# Track Symbols on 1:50,000 Printed Topographic Maps

#### **On the Lookout for Ideas Worth Borrowing**

Pete McDonald

Gångstig Vandringsled Cykelväg Traktorväg

> Vehicle track Foot track Closed route Poled route

Grote Routepaden Fietspad Voetpad Pad

Unbefestigter Wirtschaftsweg Fußweg Wattenweg Klettersteig Radwanderweg Steig Mountainbikeweg

National cykelrute (asfalt/grus) Local cykelrute Anden vej med navn / Anden vej Sti Regional cykelrute (asfalt/grus)

> Camino Senda Via pecuaria Sendero de Gran Recorrido Via verde

Merket fotrute Umerket fotrute Traktorvei Merket sti Sti Sykkelvei Fotrute, turforslag Sykkelrute

Other road, drive or track Footpath Path Bridleway National Trail Traffic-free cycle route Other route with public access Sentier Piste cyclable Sentier de grande randonnée (GR) Sentier de petite randonnée (PR) GR de pays (GRP) Passage délicat Itinéraire équestre Voie verte Ski de randonnée Ski de randonnée en passage délicat

> körstig stig spång cykelväg vinterväg

Zemesceļš Vieglā / Irdenā seguma lebraukts ceļš Cietā seguma

Via ferrata o sentiero attrezzato (per esperti) Sentiero Tracce di sentiero difficile, sovente non segnalato Sentiero generalmente segnato

> Traktorweg Zentralalpenweg Wegmarkierungen Karrenweg Schlecht erkennbare Wegmarkierungen

Carrareccia Mulattiera Sentiero Tratturo Pista o traccia

Drum di căruță, tractor Potecă, număr traseu Drum neasfaltat, drum ferestier

Elljusspår Vandringsled Traktorväg Gångstig Cykelväg Pinnastee Rada Kergliiklustee

udržovaná cesta s lávkou (instand gehaltener Weg mit Steg) neudržovaná cesta • pěšinamimoúrovňové (nicht instand gehaltener Weg • Fußweg) Pete McDonald 26 Grandview Crescent Dunedin New Zealand

pete.mcdnz@outlook.com

Text © Pete McDonald 2019 Map extracts © see credit lines

#### ISBN: 978-0-473-50307-9 (electronic)

https://petemcdonald.co/TrkSym.pdf

#### Note on the Illustrations

The pages of this document are best viewed on a large monitor at their actual size (A4). Except when the caption states otherwise, the extracts taken from the maps have not been enlarged or reduced. The spacing of the grid lines will be 2 cm or 4 cm or 8 cm, depending on the original. These images of maps will tolerate zooming-in to about 150% to reveal the detail.

Most of the illustrations of conventional signs, taken from the legends, have been enlarged because the original legends often use tiny symbols and tiny text.

The colours in the illustrations may not be totally true to the colours in the original maps.

Abbreviations

LINZ – Land Information New Zealand NZWAC – New Zealand Walking Access Commission WAMS – Walking Access Mapping System

#### Likely Change

In September 2019 the report on the findings of the review of the Walking Access Act 2008 recommended that the act be renamed the Outdoor Access Act. It also recommended that the New Zealand Walking Access Commission be renamed the New Zealand Outdoor Access Commission.

### Contents

Introduction
Tracks on LINZ's Topo50 in 201911
Australia (Victoria)
Part Two: A Mixed Bag from Europe17
Albania
Austria20
Belgium
Bulgaria24
Croatia26
Czech Republic
Denmark
Finland
France
Germany
Greece
Italy
Latvia
Lithuania43
Norway44
Poland
Portugal
Romania
Slovakia
Slovenia52
Spain
57 Sweden
Switzerland59
The Netherlands61
United Kingdom62
Vehicle Tracks and Gates66
Topographic Maps in Europe – Summary
Part Three: Back to New Zealand
Two State Map-makers and Their Maps74
Improvements
Appendix 1: Printed (Folded) 1:50,000 Maps Examined80
Appendix 2: Covers and Backs

# Part One: Tracks on Topographic Maps in New Zealand



#### Introduction

As a result of the Walking Access Act 2008, work is under way in New Zealand to develop topographic maps that show tracks and lands that are open to the public. The recent Ministry for Primary Industries report on the review of the Walking Access Act 2008 recognises the success of the online Walking Access Mapping System (WAMS). The Tracks and Trails map of the WAMS is beginning to differentiate between public tracks and private tracks, thus filling a long-standing information vacuum. In doing so, Tracks and Trails is pioneering an authoritative online national walking and cycling map.

While the WAMS has been using modern technology very effectively to meet mapping challenges, Topo50, LINZ's 1:50,000 paper topographic map series, which began in September 2009, has become ten years old. This is not necessarily elderly for such a series, but Topo50's track symbology is similar to that of the first sheet of the NZMS 260 series which arrived in 1977. The group of five track symbols, all in black, is beginning to look somewhat unambitious and unnecessarily basic, a hangover from the days when maps had few colours.

Since the arrival of the WAMS in December 2010, public and government interest has understandably focused on the constantly evolving online mapping. Little has been said recently in public about the Topo50 printed maps. Yet the digital version of Topo50, identical to the printed version, plays a pivotal role as the primary basemap for the online Tracks and Trails map.

This paper examines Topo50's suitability for that important role. As part of that examination, the study gathers examples of track symbols from printed maps from twenty-five countries in Europe. But the main research began not in New Zealand nor in Europe but in Australia. Last August I happened to be in Bivouac, an outdoor shop in Melbourne. Near the counter was a rack of Vicmap 1:50,000 topographic maps. I opened one up. It struck me how different this map was from the LINZ Topo50 maps. Not necessarily better, nor worse. But different. All vehicle tracks, for example, were broken lines, as used in the LINZ Topo50s, but in red instead of black. The rack of maps occupied a prime position in a busy shop. I bought two maps on impulse. Part Two of the paper stems from that impulse.

In Part One and Part Three, when I discuss some current New Zealand mapping issues, I do so as a map user for sixty years, but not as a cartographer or a GIS professional. I hope that this paper does not expose my ignorance in too many places. I am confident that the paper provides a reliable overview of the range of track symbologies in use on European maps in 2019. It raises the possibility that map-makers in New Zealand might consider adopting some of the European symbological solutions.

#### Tracks on Maps: Historical Snapshot, 1940s–1980s

On the front cover of this paper are some of the words attached to the track symbols on the legends of the printed 1:50,000 topographic maps of various countries, mainly in Europe. When translated into English nearly all of these track types fall into one of four main categories:

- vehicle tracks (sometimes called cart-tracks, 4WD tracks, 2WD tracks, green roads, cattleways, cattle tracks, farm roads, tractor roads, driveways, unmetalled roads, dirt tracks);
- cycle tracks (sometimes called bike paths, bridleways, shared tracks, cycle-walkways, off-road cycle tracks, bike tracks, bicycle tracks, bike-only tracks, single track);
- foot-tracks (sometimes called paths, footpaths, clear footpaths, public footpaths, trails, waymarked trails, walkways, gazetted walkways, footways, maintained tracks); and
- routes (sometimes called unmaintained tracks, footpaths in poor condition, poled routes, poorly waymarked routes, unmarked routes, faint trails on a ridge etc, mudflat hiking routes, marked ski routes, unmarked ski routes).

For much of the 20th century, many topographic maps served their users well with only one or two track symbols. Below are two extracts from legends, the first from a New Zealand map of 1947, the second from an Italian map of 1965:

Roads (	1 Two way Ritumen Con	F Ford
	One way Crete or Meta	Cutting
	Unmetalled	Embankment
	Track	····

The roads section of the legend for the 1:63,000 topographic map *Middlemarch*, 1947, New Zealand Department of Lands and Survey. The design of the line symbols, and their arrangement in a hierarchy, help to make map-reading as intuitive as possible. Foot-tracks and waymarked or unwaymarked walking routes are invariably at the bottom of the hierarchy.

Strade soggette ad intercuzioni stagionali	a due o più corsie Importane lanes mide	
fair weather roads		
Rotabile secondaria: carrarerria	con o senza rivestimento	
Secondary road; cart track	with loose artight surface	
Mulattiera; sentiero Mule track; trail, foot path	Passo valico	
Tratturo; pista o traccia; strada in costruzione Cattle track; track; road under construction		

Extract from the bottom of the roads hierarchy in a 1965 legend for Italian state 1:50,000 topographic maps. Enlarged.

#### Tracks on Maps: Developments in New Zealand, late 1960s-2019

In New Zealand in the late 1960s, after a Federated Mountain Clubs proposal for a 1,200-mile national trail, the walkways idea evolved.<sup>1</sup> The population of New Zealand in 1969 was about 2.8 million.

Ten years later, in May 1979, while discussing the concept of walkways, John Kneebone emphasised the public's need for information on access:

We must find out where people can go and it concerns me that there is no single source where this information is available. A central inventory of tracks and walkways is essential ... The dissemination of information to people is also very important ... My view is that the best method is the visual one of using a map, preferably showing the status of the land as well as the tracking systems. Maps are easily understood and we should provide them with waterproof covers for protection.<sup>2</sup>

In the 1980s and 1990s, the population of New Zealand grew. Outdoor recreation diversified and expanded, while physically active outdoor tourism increased. People began to require their topographic maps to provide more information than these maps had provided in the past.

In 2003–5, in response to government consultations, some New Zealand map users asked for topographic maps that showed which tracks were freely open to the public.<sup>3</sup> In 2008 the Walking Access Act set up the New Zealand Walking Access Commission (NZWAC), tasked, among other things, with developing topographic mapping that indicates land and tracks to which the

<sup>1 &#</sup>x27;1,200-mile Track for N.Z. Trampers', Otago Daily Times, 9 Sep 1968, p. 9.

<sup>2</sup> New Zealand Walkway Commission, *Proceedings of the New Zealand Walkways Seminar, Lincoln College, Canterbury,* 10–12 May 1979 (Wellington, NZ: Department of Lands and Survey, 1979), pp. 10–14.

<sup>3</sup> Public Access New Zealand, Improving Public Access to the Outdoors: A Strategy for Implementing Government's Election Policies (Omakau, NZ: PANZ, 2003), pp. 7–8.

public have free access. (The national mapping organisation, Land Information New Zealand, was not mandated to produce recreation or tourist maps.)

Now, in 2019, the population of New Zealand is almost 5 million, nearly twice what it was in 1969 when the walkways idea was in its infancy. The commission is partway through developing the Walking Access Mapping System (WAMS), whose online Tracks and Trails map is beginning to differentiate between public and private tracks.

The WAMS requires further development to become more complete. Its Tracks and Trails map clarifies the 'public' status of some tracks by overlaying coloured lines onto the basemap black tracks. The next two illustrations show the same area. The first extract is from a LINZ Topo50 sheet. The second is from the Tracks and Trails online map.



An extract from NZTopo50-BT24, Ada Flat (2017).

# 

An extract from the NZWAC's Tracks & Trails online map, using the LINZ Topo50 basemap. Accessed 1 September 2019.

Compare with the above. Several of the black tracks on the basemap have been overlaid with coloured lines. Brown signifies a DOC track. Yellow signifies a section of a national trail. In this example the yellow track is part of Te Araroa Trail. Blue indicates a section of the New Zealand Cycle Trail. This overlaying of tracks with new line symbols is a common practice when adapting a country's main state topographic maps to create tourist or recreational maps. The resulting maps may work reasonably well. But choosing a suitable line width and colour can meet conflicting considerations. One requirement may be that the overlaid lines stand out obviously. At the same time, these added lines should not disrupt the hierarchical symbology of the topographic basemap. In the longer term, new track symbols might become available that perform the role required of them but which also are less disruptive than the strong coloured overlaying. By examining the track symbols used on the topographic maps of other countries, we might discover some new approaches to the design of these line symbols, superior to the overlaying in solid colour. The 1:50,000 Ordnance Survey maps of England and Wales have avoided these problems of adaptation by making public footpaths and public bridleways designed features of the topographic basemap.

#### The Focus of This Study

The focus of this paper is a narrow, carefully targeted one that will zoom single-mindedly into the track symbols and little else. A legend for a 1:50,000 topographic map might contain a hundred or more elements. This paper looks only at the symbols used to depict vehicle tracks, cycle tracks, walking tracks and routes: a total of four main types of track, or of about eight types if the symbols differentiate between public and private sub-types.

I will not offer any opinions on the general readability or style of the maps; aspects like font size, colour saturation, symbol size, line widths, hill shading, paper quality and print quality are beyond the scope of my investigation.

In many countries in Europe, digital mapping identical to the printed maps is available, either free or for purchase. This digital mapping may be enhanced by overlaid thematic additions. Also, completely new digital maps, created through custom map-providers such as Mapbox, may be available. I did not examine any of these European digital maps. Despite the many differences between printed topographic maps and some of their advanced online alternatives, all the paper and online topographic maps do share one characteristic: they all need symbols, sometimes called conventional signs. Some of the examples of track symbology shown in this document, although taken from printed maps, may be of interest to the designers of online topographic mapping.

#### **Research Method**

I began the project in June 2019, before obtaining the maps. I looked firstly at the track symbols used on LINZ's Topo50 paper maps. Then, for each other country, I searched online for an up-to-date legend for that country's state 1:50,000 maps. All twenty-five countries had national mapping agencies, but not all of these agencies produced 1:50,000 maps. Quite often various considerations led to my choosing to examine the track symbols of a commercially published map series instead of, or as well as, those of a series published directly by the state agency.

Whenever possible, to compare like to like, I used the legends belonging to the printed sheets, these maps being the most equivalent maps to the LINZ Topo50 printed sheets. In a further effort to only compare like to like, I resisted the temptation to widen the study to include 1:25,000 maps.

The legends of many topographic maps include a section titled 'Roads' or 'Communications'. These sections show the line symbols hierarchically. At the top of these lists are motorways. Then come main roads, followed by minor roads and gravelled roads. Then come vehicle tracks, which may be public or private. Then, on some maps, there may be bridleways that are open to horse-riders and cyclists, as well as to walkers. Or there may be shared-use tracks for cyclists and walkers that are unsuitable for horse-riders. At the bottom of the hierarchy are foot-tracks, which may be public or private, and, finally, poorly waymarked walking or skiing routes.

As well as the track symbols shown under Roads and Tracks, some legends include additional track symbols elsewhere. For example, special symbols for national cycle trails and long-distance walks may appear under a section titled Tourist Information.

Obtaining the legends online proved to be more difficult and time consuming than I had expected. Some of the legends I obtained were not as recent as would have been ideal. Some were low-resolution images, less clear than the original legends.

Having collected a mixed bunch of legends, and in doing so having begun to better understand what else was needed, in August-September 2019 I ordered one copy of a folded 1:50,000 map for each country (when available). They were a mixture of state-published and commercially published maps, picked randomly from listing of current maps. By good fortune rather than good planning, the collection included maps of mountainous areas and flat areas, empty areas and highly populated area, urban sprawls and villaged countryside. In retrospect, I ought to have also searched the catalogues of New Zealand's map collections, but these libraries might not have held the recent European maps that I needed.

So, that's the way I approached the research. Next, as an example, I will look at a LINZ Topo50 printed sheet. This will establish a pattern that will be followed for each map.

#### Tracks on LINZ's Topo50 in 2019

Several government departments in New Zealand engage in cartographic activities. Land Information New Zealand (LINZ) is the national mapping organisation that publishes topographic maps and nautical charts. The 1:50,000 topographic maps are available both on paper and as downloaded TIFF or GeoTIFF files. In style these LINZ maps could be described as orthodox and conservative, which can be a merit or a limitation, depending on the user's point of view. At present, New Zealand's paper Topo50 maps use five symbols for tracks, as shown in the map legend extract below. None of these five symbols imply any public right of access to the track.

Publisher	Land Information New Zealand.
Name of 1:50,000 series	Торо50.
Type and coverage	Core geographic, whole of New Zealand.
Sheet name and number	Warkworth, NZTopo50-AZ31.
Date published	June 2019

Core track symbols from the roads section of the legend for *Warkworth* NZTopo50-AZ31, June 2019, enlarged. The vehicle track symbol is a single line of long dashes. Some topographic maps use a double line for a vehicle track. All five symbols are in black. The map does not have a separate symbol for an off-road cycle track (bridleway).

Number of track symbols in the legend for *Warkworth* NZTopo50-AZ31, June 2019: (Excluding symbols for surfaced roads.)

#### Tracks Not Necessarily Open to the Public

The legend for *Warkworth* NZTopo50-AZ31 includes a universal disclaimer that applies to all the tracks on LINZ's Topo50 maps. This disclaimer originates in the purist belief that topo-

graphic maps are not intended to, or cannot, show access rights, especially in regard to tracks. A LINZ information sheet explains the thinking behind

# **IMPORTANT INFORMATION:**

 Representation of a road or track does not necessarily indicate public right of access. For access rights, maps and other information, contact the New Zealand Walking Access Commission - www.walkingaccess.govt.nz

Extract from the NZ Topo50 legend, June 2019, enlarged.

this classic point of view:

Our topographic maps and data are an official record of New Zealand's landscape, and we have a responsibility to show both private and public roads and tracks. This is necessary information for emergency services who may need to use private roads and tracks to gain access to an emergency scene, and is also important for capturing change to our landscape over time.

Roads and tracks shown on our maps are not necessarily accessible to the public. This is stated on the maps and in the metadata for the datasets used to produce them.

It is not possible to accurately show which roads and tracks are public and which are private. This information can change often, and in some cases ownership or access to a road or track is not clear.<sup>1</sup>

In the 1950s, in the days of 1:63,360 paper maps, this sort of disclaimer and the explanation for it made sense, reflecting the limitations of cartography and map production in that period, as well as a need to concentrate on more important features than public tracks. The first paragraph still does make sense today. The second paragraph may soon need rephrasing to become specific instead of universal. Of greater concern, in 2019, is the apparently authoritative contention in the first sentence of the third paragraph.

In the cases of vehicle tracks, bicycle tracks, foot-tracks and mountain routes, I can think of only two circumstances that would make this categorical statement accurate. Firstly, the statement would be true if there were some insurmountable cartographic barrier preventing the use of more than two or three track symbols. No such barrier exists. In Britain, for example, the cartographic limitations were overcome in the 1960s (see page 63). Some European maps employ about nine or ten track symbols.

Secondly, the statement would be correct of tracks on New Zealand maps if nobody knew which tracks are public and which are private. I would not deny that the statuses of many tracks remain to be clarified. However, since 2008 the map-makers of the NZWAC, with the help of the Department of Conservation and local authorities, have been working steadily to make it abundantly clear which tracks are open to the public. Furthermore, since 2008 the NZWAC has been statutorily obliged, when negotiating access, to insist on achieving access that endures.

The LINZ assertion about what is possible is out of date and misleading. The LINZ restriction on what a New Zealand 1:50,000 topographic map can show can no longer be viewed as a technical limitation. The restriction has become a de facto policy. The LINZ statement on this issue would be more correct, and entirely legitimate, if it were to say: 'We do not design our 1:50,000 topographic maps to show which tracks are public and which are private. We are not explicitly mandated to do so.'

At some point in the future, it may become possible and practicable to introduce new line symbols to depict public tracks either on the Topo50 maps or, more likely, on a new series. This improvement would make the printed Topo50 maps more useful, and more welcoming and inspiring, to many New Zealanders and tourists.

#### Example of Topo50 Track Issues: Case 1

The map extract to the right shows several foot-tracks and vehicle tracks. The presence of the black track symbols on this LINZ Topo50 map does not signify any public right of access. Neither does the term 'Walkway'; many tracks with this word in their names have not been formally established and gazetted. In this example,



Extract from Warkworth NZTopo50-AZ31 (2019).

<sup>1 &#</sup>x27;Topo50 Maps', Land Information New Zealand (26 Oct 2016) <https://www.linz.govt.nz/land/maps/topographicmaps/topo50-maps> [accessed 31 Aug 2019].

one section of foot-track is the Moir Hill Walkway, a recognised walkway gazetted in November 1983. (Partly revoked in August 2018.) One of the vehicle tracks is part of Te Araroa Trail.

Map users who are familiar with walking in New Zealand may already know, from other sources or from local knowledge, that these two named tracks are usually open to the public. Other users might consult other sources, using the track names. Others might assume or guess that the tracks are open. But no such assumption can safely be made about any of the hundreds of unnamed tracks on the LINZ Topo50 maps. I met one of these confusing access situations while cycling near Dunedin one day in November 2002 (using an NZMS 260 map). I wrote about it in *Going Out for a Bike Ride.*<sup>1</sup> I wrote again about this national issue in June 2019 in a submission to the Ministry for Primary Industries review of the Walking Access Act 2008.<sup>2</sup>

#### Example of Topo50 Track Issues: Case 2

On the map extract to the right, the Topo50 foot-track symbol merely indicates a physically evident track. To ascertain the access situation, map users would need to consult either the DOC website or the WAMS Tracks and Trails map or a walking guidebook.

The foot-track along One Mile Creek, previously used as one of the starts to this walk, is now closed. The middle section of the walk, up to the spot height 1316, is misleadingly labelled Ben Lomand Walkway. It is a DOC track, not a gazetted walkway. The top section of the walk, up to the summit of Ben Lomond, appears to be a permitted way across private land or along a boundary.

The Ben Lomand Track is an important track close to New Zealand's biggest tourist destination. The track symbol on the map does not provide the map user with the information that he or she may need. This is an example of the limitations of LINZ's Topo50 mapping.

#### New Zealand – Other Printed Maps



Extract from Queenstown NZTopo50-CC11 (2016).

Several companies publish recreational topographic maps of selected areas in New Zealand. The private enterprise NewTopo (NZ) Ltd presently lists thirty-six maps designed to encourage walking in New Zealand's most popular regions. The scale of these maps varies to suit the areas. The maps demonstrate a high level of cartographic technology and production standards. The founder and driving force behind NewTopo (NZ) is Geoff Aitken. His maps demonstrate the high quality of cartography that one person, in collaboration with a commercial printer, can achieve. Writing in 2016, Aitken touched upon some of the challenges of private topographic map publishing: 'It is clear there will be opportunities for future topographic publications by the private sector in New Zealand, but their commercial viability is uncertain.<sup>3</sup>

Another company, Geographx, publishes maps of the nine Great Walks of New Zealand, mainly at a scale of 1:40,000.

<sup>1</sup> Pete McDonald, 'Going Out for a Bike Ride: An AOK Diary, 2002–3' (May 2003) <https://petemcdonald.co/ posts/going-out-for-a-bike-ride/> [accessed 27 May 2019], pp. 11–14.

<sup>2</sup> Pete McDonald, 'Next Priority: The Black Tracks: Submission to the Review of the Walking Access Act 2008' (June 2019) <a href="https://petemcdonald.co/Sub2008Act.pdf">https://petemcdonald.co/Sub2008Act.pdf</a>> [accessed 19 June 2019], pp. 15–18.

<sup>3</sup> Geoff Aitken, 'New Topo Mapping', in *Unbounded Mapping of Mountains: Proceedings of the 10th ICA Mountain Cartography Workshop* (Dresden, Germany: Technische Universität Dresden, 2017), pp. 79–89 (p. 89).

#### Australia (Victoria)

Publisher	Melbourne, Vic: Dept. of Environment, Land, Water and Planning.
Name of 1:50,000 series	Topographic Map Series, 3rd edn.
Type and coverage	Core geographic and thematic (dual role), whole of Victoria.
Sheet name and number	Falls Creek, 8324-S.
Date published	2019



NOTES TO THE MAP USER Roads - Depiction of roads and tracks on this map does not necessarily indicate a right of way. For the most up to date walking track information in Parks and Reserves refer to the Parks Victoria website: www.parkweb.vic.gov.au. Tracks depicted in waterbodies are only accessible when waterbody is dry. For more information on Iconic Four Wheel Drives refer to: www.fwdvictoria.org.au/iconic4wd

A disclaimer about public access appears as one item in a large block of marginal small-print.

9

Number of track symbols in the legend for Falls Creek, 8324-S: (Excluding symbols for surfaced roads.)



Extract from Falls Creek, No. 8324-S (2019).

Walking track or bicycle track

Vehicular track, 4WD

#### Australia (Victoria) – Other Printed Maps

The Dept. of Environment, Land, Water and Planning also produces special 1:50,000 sheets covering some national parks and other areas of recreational interest. The *Wilsons Promontory Special* map, below, is one example. Its legend is the same as the legend for the standard maps. The reverse side of the paper is a 1:50,000 orthophoto mosaic of the same area, based on aerial photography from 2015.

Publisher	Melbourne, Vic: Dept. of Environment, Land, Water and Planning.
Name of 1:50,000 series	Topographic Map Series, 4th edn. (Specials.)
Type and coverage	Thematic, selected areas of Victoria.
Sheet name and number	Wilsons Promontory Special.
Date published	2018



In this extract from *Wilsons Promontory Special*, the broken black lines are walking tracks or bicycle tracks. The broken red lines are 2WD or 4WD vehicle tracks.

Before we head for Europe, there's one point that I need to add about the LINZ Topo50 maps and the 1:50,000 maps of Victoria: despite being products of the age of globalisation, the two series are noticeably different. Vicmap, for example, has catered for petrol heads by allocating a special line symbol to Iconic Four Wheel Drives. Striking differences between the maps, from country to country, will be themes that run through the whole of this study.

Victoria has a population of 6.4 million, New Zealand's is slightly less at 4.8 million. Victoria has an area of 238,000 km<sup>2</sup>, New Zealand is slightly bigger at 263,000 km<sup>2</sup>.

# Part Two: A Mixed Bag from Europe



#### Albania

Huber Kartographie GmbH, Munich.
Hiking and Biking.
Thematic, selected parts of Albania.
Tirana – Durrës – Kruja, 5.
2014.

Rruge sezonale/sonstige Strasse/Other road

Extracts from the bottom of the roads hierarchy. Enlarged.

	Fillimi turit me bicikleta/Beginn Fahrradtour/Start Bicycle tour
	Mbarimi turit me bicikleta/Ende Fahrradtour/End Bicycle tour
	Fillimi turit me kembe/Beginn Wandertour/Start Hiking tour
	Mbarimi turit me kembe/Ende Wandertour/End Hiking tour
-1	Ture kryesore me bicikleta/Fahrrad Hauptroute/ Bicycle main route
	Ture alternative me bicikleta/alternative Fahrradroute/ Alternative bicycle route
-1	Ture kryesore me kembe/Wandern, Bergsteigen Hauptroute/Hiking main route
	Ture alternative me kembe/alternative Wanderroute/ Alternative hiking route
హాం	Ture per bicikleta/Fahrradtour/Bicycle tour

 Ture per Alpinista/Bergsteigen/Hiking tour

 Image: Comparison of the system

 Image: Comparison of the

Recreation information from legend. Enlarged.

Number of track symbols in the legend for <i>Tirana - Durrës - Kruja</i> , 5:	6
(Excluding symbols for surfaced roads.)	0



Extract from Tirana - Durrës - Kruja, No. 5 (2014).

Each bicycle or hiking route on this map has been overlaid precisely onto the centreline of the underlying line feature.

#### Austria

Publisher	Bundesamt für Eich- und Vermessungswesen (BEV). (Federal Office of Metrology and Surveying.)
Name of 1:50,000 series	Österreichische Karte 1:50 000-UTM.
Type and coverage	Core geographic and thematic (dual role), whole of Austria.
Sheet name and number	Neustift im Stubaital, 2228.
Date published	2018

roadway = fair weather road		<u> </u>	Roadway • Tractor road, cart-track
wide footpath   footpath			Wide footpath • Footpath
Core track symbols from the bottom of the roads hierarchy. Enlarged.			

 foot path marking
 Waymarked track

 badly recognizable path marking
 Poorly waymarked track

 Tracks listed under 'Thematischer Aufduck' (thematic overprint). Enlarged.
 Poorly waymarked track

Number of track symbols in the legend for *Neustift im Stubaital*, 2228: (Excluding symbols for surfaced roads.) 5



Although called 'thematic overprints', the green lines in these Austrian maps appear *beside* the line feature that they refer to, not directly over the top of that feature.



Extract from *Neustift im Stubaital*, No. 2228 (2018).

If you zoom in to this extract you can see that the green lines are overlaid to one side of the underlying black tracks. The Swedish Sverigeserien Topo50 maps use a similar technique.



Extract from Neustift im Stubaital, No. 2228 (2018).

In this extract, five footpaths, shown with black dots, meet near Westfalenhaus. The black dots have been overlaid with very slightly offset green lines, denoting waymarked tracks. Only one of these five tracks follows water margins.

#### Austria – Other Printed Maps

Many 1:50,000 topographic maps produced by commercial publishers are available for Austria. Freytag and Bernt, Kummerly and Frey, and Kompass compete with each other to design maps for walkers, cyclists and mountaineers.

Austria has a population nearly twice that of New Zealand. Its area is less than a third of the area of New Zealand.

Publisher	Nationaal Geografisch Instituut / Institut Geographique National.
Name of 1:50,000 series	Belgium: Topographic Survey Maps.
Type and coverage	Core topographic, whole of Belgium.
Sheet name and number	Nivelles, 39, 3rd edn.
Date published	2013.

	Routes locale Plaatselijke v Ortsstraßen Local roads	es vegen
Routes empierrées Wegen met losse verhardin Schotterstraßen Crushed rock roads		<ul> <li>Routes empierrées</li> <li>Wegen met losse verhardin</li> <li>Schotterstraßen</li> <li>Crushed rock roads</li> </ul>
(a) Voic pop correspondent (c) or evention (t) a final term	(2)	Chemin de terre Aardeweg Feldweg Earth track

(a)	Management of the second secon	Voie non-carrossable: (a) en escalier - (b) revêtue - (c) non-revêtue
(b)		Pad: (a) in trapvorm - (b) verhard - (c) onverhard
(c)		Path: (a) stupped - (b) payed - (c) unpayed

Core track symbols from from the bottom of the roads hierarchy. Enlarged.

Number of track symbols in the legend for the Belgium Topo50 maps: (Excluding symbols for surfaced roads.)

# 5

# print-on-demand

toutes zones & toutes échelles alle zones & alle schalen

#### www.ign.be

From *Nivelles*, 39, 3rd edn (2013).

A sign of the times. It is difficult to forecast what proportion of topographic maps will become available only by print-on-demand. In Norway and Denmark, for example, the basic state-agency 1:50,000 maps are no longer preprinted but are available by print-on-demand.

Outdoor shops make up an important marketplace for topographic maps, especially for casual sales, helped by

the enthusiasm of the shop staff. For these retailers to promote the value of and an enthusiasm for the maps, the shops need pre-printed stock.



The foot-tracks on this map – 'earth tracks' in the legend – are shown by fine unbroken black lines. (The grid lines on this map are four centimetres apart.)

Belgium is a small country in area, less than one eighth the size of New Zealand. Its population is more than twice that of New Zealand.

#### Bulgaria

Publisher	Domino.
Name of 1:50,000 series	Tourist Map.
Type and coverage	Thematic, selected parts of Bulgaria.
Sheet name and number	Stara Planina: Uzana to Vratnik, 2.
Date published	2016.
Name of 1:50,000 series Type and coverage Sheet name and number Date published	Tourist Map. Thematic, selected parts of Bulgaria. <i>Stara Planina: Uzana to Vratnik</i> , 2. 2016.

	Друг път/Other road
	Черен път/Dirt road
	Пътека/Path

Extract from the bottom of the roads hierarchy. Enlarged.



#### **IMPORTANT INFORMATION!!!**

- 1. The continuous band marking on the map shows the summer trails under the Management Plan of the Central Balkan National Park.
- 2. The broken band marking on the map shows the presence of old or not maintained band marking. Those trails are not included in the Management Plan of the Central Balkan National Park.
- 3. The symbols for the rods of the winter rod band marking on the map reflect the density of their distribution along the route, and not their precise location.
- WARNING! The winter marking featuring on the map does not always show the safest winter route!

Extracts from tourist information in the legend. Enlarged.

Number of track symbols in the legend for *Stara Planina: Uzana to Vratnik*, 2: (Excluding symbols for surfaced roads.)

9



Extract from Stara Planina, No. 2 (2016).

Each summer trail on this map has been overlaid precisely onto the centreline of the underlying footpath. *Stara Planina*, No. 2 covers an area in central Bulgaria, including the Central Balkan National Park.

#### Croatia

Publisher	Državna Geodetska Uprava (DGU) produces several national series of topographical maps, on paper and digital, including complete coverage at 1:100,000 and 1:25,000. But the DGU does not produce a national series of 1:50,000 paper maps.
Name of 1:50,000 series	None.
Type and coverage	None.
Sheet name and number	None.
Date published	None.

Number of track symbols in the legend for the DGU 1:50,000 maps:	No state
(Excluding symbols for surfaced roads.)	1:50,000 paper
	maps.

Croatia is about one fifth the area of New Zealand. It has a population of 4.1 million. In a 2018 list of GDP (nominal) per capita of sovereign states in Europe, Croatia was 31st out of 43 sovereign states. Going by this measure, of the 21 countries whose maps I examined, Croatia was the poorest. But, as mentioned above, Croatia has complete coverage of 1:25,000 topographic mapping.

#### Croatia - Other Printed Maps

The Croatian Mountain Rescue Service publishes about 17 recreational topographic maps for mountainous regions of Croatia. Most of these maps are at a scale of 1:25,000. Further coverage of mountainous areas in Croatia, mainly at 1:20,000, 1:25,000 and 1:30,000, is provided by Smand, an enterprise located in Vidovec, Croatia.

Publisher	Croatian Mountain Rescue Service (printed on demand).
Name of 1:50,000 series	Tourist and Trekking Map 1:20,000/1:50,000.
Type and coverage	Thematic, selected areas of Croatia.
Sheet name and number	Lastovsko Otočje [Lastovo Islands Nature Park], 15.
Date published	2015.

*Lastovsko Otočje*, 15, is printed on both sides. One side is at a scale of 1:20,000. The other side shows the same island at a scale of 1:50,000. The Lastovo Islands are in the Adriatic Sea.



Symbols from the legend for *Lastovsko Otočje* [*Lastovo Islands Nature Park*], 15 (2015). Enlarged.

Number of track symbols in the legend for *Lastovsko Otočje [Lastovo Islands Nature Park]*, 15: (Excluding symbols for surfaced roads.)



Extract from the 1:50,000 side of Lastovsko Otočje [Lastovo Islands Nature Park], No. 15 (2015). (The grid lines on this map are four centimetres apart.)

#### **Czech Republic**

Publisher	Czech Office for Surveying, Mapping and Cadastra.
Name of 1:50,000 series	ZM50.
Coverage of series	Whole of Czech Republic.
Sheet name and number	Paper map not accessed. This entry is based on the legend.
Date published	Legend undated, accessed online 2019.

	silnice III. tř. • neevidovaná silnice	Road • Unregistered road
~	udržovaná cesta s lávkou	Maintained path with footbridge.
	neudržovaná cesta • pěšina	Unmaintained path • Footpath

Extract from the bottom of the roads hierarchy. Enlarged.

Number of track symbols in the legend for the ZM50 maps:	2
(Excluding symbols for surfaced roads.)	3

#### Czech Republic – Other Printed Maps

Kompass, based in Innsbruck, publishes several hiking and cycling maps of regions in the Czech Republic. Saxon Bohemian Switzerland is in the northwestern Czech Republic.

Publisher	Kompass Karten GmbH.
Name of 1:50,000 series	Wandern - Fahrradfahren.
Type and coverage	Thematic, selected areas of Czech Republic.
Sheet name and number	Sächsische Schweiz, Westliche Oberlausitz, 810.
Date published	2017.



Extract from the bottom of the roads hierarchy in the legend of *Sächsische Schweiz, Westliche Oberlausitz*, 810. Enlarged.



Extract from the tourist information section of the legend for *Sächsische Schweiz, Westliche Oberlausitz*, 810. Enlarged.

Number of track symbols in the legend for Sächsische Schweiz, Westliche Ober-<br/>lausitz, 810..(Excluding symbols for surfaced roads.).

11



Extract from Sächsische Schweiz, Westliche Oberlausitz, 810.

On this map, the main tracks, denoted by an unbroken green line for cycling and by an unbroken or broken red line for walking, are offset from underlying forest/farm roads or secondary roads. This sometimes leads to three parallel line symbols, when in actuality there is only one physical feature.

# PublisherData source: Geodatastyrelsen (GST) (Danish Geodata Agency),<br/>formerly Kort og Matrikelstyrelsen (KMS). Publisher: Nordisk<br/>Korthandel.Name of 1:50,000 seriesDanmarks Topografiske Kortværk – DTK/kort50.Type and coverageCore geographic, whole of Denmark.Sheet name and numberPaper map not accessed. This entry is based on the legend.Date publishedKMS legend undated, accessed online 2019.

	. Anden vej med navn / Anden vej Other road or track (with/without name) Sonstige Strasse oder Feldweg (mit/ohne Name)
•••••••••	

Core track symbols from the bottom of the roads hierarchy. Enlarged.

Number of track symbols in the legend for the DTK/kort50 maps: (Excluding symbols for surfaced roads.)

#### Denmark – Other Printed Maps

The state survey maps (above) are usually only available by print on demand. The Nordisk Korthandel cycling maps are the best available pre-printed maps for Denmark. Most are at a scale of 1:100,000 but the cycle map of Bornholm is at 1:50,000. Bornholm is a Danish island in the Baltic Sea.

Publisher	Data source: Geodatastyrelsen (GST) (Danish Geodata Agency), formerly Kort og Matrikelstyrelsen (KMS). Publisher: Nordisk Korthandel.
Name of 1:50,000 series	Denmark Cycling Maps.
Type and coverage	Thematic, selected areas of Denmark.
Sheet name and number	Bornholm: Cycle Map of Bornholm, 8/8.
Date published	2016.



Extract from legend of Bornholm: Cycle Map of Bornholm, 8/8. Enlarged.

Number of track symbols in the legend for *Bornholm: Cycle Map of Bornholm*, 8/8. (Excluding symbols for surfaced roads.)

Denmark

2



Extract from Bornholm: Cycle Map of Bornholm, No. 8/8.

This Danish cycling map is a one-theme, single-purpose map. The cycle routes are overlaid precisely onto the centreline of the underlying feature. Hierarchical symbology takes a back seat. A broad blue line raises the prominence of the bike routes above that of motorways, leaving the map user in no doubt about where to point his or her bicycle.

Denmark has a land area less than one sixth that of New Zealand. It has a population of 5.7 million, slightly more than New Zealand's.

#### Finland

Publisher	Data source: Maanmittauslaitos (National Land Survey of Finland). Publisher: Karttakeskus.
Name of 1:50,000 series	Ulkoilukartta / Outdoor Map.
Type and coverage	Thematic, selected areas of Finland.
Sheet name and number	Ruka Oulanka Karhunkierros.
Date published	2017.

——————————————————————————————————————	Ajotie, puomi • Körväg, vägbom • Vehicle track, road bar • Fahrweg, Schlagbaum • Проезжая дорога, Шлагбаум
	Ajopolku • Körstig • Cart track • Fahrpfad • Проселочная дорога
	Polku • Stig • Path • Pfad • Тропа

Core track symbols from the standard part of the legend. Enlarged.

# ULKOILUSYMBOLIT • FRILUFTSTECKEN OUTDOOR SYMBOLS • WANDERZEICHEN УСЛОВНЫЕ ОБОЗНАЧЕНИЯ

	Karhunkierros • Vandringsleden Karhunkierros • The Karhunkierros Trail • Wanderroute Karhunkierros • маршрут Медвежья тропа
	Pieni Karhunkierros • Lilla Karhunkierros • The Pieni Karhunkierros Trail • Wanderroute Pieni Karhunkierros • маршрут Малая Медвежья тропа
	Kävelyreitti • Vandringsrutt • Hiking route • Wanderroute • Пешеходный маршрут
	Hiihtoreitti • Skidrutt • Skiing route • Skilaufroute • Лыжный маршрут
	Kävely- ja hiihtoreitti • Vandrings- och skidrutt • Hiking and skiing route • Wander- und Skilaufroute • Пешеходный и лыжный маршрут
<b></b>	Valaistu reitti • Belyst rutt • Illuminated route • Beleuchtete Route • Освещенный маршрут
	Maastopyöräreitti • Terrängcykelrutt • Mountain bike route • Mountainbikeroute • Маршрут для внедорожных велосипедов
• • • • • • •	Luontopolku • Naturstig • Nature trail • Naturpfad • Прогулочная тропа
	Esteetön reitti • Rutt för rörelsehindrade • Route for handicapped • Barrierefrei Route • безбарьерная маршрут
<b>† 4,5 †</b>	Välimatka reitillä • Avstånd på rutten • Distance on trail • Entfernung auf der Route • Расстояние на маршруте
• • • • • • •	Melontareitti • Kanotled • Canoe route • Kanuroute • Байдарочный маршрут
• • • • • • •	Koskenlaskureitti • Forsfärdrutt • Rapids shooting route • Wildwasser- fahrenroute • Маршрут спуска по порогам
====	Moottorikelkkareitti tai -ura • Snöskoterrutt • Snowmobile route • Schneemobilroute • мотосанный маршрут / мотосанная трасса

Extract from the outdoor part of the legend. Enlarged.

Four of the track symbols in the legend are the same colour, purple, but with four different line designs: a broken line with short dashes; a broken line with long dashes; an unbroken line; and a line with line decorations (like in the Vicmap legend on page 14). Line decorations attach to a pre-existing line symbol, thus avoiding the need for a new line symbol.

Number of track symbols in the legend for *Ruka Oulanka Karhunkierros*: (Excluding symbols for surfaced roads and canoe routes.)





Extract from Ruka Oulanka Karhunkierros (2017).

Oulanka National Park is in northern Finland, near the border with Russia.

The unbroken reddish-brown lines in this extract are main roads. The single unbroken black lines are vehicle tracks. The obvious thick red line symbol denotes the Karhunkierros Trail, a popular 80-kilometre walk through canyons, past rapids and with forest landscapes. The other line symbols on this map (not all appearing on the extract) include 'Mountain bike route', 'Route for handicapped', 'Canoe route', 'Rapids shooting route' and 'Snowmobile route'. The area detail on this map includes information like 'Open fell area', 'Bog, difficult to traverse', 'Bog, easy to traverse', 'Bare rock' and 'Boulder field'.

The ultramodern pioneering style of this map suggests that a robot cartographer has been employed and has been told not to leave anything out. The map has a wealth of strange detail to keep orienteers happy but perhaps an excess of detail for the average walker or cyclist.

Finland is slightly larger than New Zealand in area and it has a population of 5.5 million, slightly more than New Zealand's.

#### France

Publisher	Institut National de l'Information Géographique et Forestièr (IGN). IGN does not produce a national series of 1:50,000 paper maps.
Name of 1:50,000 series	None.
Type and coverage	None.
Sheet name and number	None.
Date published	None.

Number of track symbols in the legend for the IGN 1:50,000 maps: (Excluding symbols for surfaced roads.)	No state 1:50,000
	paper maps.

#### France – Other Printed Maps

France is the third largest country in Europe in area, after the Ukraine and the European part of Russia. It is over twice the size of New Zealand. The IGN produces several national series of topographical maps, on paper and digital, including complete coverage at 1:75,000 and 1:25,000. The French 1:25,000 maps use about ten track symbols. The labels for these symbols include: sentier; autre sentier; sentier de grande randonnée (GR); sentier de petite randonnée (PR); GR de pays (GRP); itinéraire équestre; voie verte; ski de randonnée; and piste cyclable.

The absence of a state-agency 1:50,000 series has left a market niche for commercial publishers. Several companies publish 1:50,000 topographic maps for popular walking areas in France.

Publisher	Editions Didier Richard.
Name of 1:50,000 series	Walking Maps.
Type and coverage	Thematic, selected areas of France.
Sheet name and number	Autour du Thabor, 16.
Date published	2014.



Extract from legend of Autour du Thabor, 16.

# ITINÉRAIRES DE RANDONNÉE PÉDESTRE Hiking trail / Fusswanderroute / Itinerario escursionistico a piedi Tour du Thabor Grand Tour du Thabor Variantes et ascension du Thabor Accès depuis les portes d'entrées

This Editions Didier Richard series of walking maps is based on IGN data. On the *Autour du Thabor* sheet, overlaid track symbols highlight the main route of the Tour du Mont Thabor. Overlaid symbols also highlight several variants for shorter or longer circuits, including sections of the GR5. No offset is applied; the red or purple line symbols are overlaid precisely onto the centreline of the underlying line feature.

9

Extract from legend of Autour du Thabor, 16.

« La traversée zéro carbone de Modane à Briançon »

Passage délicat

Number of track symbols in the legend of *Autour du Thabor*, 16. (Excluding symbols for surfaced roads.)

#### la Buffaz la Bonvillard Fusing Orelle le Poucet Cart track Bole of the Noiray Francoz Teppey s Sorderettes les saz Prénaont Sordières A43 la Bronsonnière Challet de la Tepey Ou Lausanne la Falconnière le Château I'an Bas la Balm Forêt a d'Orelle Bordelin Unsurfaced At road la Grande nbes Santindre Roche Plan les Frasses le Plan du Bois Bronzin le Glacelet Footpath nte GR Longefan du Mont-Thabo Variants & ascent of le Gros . 2594 Thabor Mont 2568 Crey Valmeinier Coburne Anchical Combaz des Jen Crêt de Longefan le Chapiet Pointe de la Sandonière Access by the 2829 ier end points sartsles Inversion nne Grand Tour tour du Mont-Thabor Chotion du Thabor des Marches P la Chenalette les Marches le Grand Fourchon le Petit Fourchon e Roche Noire le Libi Editions Didier Richard le Planay Mathose Roche du Lac oche 2919 des Marches Edt les Vallons Roche de Roche Noire e Orsière 3067 Noire

Extract from Autour du Thabor, No. 16 (2014).

#### Germany

Publisher	Bundesamt für Kartographie und Geodäsie (BKG). (Federal Office of Metrology and Surveying.)
Name of 1:50,000 series	DTK50.
Type and coverage	Core geographic, whole of Germany.
Sheet name and number	Paper map not accessed. This entry is based on the legend.
Date published	BKG legend undated, accessed online 2019.

	Befestigter / unbefestigter Wirtschaftsweg	Surfaced / unsurfaced farm road
	Fußweg / Klettersteig, Wattenweg	Footpath / track, mudflat route
	Fußgängerzone	Pedestrian zone
Company all sums local a first state of the state	and a fight a manual a later marked in the a DIVC	

Core track symbols from the bottom of the roads hierarchy in the BKG legend. Enlarged.

Number of track symbols in the legend for the DTK50 maps: (Excluding symbols for surfaced roads.)

#### Germany – Other Printed Maps

Bavaria is covered by the standard topographic maps of Germany, DTK50, whose track symbols are reproduced above. Bavaria also produces a recreational 1:50,000 series of folded maps, UK50. These special maps are overlaid with walking tracks and cycling routes, using the four track symbols reproduced below. No offset is applied; the red or green line symbols are overlaid precisely onto the centreline of the underlying line feature.

3

Publisher	Landesamt für Digitalisierung, Breitband und Vermessung (LDBV).	
	(Bavarian State Office for Digitizing, Broadband and Survey.)	
Name of 1:50,000 series	Umgebungskarte 1:50,000 (shortened to UK50).	
Type and coverage	Thematic, whole of Bavaria.	
Sheet name and number	Pfaffenwinkel – Northern Ammergau Alps, UK50–49.	
Date published	2016.	

(	Wanderweg	Walking track
	Radwanderweg	Bike path
•••••	Steig	Steep track
	Mountainbikeweg	Mountain-bike track

Extract taken from an LDBV information leaflet about Bavaria's UK50 paper maps, 2017. Enlarged.

Out of maps from twenty-five European countries, Bavaria's UK50 maps were the only maps with two bicycle track symbols, to distinguish between bicycle paths and mountain-bike tracks.


Symbols for walking tracks, bike paths and mountain-bike tracks from the legend for *Pfaffenwinkel* - Northern Ammergau Alps, UK50–49. Enlarged 130%.

The unbroken versions of Wanderweg (unbroken red line) and Radwanderweg (unbroken green line) are only used if overlaying onto a single-line feature, such as a fußweg (footpath). When overlaying onto a double-line feature, such as a surfaced farm road, the broken versions are used so as not to obscure the underlying symbol.

Some of the symbols can be used in combination. For example, if walkers and mountain-bikers share the same track, red Wanderweg dashes alternate with green Mountainbikeweg dots.





Extract from Pfaffenwinkel - Northern Ammergau Alps, UK50-49 (2016).





6

Tannenbich

DBV

Extract from Pfaffenwinkel - Northern Ammergau Alps, UK50-49 (2016).

The above extract has numerous walking tracks shown as continuous or broken red lines. The extract also has a few fragments of bike track, shown as continuous or broken green lines. A combination of red and green symbols indicates a shared-use track.

If judged by its refined track symbology, this Bavarian map is an outstanding map. But it could well be matched by other outdoor leisure maps that I have not seen. Another German state, Baden-Württemberg, publishes a series of double-sided, GPS-compatible topographic maps at 1:50,000 with hiking and cycling routes. Also, judging the usefulness of a map solely by the variety of tracks that it shows is too simple. The Scandinavian maps and the OS maps of Scotland have fewer symbols than the German maps because they don't need so many. People in Scandinavia and Scotland have wide-ranging rights of responsible access to the outdoors; they might want their maps to show physically evident tracks but they don't need the maps to show access rights.

Pfaffenwinkel is part of southwestern Bavaria, close to the border with Austria. Bavaria is slightly less than a quarter the area of New Zealand but has a population of thirteen million.

#### Greece

Publisher	Geopsis.
Name of 1:50,000 series	Hiking and Touring Map.
Type and coverage	Thematic, selected areas of Greece.
Sheet name and number	West Rodopi – Falakro, 133.
Date published	2015.

The West Rodopi Mountains straddle the border between Greece and Bulgaria.



Extract from the bottom of the roads hierarchy. Enlarged.

Number of track symbols in the legend for *West Rodopi – Falakro*, 133: (Excluding symbols for surfaced roads.)





Footpath in poor condition

Extract from West Rodopi - Falakro, No. 133 (2015).

#### Italy

Date published

Publisher	The Italian Geographic Military Institute (IGMI) is the Army's geographic supporting office. It is also the National Cartographic Authority. The cartography produced by the institute is considered the official state cartography.
Name of 1:50,000 series	IGMI Series 50.
Type and coverage	Core geographic, partial coverage of Italy.
Sheet name and number	Paper map not accessed.
Date published	Not known. No legend found online.
Publisher	Instituto Geografico Centrale (IGC)
Name of 1:50 000 ceries	ICC Hiking Series 50
Type and coverage	Thematic, partial coverage of Italy.

Sheet name and number Monte Rosa: Alagna e Macugnaga, 10. 2014.



Core track symbols from the bottom of the roads hierarchy. Enlarged.



Extract from the legend. Enlarged.

Number of track symbols in the legend for Monte Rosa: Alagna e Macugnaga, 10: (Excluding symbols for surfaced roads.)

8



This extract includes three different symbols for foot-tracks. Some of these foot-tracks, on other parts of the map, are regional or national trails and are labelled accordingly, eg T.M.R. (Tour del Monte Rosa). This extract has two examples of barred roads, closed to unauthorised vehicles.

not always marked.

marked.

# Italy – Other Printed Maps

Commercially produced 1:50,000 topographic maps are available for many areas of Italy, often overlaid with hiking routes.

#### Latvia

Publisher	Latvijas Ģeotelpiskās informācijas aģentūra (LĢIA).
Name of 1:50,000 series	Latvijas Republikas Topogrāfiskā Karte – Top50NL.
Type and coverage	Core geographic, whole of Latvia.
Sheet name and number	Priekule, 3141.
Date published	2017.

	lelas
a b c	a – maģistrālās ar cietu segumu; b – maģistrālās ar vieglu segumu; c – ielas C – street Ceļi būvniecības stadijā
a b	a – cietā seguma; b – vieglā/irdenā seguma a – hard surfaced b – loosely/lightly surfaced road
r	Ceļi bez seguma Unsurfaced road
a b	a – zemesceļš; b – iebraukts ceļš a – dirt road <u>b – driveway</u>

Core track symbols from the bottom of the roads hierarchy. Enlarged.

Number of track symbols in the legend for *Priekule*, 3141: (Excluding symbols for surfaced roads.)



3

Extract from Priekule, No. 3141 (2017).

Priekule is a town in southwestern Latvia. *Priekule*, No. 3141 is published by the Latvian state mapping agency and is printed on plastic. It has no added thematic content on outdoor recreation or active tourism. Latvia is a quarter the size of New Zealand in area. It has a population of 1.91 million.

## Lithuania

Publisher	Leidykla Briedis.
Name of 1:50,000 series	Topografinė informacija 1:50,000 (Top50LKS).
Type and coverage	Thematic, selected areas of Lithuania.
Sheet name and number	Curonian Spit, 9.
Date published	2016.



Number of track symbols in the legend for *Curonian Spit*, 9: (Excluding symbols for surfaced roads.)

#### Kun Piramidinės (Mirusios) kopos Naujieji Nagliai (1730–1760 m.) Libio ilanka Vinkio kopa Naglių rezervatas Pažintinis takas Naglių rezervate Lydumo ragas Naujieji Nagliai (Agila) (1760–1834 m.) 15/ Naglių kopa Naglių įlanka **Bicycle path** Forest path A Real Birštvyno ragas 16 Karvaičių kraštovaizdžio Žirgų (Arklių) 17 draustinis Birštvyno kyšulys Pervalkos L.Rezai Forest path Pervalka "Baldininkas", "Pervalkos Agila" 0,9 kopa Kopa Skirps 18 Pervalkos žvejų namai Leidykla Briedis Pervalkos ilanka

The Curonian Spit is a long sanddune spit that separates the Curonian Lagoon from the Baltic Sea.

3

Extract from Curonian Spit, No. 9 (2016).

#### Norway

Publisher	Data source: Kartverket (Norwegian Mapping Authority). Publisher: Nordeca.
Name of 1:50,000 series	Norge-serien 1:50,000, shortened to N50. Kartverket describes these maps as 'suitable as a hiking map and for recreational use in the mountains, in the forest, along the coast and for hunting and fishing'. In 2015, Kartverket stopped printing these maps. In some cities in Norway the customer can have the map printed on demand.
Type and coverage	Core geographic, whole of Norway.
Sheet name and number	Paper map not accessed. This entry is based on the legend.
Date published	Legend dated 2012, accessed online 2019.

	Privat vei. Låst bom. Private road. Closed road barrier/gate.
	Traktorvei. Cart track.
	Merket sti, gang-, sykkelvei. Marked footpath/trail, walk way, cycle track.
	Sti. Gangbru. Footpath. Foot bridge.
Core track symbols	from the roads section of the 2012 legend. Enlarged.

Number of track symbols in the legend for the N50 maps: (Excluding symbols for surfaced roads.)

4

#### Norway – Other Printed Maps

As well as publishing the Norge-serien 1:50,000 maps, the commercial firm Nordeca publishes a series of recreational 1:50,000 maps for Norway's popular hiking areas. The maps are based on Norway's state topographical survey. The overlaid tourist information varies from title to title but includes local footpaths, in some cases distinguishing between easy and more difficult trails. Many titles also indicate cycle or ski routes and alpine skiing slopes.

Vest-Lofoten is an open bight of sea between the Lofoten Archipelago and Norway. The back of the *Vest-Lofoten* sheet carries information on the Lofoten area in Norwegian, German and English. It also includes an abbreviated version of the Norwegian Mountain Code and advice about allemannsretten, the public right of access to forests and fields.

Publisher	Nordeca.
Name of 1:50,000 series	Turkart [Trip Map] 1:50,000.
Type and coverage	Thematic, selected area of Norway.
Sheet name and number	Vest–Lofoten, 2745.
Date published	2016



Number of track symbols in the legend for *Vest–Lofoten*, 2745: (Excluding symbols for surfaced roads.)



Extract from Vest-Lofoten, No. 2745 (2016).

As well as 'Footpath, suggested trail' and 'Unmarked footpath', this map's legend includes a symbol for a bicycle route, but this particular sheet has no bicycle routes.

Illuminated ski trail

9

# Poland

Publisher	Główny Urząd Geodezji i Kartografii (GUGiK).
Name of 1:50,000 series	Mapa topograficzna. GUGiK 1:50,000.
Type and coverage	Core geographic, whole of Poland.
Sheet name and number	Paper map not accessed. This entry is based on the legend.
Date published	Legend undated, accessed online 2019.

A search online for an up-to-date legend for the Polish state 1:50,000 topographic maps failed to find a readable PDF or JPG but did find a low-resolution GIF version of the legend. By viewing this GIF on the screen it is possible to see that these maps have symbols for gravel roads, cart-tracks and footpaths. They also have a symbol for 'tourist trails', available in five colours.

Number of track symbols in the legend for the GUGiK 1:50,000 maps: (Excluding symbols for surfaced roads.)

# 7

11

### Poland – Other Printed Maps

Commercially produced folded 1:50,000 topographic maps are available for many areas of Poland, often with overlaid hiking and cycling routes. The Tatra Mountains form the border between Poland and Slovakia.

Publisher	Publisher: CartoMedia. Retailer: Sygnatura.
Name of 1:50,000 series	CartoMedia Tourist Maps of Southern Polish Highlands.
Type and coverage	Thematic, selected areas in southern Poland.
Sheet name and number	Tatry W Całości, 11.
Date published	2016.

	drogi inne • drogi zamknięte i gruntowe • drogi polne lub leśne • ścieżki other roads • closed and unpaved roads • field and forest roads • footpaths sonstige Straßen · Straßen für Kfz gesperrt · Feldwege, Waldwege · Wege другие дороги • грунтовые дороги • полевые или лесные дороги • тропинки ostatné cesty • nespevnené cesty • poľné a lesné cesty • chodníky
	znakowane szlaki turystyczne <i>marked tourist routes</i> markierte Wanderrouten обозначенные туристические маршруты turistické značkované chodníky
1960. <b>(7</b> . 1976) N N	trasy dla rowerów górskich • ścieżki dydaktyczne <i>mountain bike routes • instructive trails</i> Mountainbikerouten • Lehrpfade трассы для горных велосипедов • дидактические маршруты cykloturistické trasy • náučné chodníky
<u> </u>	nartostrady i trasy zjazdowe • szlaki narciarskie <i>ski tracks, downhill ski trails</i> • <i>ski trails</i> Skipisten, Skiabfahrten • Skirouten лыжные трассы и спусковые лыжные трассы lyžiarske zjazdové trate a svahy • lyžiarske bežecké trate

Extracts from the legend of Tatry W Całości, 11 (2016).

Number of track symbols in the legend for *Tatry W Całości*, 11. (Excluding symbols for surfaced roads.)



Extract from Tatry W Całości, No. 11 (2016).

Line features overlaid onto this map are offset from the underlying basemap line features. This sometimes leads to three parallel line symbols where there is only one physical feature. If you can see past the map's clutter, however, much recreational information is there: footpaths, mountainbike routes, ski trails, etc.

Poland is slightly bigger than New Zealand in area. It has a population of 38 million, eight times that of New Zealand.

#### Portugal

Direção Geral do Território (DGT).
Instituto Geográfico Português (IGP) (Portugal Civilian Survey).
Civilian Topographic Series 1:50,000.
Core geographic, whole of Portugal.
Gouveia, 17D.
2013.

	Municipais e outras			,									
	Aterros, desaterros							•	•				adalahan AAAAAA
n, road IOS	Municipais e outros Municipal and other		ł	ŕ				•			•		
Way, patl Caminh	Vicinais e veredas . Local roads and paths				×	·	,	·		ł			<u></u>

Core track symbols from the bottom of the roads hierarchy. Enlarged.

Number of track symbols in the legend for <i>Gouveia</i> , 17D:	2
(Excluding symbols for surfaced roads.)	3



Extract from Gouveia, No. 17D (2013).

*Gouveia* 17D is a sheet from a conventional national 1:50,000 series of topographic maps. The maps have no thematic additions. The symbol for local roads and paths (Vicinais e veredas) appears frequently on this extract in its double-line form. It is difficult to tell from the legend which of these occurrences are vehicle tracks and which, if any, are footpaths.

#### Romania

Publisher	Bel Alpin Tour.
Name of 1:50,000 series	Tourist Map.
Type and coverage	Thematic, selected areas of Romania.
Sheet name and number	Munții Retezat - Retezat Mountains, 5.
Date published	2016.

The Retezat Mountains are in Transylvania, central Romania.



Extract from the roads section of the legend for Munții Retezat - Retezat Mountains, 5, enlarged.

Number of track symbols in the legend for *Munții Retezat - Retezat Mountains*, 5: (Excluding symbols for surfaced roads.)



Extract from Munții Retezat - Retezat Mountains, No. 5 (2016).

#### Slovakia

No information was found about Slovakian state-agency 1:50,000 topographic maps. The hiking and recreation map examined below is published by Shocart, a company in the Czech Republic.

Publisher	Shocart.
Name of 1:50,000 series	Turistická Mapa.
Type and coverage	Thematic, whole of Slovakia.
Sheet name and number	Slovenský Raj, 1106.
Date published	2018.

spevnená cesta, cesta, chodník, priesek • zpevněná cesta, cesta, pěšina, průsek • wzmocniona droga, droga, ściežka, przesieka • dirt road, cart track, foot path, narrow ride • befestigter Weg, Karrenweg, Fußweg, schmale Schneise • egyéb burkolt utak, szekérút, ösvén

Extract from the roads section of the legend for Slovenský Raj, 1106, enlarged.



Extract from the tourist section of the legend for *Slovenský Raj*, 1106, enlarged.

Number of track symbols in the legend for *Slovensky Raj*, 1106. (Excluding symbols for surfaced roads.)

4

The National Park of Slovenský Raj (Slovak Paradise) is in eastern Slovakia. In area, Slovakia is less than one fifth the size of New Zealand. It has a population of 5.5 million.



Extract from Slovenský Raj, 1106, enlarged. The skewed grid lines are as on the original.

On this map, the main tracks, denoted by strong coloured lines, are offset from underlying footpaths or farm tracks or dirt roads. This sometimes leads to three parallel line symbols, when in actuality there is only one physical feature.

#### Slovenia

Publisher	Not known.
Name of 1:50,000 series	Slowenischen Karte Topo50.
Type and coverage	Core geographic, whole of Slovenia.
Sheet name and number	Paper map not accessed. This entry is based on the legend.
Date published	BEV legend for Slovenia state 1:50,000 maps, dated 2014, accessed
	online 2019.

 All weather road, not for motor traffic
 Fair weather road - Worse track
 Path, footpath

Core track symbols from the bottom of the roads hierarchy in a legend published by the Austrian state mapping agency (BEV) in 2014. Enlarged.

Number of track symbols in the legend for the Slovenian 1:50,000 maps: (Excluding symbols for surfaced roads.)

### Slovenia - Other Printed Maps

Slovenia is a small country, one thirteenth the area of New Zealand. It has a population of two million. A commercial publisher, KartoGrafija, publishes a few tourist topographic maps for walkers and cyclists at 1:75,000 or 1:50,000. Local hiking tracks and recommended cycling routes are highlighted. KartoGrafija also publishes a few mountain topographic maps at 1:50,000 or 1:25,000.

4

Publisher	KartoGrafija.
Name of 1:50,000 series	Turistična Karta (Tourist Map).
Type and coverage	Thematic, selected areas in Slovenia.
Sheet name and number	Štajerska, 03.
Date published	2014.

Štajersk (Styria) is a region in northeastern Slovenia.



Extract from legend for Štajerska, 03. Enlarged.



Extract from legend for Štajerska, 03. Enlarged.

Number of track symbols in the legend for <i>Štajerska</i> , 03:	7
(Excluding symbols for surfaced roads.)	1



Extract from Štajerska, No. 03 (2014).

On this map, the main tracks, denoted by an unbroken red line for walking and by a broken darkblue (or black?) line for cycling, are offset from the underlying minor road or vehicle track. This sometimes leads to three parallel line symbols, when in actuality there is only one physical feature.

#### Spain

Publisher	Instituto Geográfico Nacional (IGN).
Name of 1:50,000 series	Mapa Topográfico Nacional de España 1:50,000 (MTN50).
Type and coverage	Core geographic, whole of Spain.
Sheet name and number	Paper map not accessed. This entry is based on the legend.
Date published	Legend undated, accessed online 2019.

Camino. Senda. Vía verde.	 Path. Track. Green lane.
Vía pecuaria. Sendero de Gran Recorrido.	Cattle way. Long-distance trail

Core track symbols from the bottom of the roads hierarchy. Enlarged.

Number of track symbols in the legend for the MTN50 maps:	5
(Excluding symbols for surfaced roads.)	3

#### Spain – Other Printed Maps

Several commercial companies in Spain produce printed topographic maps for selected areas as alternatives to the small sheets in the civilian or military surveys produced for the whole of Spain.

Also, the Institut Cartogràfic de Catalunya produces a series called Cartogràfic de Catalunya 1:50,000. The long-distance GR hiking trails (Gran Recorrido in Spanish, Gran Recorregut in Catalan) and the Via Verde routes appear on these Catalunya maps as overlaid lines. Mountain refuges are marked and a range of symbols indicate various places of interest including sport and recreational facilities.

Publisher	Institut Cartogràfic i Geològic de Catalunya.
Name of 1:50,000 series	Mapa comarcal de Catalunya 1:50,000.
Type and coverage	Core geographic, whole of Catalunya.
Sheet name and number	Alt Urgell, 04.
Date published	2014.

Alt Urgell is a comarca (county) in the Catalan Pyrenees. My understanding of the symbols in the legend of the *Alt Urgell* map is not entirely clear. (Google Translate struggled with Catalan.) But I've worked out that this map uses single black lines for foot-tracks, unbroken and extremely fine. The map shows 'senders de gran recorregut' – literally 'great trails' – with red dots, which are offset very slightly if there is an underlying feature, such as a track or stream. The next page carries a map extract on which are examples of the foot-tracks and of one GR.

Number of track symbols in the legend for *Alt Urgell*, 04: (Excluding symbols for surfaced roads.)





Extract from Alt Urgell, No. 04 (2014).

GR3, a *sender de gran recorregut*, shown in tiny red dots, crosses this extract. When this regional trail follows a line feature, such as a vehicle track, the red dots are slightly offset from the underlying line feature. Many ordinary foot-tracks are shown as hair-like black lines, a test of the map user's eyesight. (The grid lines on this map are ten centimetres apart.)



Alt Urgell, No. 04 (2014 edition).

This Catalan map, at a width of 1.14 metres and with a height of 1.46 metres, is the biggest map I've ever seen. It fits the whole of the county of Alt Urgell onto one sheet. Printed on a thin tough plastic and priced in London at £10.99 excluding VAT (NZD 21.90).

#### Sweden

Publisher	Government agency: Lantmäteriet. Publisher: Norstedts Kartor. Retailer: Kartbutiken.
Name of 1:50,000 series	Sverigeserien - Topo50.
Type and coverage	Thematic, selected areas in southern Sweden.
Sheet name and number	Kalmar, 9.
Date published	2018.

Sverigeserien - Topo50 is an outdoor map series based on data supplied by the government agency Lantmäteriet. The series consists of 116 sheets with coverage of southern and central Sweden and the northern coastline. Kalmar is a city in the southeast of Sweden, situated by the Baltic Sea. The map is marketed as suitable for outdoor activities such as hiking, trail running, hunting, fishing, horse riding, cycling, mountain biking, canoeing and skating. The map is printed on both sides of a weather-resistant material called Polyart.

o	Enskild sämre bilväg med vändplan <i>Private road, poor standard with turning place</i> Schlechtere private Autostraße mit Wendeplatz
	Uppfartsväg, parkväg, cykelväg <i>Approach road, park road, cycle path</i> Auffahrt, Parkweg, Radweg
	Traktorväg <i>Tractor track</i> Traktorweg
======	Väg under byggnad <i>Road under construction</i> Autostraße in Bau
	Gångstig <i>Foot path</i> Pfad
	Elljusspår <i>Illuminated track</i> Joggingpfad mit Beleuchtung
	Vandringsled <i>Hiking trail</i> Wanderweg

Extract from the roads section of the legend of the Sverigeserien - Topo50 series, enlarged.

Number of track symbols in the legend for Kalmar, 9:	6
(Excluding symbols for surfaced roads.)	0



The series Sverigeserien - Topo50 has two symbols for a foot-track: black dots (footpath) and red dots (hiking trail). On this extract, a hiking trail runs up the coast. When a hiking trail follows a tractor track or a private road or a main street, the red dots are fractionally offset from the underlying feature, so as not to obscure that feature.

The legend includes a symbol for 'Approach road, park road, cycle path'. This map extract has no examples of this line symbol.

### Sweden – Other Printed Maps

As well as publishing Sverigeserien, Norstedts Kartor also publishes an outdoor-map series called Outdoorkartan. This series includes twenty-eight 1:50,000 topographic maps of selected recreation areas in southern Sweden. A Norstedts information sheet on Outdoorkartan includes a section about allemansrätten, the right of public access that gives everyone the right to enjoy Sweden's outdoors.<sup>1</sup>

Sweden has a population about twice that of New Zealand and a land area about 1.6 times New Zealand's.

<sup>1</sup> Norstedts Kartor, 'Outdoorkartan', Norstedts Kartor (no date) <http://outdoorkartan.se/en/> [accessed 11 Sept 2019].

### Switzerland

Publisher	Federal Office of Topography, also known as Swisstopo.
Name of 1:50,000 series	National Map 1:50,000 (NM50).
Type and coverage	Core geographic, whole of Switzerland.
Sheet name and number	Paper map not accessed. This entry is based on the legend.
Date published	Legend dated 2018, accessed online 2019.

3 m Road (> 3 m) hard surface, unsurfaced, not suitable for vehicles	
2 m Track (> 2 m) hard surface, unsurfaced, not suitable for vehicles	
1 m Track (< 2 m), footbridge	
Signposted route	
Track fragment	

Core track symbols from the bottom of the roads hierarchy. Enlarged.

Number of track symbols on the standard NM50 maps: (Excluding symbols for surfaced roads.)

8

#### Switzerland – Other Printed Maps

As well as publishing the standard NM50 maps, Swisstopo publishes special 1:50,000 hiking maps that cover the whole country and are available printed. The hiking maps are published in cooperation with the Swiss Hiking Federation.

Publisher	Federal Office of Topography, also known as Swisstopo.
Name of 1:50,000 series	Swisstopo Wanderkarte [Hiking].
Type and coverage	Thematic, whole of Switzerland.
Sheet name and number	Mischabel, 284 T.
Date published	2013.



Extract from the overlaid margin information on *Mischabel*, 284 T. Enlarged.

Number of track symbols in the legend for *Mischabel*, 284 T: (Excluding symbols for surfaced roads.)



Extract from Mischabel, No. 284 T (2013).

At first glance this map looks like a military adaptation of a civilian map. But when you look closely at the red tracks, it becomes obvious that the overlaying has been accomplished with great precision characteristic of the best of modern maps. This pedestrian-focused map contrasts obviously with the Bavarian map on page 36, which is more multi-purpose, showing a wider variety of tracks.

#### Update - Swisstopo 1:50,000 Hiking Maps

The 2013 *Mischabel* 284 T sheet illustrated above may be an out-of-date version of this series. Apparently the latest sheets in this series are based on the new-generation 1:50,000 national map. The new maps show the trails in yellow, red and blue, matching the trail signage on the ground. The three colours represent the official levels of difficulty. Yellow=hiking trail, red=mountain hiking trail, blue=alpine hiking trail.

### **The Netherlands**

Publisher	Kadaster Geo-Informatie. Formerly Topographische Dienst.
Name of 1:50,000 series	Topographic map 1: 50,000, shortened to TOP50NL.
Type and coverage	Core geographic, whole of The Netherlands.
Sheet name and number	Eindhoven, 51-West.
Date published	2019.

onverharde weg	unmetalled road
fietspad	cycle track
pad, voetpad	path, footpath

Core track symbols from the bottom of the roads hierarchy. Enlarged.

Number of track symbols in the legend for *Eindhoven*, 51-West: (Excluding symbols for surfaced roads.)



Extract from *Eindhoven*, No. 51-West (2019).

The Netherlands is a crowded county, one eighth the area of New Zealand and with a population of 17 million. The above extract of an area near Eindhoven has a dense network of local roads (yellow) and unmetalled roads (double lines with a hint of grey fill). One of the symbols for a cycle track is similar to the symbol for a narrow local road. I could not spot any cycle tracks on this extract. There appear to be few footpaths, but some would probably show up on 1:25,000 mapping. The Dutch Cadastre, Land Registry and Mapping Agency is strongly promoting topographic mapping at a scale of 1:25,000.

3

# **United Kingdom**

Publisher	Ordnance Survey.
Name of 1:50,000 series	Landranger Active Map.
Type and coverage	Core geographic and thematic (dual role), whole of UK.
Sheet name and number	Buxton and Matlock, 119.
Date published	2016.

 Road generally less than 4m wide

Other road, drive or track

Core track symbols from the bottom of the roads hierarchy. Enlarged.

PUBLIC RIGHTS OF WAY			
	Footpath Bridleway	Public rights of way shown on this map have been taken from local authority definitive maps and later amendments.	
	Restricted byway (not for use by mechanically propelled vehicles) Byway open to all traffic	The symbols show the defined route so far as the scale of mapping will allow. Rights of way are liable to change and may not be clearly defined on the ground. Please check with the relevant local authority for the latest information.	
The representation on this map of any other road, track or path is no evidence of the existence of a right of way.Rights of way are not shown on maps of Scotland, where rights of responsible access apply. For more details visit: outdooraccess-scotland.com			
OTHER PUBLIC ACCESS			
• •	National Trail, Scotland's Great Trails, European Long Distance Path and selected recreational routes National Cycle Network; On-road cycle route	••••• Other route with public access (not normally shown in urban areas) The exact nature of the rights on these routes and the existence of any restrictions may be checked with the local highway authority. Alignments are based on the best information available. These routes are not shown on maps of Scotland.	
0 0 0	Traffic-free cycle route		

In the case of England and Wales, these Landranger maps use nine different track symbols (excluding the one for an on-road cycle route).

England and Wales Number of track symbols in the legend for the Landranger maps: (Excluding symbols for surfaced roads.)	9 or about 13 if you include combinations.

Scotland	5
Number of track symbols in the legend for the Landranger maps:	3
(Excluding symbols for surfaced roads.)	
People in Scotland enjoy wide-ranging rights of responsible access to land. So	
Scottish maps do not need the public footpath or public bridleway line symbols	
that are essential on maps of England and Wales.	

#### United Kingdom – Notes

The *Buxton and Matlock* Landranger map is the last of the European maps that I have looked at. For the previous twenty-two maps, I have deliberately avoided discussing people's rights of access to tracks (except for a mention of allemansrätten in the Sweden section). Such rights vary greatly from country to country and embody long-standing social conventions and a mixture of very old and relatively new formal rules. In the case of the tracks on UK Landranger maps, however, it becomes impossible to skate around the access aspects any longer because in the 1960s the UK wrestled with similar mapping issues to those being tackled in New Zealand today.

Like the legends of the topographic maps of New Zealand and of Victoria described on page 11 and on page 14, the legend of the Landranger maps carries an access disclaimer. This disclaimer appears under the four public-rights-of-way symbols and it includes a crucial extra word, 'other': 'The representation on this map of any *other* road, track or path is no evidence of the existence of a right of way.' (My italics.) In other words, the disclaimer does not apply to the public footpaths and public bridleways.

There is a significant difference between the Ordnance Survey 1:50,000 topographic maps of Scotland and those of England and Wales. Map symbols that differentiate between public and private footpaths and between public and private bridleways, so essential and crucial on the maps of England and Wales, are not necessary on the maps of Scotland. Looking at this fundamental and surprising difference from a New Zealand perspective begs the question: which of these two blocks is New Zealand most like? Which approach to showing the tracks would suit New Zealand best?

In terms of mountainous terrain and population density, large parts of New Zealand are more like Scotland than England. Regarding the mapping of cycle tracks and foot-tracks, however, the needs of map users in New Zealand are more like the needs of map users in England and Wales than those of map users in Scotland (or of map users in Norway and Sweden). Map users both in New Zealand and in England and Wales need the maps to show which tracks are public and which are private.

How did the Ordnance Survey maps of England and Wales acquire their public footpath and public bridleway symbols? They did not appear overnight. They evolved over two decades after 1949, when the National Parks and Access to the Countryside Act introduced procedures for the recording and mapping of rights of way across much of England and Wales. The first inchto-the-mile map (1:63,360) to show these rights of way was published in 1959. Many footpaths that had been shown as broken black lines became broken magenta lines, not by overlaying but by replacement. So the new symbols became part of the design of the map, not adaptations.

By the late 1960s, most local authorities, excluding the old Urban Districts and Inner London Boroughs, had completed their definitive maps. Gradually the 1:50,000 maps of England and Wales gained their rights of way. The process was not without teething problems; at least one map of part of the Lake District showed a public footpath, sketched in provisionally, going straight over a vertical crag. Looking back at this period, Nicholas Crane wrote:

The 1960s was a decisive decade for the OS as it saw the transformation of the one-inchto-the-mile series into a bestseller. The redesigned seventh series of the one-inch rocketed to sales of nearly one-and-a-half million a year. A cartographic classic, this was the map that turned a generation on to the great outdoors.<sup>1</sup>

Local authorities in England and Wales are obliged to keep their 1:10,000 definitive maps of public footpaths and public bridleways up to date. (Walkers and cyclists in England and Wales

<sup>1</sup> Nicholas Crane, 'Britain: Master of all He Surveys', Telegraph (30 Oct 2004) <https://www.telegraph.co.uk/travel/731568/Britain-Master-of-all-he-surveys.html> [accessed 23 Aug 2019].

now also enjoy some area access to precisely defined open country, but these rights are more restrictive than those enjoyed by people in Scotland.)

An analogous process began in New Zealand more recently. During the walking-access debate of 2003–8, the majority opinion rejected the idea of creating area access (sometimes called the right to roam) over private rural land. Had New Zealand moved towards creating extensive rights of area access, as Scotland had done, we would not now be needing to split our rural tracks into public and private categories. Our maps could have been more like the Scottish and Scandinavian ones, not requiring symbols for public footpaths or public bridleways. But instead, New Zealanders very definitely dismissed, or at least shelved, the idea of statutory area access to private land. As a consequence of this rejection, the focus of attention in New Zealand swung purposefully onto linear access across rural land, and especially onto the need for foot-tracks and cycle tracks.



Extract from Buxton and Matlock, No. 119 (2016).

On the Landranger maps, when a public footpath or public bridleway follows an existing line feature, such as a vehicle track, no offset is applied. The magenta line symbols are overlaid precisely onto the centreline of the underlying line feature.



Screenshot from www.stanfords.co.uk, 2019. Once upon a time the choice was paper or cloth. Buyers of Ordnance Survey Landranger maps now have a choice of paper or paper laminated on both sides. Looking further afield, across Europe, maps are being printed on a variety of different papers and different plastics.



(Above) Extract from Buxton and Matlock, No. 119 (2016).

The Ordnance Survey printed maps come with a code that gives access to a digital map. All current edition OS Landranger 1:50,000 maps and OS Explorer 1:25,000 maps have the mobile download available for Android and iOS (Apple) devices. So you have the same map on your phone as you have on paper. One track symbology, designed for the printed maps, serves both purposes. You need to learn only one set of conventional signs. In New Zealand, the only national series of printed maps available for use in one of these dual-purpose arrangements would be LINZ's Topo50, which does not show public access.



The *Buxton & Matlock*, No. 119 (2016) map on the author's phone.

#### **Vehicle Tracks and Gates**

My interest in examining the track symbols on European maps has mainly focused on the depiction of bicycle tracks and foot-tracks. I haven't said much about the symbols for vehicle tracks. Suffice to say that in the maps examined, the symbol for a vehicle track took eight different forms.

When designing the track symbols for a new map, one of the important early decisions is the symbol for a vehicle track, the main choice being between a double line and a single line. LINZ's Topo50 uses a single broken black line. Some 1:50,000 topographic maps use a double unbroken black line, which is arguably a more intuitive symbol for this feature.



Extract from *Dunedin*, CE17 (2015), showing vehicle tracks (and one foot-track) on the northern Silver Peaks.



Extract from *Pfaffenwinkel - Ammergauer Alpen Nord*, 49 (2016). This map uses a double unbroken black line (with a white fill) for a vehicle track or unsurfaced road.



A vehicle track.

#### Gates

In some countries, being confronted by a locked gate, carrying a private notice or the name of a farm or forestry company, alerts you to the fact that a road or a vehicle track is private. In New Zealand, a locked gate raises the possibility that a road or a vehicle track *might* be private. (Gates across unformed public roads are common, for farming reasons, but it is illegal for the landholder to lock them.) The maps in some countries use a gate symbol to show the start of a private road or of a private vehicle track. LINZ's Topo50 already has two potentially useful gate symbols, one black and one red. I do not know how often they are used:

#### Gate, locked gate, cattlestop.....

Extract from legend of Warkworth, No. AZ31, 1.05 edn., 2019.

Here is how the Finnish map Ruka Oulanka Karhunkierros shows a road bar:

Ajotie, puomi • Körväg, vägbom • Vehicle track, road bar • Fahrweg, Schlagbaum • Проезжая дорога, Шлагбаум

Extract from the legend of Ruka Oulanka Karhunkierros (2017). Enlarged.

Here is how the Victoria map *Falls Creek* No. 8324-S shows private access roads and vehicle-track restrictions:

Private access, proposed road	
Road Restrictions. MVO Management Vehicles Only SSC Subject to Seasonal Closure SHWL Subject to Height or Weight Limits RPC Road Permanently Closed. RU Road Unmaintained DWO Dry Weather Only	(MVO) (SSC) (SHWL) (RU) (DWO) (RPC)

Extract from the legend of Falls Creek, 8324-S (2019). Enlarged.

Here is how the UK Landranger map Buxton and Matlock No. 119 shows a gate:



Extract from the legend of Buxton and Matlock, 119 (2016). Enlarged.

Here is how the Italian IGC map *Monte Rosa* No. 10 shows roads that are restricted to authorised vehicles:



Extract from the legend of Monte Rosa, 10 (2014). Enlarged.

The Monte Rosa map extract on page 41 has examples of this gate symbol in use.

Here is how the Norwegian map Vest-Lofoten No. 2745 shows private roads and toll roads:



Extract from the legend of Vest-Lofoten, 2745 (2016). Enlarged.

Here is how the French map Autour du Thabor No. 16 shows roads not open to motor vehicles:



Extract from legend of Autour du Thabor, 16. Enlarged.

The legend extract and map extract below show how the Swedish map *Kalmar* No. 9 shows private roads. Private roads in Sweden may often be closed to motor vehicles but open to walkers, who have allemansrätten.



Extract from the legend of Kalmar, 9 (2018). Enlarged.



Extract from Kalmar, No. 9 (2018). Enlarged 200%. Includes seven examples of barriers across private roads.

In the 2000s, Terralink International published some recreational topographic maps for selected areas of New Zealand. The extract below has examples of a gate and a locked gate. The inclusion of access information in text boxes was a debatable aspect of these maps cartographically. The series did not pioneer any new line symbols for tracks.



Extract from *Queenstown & Cromwell Recreation Areas*, a 1:50,000 recreation map published by Terralink International, 2003. Enlarged.

#### **Topographic Maps in Europe – Summary**

I am wary of generalising about the 1:50,000 printed topographic maps that have landed in my letter-box over the last couple of months. But I can say two things. Firstly, if you thought that printed maps were old-school thinking ... Think again! Secondly, these modern maps are remarkably different from one another. Compare, for example, the futuristic detail of the Finnish *Ruka Oulanka Karhunkierros* with the solid simplicity of the Portuguese *Gouveia* or with the commercial razzmatazz of the Polish *Tatry W Całości*.

Regarding their depiction of tracks, the maps vary widely, even at the most fundamental and important level.

Some maps do not include any symbol specifically for a bicycle track. In the maps that do have a bicycle track symbol, those symbols take eight forms. The term 'cycle track' can cover everything from flat excursions in the Netherlands to narrow and rocky downhills in the French Alps.

In the case of foot-tracks, no longer do the single broken black lines have a monopoly. The Bavarian UK50 recreation maps, for example, have seven red or red-and-green line symbols for hiking tracks. Other than black, the most common colour for a foot-track was red.

Different countries have different needs and priorities. The German 1:50,000 DTK50 maps have a track symbol for mudflat hiking routes. The Finnish state 1:50,000 maps allocate a track symbol to winter roads, whereas the Austrian UTM and the Slovenian state 1:50,000 maps have a symbol for fair-weather roads. The Spanish 1:50,000 MTN50 maps give track symbols to cattle ways and green roads. The Swedish Sverigeserien 1:50,000 maps assign a symbol to illuminated tracks, important amenities in a country that has long winter days. These Swedish maps and the Norwegian N50 maps have a symbol for private roads. The Italian IGC Series 50 maps have a symbol for via ferrata ('iron ways'). The Swiss NM50 maps give a symbol explicitly to signposted walking routes, while New Zealand's Topo50 maps have a symbol for poled routes.

High-quality printing in some countries is now producing results so sharp that the finest detail is beyond the reach of average eyesight, unless you use a magnifying glass. The Bavarian UK50 series appears to be in a class of its own, using an elaborate track symbology that has yet to be widely imitated at 1:50,000.

Several national mapping agencies, such as those in France and Croatia, no longer produce 1:50,000 topographic mapping. This may not necessarily signal a contraction. In France, the IGN is attaching much importance to 1:25,00 and 1:75,000 mapping. In Croatia, the DGU seems to be prioritising national coverage at 1:25,000. I have deliberately avoided, in this paper, becoming involved in the pros and cons of 1:25,000 topographic mapping. Suffice to say that if anyone were to repeat this study to look at 1:25,000 maps, the availability of 1:25,000 maps in New Zealand (nil) would contrast clearly with their availability and popularity in Europe.

I said earlier that the European maps that I had looked at were strikingly different from one another. Behind the differences, all the countries shared one obvious trend: the drawing up and publishing of recreational topographic maps has become an essential part of their tourist industries and of their active outdoor sectors. In some regions, commercial companies compete with each other, producing rival 1:50,000 recreational or tourist folded maps for the same areas. A search of the website of Stanfords, a London map retailer, with the filter set to 'Topographic maps and atlases' and 'Europe', produced a list of 7,765 items. As regards the market for these maps, the population of Europe in September 2019 was about 747 million, according to United Nations estimates.

Despite the ever-advancing capabilities of the smart phone, it would take a brave commentator to forecast that printed maps are on the way out. Many map users like to spread their maps across a table, something you cannot do with a phone. In the UK during the 2017-18 financial year, the sales of the Ordnance Survey's paper maps (including the 1:25,000 maps) grew by 7 per cent, with 1.73 million maps sold. When an Ordnance Survey paper map is sold, the buyer receives a code to download the digital version of that map (see page 65). The Ordnance Survey has recognised and exploited the great practical advantage of having the same map on paper as you have on your phone. Here is what Nick Giles, the Ordnance Survey's managing director of leisure, said about the combination of paper and digital maps:

In many industries you are seeing traditional printed products in decline while digital is on the rise. But in terms of OS map sales we are delighted to see both formats working hand in hand...

People are now realising the importance of mapping and the need to carry both types from a safety point of view. The world has gone mobile and it is handy to have downloaded OS maps on your smart phone. It is convenient, fits in your pocket and is the most up-todate mapping available. But you can never 100 per cent rely on technology. Phones run out of battery, or even end up being dropped in puddles. By having a paper map with you as well as OS maps on your phone, wherever you are in Great Britain you can be sure you won't be lost.<sup>1</sup>

Stanfords of London claims to be 'the world's largest map and travel book retailer'. Measured in turnover, the split at Stanfords between physical and digital maps is half and half. Among its customers are military agencies all over the world. In October 2019, Vivien Godfrey, the chief executive of Stanfords, said that 'while they [the military customers] all switched to digital maps 10 or so years ago, they are now rushing back to paper ones ... You just don't get any perspective if you are looking at a map on a small screen. And the batteries on handheld devices run out, especially in very cold environments.'<sup>2</sup>

There has been some support for this view in New Zealand. A LINZ map-reading guide advises its readers: 'Note: a GPS is no substitute for a map and compass.' In 2016 Geoff Aitken, the founder and owner of the private company NewTopo (NZ) Ltd, wrote:

Contrary to some people's expectations, GPS and other technologies have not superseded the need for a paper map in the field. Maybe it never will. Last year a mountaineer visiting New Zealand from Europe found himself in a difficult situation after transferring a map to a handheld device and using it so much his batteries went flat. Local Search and Rescue personnel were not impressed. This incident highlights the need for paper copies of maps in spite of technological advances in other communication fields.<sup>3</sup>

It is now time for me to return, mentally, to New Zealand, mission accomplished. Am I bringing anything useful back with me?

A handy but sometimes fuzzy way of looking at a range of topographic maps is to divide them into two sets: core geographic and thematic. The core geographic European maps examined in this study were *Gouveia* (Portugal), *Nivelles* (Belgium), *Priekule* (Latvia) and *Eindhoven* (The Netherlands). Every foot-track symbol and vehicle-track symbol on these four orthodox maps is black.

Two of the twenty-five maps were oddities, being national-agency core geographic maps with some thematic content. These were *Buxton & Matlock* (England and Wales), authoritatively showing footpaths and cycle tracks that are open to the public, and *Neustift im Stubaital* (Austria).

<sup>1</sup> Ordnance Survey, 'Ordnance Survey Announces Rise in Sales for Both Paper and Digital OS Maps', Ordnance Survey (25 May 2018) <a href="https://www.ordnancesurvey.co.uk/about/news/2018/paper-digital-map-sales-increase.html">https://www.ordnancesurvey.co.uk/about/news/2018/paper-digital-map-sales-increase.html</a> [accessed 23 Aug 2019].

<sup>2</sup> Will Smale, 'The Map Store Boss Who Took the Long Route', BBC News (21 Oct 2019) <a href="https://www.bbc.com/news/business-50069476">https://www.bbc.com/news/business-50069476</a>> [accessed 6 Nov 2019].

<sup>3</sup> Geoff Aitken, 'New Topo Mapping', in *Unbounded Mapping of Mountains: Proceedings of the 10th ICA Mountain Cartography Workshop* (Dresden, Germany: Technische Universität Dresden, 2017), pp. 79–89 (p. 87).

Thematic topographic maps are maps that cater for specific users. Of the twenty-five maps examined, nineteen were thematic. At the start of this thematic set, occupying one extreme, was the narrow simplicity of the *Bornholm* (Denmark) cycle map, great for cyclists, less useful for walkers. Somewhere in the middle of this range of thematic maps was *Pfaffenwinkel – Northern Ammergau Alps* (Bavaria), based on the German core geographic maps (DTK50s) but with extensive overlaid tracks. Furthest away from the pure royal lineage were the commercially produced general tourist maps, attempting to show walking tracks and bike tracks as well as local museums, adventure sports sites, viewpoints, skateboard parks, picnic tables and ice-cream vendors.

Some countries in Europe have the best of both worlds: a state-agency orthodox series of 1:50,000 topographic maps covering the whole country and a high-quality recreation or tourist series, also at 1:50,000. New Zealand looks unlikely to ever have two such series of printed maps, each covering the whole country. But we could redesign Topo50, or replace it with a completely new series, to serve several purposes: recreation and tourism as well as core geographic information.
# Part Three: Back to New Zealand



#### **Two State Map-makers and Their Maps**

If solving cartographic challenges was your forte and if you were arriving at Auckland Airport carrying a bag of modern track symbols that you were eager to put to work, this country at the present time would be an interesting place in which to work. The situation is ripe for an alliance of pragmatic copycats, on the lookout for ideas worth borrowing, and cautious innovators, aware of the complexities that lie behind walking and cycling access to the New Zealand countryside. For a start, there are two state map-makers and seven maps:



The above framework contains seven maps. Most of them probably have track symbols that could benefit from some ideas from Europe, but I will concentrate my attention on Topo50, Tracks and Trails, and Find My Adventure.

#### LINZ and Topo50: Sorry, we don't do access

The LINZ Topo50 series remains the only series of printed 1:50,000 maps to cover the whole of New Zealand. Because New Zealand has a relatively small number of potential buyers of printed maps, New Zealanders will probably never have a second, alternative series of printed 1:50,000 topographic maps that covers the whole country.

Countries can take different approaches to some important design aspects of their topographic maps. On page 11 I discussed the LINZ disclaimer that is printed on every Topo50 map. I questioned a sentence in a LINZ information sheet: 'It is not possible to accurately show which roads and tracks are public and which are private.'

There is another twist to this situation. LINZ has a mandate that explicitly requires it to undertake topographical mapping to a degree of quality and quantity defined by the defence force, police, fire service, ambulance, search and rescue, and agricultural, horticultural and forestry central government ministries.<sup>1</sup> There's no mention of outdoor recreation or tourism.

Let's try to get to the nub of this mapping issue, as I see it from the outside, a long way away from Wellington. Many government departments or organisations engage in cartography, but the matters examined in this study involve just two state map-makers. One of them, LINZ, the senior partner on mapping, is adamant that topographic maps cannot differentiate between public and private tracks. Even if we disprove that contention, things will not change, because legislation does not explicitly require LINZ to consider the needs of outdoor recreators or of active tourists.

The other state map-maker in this story, the NZWAC, has the statutory function of 'compiling, holding, and publishing maps and information about land over which members of the public have walking access'.<sup>2</sup>

There does seem to be a diametrically opposite difference here between the role of LINZ and that of the NZWAC. At the heart of this difference are two contrasting interpretations of topographic mapping. How clear is the dividing line between the two interpretations? Is it distinct and straightforward or is it arbitrary and inflexible?

In 1976, the mapping section of the Department of Lands and Survey employed eighty registered land-surveyors, a hundred survey technicians, about 560 draughts-people and about forty others. Even so, several circumstances – such as technological limitations, other priorities and a lack of demand – prevented the army of cartographers from designing maps that showed walking and cycling access. But the same cartographic limitations do not exist any more. This is an indisputable fact, confirmed by examining current maps from twenty-five countries in Europe. The LINZ viewpoint, a narrow interpretation of the capabilities of topographic maps, evolved when those cartographic constraints did exist and before LINZ itself existed. LINZ inherited this established philosophy and a correspondingly narrow mandate in 1996.

Now, despite several decades of advances in GIS and cartography, progress that LINZ has been heavily involved in, it seems that current legislation requires LINZ to maintain a narrow interpretation of the purpose of its 1:50,000 topographic maps. The law does not either require or allow LINZ to apply its expertise to produce maps that show walking and cycling tracks that are open to the public. As I see things, the matter has become, consciously or unconsciously, a matter of policy, not one of inadequate technology.

Why does this issue matter? Why is Topo50 important? Can't the NZWAC just carry on with its development of the WAMS maps, which show walking and cycling access? The diagram on page 74 summarises the ways in which LINZ and the NZWAC coexist and cooperate. There are two reasons why Topo50 remains a crucial part of our mapping of walking and cycling access:

<sup>1</sup> Drecki, Igor and Antoni Moore, 'Cartographic Activities in New Zealand 2015–2019', Cartopress, New Zealand Cartographic Society (2019) <a href="https://icaci.org/files/documents/national\_reports/2015-2019/newzealand-2019\_hq.pdf">https://icaci.org/files/documents/national\_reports/2015-2019/newzealand-2019\_hq.pdf</a>> [ac-cessed 24 Oct 2019], p. 15.

<sup>2</sup> Walking Access Act 2008, Section 10c.

- the digital version of Topo50 is the primary basemap for the Tracks and Trails map. It profoundly affects the track symbology of the Tracks and Trails map bacause it leaves the Tracks and Trails map to do all the hard work in the job of denoting access. One way to balance the load would be to shift some of the depiction of access onto the basemap. The Tracks and Trails map could then indicate regional and national trails with line decorations instead of with overlaid lines that sometimes obscure underlying detail.
- 2. the paper version of Topo50 is the only printed 1:50,000 topographic map that could form one half of a map-plus-phone combination of the sort described on page 65.

## Commercial Publishers of Printed Topographic Maps

One or two commercial publishers may continue to produce some printed topographic maps, especially for popular recreational areas. But even if visitors from overseas buy some New Zealand maps, the market for these maps is small compared to, say, the market open to the Swiss firm Kummerly and Frey, a publisher based in a country of 8.5 million people and relatively close to over 700 million other Europeans. Geoff Aitken has tested the New Zealand market. Even with his excellent products, over about a decade of selling maps, 'half of the 40 NewTopo maps could be considered to be commercial failures'.<sup>1</sup>

## New Zealand Walking Access Commission: Walking Access Mapping System (WAMS)

There are some topics I've hardly touched upon yet. This study has looked only at printed maps, not at digital maps. But to discuss any ideas that New Zealand might borrow from Europe, I now need to widen the subject to include the digital maps that NZWAC is developing. The online Walking Access Mapping System (WAMS), created by the NZWAC and its GIS contractors, has developed steadily for ten years, is adapting new technology to solve national mapping issues, and is likely to undergo further improvement and refinement for another decade or so. The WAMS is quite a complex bundle of information sources. Presently it includes six different digital maps: the Tracks and Trails map, the Outdoor Access map, the Public Access Areas map, the Property Information map, the Hunting and Fishing map, and the Find My Adventure map. I have yet to decide whether this is evolutionary heaven or evolutionary hell.

The Tracks and Trails map shows some tracks in a way that implies that they are open to the public. These include gazetted walkways, Department of Conservation tracks, national trails (such as Te Araroa) and the NZ Cycle Trail. The Tracks and Trails map also shows many other tracks – the black tracks – whose statuses await investigation.

The Find My Adventure map is a recent addition to the WAMS. It is being created through the custom map-provider Mapbox and is based on a new database using high-quality data. The commission's GIS staff are working directly with individual councils to obtain the councils' track data and to gradually build the database. This large project will take some time. It remains to be seen whether all the local authorities have the means to collect the necessary high-specification data.

## New Zealand Walking Access Commission: Tracks and Trails Map

An important touchstone for gauging the success or otherwise of the WAMS is the quality and completeness of its online Tracks and Trails map. This online map uses the LINZ Topo50 as a basemap, overlaying Topo50's black tracks with strong coloured lines as shown on page 8. This is effective in some ways but might not be an ideal solution aesthetically or cartographically. A better solution would require new track symbols that can be overlaid onto the basemap's tracks but which do not disrupt the hierarchical symbology. Some examples of track symbols that could be used to achieve this can be seen in the 1:50,000 printed topographic maps *Neustift im Stubaital* (Austria) and *Pfaffenwinkel – Northern Ammergau Alps* (Bavaria).

The Austrian OK 1:50,000 UTM printed topographical maps employ a variation on the direct overlaying of line symbols. An extract on page 20 shows this variation. The overlaid green lines

<sup>1</sup> Geoff Aitken, 'New Topo Mapping', in Unbounded Mapping of Mountains: Proceedings of the 10th ICA Mountain Cartography Workshop (Dresden, Germany: Technische Universität Dresden, 2017), pp. 79–89 (p. 89).

appear beside the line feature that they modify, hence not obscuring that feature. The Swedish Sverigeserien 1:50,000 maps and the Catalan 1:50,000 maps use a similar solution.

The special recreational topographic maps of Bavaria show that, given highly accurate printing, it is possible for a paper 1:50,000 topographic map to differentiate between as many as thirteen different varieties of track. (I use the word 'track' here in a wide sense, as used throughout this document, encompassing vehicle tracks, cycle tracks, foot-tracks and unmaintained routes.) The designers of the Bavarian map use overlaying extensively to create new track symbols. They do so in an ingenious and intricate way that maintains a logical hierarchy. An extract on page 36 shows the track symbols used on these maps.

An alternative approach, superior to overlaying the basemap line symbols, would require redesigning the track symbols of the Topo50 basemap to differentiate public tracks from private tracks. Doing this would lead to desirable and far-reaching improvements to the Track and Trails map. A heap of ideas on track symbols are now available here, in this study. The first-choice place for a few of these ideas to be employed would be a redesigned Topo50 or its successor. This seems unlikely to happen. As far as I'm aware – I am looking in from the outside – LINZ has shown no appetite for such a helpful redesign. A categorical LINZ statement sets out what LINZ sees as being an unavoidable limitation of 1:50,000 topographic mapping in New Zealand:

Roads and tracks shown on our maps are not necessarily accessible to the public. This is stated on the maps and in the metadata for the datasets used to produce them. It is not possible to accurately show which roads and tracks are public and which are private. This information can change often, and in some cases ownership or access to a road or track is not clear.

That's clear. No redesign of Topo50 track symbols. Like it or lump it. Before permanently rejecting this possibility we ought to recognise how very successful such a redesign can be. An example of a core national topographic series that shows walking and cycling access is the UK's Landranger maps. Their magenta line symbols for public footpaths and public bridleways, which achieve their purpose without obscuring any underlying detail, are familiar to millions of Britons. The magenta lines, in company with the various black symbols for other tracks, form an intuitive hierarchy. An extract on page 62 shows these symbols.

I hasten to add that in seeking to show linear public access on either Topo50 or on the Tracks and Trails map, New Zealand's map-makers face greater complications than did the designers of the UK's 1:50,000 topographic maps of the 1960s. The Ordnance Survey cartographers needed to show two main legal mechanisms: public footpaths and public bridleway (plus two oddities, far less common, called restricted byways and byways open to all traffic). Rights of public access to tracks in New Zealand involve eight reservations that make up the Queen's Chain: roads; marginal strips; ambulatory marginal strips; public reserves along water; esplanade reserves of various types; recreation reserves; esplanade strips; and Maori reservations.<sup>1</sup> And remember that the public have access to many tracks across publicly owned land, such as in national parks. As well, there are an increasing number of gazetted walkways based on easements. This mix of legal mechanisms remains a cartographic challenge but not an insurmountable stumbling block. I've mentioned ten legal access mechanisms. So, do the maps need ten additional track symbols, apart from the black tracks? Or can we herd these legal categories into two or three genres and invent some suitable new labels in plain English such as 'other foot-track legal'? This herding into a few genres has been an obvious solution all along, but the idea might still be waiting to be recognised and adopted by our walking access leaders. If these new generic track symbols were introduced, the maps that use them would need to carry a note about the range of underlying legal mechanisms.

<sup>1</sup> Land Access Ministerial Reference Group, Walking Access in the New Zealand Outdoors: A Report by the Land Access Ministerial Reference Group (Wellington, NZ: Ministry of Agriculture and Forestry, 2003), p. 14.

#### Improvements

#### Walking Access Mapping System: Improvements Are Coming

In September 2019, the Ministry for Primary Industries published a report on the findings of the review of the Walking Access Act 2008. One of the report's findings was that the walking access mapping system (WAMS) was one of the two most important things that the commission's stakeholders valued. In highlighting this growing public importance of the WAMS, the review panel correctly identified the most significant success of the 2008 act. The report recommended an increase in the commission's funding to support the particular purpose of continuously improving the WAMS:

Recommendation 29

- a) given the core work of the [New Zealand Walking Access] Commission, specifically the Walking Access Mapping System and the work of Regional Field Advisers, is highly valued, the Commission's baseline funding be increased to, at a minimum, keep up with the pace of inflation; and
- b) any changes to the scope or quantum of the Commission's work as a result of this review be accompanied by appropriate additional funding.

Another recommendation relevant to the mapping issue was that other government agencies should be required to work with the commission (rather than passing work on to the commission or leaving it to the commission to approach them). Six agencies were named. They included LINZ and Tourism New Zealand.<sup>1</sup>

A formal policy process, including consultation, will take place in 2020, before the government decides what changes will be made to the 2008 act and to the work of the commission. So an opportunity for the various parties and the public to discuss the future of the WAMS might occur in 2020.

I hope that the government does allocate the funds necessary to maintain and improve the WAMS, a major component of the commission's *raison d'être*. If the funding does become available, the commission should be able to intensify its efforts to obtain from local authorities the high-specification data for the local tracks that are open to the public. Given the cooperation of the local councils, a nearly complete Tracks and Trails map would then become more clearly visible on the horizon.

Even in its present form, constrained by having to use the ageing Topo50 basemap, the Tracks and Trails map already goes part of the way towards meeting the needs of recreational map users, albeit only electronically, not yet with printed maps (unless you print them yourself). This map has the potential to show, for the whole of New Zealand, which tracks are public and to hence meet a long-standing need. Development of the Track and Trails map can continue even if LINZ declines to redesign the track symbology of the Topo50 basemap.

## LINZ's Topo50: Limited Track Symbology, No Improvements Planned

There have been times in the past when New Zealand's topographic maps were up there with the best in the world. But the kindest thing I can say about today's Topo50 is that it is resting immovably on its laurels. A determining issue facing the NZWAC, but largely out of its hands, is the question of whether Topo50, or its successor, will remain in the strictly orthodox traditional category of topographic maps, limited to core geographic information, or will be redesigned to accommodate some thematic needs, such as denoting tracks open to the public. For walkers and cyclists, a crucial aspect of the Topo50's style and content is its track symbology.

<sup>1</sup> Logan, Hugh, Sandra Faulkner and Leith Comer, *Report on the Findings of the Review of the Walking Access Act 2008* (Wellington: Ministry for Primary Industries, 2019), pp. 6, 65.

The LINZ Topo50 series began in September 2009, so it is only ten years old, quite young for a topographic map series. But the Topo50 track symbology is now well into old age, having not changed much since the first sheet of the NZMS 260 series arrived in 1977.

I said earlier that a useful division of topographic maps was into two sets: core topographic and thematic topographic. There's a vague natural boundary between the two types. But this dividing line has never been completely clearcut. State-agency core topographic maps, for example, often show local and regional government boundaries, which are political features, not physical ones. Need this division be so rigid as LINZ asserts it to be? Most countries, including New Zealand, can afford only one national series of printed 1:50,000 maps. I am not suggesting that our Topo50 maps should show ice-cream vendors. But given a tweak to its mandate, LINZ could shift the dividing line slightly to allow Topo50 to differentiate public from private tracks, as the Ordnance Survey has done with its Landranger maps. In this way, the most fundamental division, that between public and private tracks, would be shown on printed maps at Topo50 level, leaving the online Tracks and Trails map to add lower-order information using overlaid symbols or interactive enhancements.

In the short term, discussing and clarifying the content and design of Topo50 for the immediate future would helpfully inform and consolidate the Commission's decision-making as it develops the Tracks and Trails module of the WAMS and the Find My Adventure map. In the longer term, the problems with Topo50 are both political and institutional. LINZ has a legislated mandate and an institutional philosophy that fail to recognise outdoor recreators and active tourists as important stakeholders in its topographic mapping. In actuality, walkers and trampers and mountaineers and cyclists and mountain-bikers and other track users are collectively probably the most numerous users of Topo50 maps.

## Appendix 1: Printed (Folded) 1:50,000 Maps Examined

New Zealand	<i>Warkworth</i> . 1:50,000. NZTopo50, No. AZ31, 1.05 edn. Wellington, NZ: Land Information New Zealand, 2019.
Australia (Victoria)	<i>Falls Creek</i> . 1:50,000. Topographic Map Series, No. 8324-S, 3rd edn. Melbourne, Vic: Dept. of Environment, Land, Water and Planning, 2019.
Australia (Victoria)	<i>Wilsons Promontory Special</i> . 1:50,000. Topographic Map Series, Special, 4th edn. Melbourne, Vic: Dept. of Environment, Land, Water and Planning, 2018.
Albania	<i>Tirana - Durrës - Kruja [in Albania]</i> . 1:50,000. Hiking and Biking, No. 5. Munich, Germany: Huber Kartographie GmbH, 2014.
Austria	<i>Neustift im Stubaital.</i> 1:50,000. Österreichische Karte 1:50,000-UTM, No. 2228. Vienna, Austria: Bundesamt für Eich- und Vermessungswesen, 2018.
Belgium	<i>Nivelles</i> . 1:50,000. Belgium: Topographic Survey Maps, No. 39, 3rd edn. Brussels, Belgium: Nationaal Geografisch Instituut / Institut Géographique National, 2013.
Bulgaria	<i>Stara Planina: Uzana to Vratnik.</i> 1:50,000. Tourist Map, No. 2. Sofia, Bulgaria: Domino, 2016.
Czech Republic	Sächsische Schweiz – Westliche Oberlausitz. 1:50,000. Wandern – Fahrradfahren, No. 810. Innsbruck, Austria: Kompass Karten GmbH, 2017
Croatia	<i>Lastovsko Otočje [Lastovo Islands Nature Park]</i> . 1:20,000/1:50,000. Tourist and Treking Map 1:20,000/1:50,000, No. 15. Zadar, Croatia: Croation Mountain Rescue Service, 2016.
Denmark	<i>Bornholm: Cycle Map of Bornholm.</i> 1:50,000. Denmark Cycling Maps, No. 8/8. Copenhagen, Denmark: Nordisk Korthandel, 2016.
Finland	<i>Ruka Oulanka Karhunkierros</i> . 1:50,000. Ulkoilukartta / Outdoor Map. Helsinki, Fin- land: Karttakeskus, 2017.
France	<i>Autour du Thabor</i> . 1:50,000. Walking Maps, No. 16. Grenoble, France: Editions Didier Richard, 2014.
Germany	<i>Pfaffenwinkel - Ammergauer Alpen Nord</i> . 1:50,000. UK50, No. 49. München, Germany: Landesamt für Digitalisierung, Breitband und Vermessung (LDBV), 2016.
Greece	West Rodopi - Falakro. 1:50,000/1:35,000. Hiking and Touring Map, No. 133. Kavála, Greece: Geopsis, 2015.
Italy	<i>Monte Rosa: Alagna e Macugnaga</i> . 1:50,000. IGC HikingMap, No. 10. Turin, Italy: Insti- tuto Geografico Centrale, 2014.
Latvia	<i>Priekule</i> . 1:50,000. Top50NL, No. 3141. Riga, Latvia: Latvijas Ģeotelpiskās informācijas aģentūra, 2017.
Lithuania	<i>Curonian Spit</i> . 1:50,000. Topografinė informacija 1:50,000 (Top50LKS), No. 9. Vilnius, Lithuania: Leidykla Briedis, 2016.
Norway	Vest-Lofoten. 1:50,000. Turkart, No. 2745. Lysaker, Norway: Nordeca, 2016.
Poland	<i>Tatry W Całości</i> . 1:50,000. CartoMedia Tourist Maps of Southern Polish Highlands, No. 11. Koszalin, Poland: CartoMedia, 2016.
Portugal	<i>Gouveia</i> . 1:50,000. Civilian 1:50,000 Topographic Series, No. 17-D. Lisbon, Portugal: Direção-Geral do Território, 2013.
Romania	<i>Munții Retezat - Retezat Mountains</i> . 1:50,000. Tourist Map, No. 5. Bucharest, Romania: Bel Alpin Tour, 2016.
Slovakia	<i>Slovensky Raj.</i> 1:50,000. Turisticka Mapa, No. 1106. Zadverice-Rakova, Czech Republic: Shocart, 2018.
Slovenia	<i>Štajerska</i> . 1:50,000. Turistična Karta (Tourist Map), No. 3. Ljubljana, Slovenia: Karto- Grafija, 2014.
Spain	<i>Alt Urgell.</i> 1:50,000. Mapa comarcal de Catalunya, No. 4, 7th edn. Barcelona, Spain: Institut Cartogràfic i Geològic de Catalunya, 2014.
Sweden	<i>Kalmar</i> . 1:50,000. Sverigeserien - Topo50, No. 9. Stockholm, Sweden: Norstedts Kartor, 2019.

Switzerland	<i>Mischabel.</i> 1:50,000. Swisstopo Wanderkarte [Hiking], No. 284 T. Wabern, Switzerland: Federal Office of Topography (Swisstopo), 2013.
The Netherlands	<i>Eindhoven</i> . 1:50,000. Topographic map 1: 50,000, No. 51-West. Zwolle, The Netherlands: Kadaster Geo-Informatie, 2019.
United Kingdom	<i>Buxton and Matlock</i> . 1:50,000. OS Landranger Active Map, No. 119. Southampton, UK: Ordnance Survey, 2016.

#### **Appendix 2: Covers and Backs**

The front and back covers of the maps examined in this study ranged from plain and serious, through attractive and well-designed, to cluttered and over-commercial. Typically they included the map title, map number, series name, publisher, ISBN and three illustrations: a piece of the map, a fragment of the sheet index, and a local landscape photograph.





Front and back cover and marketing icons of the Bavarian map *Pfaffenwinkel* 49 (2016).



UTM GPS

The four icons on the front cover of this Bavarian map make the map's thematic genre clear. They target and inform potential buyers.



Front cover of the LINZ Topo50 map Dunedin CE17 (2018).

This Dunedin map's utilitarian cover, with no mention of tourists or walkers or cyclists, is appropriate for this orthodox, purely topographic map. If the LINZ Topo50 series was updated to show which tracks were open to the public, the covers could be redesigned to appeal to a wider market and to promote outdoor recreation and active tourism.





















	LATVIJAS REPUBLIKAS
	TOPOGRĀFISKĀ KARTE
	MEROGA 1:50 000
	3. IZDEVUMS
PRIEKULE	3141 <b>D</b> <b>D</b> <b>D</b> <b>D</b> <b>D</b> <b>D</b> <b>D</b> <b>D</b>



























#### The Backs of the Maps

One of the statutory functions of the NZWAC is 'educating the public about ... walking access'. The backs of topographic maps could be effective sites for the NZWAC to place information about walking and cycling and other outdoor recreation.

The paper map shown here was covered with self-adhesive film in 1990. I used this map on a visit to Derbyshire in 2017 (while my daughter used the current 1:25,000 mapping on her phone). The map is still untorn and flexible. Topographic maps are becoming increasingly available printed on thin but tough



The author with a 1990 1:63,360 Ordnance Survey *Peak District* tourist map, 2019.

plastic, potentially giving the maps very long lives.

Six of the twenty-five European maps examined in this study had maps on both sides. They were *Lastovsko Otočje* (Croatia), *Ruka Oulanka Karhunkierros* (Finland), *West Rodopi - Falakro* (Greece), *Curonian Spit* (Lithuania), *Kalmar* (Sweden) and *Stara Planina* (Bulgaria).

Eight of the other European maps carried walking or cycling or general tourist information on the back of the map. Of interest, regarding ideas worth borrowing, were the backs of the *Mischabel* hiking map (from Switzerland), the *Vest-Lofoten* trip map (from Norway), and the *Bornholm* cycle map (from Denmark).



The back of Swisstopo's Mischabel 284 T 1:50,000 topographic map (2013).

The back of *Mischabel* 284 T carries information about a Swiss hiking umbrella body that since 1934, 'together with its associated cantonal hiking organisations, has been engaged in the service of an attractive, safe and well-signposted network of hiking paths in Switzerland and the Principality of Lichtenstein. Together they promote hiking as a rich experience close to nature – and an activity that supports good health.'



The back of *Bornholm* 1:50,000 Denmark Cycling Map 8/8 (2013).

The back of *Bornholm* 8/8 has information in Danish, English and German about cycling on the island of Bornholm, a place 'almost tailor-made for bikers, with marked trails everywhere. A large part of these do not allow cars as they follow previous rail tracks or rescue paths – a great benefit for families with children'.



The back of Tatry W Całości, No. 11 (2016).

The back of *Tatry W Całości* No. 11 (2016) has tourist information, mainly in Polish, specific to the area covered by this sheet.



Back of Štajerska, No. 03 (2014).

The back of *Štajerska* No. 03 (2014) has tourist information in Slovene and English, specific to the area covered by this sheet.



The back of Vest-Lofoten 2745 (2016).

The back of *Vest–Lofoten* 2745 has tourist information in Norwegian, English and German. Some of the information is specific to the area covered by this sheet, such as 'Welcome to Lofoten'. Some of the information is general, such as 'Mountain code' and 'Public right of access' (allemannsretten).

#### Public right of access

Throughout history, the public have had the right of access to forests and fields, and to harvest from nature. This right is conditional upon such use of nature not causing a disruption for others. You are therefore obliged to leave nature as you find it.

Remember that you are merely a visitor to the countryside! Right of access is in principle free in outlying fields, but is more restricted in cultivated land and in specific conservation areas. Cultivated land is defined as all land for crops, such as fields, gardens, plantations and farms. These areas need to be fenced in. Outlying fields are all untilled land that is not defined as cultivated land. In practice, this means the majority of lakes, moors, forests and mountains in Norway.

#### Access to nature

The free right of access allows you to walk, ski, horse ride or cycle in outlying fields. The use of motorised vehicles in outlying fields is however forbidden. You can swim, canoe, row and sail on lakes and watercourses. During the winter, you can also walk over cultivated land, i.e. when the ground is frozen or covered in snow, during the period from 14 October to 30 April. During the summer, you must make use of the waymarked paths or roads through cultivated land.

#### Overnight stays, picnics and camping

Overnight stays, picnics and camping are allowed in outlying fields. Picnics and camping in cultivated land require the permission of the landowner. Pay consideration to inhabited houses and cabins. It is not permitted to pitch a tent closer than 150 metres



Extract from the information on the back of Vest-Lofoten 2745 (2016).