1. Trio Taxi

1.1. Background

The Trio Taxis, Gavin and Mike are equipped with a 250 W mid-drive Brose motor and have been fitted with a smaller chain ring to improve the hill climb ability. The new Trio CLs, Jenny and Gary, have a 250W mid-drive Bosch motor with a Enviolo continuously variable hub. We have a spare battery for both Brose and Bosch systems.

1.2. Stability

The Trio is unstable if turned sharply at speed and especially if unloaded or unevenly loaded. Therefore, **Slow gentle turns** are recommended.

1.3. Features

The Trios have the following features:

1.3.1. Trios Gavin and Mike - Shimano Nexus 8 speed rear hub. Trios Jenny and Gary - Enviolo continuously variable hub.

1.3.2. Trios Gary and Mike have a rotating gear selector. Trios Jenny and Gary have a rotating continuously variable shifter. For all Trios take load off the pedals when shifting. The new Bosch Trios can shift even when stationary.

1.3.3. A fold down canopy and loose leg blanket.

1.3.4. Trios Gavin and Mike - Battery installed in the box under the passenger seat. Insert the rounded end of the battery into the back of the holder, then slide the bottom of the battery to the left until it locks into position. Trios Jenny and Gary – Battery installed on back of passenger box. Insert the battery into the bottom bracket then push the top hard into the top bracket till it locks. Test it is secure before letting go. Keys are required to remove the batteries from both Trio models.

1.3.5. Hydraulic disc brakes on all wheels.

1.3.6. Pilots must not exceed 15 km/h with passengers on board.

1.3.7. The battery state of charge is given in % at the top right corner of the display.

1.3.8. Replacement batteries cost some $1,500 each and are targets for theft. Pilots are requested to exercise care to secure batteries as much as possible.

1.4. Operating Manuals

The Operating Manuals are available on the CWA North Shore Web Site - Pilot Tab.

1.5. Cautions

1.5.1. The Trio is unstable when loading or unloading passengers. If the passenger steps on the footrest it can tip forward. To address this, we have fitted short legs to the removable plate. The plate should be inserted with an edge under one of the tip-limiting brackets for loading and unloading. The leg lengths are different to allow for uneven ground. Passengers can step up on to the removable plate to facilitate their entry to the trishaw.

1.5.2. When walking the Trio, pushing forward on the handlebars can result in the trishaw tipping forward. The right hand must be positioned on the pannier rack or seat to keep the rear wheel on the ground.

1.5.3. We have had reports that, when descending hills, Pilots should exercise great caution not to apply the front brakes severely as the trishaw tends to tip forward resulting in the rear **wheel leaving the ground.** This is not only frightening for the passengers and the pilot but

is potentially very dangerous. Therefore, when descending hills and especially steep hills, the Pilot **must** limit speed and seek to avoid sudden stops. We have fitted brackets under the footrest to limit the tipping of the trishaw. Caution must be exercised when traversing over uneven ground as the brackets can scrape the tops of humps.

1.5.4. It is important to have shifted to a low gear PRIOR to beginning a hill climb. While the motor is capable of propelling the trishaw in a higher gear, this puts unnecessary stress on the motor.

1.6. Battery Charging

Lithium-ion batteries degrade rapidly if they are regularly charged to full voltage or kept at full voltage for extended periods. We therefore try to limit the frequency and extent of charging to extend battery life. A timer is provided to allow the duration of charging to be set in accordance with the table on each battery charger. Pilots are asked to note the state of charge of the battery at the end of the ride and charge batteries for the time indicated. Clip the trishaw keys to the battery charger cable.

If the Pilot finds a battery has insufficient charge for the contemplated ride, then a spare battery can be taken along, if one is available.

2. VeloPlus

2.1. Background

The VeloPlus can carry a **maximum wheelchair and passenger load of 140kg**. It is powered by a hub motor delivering 40Nm of torque. The original cassettes have been replaced with a 13-46 (Joy) tooth 9-speed cassette and 11-46 (Amy) tooth 9-speed cassette. This should allow a 60kg pilot to climb an 8.5% gradient when fully loaded. The rear rack can accommodate 2 batteries, one on either side. There is a switch under the front of the rack with 3 positions, Left, Middle and Right. When in the Middle position the batteries are disconnected. So, check this if the system does not activate when the battery is installed. We have a spare battery. There are 2 battery keys, one fits the battery marked Joy and the other fits both batteries marked Amy. The keys are labelled accordingly.

2.2. Stability

The VeloPlus is unstable if turned sharply at speed and especially if unloaded. Therefore, **slow gentle turns** are recommended.

2.3. Features

The VeloPlus has the following features:

2.3.1. There are hydraulic disc brakes on the front and caliper brakes on the rear wheels. These can be locked on, and both must be engaged when loading or unloading a wheelchair.

2.3.2. Loading Platform - By removing a locking pin and operating a leaver the platform is unlocked and tips forward to allow loading of the wheelchair. Ensure that both platform locks engage and reinstall the locking pin after loading a wheelchair.
2.3.3. Passengers in wheelchairs must be loaded by 2 people one on each side. See the video in the CWA North Shore Web Site - Pilot Tab. Do not use the method shown by Van Raam of one person pushing the wheelchair up the ramp at speed. Passengers can have poor core strength and can be injured by this loading technique.
2.3.4. There are 3 belts with hooks for securing the wheelchair to the frame and a seatbelt to secure the passenger.
2.3.5. There are 3 levels of assist and a walk assist, which has a maximum speed of 6km/h and can also boost the power when needed while riding.
2.3.6. Five lights on the controller indicate the level of battery charge (Joy) and the controller on Amy provides the % charge.
2.3.7. Pedaling backwards will engage a reverse gear with a maximum speed of 3km/h.
2.3.8. We have built a bicycle carrier, which fits on the platform, to facilitate a pilot moving the VeloPlus between bases. See the video on the CWA North Shore Web Site – Pilot Tab.
2.3.9. Replacement batteries cost some $1,500 each and are targets for theft. Pilots are requested to exercise care to secure batteries as much as possible.

2.4. Operating Manuals

The Operating Manuals are available on the CWA North Shore Web Site - Pilot Tab.

2.5. Cautions

2.5.1. The ground clearance under the platform is less than 60mm so obstacles must be avoided.
2.5.2. It is important to have shifted to a low gear PRIOR to beginning a hill climb. While the motor is capable of propelling the trishaw in a higher gear, this puts unnecessary stress on the motor.

2.6. Battery Charging

Lithium-ion batteries degrade rapidly if they are regularly charged to full voltage or kept at full voltage for extended periods. We therefore try to limit the frequency and extent of charging to extend battery life. A timer is provided to allow the duration of charging to be set in accordance with the table on each battery charger. Pilots are asked to note the state of charge of the battery at the end of the ride and charge batteries for the time indicated. There is a button on the side near the bottom. When pressed green lights will illuminate to indicate the state of charge. Clip the trishaw keys to the battery charger cable.

Ian Rose-Innes March 17th, 2026.