

Bushwalk Navigation with Smartphone (iPhone)

Part 2 – Planning the walk track

Version 2.0

Prepared by Eitan Froumine
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B'nai B'rith Ramblers Bushwalking Club



www.bbramblers.org.au

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1 Overview

This document will help you prepare a walking track using the Avenza-Maps and the Komoot applications on an iPhone. The Avenza-Maps and Komoot applications are also available for Android. I assume that the use of these applications on Android is very similar.

The document is organized as follows:

- Section 1 - Overview and background information
- Section 2 - Preparation that should be done before the training
- Section 3 - Practice that will be done at training
- Section 4 - Advanced Practice for those who wish to continue practicing in their on time.
- Section 5 - Navigation practice

1.1 GPS

The Avenza-Maps and Komoot applications use the Global Positioning System (GPS) to find your current location and draw it on maps. GPS works at any weather condition.

Extract from <http://www.physics.org>:

The GPS is a network of satellites orbiting the Earth. The system was originally developed by the US government for military navigation but now anyone with a GPS device can receive the radio signals that the satellites broadcast. Wherever you are on the planet, at least four GPS satellites are 'visible' at any time. Each one transmits information about its position and the current time at regular intervals. These signals, travelling at the speed of light, are intercepted by your GPS receiver, which calculates how far away each satellite is based on how long it took for the messages to arrive. Once it has information on how far away at least three satellites are, your GPS receiver can pinpoint your location using a process called trilateration.

GPS signals are independent of mobile phone technology. The GPS signals can be received anywhere in the world in open space (regardless of mobile phone reception availability). The GPS signals cannot penetrate and be used inside buildings.

Maps that are used in GPS applications are sometimes available online where there is mobile phone data reception. Most GPS applications let you download the maps and walk-tracks into your smartphone, so you can use them also when there is no mobile phone reception.

1.2 Further reading

It is assumed that you know how to read a topographic map. If not please study the "Maps Reading Guide" that is published by Geoscience Australia.

To download the guide, go to

<https://ecat.ga.gov.au/geonetwork/srv/eng/catalog.search#/metadata/102240>

and click on the “Open Link” button next to “*Download the Map Reading Guide (pdf – 19.6MB)*”.

As a minimum, I suggest that you study the content from the “Maps symbols” section up to and including the “Contour lines” section. You should be able to identify on topographic maps (using the contour lines) the following land formations: gentle slopes, steep slopes, hills, mountains, spurs, valleys and ridges. But if you don't manage to master this skill, you can still come to the training and hopefully you will learn this skill as we go.

1.3 Geodetic Reference Datum

If you use Avenza-Maps in conjunction with paper maps, make sure that the Avenza-Maps “display format” is the same Datum format as used on the paper maps. Australian maps are usually printed using the MGRS/USNG WGS84 (World Geodetic System) reference coordinate system.

2 Preparation (before the training)

You should install the Avenza-Maps and Komoot applications on your smartphone before the training.

Also please install the “Lerderderg State Park Visitor Guide” map and the “Melbourne Transit: Stonnington” map into Avenza-Maps.

See instructions in sections 2.1, 2.2, 2.3 and 3.1 in the following link

<https://drive.google.com/open?id=1ZFpYngMUDXLKHbvJp3nCw3Uh6c9GsC6J>.

To load the maps into Avenza-Maps, see section 2.3 in the above link or alternatively follow these instructions:

- Click on “Store” (bottom of the screen)
- Click on the “Find Maps” (top of the screen) then Enter “Lerderderg State Park Visitor” and click on “Search”
- Click on “List” (top of the screen)
- Identify the map, if it is not already installed, click on “FREE”, then click on “INSTALL NOW”

Similarly install the “Melbourne Transit: Stonnington” map.

Using a web browser (preferably on a computer and not on the smartphone) register to the www.trailhiking.com.au web-site. Please bring your login-name and password for the training session.

3 Practice

The following exercises will be done during the training session:

- Example - How to prepare a walking track in Komoot
- Example - How to prepare a walking track in Avenza-Maps
- Example - How to import GPS track from trailhiking.com.au to Komoot

3.1 Example - How to prepare a walking track in Komoot

This example shows how to plan a circular-walk along the "Main Range Walking Track" in Kosciuszko National Park. See Figure 1.

Method:

- Familiar yourself with the route of the walk (e.g. by studying information that is available on the Internet) and then prepare a list of points along the route:
 - The starting point (which is also the end-point for a circular-walk)
 - The destination point (i.e. the end-point) if you are walking one-way.
 - Waypoints along the track (between the starting-point and the destination point)
- Open the Komoot application, click on "Plan" then on "Plan New Route" and enter the above points, save the route, and then turn on the "Store for Offline Use" switch so you can navigate even when there is no Internet connection.

For instance, the list below describes the walk from point to point along the "Main Range Walking Track" in Kosciuszko National Park:

- Start the walk at "Charlotte Pass", at the end of Kosciuszko Road (there is a loop at the end of the road).
- then walk on the track going North-West to the "Blue Lake",
- then walk West to "Carruthers Peak",
- then walk on the track going Southwards to "Mount Kosciuszko",
- then walk from "Mount Kosciuszko" to "Rawson Pass" and
- then walk back to "Charlotte Pass" (to the East).



Figure 1. "Main Range Walking Track" in Kosciuszko National Park

Instructions:

- Open Komoot
- Select "Plan" (bottom of screen), then select "Plan New Route"
- Make sure the activity type is "Hiking", or change it to "Hiking"
- Make sure "Round Trip" is selected (other option is "One Way"), or change it to "Round Trip"
- Define the starting point "A":
 - Click inside the text field "Choose Start"
 - Click "Choose on Map"
 - Click "Search" (top of screen)
 - Click on the "Where to?" and write "Charlotte Pass" then click on "Search" (bottom of screen). You'll see a list of locations, then select "Charlotte Pass, Place, New South Wales, Australia".
 - Wait until Komoot loads the map with "Charlotte Pass"
 - Identify the walk's starting-point on the map which is at the end of Kosciuszko Road (there is a loop at the end of the road) and click on it
 - Select "Start Here"
 - You should see "Charlotte Pass Lookout" inside the "A:" text field
- Add the next waypoint "1":

- Click inside the text field "Choose Destination"
(Tip: we will keep moving the “destination” as we move along the track)
- Click on "Choose On Map"
- Search the "Blue Lake". It should be "somewhere" North of "Charlotte Pass". Search an existing track that leads to the lake. Click on a point on the track where you reach the lake.
- Click on "Set as Destination". Komoot then draws a track from the starting point at "Charlotte Pass" to the destination near the "Blue Lake".
- Add additional waypoints:
 - Click on the "+" "Add Waypoints"
 - Click on "Choose On Map"
 - Search for "Carruthers Peak" on the map - It should be West of the "Blue Lake"
 - Click on the location of "Carruthers Peak" on the map
 - Click on "More Options" and then click on "Set as New End Point" – WayPoint “2” is created.
 - Add waypoint “3” for "Mount Kosciuszko"
 - Search for " Mount Kosciuszko" on the map - It should be South West of the " Carruthers Peak "
 - Click on the location of "Mount Kosciuszko" on the map
 - Click on "More Options" and then click on "Set as New End Point" – waypoint “3” is created.
 - Similarly add waypoint “4” for "Rawson Pass"
 - Search for "Rawson Pass" on the map - It should be South East close to "Mount Kosciuszko"
 - Click on the location of "Rawson Pass" on the map
 - Click on "More Options" and then click on "Set as New End Point" – waypoint “4” is created.
 - Since we choose a “Round Trip”, the track continues all the way to the starting point.
- Save the walking route
 - Click on "Save"
 - A message "Give your route an amazing name" pops up. Enter the name of the walk, e.g. "BBR's Main Range Walking Track" and select "Save"
 - Wait a few moments until Komoot saves the route
- Turn the "Store for Offline Use" switch ON and wait till "Downloading..." is complete
- If you want to share the route with others, switch "Private Tour" to OFF

The walking track is ready for navigation.

During the walk, when you reach the starting-point (of the walk), select "Start Navigation" to start recording the actual walking track as you walk along the "Main Range Walking

Track" in Kosciuszko National Park. You will be able to see your actual walking track relatively to the planned track.

3.2 Example - How to prepare a walking track in Avenza-Maps

- Open the Avenza-Maps app
- Select the "Lerderderg State Park Visitor Guide" map.
- Draw the walk's route, as shown in Figure 2 below, using the "Draw and Measure" feature.
- Drop "pins" (waypoints) along the route so you can navigate from one "pin" to the next.

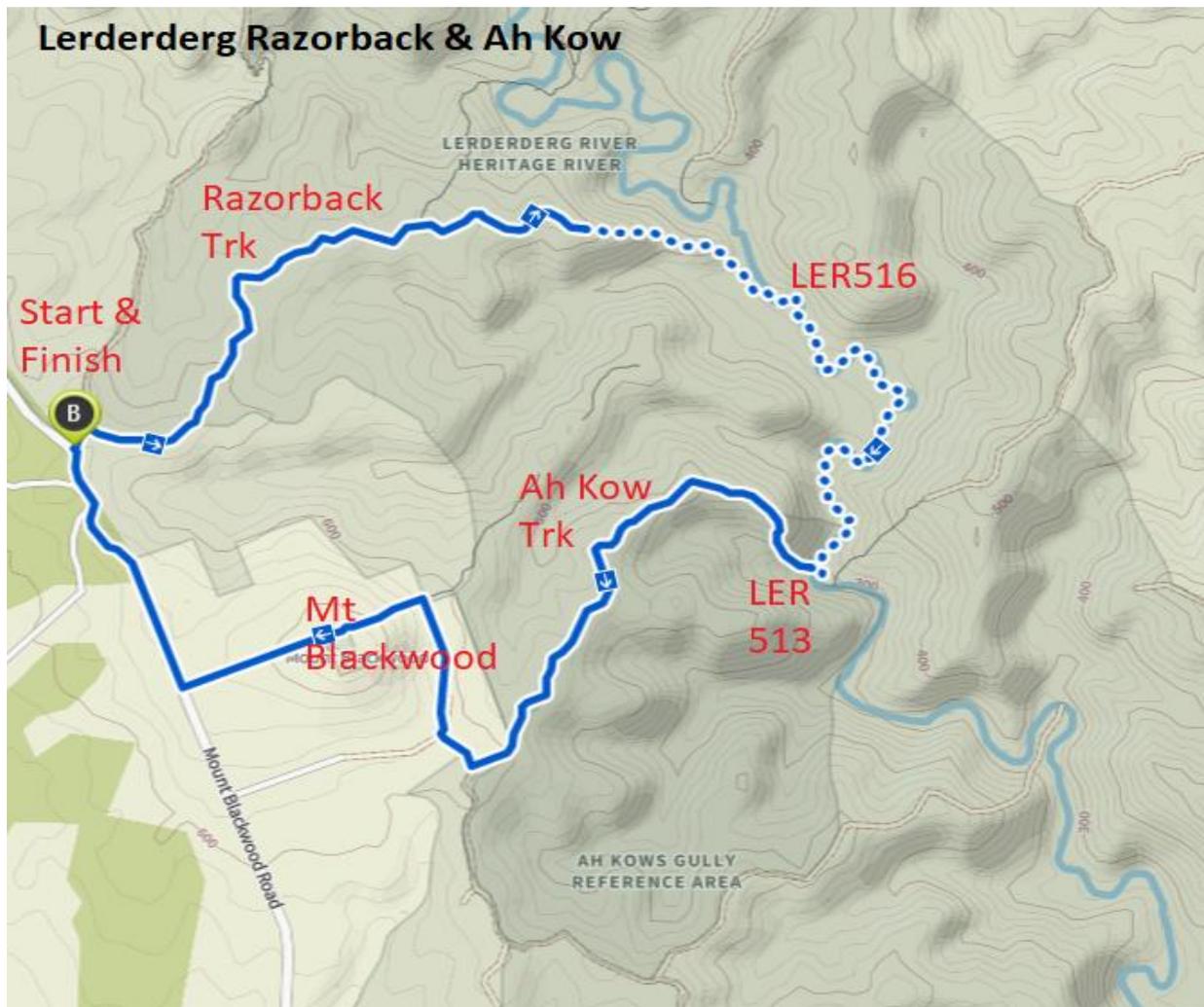


Figure 2. Lerderderg Razorback & Ah Kow

3.3 Example - How to import GPS track from trailhiking.com.au to Komoot

In your smartphone, Google search "Lerderderg Razorback & Ah Kow" then go to the <https://www.trailhiking.com.au/razorback-and-ah-kow-spurs/> page.

- Login to the trailhiking.com.au web-site
- Download the GPX file – “Razorback and Ah Kow Spurs.gpx”
- Click on “Open in...”
- Click on “Copy to Komoot”
- In Komoot, click on “Import as planned Tour” (or “Add to profile” as a Completed Tour) and follow the instructions
- Save the route
- Turn on “Store For Offline Use”

4 Advanced practice

This is an advanced practice for those who wish to continue practicing in their on time.

4.1 How to import GPS track from trailhiking.com.au to Avenza Maps

Note: Tracks and “pins” (waypoints) are stored in Avenza-Maps separately from the maps. The tracks and pins are stored as a “layer” that is superimposed (i.e. drawn) on the map.

Importing GPS tracks to Avenza Maps is not a straight forward task. In a nutshell the process is as follows:

- Download the GPX file (as in the previous section)
- Convert the GPX file to KML or KMZ format (e.g. use the converter in the <https://www.gpsvisualizer.com> web-site).
- Import the KML or KMZ file as a layer into Avenza-Maps and link it to a specific map.

See instructions in the “USING THE ‘AVENZA MAPS’ APP ON YOUR SMART PHONE” notes that were produced by Andrew Robinson from Bushwalking Victoria.

4.2 How to import GPS track from Komoot to Avenza Maps

Importing GPS track from Komoot to Avenza-Maps is not a straight forward task. In a nutshell the process is as follows:

- Export the track from Komoot in GPX format.
- Convert the GPX file to KML or KMZ format (e.g. use the converter in the <https://www.gpsvisualizer.com> web-site).
- Import the KML or KMZ file as a layer into Avenza-Maps and link it to a specific map.

See instructions in the “USING THE ‘AVENZA MAPS’ APP ON YOUR SMART PHONE” notes that were produced by Andrew Robinson from Bushwalking Victoria.

4.3 How to convert GPS formats

The GpsVisualizer (<https://www.gpsvisualizer.com>) web-site allows converting GPS files from one format to another.

5 Navigation practice

Input:

- The location of A, B, C and D are x_1, y_1 , x_2, y_2 , x_3, y_3 , and x_4, y_4 respectively

Exercise:

1. Use Avenza-Maps to plan a walking track from A to C via B.
2. Use Komoot to plan a walking track from B to A via D.
3. Use Avenza-Maps to navigate from A to C via B.
4. Use Komoot to navigate from B to A via D.