250-450 grams less
- **Longer lasting-** 11 and 12 speed chains are more durable than 8, 9, and 10 speed chains. 1x chains, cassettes, chainrings last longer.
- **More technologically advanced-** A lot of research and development is going into designing better 1x drivetrains.
- **Fewer chain drops-** 1x drivetrains use a clutch derailleur and run the chain at higher tension so the chain stays more secure.
- **Handlebar space-** 1x drivetrains remove the additional shifter control from the handlebar.

1X Drivetrain Cons

- **Less efficient**- 1x loses 3 watts more power. 1x drivetrains run the chain at a greater angle, higher speed, and at higher tension.
- **Less gear range**- Current 1x drivetrains max out at 520% gear range versus 2x with a 623% range
- **Larger and less consistent steps between gears**—Most 1x drivetrains have a 15% change between gears.
- **More expensive**- 1x groupsets are newer, modern, you pay about \$100 more than comparable 2x (because they can ☹️ should be cheaper)

3D Printed Bicycles, a follow up article:

The first fully 3D printed bikes have already entered the market. Also, some partial 3D printed component bikes assembled and glued together in the same way as layered bikes are now. Traditionally, bikes have been made via an intricate process of assembling many different parts. In the case of a carbon fibre composite bikes there are nearly 400 sheets of carbon fibre layered manually in various directions and sealed together with epoxy (Many potentials to get it wrong and unless the labour is cheap at an extremely high cost). 3D printing is a new method of manufacturing that has come on the scene for the custom fabrication of bikes.



Why the follow up? Because 3D is the most likely future for bicycle frames, forks, handlebars, stems, seat posts, pedals, cranks and probably [tyres](#); maybe not gears or wheels yet. One of the biggest advantages of 3D printing is the design flexibility it offers, that flexibility goes hand in hand with the ability to customise bike parts cost-effectively, thanks in part to toolless production. A 3D-printed carbon fibre frame allows bike manufacturers to shorten and simplify a long process of introducing a new bike to market.

Couple that with the basic advantages of 3D printing

1. **Faster Production** *3D printing production takes hours not weeks*
2. **Easily Accessible** *Can be made in a small plant near destination market*
3. **Better Quality** *Consistent reproduction by computer control, not manual*
4. **Tangible Design, Testing.** *Proto problem found, modify, print new version.*
5. **Cost-effectiveness.** *Massive labour cost reduction*
6. **Creative Designs and Customization Freedom**
7. **Unlimited Shapes and Geometry**
8. **Can Implement Assorted Raw Materials**
9. **Less Waste** *from subtractive manufacturing e.g., milling from a block*
10. **Risk Reduction** *verify product prototypes before manufacturing*

Try these videos:

- ① [3D Printed Carbon Bike - is honeycomb the future of cycling?](#)
- ② [This is the World's First 3D-Printed Carbon Bike](#)
- ③ [James Novak wins global award for his 3D printed bike](#)
- ④ [Bike Startup - 3D-printed carbon e-bike](#)
- ⑤ [Will Your Next Bike Be 3D Printed?](#)
- ⑥ [Aalborg Engineers 3D Print a Functional Bicycle Frame in One Go](#)

Travelling safely with batteries and portable power packs

We use batteries to charge most of our portable electronic devices (PEDs), but they can have serious safety consequences if they are not carried correctly when you are flying. Australian Civil Aviation Safety Authority have produced various safety materials to help you make sure your luggage is safe: [Can I pack that? dangerous goods app](#); and safety video [travelling safely with lithium batteries](#).

Batteries under 100Wh rating:

- The batteries that power your phone, laptop and camera are usually under the 100 watt-hour (Wh) rating.
- If you are carrying a **spare battery** that's not in one of these devices, it **must be in your carry-on baggage only**.
- **Spare batteries, regardless of their size are not to be carried in checked luggage.**

Lithium-Ion batteries 100-160Wh rating: [\(how to calculate Wh\)](#)

- These are more powerful batteries and can be found in power tools between 100 -160Wh **must have approval** before flying.
- If the battery is installed in a device, it can be carried in either checked or carry-on baggage.
- There is a limit of two 100 -160Wh spare batteries per person. These batteries must only be packed in carry-on luggage and have their terminals individually protected to minimise the risk of contact other metal objects in your luggage.

High Watt hour (Wh) rating or lithium content: i.e., Ebike batteries

Lithium-ion (polymer) batteries exceeding 160-Watt hours (Wh) and **Lithium metal** batteries exceeding 8g lithium. These large batteries pose an unacceptably high risk and cannot be accepted on board passenger aircraft.

A SOLUTION: to abide by the IATA airline restrictions and power your Ebike is [Grin Technologies Batteries](#) who created multiple connected 98Wh liGO batteries (used by Bike Friday). You can **DIY** by connecting [2 X 18v 5Ah power tool batteries](#), but you must know how to create a safe true isolating solution the outcomes of getting it wrong has dire consequences and it may only give you short run times. At the relatively low cost of power tool batteries, you could buy two more and gift in the overseas country on exit it all depends how desperate you are to take your Ebike international – you could hire a battery or [hire an ebike](#). A specialized Pitch non-ebike 14 days \$295 cost \$900 an Avanti Montari Ebike 14 days \$995 cost \$3000 – (It is all relative you pay for a third of the bike in 14 days)

SPECIAL VIDEO FOR TECH NERDS: ➤ [\(52\) Grin Technologies HQ Tour and Deep Dive Interview with Justin Lemire-Elmore](#)

REVIEW: [Unihertz ATOM, World's smallest 4G Rugged Smart phone](#) for sale at [Amazon](#) or [ebay](#) AU\$297

I resisted the urge to buy a large modern smart phone for many years, for reasons that all that was offered was oversized, fragile, exposed glass encased smart phones. Recently, I decided to have another look for a small modern rugged phone. Surprise! I found what seemed like the perfect answer. A small, light, waterproof and toughened phone made for rough outdoor use. Not even dear - under \$300 delivered. You can even take it swimming, according to the blurb. Perfect if you happen to fall off your bike in the middle of a river crossing! I am now using reading glasses to read the screen, but that is a small price to pay for a phone that fits in the same pocket that my old flip phone fitted, even with some cheap glasses added. The battery life is around two days but seeing that it uses a standard USB3 type charging cable, power won't be hard to find. I have installed a few apps to make my life easier, strangely I cannot yet get the covid tracking app to work but that's life for a novice smart phone user. I can still wield a pen in any case.



Positives: It is compact, light, 4G, Android 9, rugged being waterproof, dustproof, shockproof and battery is decently sized too.

Negatives: hey, I need to wear reading glasses for using a phone for the first time in my life.

Luckily, cheap glasses are really really cheap these days. Cheers, Jilden