AN HISTORICAL CARTOGRAPHIC ANALYSIS OF OIL COMPANY ROAD MAPS

by

Ian Byrne

Canterbury Christ Church University

Thesis submitted

for the Degree of Doctor of Philosophy

2024

Abstract

This thesis undertakes an historical cartographic review of the oil company road map. It notes that although some academic cartographers have dismissed them as being of little interest, others recognise their importance. It identifies many types of map from the earliest road atlas produced by Pratts Perfection Motor Sprit in Britain in 1904, right up to service station locator maps still being given away in Latvia as late as 2019. Its focus is on maps in the century from 1905 to 2005, after which Google Maps was launched and the paper road map entered a rapid decline.

Unlike topographical maps, which have been more widely studied, much of the interest of these maps lies not on the map image, but on the paper surrounding it – the *perimap* that can include charts, photographs, texts and – less frequently – third party advertisements. The thesis seeks to expand previous content analysis of maps to encompass these additional elements, to provide a more rounded view of the genre, through a novel methodology systematically categorising symbols and other design elements; this approach is applied to a sample of 300 maps from nine countries.

The research provides a detailed analysis of oil company road map, including (but not restricted to) the development of common, simplified design parameters and symbologies across geographies, largely under the influence of US commercial cartography and identifying the extent to which their design (including covers and advertising elements) distinguishes oil company maps from other road maps. In doing so, it takes a novel approach to the review of content, extending the approach used by Kent and Vujakovic (2009) and Davis (2018).

The traditional cartographer-user split is mediated here by the oil company that commissioned (or was sold) the product, and the service station operator who served as the interface with the customer. Expectations of these different participants in the process may not always align, and case studies include original research showing how one cartographer sought to sell its maps to oil companies, how oil companies sought to influence cartographic design, and how oil companies persuaded service station operators of the value of their maps.

The key finding is that although there was a concerted effort to promote commonality of style by some companies (Esso, Shell, Gulf), this was largely confined to the 1950s and 1960s, and with few exceptions, maps from a single country shared at least as many common features as those from a single multi-national oil company. Moreover, after companies in the USA scaled back their map programmes, the influence of locally-based cartographers grew and, with the move away from paper maps to online delivery, many of the nuances of mapping have been lost. The thesis concludes by hypothesising that the move away from paper may prove detrimental to widespread understanding of maps and place.

Acknowledgements

I would like to start by thanking Canterbury Christ Church University for entertaining an unsolicited approach to undertake doctoral research on a topic that has received virtually no academic attention in the past. In particular it would not have been possible without the inspirational support and enthusiasm of Dr Alexander Kent for guiding me back into academic studies after a break of almost 40 years, and a willingness to consider ideas that may have been outside the mainstream. I would also like to thank Professor Peter Vujakovic for his unfailing support for the work, and to Dr Daniel Donoghue and Dr Chris Harvey for picking up the supervisory reins when it was far too late to turn the supertanker around. Finally at Canterbury, I would like to acknowledge Dr Martin Davis for demonstrating that it is possible to write a thesis on a rarely studied aspect of cartography.

As with many theses researched at a time of COVID, I made fewer visits in person to libraries or archives than I had initially intended to do. This meant that I perhaps ended up more reliant on my own collection of original maps and documents, as well as on the extensive online archives. However I would like to specifically thank the Newberry Library in Chicago for welcoming me just before COVID struck, enabling full access to some of the US cartographer archives. The catalog of maps created by Richard Horwitz before donating them to the Osher Library at the University of Southern Maine was also helpful.

This thesis has been born from an attempt to provide a more rigorous and academic review of a genre of maps that are collected by a small group of enthusiasts, mainly in North America. Many are members of the Road Map Collectors Association (RMCA) and I would like to acknowledge support from a number of members, answering questions about maps in their collections. In particular, I should mention Mark Greaves, the longstanding editor of *The Legend*; Stan DeOrsey, for his unparalleled knowledge of Esso maps and for having instigated the RMCA catalog some 40 years ago; Tom Sveum, for his knowledge of maps marking service station locations; Judy Aulik, for her interest in how women were depicted; Dave Leach, for his global reach; and Walt Wimer Jr., for his boundless enthusiasm after almost 70 years preserving these maps. I would also like to thank members of the Charles Close Society for accepting that there are interesting maps not published by the Ordnance Survey, and showing that it is possible to make a serious study of relatively modern mapping. Thank you, all.

I would also like to acknowledge the anonymous contribution of secondhand booksellers, charity shops, traders at the annual Beaulieu Autojumble and eBayers for choosing to try and sell the maps under study, rather than consign them to recycling (or worse). Without them there could have been no thesis.

Dedication

Now when I was a little chap I had a passion for maps. I would look for hours at South America, or Africa, or Australia, and lose myself in all the glories of exploration. At that time there were many blank spaces on the earth, and when I saw one that looked particularly inviting on a map (but they all look like that) I would put my finger on it and say, "When I grow up I will go there".

Joseph Conrad, Heart of Darkness (1899)

I also had a passion for maps as a child. My first acquaintance was with a book of street maps showing the route of the 1962 Milk Race (for cycles) which I was given by my grandfather to draw on, as it was only printed on one side of each page. But I ignored the blank pages and delighted in extending the towns, building imaginary suburbs for future cycle races to explore.

It was natural that when my family first ventured abroad in the 1960s, I volunteered to be the navigator. This thesis is therefore dedicated to the memory of my parents, without whom I would never have developed my love of maps and travelling hopefully. They first took us across France in 1965 and before long I was proudly guiding us on journeys ranging from Lisbon to Lidköping and Duncansby Head to Dubrovnik, with (most often) a Shell map on my knee.

Contents

Please note that the Table of Figures *is located at the end of the thesis, preceding the references.*

References to specific maps in the text are given in square brackets. Map references from [1] to [301] were included in the sample subjected to detailed content analysis and are tabulated in Appendix 3; references from [500] upward were not included in the sample, but are tabulated in Appendix 5.

Chapter 1:

Introduction

1. Introduction

This thesis investigates the oil company road map.

1.1. Background to the Research

The twentieth century is sometimes referred to as the 'Petroleum Age' (Grinlinton 1995, Barrett and Worden 2012) owing to the influence of oil both economically and culturally. Petroleum fuelled the private cars that led to huge increase in personal mobility, at least in the relatively affluent 'West', creating a demand for maps to allow motorists to explore and discover their country (Nicholson 2004, Akerman 2006). Simultaneously, the century exhibited an explosion in the number and type of maps produced, as technological advances permitted quicker customisation of maps and the cost of printing maps, especially in full colour, fell in real terms. The overlap between these two trends is the oil company road map – a map created by, or for, those firms selling fuels or lubricants to motorists. These maps were created in vast quantities (Ristow and Bahn 1964) with substantial numbers surviving permitting a small group of collectors to preserve them, mainly in North America. However, despite their near ubiquity, and potential influence on users' perception of place, they have been subjected to only very limited academic study. This thesis seeks to address that omission.

In the methodology chapter it is observed that although oil company road maps can be found in libraries, they are often inconsistently catalogued, often omitting the connection to an oil company completely. Much of the research requiring analysis of a physical map has therefore had to be done on examples held in private collections, specifically that of the author of this thesis.

1.1.1. An autoethnographical approach

As a genre, these maps were published on paper between 1904 and around 2019 (see Chapter 3), with most activity between the early 1920s and the mid 2000s, when online mapping began to displace the paper version. The inevitable question is then to ask "why study them now?" One answer is simply because there have been no detailed academic reviews of the topic, despite their ubiquity in certain, mainly Western, countries when at their peak production. Of course, just because something is commonplace does not make it worthy of study, and this thesis explores why oil company road maps are of sufficient cultural and cartographic significance to justify the present study. However a second answer is more personal, and to observe that as a long-term user and collector of the physical maps, there is inevitably an autoethnographical element to this thesis.

However it would be wrong to over-emphasise the autoethnography. This thesis seeks to provide a more layered account, with substantial data analysis and a wider review of how oil company road maps relate to the evolving cartographic paradigms, while recognising that in common with most autoethnographical research there may be a therapeutic reason (Ellis et al, 2011). In this instance that

may relate to the conflict between a fascination with the oil company road map (and a personal collection of over 9,000 such maps) and a strong conviction about (and professional interest in) the dangers of climate change, to which the burning of petroleum products in personal transportation is a significant contributor (CCC 2020, Jaramillo et al 2022).

However, before we can go any further, it is necessary to explain what will be meant by an 'oil company road map'.

1.2. Definition of an oil company road map

This can be developed in stages:

- Although there is no single accepted definition of a map (Andrews 1996), this thesis will use a common dictionary definition, namely that a map is "*a representation, usually on a plane surface, of (part of) the earth's surface showing physical and political features, etc.*" (modified from Oxford 1976:665). This study will restrict itself to flat or folding maps printed on paper (which on older maps may be backed by cloth), but may extend to examples in road atlases or booklets.
- A Road Map may be defined as a map is one that can be used for navigation or wayfaring by a motorist, using roads marked on the map. Not all roads need be shown and they may be restricted to a single type, such as motorways. Most road maps show additional information such as major settlements, selected natural features (such as rivers or coastlines) and administrative boundaries. They may optionally show a wide range of additional features including commercial or tourist information, as discussed in Chapter 5.

  Note that in North America these are often known as "highway maps" and some companies chose to label them with specific name; in this thesis, the term "road map" will be used irrespective of what is written on the cover. Road maps may be similar to topographical maps, which usually place a greater emphasis on natural physical feature features, or tourism maps, produced primarily to promote a single city, region or country. The distinction is discussed in greater detail in Annex 1.

  Road maps may sometimes focus on an urban area, but in this thesis are considered to be distinct from street maps or town plans that mark and name substantially all roads within an urban area.

  Road maps are assumed to be primarily designed for use by drivers of motor vehicles ("motorists"), but may also be used on occasion by cyclists and pedestrians, subject to limitation of scale.
- an "oil company road map" is a road map that has been sold or given away by an oil company, carrying identification of that company, typically by use of a logo or other branding. For the

purposes of this thesis, an "oil company" is assumed to be any entity, private or publicly-owned – including state monopolies, that is (or was at the time of the publication of the map) engaged in the refining, distribution and retailing of road fuels and/or motor oils (lubricants), including the operation of service stations. Appendix 1 considers the various types of oil company in greater detail to provide a contextual space into which the oil company road map fits.

Some oil company road maps were produced with the primary purpose of enabling customers to locate that company's facilities (usually service stations, but sometimes a subset such as those retailing diesel, or attached cafés). These maps often used highly simplified cartography with limited additional detail, and referred to in this thesis as being "locator maps" (see Annex 1.3.1).

In summary, an oil company map will selectively mark roads and/or streets; it will normally be printed on paper as a sheet map or atlas but recent examples may be delivered electronically; it will primarily be designed for use in wayfinding, but may also have touristic elements common to tourism maps: but it must bear some degree of branding from the oil company concerned. Figure 1 summarises some of these links and overlaps. The ranges of scales and costs (which may be interpreted either as production cost or the cost paid by the end user) are purely indicative, but some oil company maps (and many tourism maps) were free at the point of distribution.

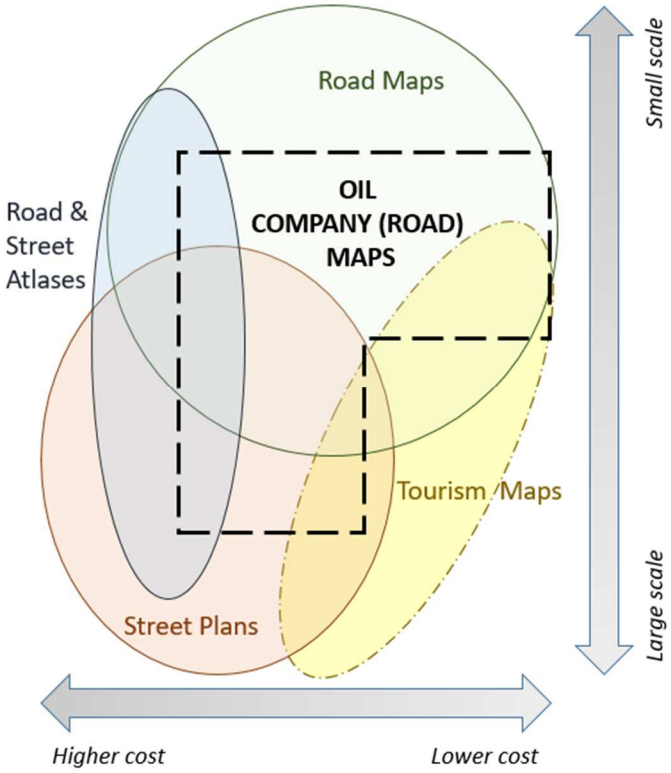


Figure 1: Oil company maps in the context of road and tourism maps

1.2.1. Distribution of oil company maps

One justification for the study of oil company road maps is that they form a genre that was widely distributed in large numbers, with estimates of total production of several billion as early as the 1960s (Ristow and Bahn 1964). Figure 2 indicates countries with examples in either the author's own collection or that of the Horwitz collection donated to the Osher Map Library at the University of Southern Maine (Horwitz 2017).

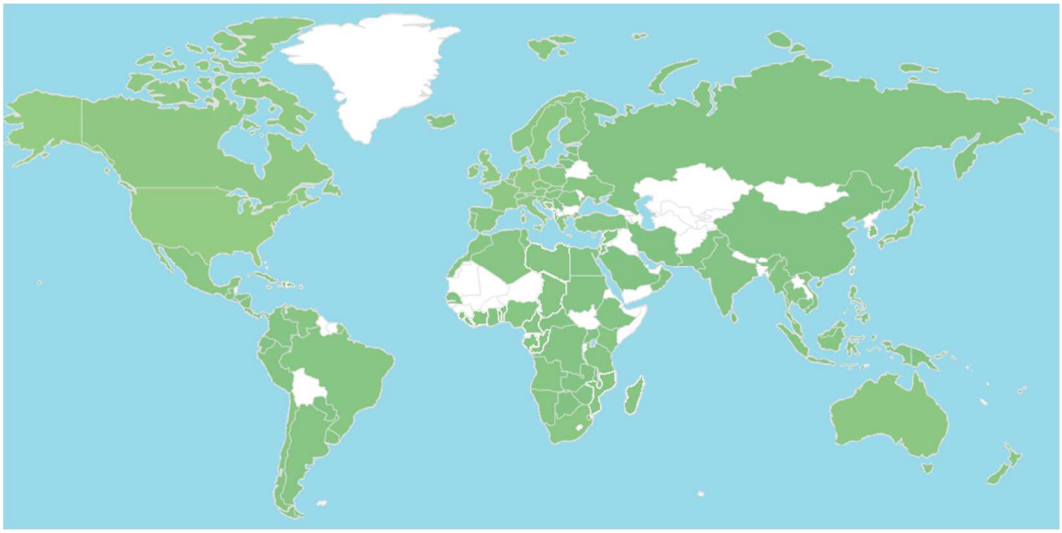


Figure 2: Countries with oil company maps in author or Horwitz collections

In some cases only one or two maps are known, but in others there are many examples from multiple brands, typically spanning the 1920s to 1990s. Chapter 3 reviews the range of maps chronologically.

1.2.2. Summary and examples

This section has distinguished between types of map by purpose. However, one of the research questions concerns whether there are distinctive cartographic conventions that also distinguish oil company road maps. The four extracts shown below, of the Cotentin Peninsula in NW France, demonstrate some of these characteristics, as will be developed in the analysis in Chapter 5.

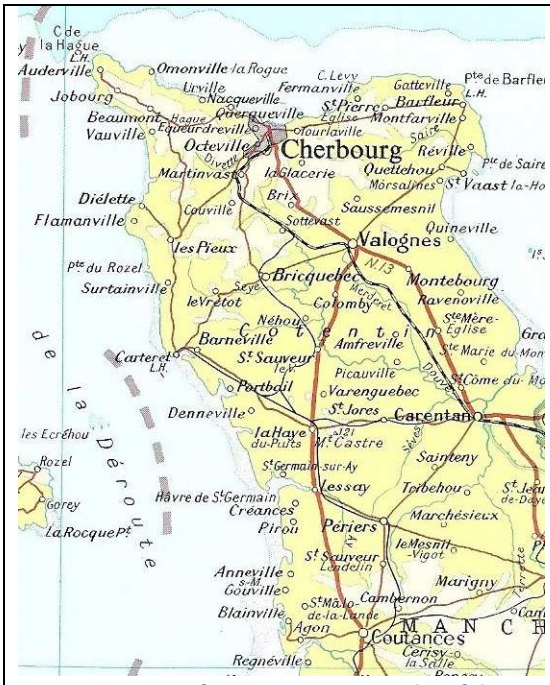


Figure 3: Cotentin from Times Concise Atlas of the World, 1980 - cartography by John Bartholomew

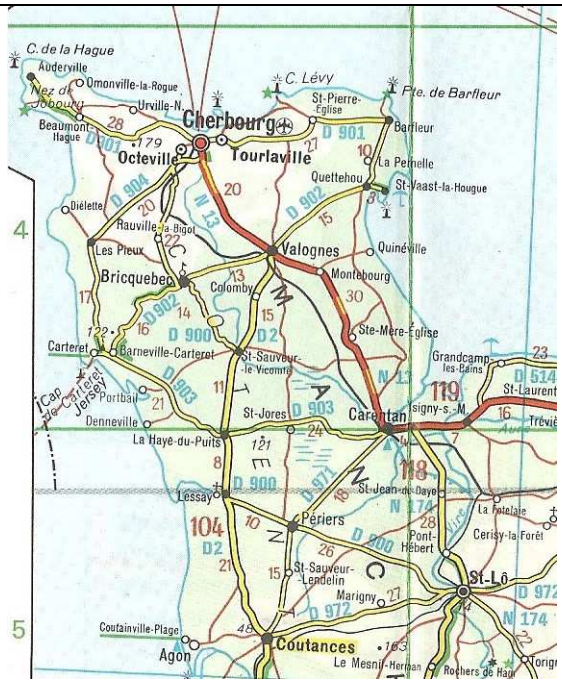


Figure 4: Cotentin from AA Road Book of Europe, 1976, cartography by Kümmerley & Frey

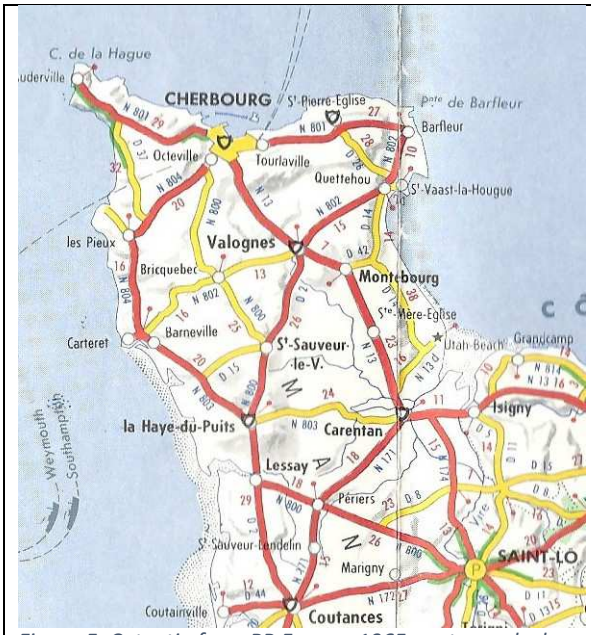


Figure 5: Cotentin from BP France, 1965, cartography by Dechaux

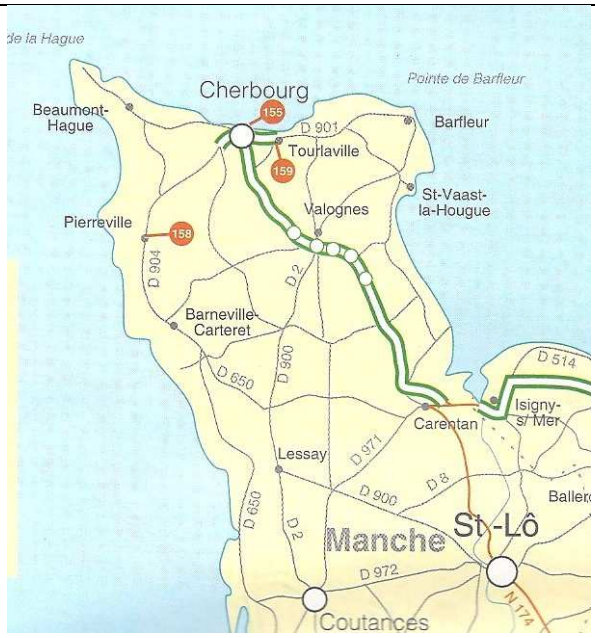


Figure 6: Cotentin from Carte des Stations Shell France, 1999, cartography by CDP

The four maps show some of the distinguishing features identified below; all were published at the scale of 1:1,000,000. Figure 3 is taken from a general purpose atlas; a few roads are shown but not numbered. Figure 4, from an Austrian cartographer, is typical of the Autro-German-Swiss style of road mapping, with rather more detail than on more US-influenced maps. It also shows both a rectangular grid (in green) and lines of longitude (in blue). Figure 5, as an oil company road map, shows a comparable level of detail to the Kümmerley & Frey map but has quite subtle indications (by a black open shield symbol) where BP stations may be found. This map was prepared by Dechaux, but appears to have recycled cartography by Blondel la Rougery; it was widely distributed with 400,000 copies printed. Finally, Figure 6 is a more recent example of a locator map, described as a "réalisation" for EuroShell by CDP, so presumably drawing on a third party GIS system. Despite its limitations, by marking main towns and road numbers, it would just be usable for navigation by motorists, and its simplicity foreshadows consumer-facing online products such as Google Maps.

1.3. Research objectives

The aim of this thesis is to apply a rigorous cartographic analysis to the oil company road map using a novel analysis, and to place these maps into wider context. Specifically, its objectives are:

- To determine if there are characteristics that are specific to oil company road maps which transcend national boundaries and/or differ from other contemporaneous maps;
- To investigate the process of preparation and marketing of oil company road maps, with a focus on the relationship between the oil company, its cartographer and its immediate customers (the operators of service stations)

A secondary aim is to seek to identify the influence that oil company road maps may have had on the development of cartography in the twentieth century. It is however outside the scope of the thesis to explore how these maps may have influenced users' perception of place or subsequent products, such as online maps or satnav maps for use in vehicles.

As will be seen in Chapter 5 (Methodology) a key area of novelty is the introduction a structured analysis not just of the map content, but of text and graphics surrounding the map (or on its covers), sometimes known as the "perimap" (see 5.8). This builds on earlier work by Wood and Fels (2008, 2010) and allies it to the cartographic analysis of Kent and Vujakovic (2009) and Davis (2018), which focused solely on the main map plane. This approach is designed to enable a clearer understanding of some of the non-cartographic elements that may influence users on commercial maps. A decision was taken not to extend the analysis "off the map" to associated elements (called by Wood and Fels the "epimap").

1.4. Structure of thesis

Chapter 2 provides a short review of some of the previous academic discussions around road maps. Noting that those associated with oil companies have not been studied in depth, Chapter 3 provides an extended chronological review of oil company road maps, starting with the earliest known example (Pratt's Perfection Motor Spirit, 1904 [596]) to some of the most recent examples, including around 100 small images of map extracts or covers. This chapter is drawn mainly from primary sources – the maps themselves, in private collections (including my own) and those in public libraries, notably the Newberry Library in Chicago and the Horwitz collection (accessed before its donation to the Osher Map Library, USM). The scope is however global, with examples from all continents (including one Chilean issue covering Antarctica). If there is an apparent bias towards North America, Western Europe and Australasia, this reflects the observed distribution of this type of map: countries where typical citizens had the right to travel freely and the income to be able to afford to do so, with a competitive retail petroleum industry willing to use road maps as a marketing tool.

Chapter 4 then reviews the wider literature around maps, identifying some of the paradigms framing the communication of information from maps, and how they are perceived by users.

Chapter 5 introduces a novel methodology for analysing the content of oil company road maps. It builds on earlier work focused mainly on larger-scale topographical maps, extending the scope to include accompanying text and images that may be overlaid on the map, around the borders of the map or on its covers. The second part of this chapter considers the basis for selection of a sample of oil company road maps on which to test the methodology. 302 maps were selected, drawn from nine countries – UK/Ireland, France, (West) Germany, Italy, Netherlands, USA, Canada, Australia and Thailand –

representing countries with varying cartographic traditions, and these are analysed both quantitatively and qualitatively in Chapter 6. Appendix 2 contains a full listing of the maps selected and key characteristics providing quantitative support to the findings in Chapter 6.

The next chapter seeks to address the second research question, amplifying aspects of some of the links between cartographers, companies and customers (operators of service stations) – the first two case studies showing how the content of a specific map (Esso Pennsylvania, 1954) was explained to service station dealers so that it could be better marketed to their customers, and a short review of how oil companies more generally marketed maps to their dealers. The third short review considers how Esso worked in the UK with its 1950s cartographer, Edward Stanford Limited, and how it retained copyrights, partly drawing on material the Edward Stanford archive. The final case study looks at the relationship between one Canadian cartographer (Rolph McNally) and its customers, drawing on primary materials in the archive in the Newberry Library.

Chapter 8 then pulls together the findings in a discussion of the characteristics of oil company road maps. It also includes a section on ethical issues around oil company maps and their study. The concluding chapter provides a summary of the work so far, and offers some suggestions for areas of further study.

I started this introductory chapter with the statement that there has been hitherto very little academic interest in road maps. Indeed, searching on the British Library's EThOs site of doctoral theses (accessed 19 June 2020) for the combined terms of "road map" and "cartography" reveals none recorded from a database of 555,000 theses. As far as can be seen, all the references to "road map" use it in its figurative sense – with virtually no consideration for the underlying and often undervalued artefact. This thesis will attempt to redress some of that balance, with the next chapter looking at the work that has been done to date.

Chapter 2:

Background to the study of road maps

2. The study of road maps

This chapter looks at some of the previous research into all types of road maps, rather than specifically to those from oil companies, and at the limitations of previous studies. It does not delve further into academic studies of maps or cartography in general, which is covered in the wider literature review in Chapter 4.

The scope of this thesis is intentionally broad, tracing the development of the oil company road map over a timespan of more than a century. The extended overview of such maps in the following chapter is necessary as there have previously been few systematic or academic studies into the product (Lierz 1990, Akerman 2002, 2020, Murray 2006, Dando 2018). This is despite automobile road maps, at least in the global West, arguably becoming the predominant popular map form sold in the twentieth century (Edney 2019:159), together with topographical maps typically with scales around 1:50,000 or one inch to the mile (Delano Smith 2006). To enable a fuller understanding of the development of the oil company map, some of its defining characteristics, and its temporal and geographical scope, this overview of such maps draws on maps held in private collections, principally that of the author, and of the large collections in the Newberry Library (Chicago) and the Osher Library at the University of Southern Maine. Although there are examples of such maps in European libraries (and further afield) they are inconsistently catalogued and described, generally recording only the single main area and cartographer or publisher, and often ignoring the oil company sponsor unless their name explicitly appears in the map title.

The few papers that have considered oil company maps within their scope have generally been focused on the USA (Akerman 2006, 2020), but an exception to this was Tim Nicholson's review of cycling and motoring maps before 1960 in Western Europe (Nicholson 2004). This lack of interest in oil company road maps is in some ways surprising, as numerically they have been significant, especially in North America where by 1964 over 200 million 'gas station maps' were being printed each year, with a cumulative production over the preceding 50 years in excess of 5 billion (Ristow and Bahn 1964). Global numbers are harder to find, but within the UK in the 1950s the Shellmex-BP group ordered over 5.3 million branded maps from George Philip and Son; Esso had published twice that number (Esso Dealer, 1957) and, relative to population, there appear to have been higher numbers in Australia. In December 1959, the Gulf European Company, which was a second tier marketer in Europe, sent the cartographer John Bartholomew & Co a request to quote for the production of a total of 2,100,000 maps covering its six national markets (Finland, Denmark, Holland [*sic*], Belgium/Luxembourg, Sweden and Switzerland) plus a general map of Western Europe (Gulf European Company 1959).

The lack of academic interest is also surprising given their geographical scope, and that they encompass a period of almost 120 years. . Despite this ubiquity, and a small number of popular books, very little has been written about road maps of any type in formal academic literature.

In contrast, there has been some interest shown in oil company road maps in the grey literature, especially in North America. Yorke et al (1996) '*Hitting the Road*' was focused mainly on cover art of American maps; similar coverage of these maps is provided by the newsletter of the Road Map Collectors Association (*The Legend*) and a regular feature in *Check The Oil* magazine. Globally they have been covered in the (now defunct) French magazine *Retro Tourisme* (formerly *Route Nostalgie*) and the Australian *ACCA Magazine*, although many of the non-North American articles have been written by the present author. Online the picture is similar, with a handful of sites aimed at collectors or hobbyists, but the most substantial sites are from the Road Map Collectors Association (RMCA, 2023), the *European Petrol Maps* website (Byrne, 2020), both of which have been maintained by the author, and the German Landkarten Archiv site (Ritz, 2023), which has numerous fully zoomable maps of Germany and a small number of Esso maps from elsewhere in Europe, but little textual analysis.

One possible explanation for the lack of interest in the study of road maps in general could be summed up by the views of Robinson and Petchenik (1976, 14) that the "common road map" should be considered as an example of a "less sophisticated" tool; such maps may fall short of any cartographic ideal (Akerman 2020). This is not universal; Bockenhauer (1994) observed "*there is no doubt that highway maps are indeed sophisticated and multi-purpose. They are full of messages and meanings and are used by both motorist and maker alike*". This view was expressed soon after Wood and Fels had undertaken their widely cited analysis of the 1978-9 North Carolina State Highway Map (Wood and Fels 1986, Wood 1992: 95-107, revisited in Wood 2010: 67-78) developing an approach to analysis that is still relevant today and will be drawn upon in this thesis. Had Wood and Fels been writing 10 years' earlier they might had drawn productively upon an oil company map as opposed to an officially published state highway map; by 1986 the former were mainly of historical interest in the USA, and well into their long decline in much of Europe and elsewhere. Wood and Fels' initial work predates that of Harley (1988, 1989) in a more formal deconstruction of the map and finding silences and hidden messages within it; both will be considered further in Chapter 4.

Harley's and Wood's approach lies midway in an arc of theoretical development in the study of maps over the past 70 years or so, with modern conceptions of cartography starting with the work of Robinson in the 1940s, moving through post-modern cartography exemplified by Harley and Crampton in the 1990s, to post-representational cartography espoused by Perkins (2004), and Kitchin and Dodge (2007) among others (Azócar 2012, Azócar and Buchroithner 2014) who see the physical embodiment of the map as simply one part of a wider process that leads to their being continually 're-made' every time

someone engages with them (Kitchin and Dodge 2007, Rossetto 2012). Azócar and Buchroithner downplay the influence of Derrida and Foucault referred to by many academic cartographers (Harley 1989, Crampton 2001, Davis 2018 to name just three), preferring instead to place the development of maps in the context of classical Austro-German philosophers such as Kant, Wittgenstein and Popper. Although this will be briefly considered in Chapter 4, the development of the cartographic communication paradigm (or map communication model) by Robinson, Board, Koláčný, Petchenik and others from the 1950s to the early 1980s has more direct relevance to the parallel development of the oil company road map from a basic product in the 1920s and 1930s to one of increasing sophistication by the time that economics (and latterly web-based mapping) sent it into a sharp decline. Nonetheless, when it comes to analysing the content of these maps, the cartographic element (the 'map plane')will not usually sit alone on the paper; analysis of the 'perimap' (the ancillary content around the main map) identified by Koch (2008) and Wood and Fels (2010:97) will also infuse the methodology described in Chapter 5 and applied in Chapter 6.

In parallel with a developing theoretical understanding of how maps work, or communicate, or engender practices or even performances among users (Coleman and Crang 2002, Kitchin 2010, Rossetto 2012), there continue to be more practical attempts to improve the design and usability of maps. These often draw on the work in semiotics of Bertin (1983/2011 in English translation) and are probably best encapsulated in a single volume through the varying editions of Robinson et al's *Elements of Cartography* (1953 onwards) and MacEachren's 1995 text *How Maps Work*. The key concepts in producing a road map at a relatively small scale (typically ranging from around 1:200,000 down to 1:1,500,000 in less densely populated regions[1]) are around selection and simplification – which features need to be left on the map, and which can be safely removed. These techniques have been used by practising cartographers who would "probably shudder at the mention of deconstruction" , believing they follow a scientific discipline to create a "mirror of nature". Instead many cartographers strive for objectivity, accuracy and truthfulness (Harley, 2001:154-5), while responding to constraints of those commissioning the maps including omissions for security reasons or additions as copyright traps (Postnikov 2002, Monmonier 1996:47, Bartlett 2015). In some ways these attributes are seen as beacons for road maps to achieve, cleansed of unnecessary detail, although sometimes adding additional features such as tourist attractions and service stations sponsored by the map distributor (the oil company). The influence of the latter may also, on occasion, be seen in selection of specific colour schemes – leading to main roads in corporate colours such as orange for Gulf, green for BP or blue for

[1] From my collection, the parent population used for the sampling in Chapter 6, the upper sextile is 1:1,320,000 and the lower 1:200,000. However the collection includes a significant number of oil company city maps (town plans) and is skewed towards UK maps, which were typically issued in sectional map series at a significantly larger scale than most oil company maps in North America, Australia or Africa, for example.

Aral, in defiance of local conventions. Analysis of the usability of all types of maps continues, with much of the work focusing on the design of point symbols (e.g. Forrest and Castner 1985, Medynska-Gulij 2003, Korpi and Ahonen-Rainio 2010, 2013). This too will be picked up again in Chapter 4, along with the approaches towards comparative analysis of map symbols described in more detail in Chapter 6.

Comparative analysis of map design has a long history, driven initially by the military to ensure that those in the field were able to interpret "foreign maps". That is in fact the full title of Olson and Whitmarsh's seminal text, published in 1944 to fulfil an "urgent wartime need", but also expected to "fill a long-felt prewar cartographic void". More recently, comparative analysis has continued to look at differences on nationally produced topographic maps (Kent 2009, Kent and Vujakovic 2009, Ory et al 2015) or maps for military or relief purposes (Korpi and Ahonen-Rainio 2010, Bianchetti et al 2012) including Soviet military maps that have now become available in the West (Davies and Kent 2017, Davis 2018). In contrast, despite the widespread availability and use of road maps, little attention appears to have been paid to comparing their design, one of the themes of this thesis. In the USA this may have been because "only minor stylistic preferences…distinguished the products of one map publisher from another" (Akerman 2002). In Europe, there were often much wider differences within even a single market – a fact noted in the comparison undertaken for Which? Magazine (Consumers' Association 1963). Other reviews tend to be concentrated on smaller numbers of maps or road atlases (Sheppard and Adams 1971), although the German *Landkartentest* website (ca2003-10, no longer available) attempted a broader comparison. Chapter 5 will contain the main comparative analysis work in this thesis.

Usability can be tested objectively, for example by timing a small group of real or potential map users to undertake a specific task – such as locating a feature or wayfinding on the map, or subjective, taking into account the qualitative opinions of the group. Many recent studies on map usability have taken the former approach, sometimes using geography or cartography students, so hardly representative of the wider population. In practice, it is necessary to make assumptions on the intended user. Although some have identified the oil company road map as being almost entirely aimed at a white, male, middle-class motorist, Dando (2018) makes a case that women, or at least American women, had long been actively involved in map use and so were equally part of the target group. In contrast there seems to be a general acceptance of the "whiteness" of maps (Akerman 2002, Edney 2019:72), including commercial or oil company issues, whether ignoring completely relegating BAME people to subordinate roles on map covers, regarding them as curiosities or reinforcing myths ("Red Indians") or generally aligning the oil company map with colonial power bases in Africa and Asia. Harley (1988) had acknowledged the connection between maps and the representation of power among earlier generations; this is implicit in road maps (which generally lack the Ordnance Survey's self-effacing disclaimer "*The representation of*

on this map of any other road, track or path is no evidence of the existence of a right of way"). Power is inextricably linked to the ethics surrounding maps (Harley 1991) and even the relatively humble oil company map may raise questions of its user – is your journey necessary, what is the environmental impact of it, and is it right to trust a map bearing the image of a company which may have different ethical standards from the user? The ethics around oil company road maps will be briefly considered within Chapter 8, as part of the discussion around findings.

If the overall thrust of this thesis is positivist in approach (which may reflect the author's background as a mathematician and chartered accountant), when it comes to assessing the success of a map for its intended user(s), it inevitably becomes interpretivist. The main research objective is thus primarily descriptive, aiming to identify characteristics, rather than to assess the success (or otherwise) of the maps under study.

Usability also makes assumptions about the user, and the practice of use. Users may have different demands or expectations of a map: Monmonier (2000:475) follows Bertin and MacEachren in distinguishing between map reading, which makes more demands on the user to process information, and map viewing as might apply to an advertising or propaganda map. Motorists – the presumed users of oil company road maps – may be looking for simple wayfinding, or they may be using the map as a tourism map, seeking out potential places of interest to visit. They may study the map carefully before a journey, or hurriedly snatch a glimpse of it while on the road, or pausing briefly at traffic lights. The ideal map for each of these scenarios will differ; any single map must inevitably be a compromise and may reflect assumptions as to the map's use by the cartographer, the oil company or another actor. Familiarity with the design of the map may also vary – although, partly through the use of icons and conventional symbols, all road maps should aim to be usable without formal training (Keates 1996:147). A user may become more familiar with the aesthetics, style or design of one company's products even if inherently there is no advantage to them. When considering how a map was used, clues may be provided on the physical map including annotations added to it (Akerman 2020), either by previous users or officially by an oil company touring service.

The archival and documentary research summarised in Chapter 7 has shown that for most oil companies, the sale and distribution of maps was seen as part of the marketing function. Consequently, the branding and marketing associated with the sponsor may be linked also to the service station as part of a wider image building exercise – the concept of the petroleumscape (Hein 2018) or the place-product-packaging of Jakle and Sculle (1994).

In summary, there has been little academic research into road maps, although the work of Wood & Fels (1986) and then Wood (1996, 2010) on the North Carolina Highway Map, including the distinction

between the ‘map plane’ and the ‘perimap’ will be helpful for the analytical section of this thesis. The development of road maps – and in particular oil company road maps – has mainly been described in the grey literature, with a focus of cover art (Yorke et al 1996) and through informal publications by collectors.

Before we can look deeper into the literature around maps in subsequent chapters, it will be helpful to provide an overview of the range of oil company road maps that fall within the scope of this thesis.

Chapter 3:

The development of oil company road maps

3. The development of oil company road maps

This chapter aims to provide a broadly chronological review of the oil company map globally. Drawing largely on primary sources (the maps themselves), it considers where and why oil companies began issuing maps and how universal was the practice. The oil company map did not emerge in isolation, but reflected the differing national conditions in each of the main markets it which arose.

3.1. Before oil companies: the first road maps

Early maps were cadastral (to show land ownership) or intended to represent places (cities, counties countries, territorial boundaries), rather than for direct use in wayfinding. Although military maps may have been a partial exception, it is not immediately obvious when maps that were of use to more general travellers for wayfinding were first produced. Early maps, such as the Gough map of 1360, that may show roads (Brotton and Millea 2019) cannot be considered as "road maps": they would not allow a user to plan and then navigate a journey, whether undertaken for official, business or leisure purposes. Some county maps began to show roads in the late sixteenth century such as a 1598 map of '*Hartfordshire'* by John Nordern (Allen 1992:98, who also notes Nordern's maps were among the first to show a key of symbols and triangular distance charts) or Symonson's 1596 map of Kent, unlike the more famous 1611 atlas ('Theatre') of John Speed (Nicholson 1988). By the time Thomas Moule published his county maps (as sheets 1830-1836; as an atlas in 1836, but remaining in print until the 1870s) many features of later road maps were visible. Moule took advantage of steel plates to print large numbers of low-cost county maps – at 1s plain or 1s 6d coloured – and so were within reach of the growing numbers of middle classes who might need a map. Moule's simplified style – while owing some debt to the larger scale Ordnance Survey maps that were also beginning to appear – gave greater emphasis to main roads, and stylistically had much in common with road maps as late as the mid-twentieth century, when low-cost colour printing again revolutionised the production and design of maps.

The strip maps of John Ogilby, published in 1675 as *Britannia or an Illustration of the Kingdom of England and Dominion of Wales By a Geographical and Historical Description of the Principal Roads thereof*, are sometimes claimed to be the first road atlas. This is supported not just by the lengthy title – which emphasises the word "Roads" by printing it in red – but also through the publication of a pocket version of which few examples survive as they are presumed to have fallen apart with constant use (Allen 1992). Shorn of unnecessary detail, the maps clearly show each road by the now conventional casing lines, marking the full extent of buildings on or beside the route and including a compass rose for orientation. Unlike a true road map, they fail to offer the user meaningful route choice, being essentially one-dimensional, but the strip map has a recurring appearance on more general road maps. In the USA, the absence of a Federal road numbering system led to private initiatives such as those of

the Lincoln Highway Association, Rand McNally's Blazed Trails, or the B.F. Goodrich Tire Company's trail markers (Akerman 1993, 2002; Plaiss 2012). Despite this, later US maps were nearly all based around individual or small groups of states and the concept of the strip map fell away. Nevertheless, a few oil company examples exist and are more likely to have been bespoke editions created for the oil company than for ordinary sheet maps; their heyday was in the relatively early years of motorways which may have upended a motorist's perception of geography (Shell 1974 [613]) and provided opportunities for sightseeing (BV-Aral 1951 [524], Gulf 1982 [567]) and businesses adjacent to the new roads (notably the US Travelaides created by the 3M Company and sold to at least 14 of the large oil companies over the 1969-74 period). Ironically, many GIS products aimed at motorists have reverted to a strip map format, again limiting the freedom of the user to select their own route according to preferences.

Pickles (2004:130) states that the first pocket-sized map to be used on the street was *Collins' Illustrated Atlas*, produced in London in 1854 with maps for walkers and cyclists only coming into use after the railways enabled users to visit unfamiliar places. Nicholson (2004) sets 1885 as his starting point; in his wider review (*Wheels on the Road*, 1993) he had used 1870. These may have been more accurately designated as street maps or footpath maps rather than road maps, but the term "road" is broad enough to cover both. The Oxford English Dictionary (Oxford 1989) has the following as the earliest known reference to a "road map" as such, significantly from an American source:

> ***1883*** **Wheelman** ***(Boston, Mass.) I. 315*** *The preparation of road maps and posting of guide-boards are to be important features in next season's work.*

As noted in Chapter 2, the need for road maps distinct from those for cyclists or pedestrians, only arose once the used of self-propelled vehicles became widespread.

3.2. Early Years: the oil company map first appears in the UK

Britain had a long tradition of commercial road maps sold to the growing numbers of middle-class cyclists and walkers. It was natural that when cars first became relatively widespread map distributors (such as W.H. Smith as well as the cartographers themselves) should extend the scope to motoring as well, even if the maps inside the covers were fundamentally unchanged. Advertising had been carried on many of these maps since the 1860s although many of these early advertisers appear to have been promoting products of general interest to the middle classes such as hair oil, patent medicine or sewing machines (Nicholson, 2008). By the turn of the 20th century there were however a significant number of maps targeted at cyclists and carrying specific promotional material for them. With several English or Scottish publishers competing to sell maps in the early years of the twentieth century, including Gall and Inglis, Bartholomew, George Philip, Bacon, W and A K Johnston and numerous local printers and stationers, it is perhaps surprising that relatively few specifically targeted the rapidly growing market for motoring or companies supplying motorists.

Nonetheless, a few early oil company examples have been found from the UK. The very first known examples (Nicholson, 2008) came from the UK subsidiary of the Standard Oil Company, Pratt's Perfection Motor Spirit.

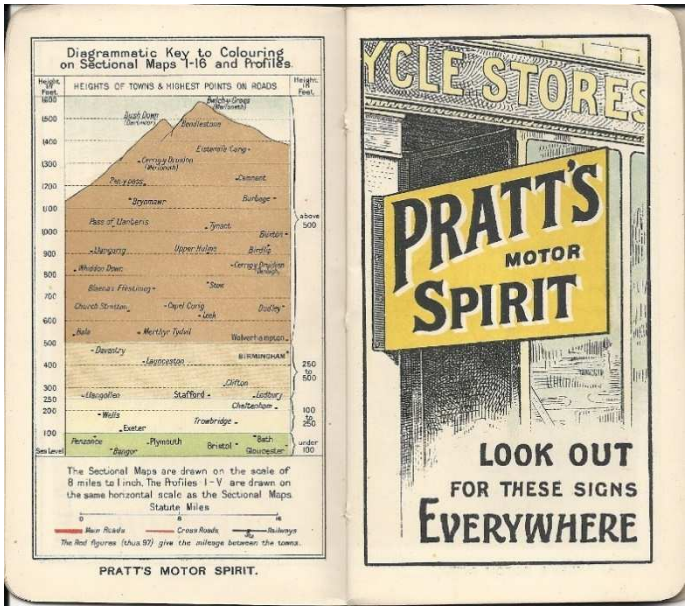


Figure 7: Pratt's 1904 Road Atlas of South-western England (a) Altitudes and advertisement [596]

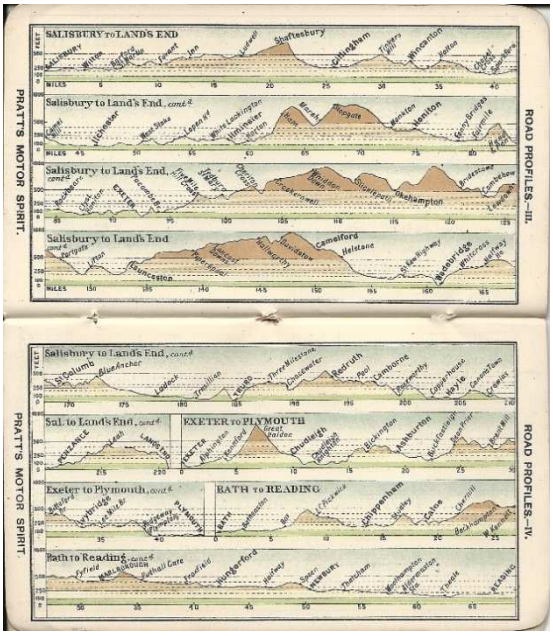


Figure 8: Pratt's 1904 Road Atlas of South-western England (b) Road Profiles - Salisbury to Land's End

Figure 9: Pratt's 1904 Road Atlas of South-western England (c) Section 13 Dorchester

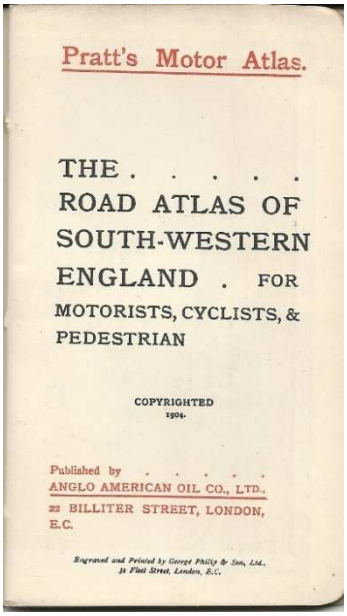


Figure 10: Pratt's Road Atlas of South-western England (Pratt's 1904)

This took the form of a series of small road atlases, each measuring approximately 90 x 155 mm and containing around 15 to 22 pages of roadmaps at 8 miles to the inch (1:506,880) and four to seven pages of road profiles. Britain was covered by four such atlases. Two were published in 1904 covering South-eastern England and South-western England (which included all of Wales) respectively. The remaining two sections were first published the following year and cover Northern England and

Scotland. All four titles were issued in red covers that had a third leaf to enable them to be fitted into a custom red leather slipcase, which also included a pocket for the newly introduced driving licence. The wallets and maps were distributed freely to chauffeurs who had registered with the oil company. The maps were prepared by George Philip and Son Ltd and used hypsometric tinting as well as including road profiles at the rear, as hills were a significant problem for early motorists. The maps were quite simple, making it easier for the chauffeur to identify his route, uncluttered by extraneous detail.

These maps were subsequently recycled into a single volume atlas of England and Wales, excluding the Scottish maps, again with the 1905 copyright date. The same copyright year appears on a slightly larger (220 x 130mm) format road atlas bound into dark green cloth covers [1]. George Philip again provided the maps but at the slightly larger scale of 6 miles to the inch. These larger atlases were re-issued several times: although the first two variants carried the 1905 copyright date, later editions carried revision dates of 1914, 1915, and 1920 with a substantially revised edition in 1929. An equivalent atlas covering Scotland and Ireland was published with copyright dates of 1905 and 1915. Pratt's also issued an undated accordion folded map of the routes to the 5 main channel ports (Newhaven, Folkestone, Dover, Harwich and Southampton), with details in English and French. If Britain had a head start in oil company maps it did not maintain it. Before the first world war there were two sets of loose-leaf maps printed on light card and distributed in a cardboard slipcase by the Duckham's lubricating oil company, and a small atlas of maps around the River Thames issued for the Bowring Petroleum Company (Mex Motor Spirit). There were no more maps until around 1930 when BP issued a series of simple booklet type maps sold for 6d (2½p) called Road Guides.

Stiff paper covers contained 22 two colour maps pages. Unlike the earlier Pratt's atlases these had relatively simple cartography at the scale of 4 inches to the mile using the green of BP, rather than the more normal red. Towns or villages with BP pumps were indicated, and adverts for local businesses likely to be of interest to touring motorists, such as hotels and tearooms were printed opposite each map. The guide was designed and printed by the British Publishing Co of Gloucester. At the rear a list of "BP" pumps identifies 97 locations on this small section alone, but with garages in the 1930s typically selling at least four brands of petrol (Monopolies Commission 1965), Britain was not well suited to giving away free oil company road maps. As a result, petrol companies tended not to produce maps at all.

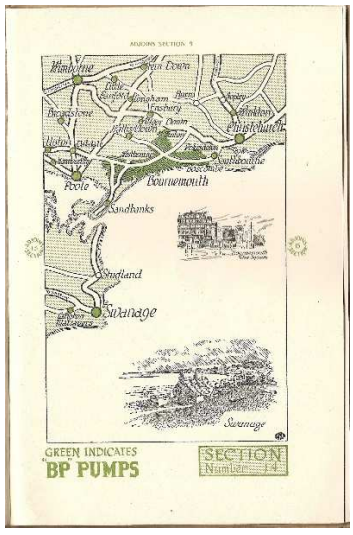


Figure 11: 1920s BP Road Guide section 14 [3]

Exceptionally, the introduction of diesel fuel in the 1930s led to Pratts/Esso and Shellmex-BP issuing occasional maps for drivers of HGVs looking for Essodiesel or "Diesoleum" (Shell-BP).

One notable exception was the interloper in the market – Russian Oil Products, which undercut other companies through its sale of Soviet oil under the R.O.P.-ZIP brand. They produced three maps in the late 1930s; one of England and South Scotland in 1936 by John Bartholomew and Son at the scale of 1:1 million, then one of Britain by Geographia in the following year. A third map but only of Scotland, also by Geographia, may have been a special issue for the 1938 Empire Exhibition in Glasgow; the map on the cover is of the Caucasus "where R.O.P. Oils come from".

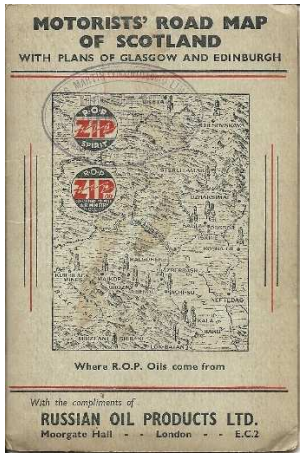
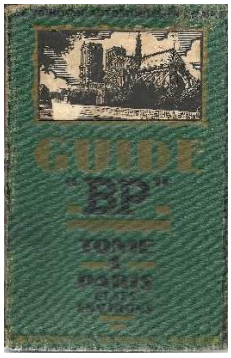


Figure 12: 1938 ROP-ZIP map of Scotland [660]

3.2.1. Early Years: Continental Europe

There was a little more activity in continental Europe. Motoring was quickest to take off in France and Germany. In France there was a tradition of using maps based on the *Cartes d'Etat Major* produced by the Service Géographique de L'armée, including those published by Taride and de Dion Bouton. However from 1910 onwards, map publishing was disrupted by the arrival of Michelin which provided relatively low cost maps using a simplified design more suited to motoring (Darmon 1997).

The first known publication containing a significant number of maps associated with a petrol company came from BP in 1926, when it sold a guide to the environs of Paris (followed by one to the Alps/Côte d'Azur).



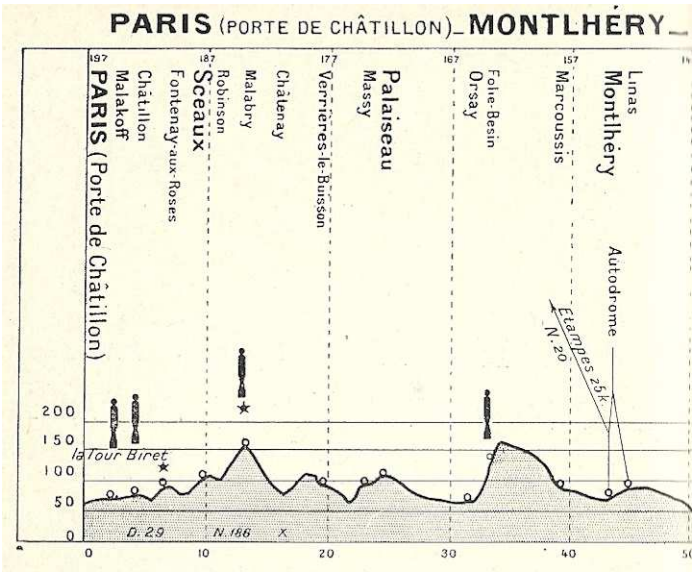


Figure 13: (a) 1926 BP Guide to Paris and its Environs; (b) extract showing road profile and BP pumps [530]

These contained coloured maps, road profiles (Figure 13b) and town plans. At the very end of the 1920s, the Service Géographique de L'armée in partnership with a marketing agency (EPOC) published maps where the reverse was given over to advertising from several firms – usually issued in slip envelopes sponsored by Dunlop tyres. Shell took space on many of these maps and overprinted some in the top margin of the map as being "*offert par Shell*" (offered [free] by Shell). The series extended beyond mainland France to include three sections covering Algeria.

In Germany, there were similarly few maps until the early 1920s, when the local Standard Oil subsidiary issued a small scale map of the country showing towns where its depots were located. Apart from a lone Shell-Stettin map, probably from the late 1920s, and occasional bespoke covers by local fuel distributors on commercial map issues (such as a BV-Kraftstoffe on a 1920s Lux map covering the states of Hessen and Nassau) there appear to have been no coordinated map issues by oil companies until around 1930.

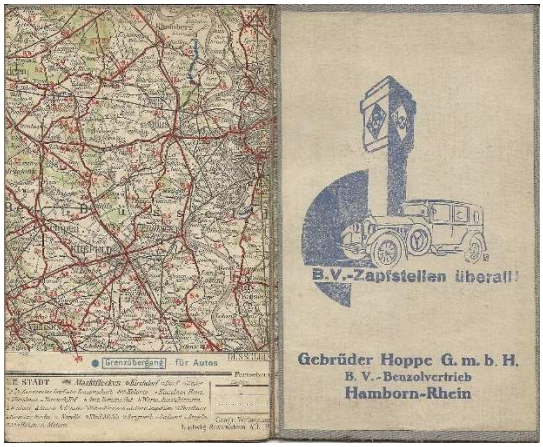


Figure 14: 1920s Ravenstein section 70, dissected onto cloth, with all 8 rear panels promoting Gebrüder Hoppe, a distributor of BV products [535]

Elsewhere in Europe there are few roadmaps issued by or for oil companies that pre-date 1930. In Poland Standard Nobel, the local affiliate of Standard Oil, sponsored a regular folding sheet map, and a local company Galkar distributed a combined map and distance chart. There is a notable map of Portugal, dissected on cloth, that was published by Auto-Gazo (the local affiliate of Mobiloil) dated 1916. As there was a further edition published around 1930 it is just possible that this firm may have produced maps of the country on a more or less regular basis through the 1920s.

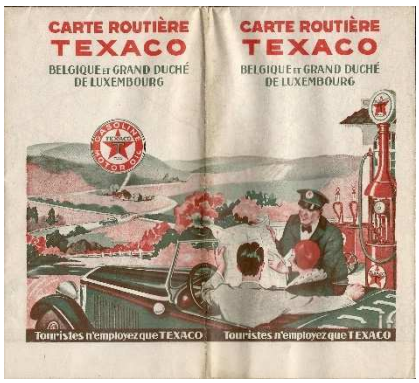


Figure 15: c1930 Texaco map of Belgium/Luxembourg [647]

At the very end of the decade, Texaco produced maps for Belgium and Netherlands that reproduced a cover design first used in the USA around 1928, although the European equivalents are undated. But the use of a common design is already foreshadowing the next phase of oil company maps where programmes were coordinated centrally, rather than issues being arranged locally on an ad hoc basis, a trend that can be traced back to the Gulf maps in the USA in the 1910s.

3.3. Early Years: USA maps from 1910 to 1939

In North America, the 1910s and early 1920s were similarly a period of experimentation by oil companies with little central coordination. It is uncertain which firm published the first oil company roadmap (Cole 1997) but it may have been the Indian Refining Company under its Havoline trademark described as Indian Pathfinder Havoline Tours Book 3: Philadelphia, Eastern Pennsylvania and New Jersey. This is dated July 1, 1910 and presumably there would have been at least two others in the series. Union Oil Company of California also co-sponsored a photo guide in the same year, with very basic maps by W.G. Thorpe. Two years later (although it refers to there having been an earlier edition) the Monarch Oil Refining Company distributed a pocket-sized booklet of strip maps covering California

and Nevada – both the Union and Monarch items bearing a cover price (Yorke et al 1996, Akerman 2006).

But if the archetypal US oil company road map is a freely distributed sheet map, it was just a year later, in 1914, that Gulf Oil started mailing maps to its customers. Initially of Allegheny County (PA), the following year Gulf provided state maps of New York, New Jersey, Pennsylvania and New England, and soon after added tours centred on Pittsburgh. Gulf is often named as the first company to have given away roadmaps because in 1934 they ran an advertisement claiming to be so. "*Look … they gave me a map!*" ran the advert. "*20 years ago a surprised and pleased motorist climbed back into his automobile holding a roadmap. It had been given to him by a Gulf filling station man. It was the first time any such aid has been offered a traveler. It was the first evidence of an interest in the motorist that was to change filling stations to service stations.*" Gulf's initiative, unlike the other early map examples cited, was repeated in each of the following years, and rapidly extended to include a wide area around its base in Pittsburgh. As a result, it is fair to say that that Gulf did indeed commence the first formal map programme.

Figure 16: 1916 Gulf map of Pennsylvania [568]

Other major oil companies were slow to follow suit. The Atlantic Refining Company issued a map of Pennsylvania and Delaware around 1915, and repeated the exercise the following year, but appears not to have issued a follow-up until 1926 (Akerman 2006). Associated Gasoline published a map of Motor Tours of California, Oregon and Nevada in 1916. Sohio, which was the Standard Oil affiliate in Ohio, issued a map of the state in 1917, but appears to have then waited until 1924 for its next issue. The Gulf, Atlantic and Sohio issues were either anonymous or produced by the Automobile Blue Book Company, which published its guides for motorists annually between 1901 and 1929, and could be seen as a precursor to inexpensive roadmaps (Bauer 2009).

Apart from these issues, there are a few maps reported on the RMCA catalog (2023) to have been produced for small companies with names such as Borowski Brothers, 1911, and Hutchinson Bros, 1913, and a small number from lubricant firms produced towards the end of the decade. These included four different states issued on behalf of Hermoline (Herring-Wissler of Des Moines, Iowa) between 1917 and 1919 using cartography by Kenyon, the first of the sequence of maps for Harris Oils covering Eastern New York and New England published in 1918 using Rand McNally cartography, and one from Amalie Oils about which little is known.

The emergence of Rand McNally into the field is significant. Formed in Chicago in 1868, the company brought together the printing skills of William Rand with the cartography of Andrew McNally. They publish their first map in 1872, although their main business was printing railroad tickets and schedules. After Rand left the company in 1899, maps became more important with the first roadmap printed around 1904 (Akerman 2006). The duality of its railroad and roadmap operations can be seen in its indexed pocket maps from around 1918. A booklet is entitled Rand-McNally Indexed Pocket Map and Shippers Guide of Mississippi. It is basically a Gazetteer of all the settlements in the state listed in alphabetical order listing population, railroad connections, Telegraph stations, and payment offices. This is a bookended by an eclectic mix of adverts for products and services such as typewriters, railroads, a course in personal efficiency, travelers checks, land in Western Canada, mortgages, hotels in Chicago, pens, and – notably – one recruiting salesmen for Geo. C. Peterson Co. Pioneer Petroleum Products. This company, which did not become a large or successful retailer of gasoline in the USA, had nonetheless sponsored one side of the map bound into the back of the booklet. This was simply a rudimentary black and white roadmap, with so little detail that more than a dozen counties had no roads, settlements or other features marked. In contrast, the main map of the state printed on the other side in four colours, showed all the towns listed in the Gazetteer, as well as the Mississippi railroads but no motor roads. Despite the crudeness of the road map side, Rand McNally felt it important enough to put the entire package in a light card cover with the title Rand-McNally Indexed Pocket Map and Auto Road Guide.

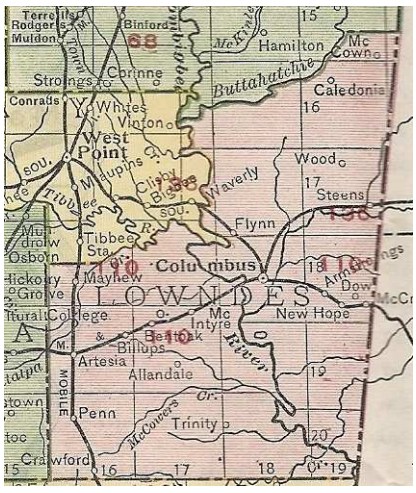


Figure 17: Rand McNally Pocket Map of Mississippi, 1918 showing only railroads [594]

Figure 18: Rand McNally Auto Guide (reverse of Pocket Map) sponsored by Pioneer Petroleum [594]

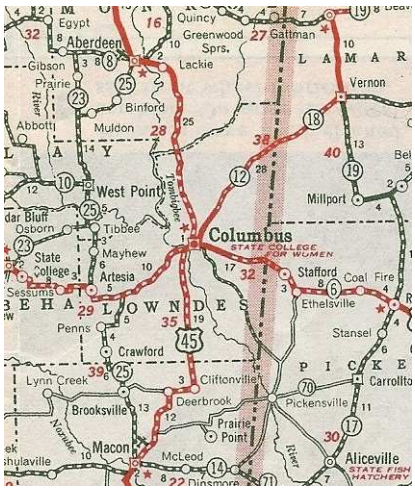


Figure 19: Rand McNally map of Mississippi, for Sinclair Oil Corp., 1937 (see Figure 20 for cover) [632]

Rand McNally were only reflecting a growing demand from US motorists. Car ownership had grown exponentially since the introduction of the Ford Model T in 1908, even though at that time less than 9% of roads had a hard surface. By 1919, there were some 6.6 million private automobiles and 0.9 million trucks registered in the US (Nguyen, 2015). Owners of these vehicles needed to know not just how to

get to a particular destination, but also the sort of route surface that they were likely to find on the way. In July 1919, for example, a military convoy took 62 days to drive from Washington DC to San Francisco, a distance of 3,242 miles. Although it largely followed the so-called Lincoln Highway, one of the marked trails that had been established to guide and encourage motorists, the convoy was at one point seriously delayed by being axle deep in dust, demonstrating that dry weather was just as difficult for road traffic as the notorious mud. Dwight D Eisenhower accompanied the convoy as an observer, and his experiences are credited with his later enthusiastic support for the development of the interstate highway system when he became president. (Swift 2011). Although the crude 1918 roadmap had no indication of road surfaces, by the 1920s almost all maps aimed at motorists graded the quality of road. This may help explain the rapid take-up of commercial mapping; topographical maps tended not to show surfaces in detail.

It would be wrong to give Rand McNally the sole credit for developing the low-cost commercial roadmap in the USA. Numerous other printers and cartographers worked with newspapers, local businesses and oil companies in the 1920s, with Langwith, Clason, Cram and Eubank also playing an important part in creating new low-cost maps for motorists (Akerman 2006, Wyckoff 2016, RMCA 2023). But the largest competitor to Rand McNally in the field was the HM Gousha company, which was founded by four ex-employees of Rand McNally in 1926.

The third main cartographer was the General Drafting Company, set up quite independently of Rand McNally by Otto Lindbergh in New England in 1909. Although Lindbergh had published a few maps for commercial customers prior to 1922, his breakthrough came in 1923 when he sold his first map for Standard Oil Company of New Jersey. Unlike the other main cartographers, General Drafting had a policy of only working for one company in each area at a time, and these were generally affiliates of the regional Standard Oil companies (later almost exclusively for affiliates of Standard Oil of New Jersey – Esso). When assessing US oil company issues, it is possible that disproportionate numbers of General Drafting maps may have survived, as those produced for Esso between the late 1930s and 1964 generally featured attractive covers and – in the 1950s – a pictorial guide as well.

There was limited competition from the cartographic department of the various state governments, which in general did not work with oil companies or other commercial sponsors, preferring instead to make their maps available freely through channels such as state visitor centres.

The growth in oil company maps is seen vividly in the next decade. A petroleum map catalogue maintained by the Road Map Collectors Association (RMCA) lists over 150 companies for which branded roadmaps were issued in the 1920s.

Figure 20: Larger companies took advantage of map covers to attract customers (Sinclair, 1937) [632]

Almost all the large marketers of gasoline had commenced issuing maps by around 1928, with many issuing a few titles earlier in the decade before expanding to a comprehensive map programme covering their entire marketing territory – Conoco and Texaco had national map coverage by 1930 (Akerman 2006). Cartographers such as Rand McNally prepared stock maps for each state which could simply be printed in custom covers for the oil company concerned. As a visual reminder of the brand of gasoline that had provided the map, considerable effort was made in the 1930s to produce attractive cover designs, even if the content of the map inside was similar, using a simplified style, called a "network map" by Akerman (2006). During the 1930s larger companies produced increasingly extravagant cover designs that extended to 3 or 5 folds, as shown in the Sinclair map cover (Figure 20), dating from 1937.

Smaller companies could often only afford a much more basic cover customisation. To assist them competing with their larger competitors, in the late 1920s several state-wide petroleum marketing associations were established and briefly produced an attractive map cover design on which the independent companies' details could be overprinted. Although the underlying map was usually from one of the big cartography companies, this approach seems to have been used most widely in the Midwest, including Ohio (Figure 21), Wisconsin, Illinois, Minnesota and North Dakota. An alternative approach was for the independent firms to adopt a common marketing image from a cooperative body such as Sovereign Service (Figure 23) or Dixie Distributors. In the 1930s a new entrant to the map market, Mid-West Map company (MWM), funded its maps by collective advertising from large numbers of small businesses. However it also had a blank panel on the front cover in which any one of those businesses could add its own advertising details (Figure 22). After MWM was acquired by HM Gousha in 1939, this approach was mainly employed by Rand McNally which produced a wide variety of "generic" covers that could be customised cheaply by independent distributors.

Figure 21: 1928 Ohio Petroleum Marketers Association design for Talley Brothers (Rand McNally map) [645]

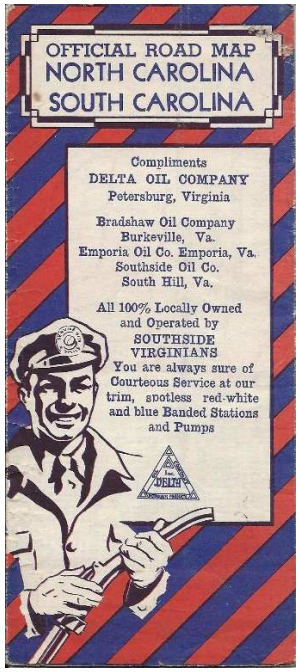


Figure 22: 1937 Mid-West Map Company generic cover, overprinted for Delta Oil Company [544]

Figure 23: 1936 Sovereign Service collective map cover for Derby Oil Co (Rand McNally map) [637]

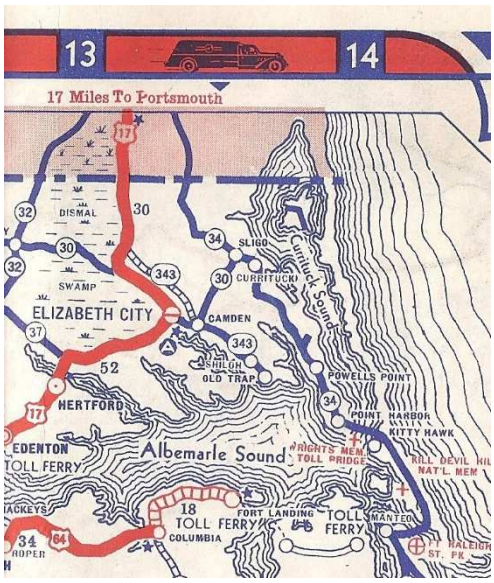


Figure 24: MWM maps used a cruder style than its main competitors (Delta [544])

During the 1930s, the number of cartographers used by oil companies consolidated to just four. Rand McNally retained the largest share of the business, but HM Gousha grew strongly, partly as a result of in 1935 lawsuit in which Rand McNally had been accused of copying some of the designs from the younger company. Although this was settled out of court, it was reported that one of the terms of the settlement was that the two companies had agreed to share a number of major oil company accounts between them (Carroll 2015). As noted above, MWM (Figure 24) and General Drafting Company completed the quartet.

Most maps by the 1930s covered a single state, or a conventional grouping of states determined by the cartographers –bespoke groupings are uncommon, although were used by Texaco [56, 64]. As an example of an earlier title, Rand McNally produced several editions of a map of the '*Great Lakes District*', with a detailed map of Northern Indiana, for the Gafill Oil Company, marketers of Sunray products in the late 1920s. Both maps were carefully centred on South Bend, IN, where Gafill was based but by 1930-2 it was only providing regular Rand McNally issues of Indiana and Michigan.

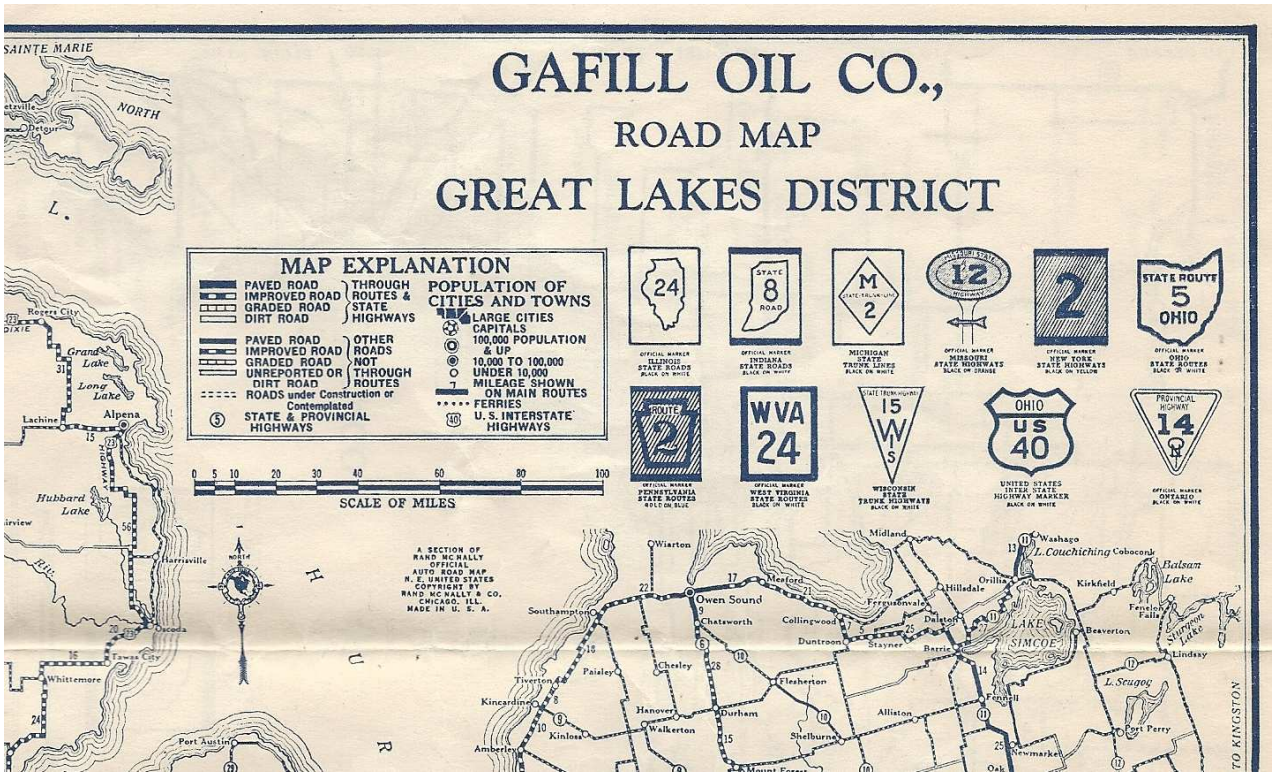


Figure 25: Gafill Oil Company map extract, ca1928, Rand McNally cartography [643]

As noted above, oil company maps typically grouped certain states, possibly as a money-saving measure, but also to assist motorists travelling across state boundaries. Although not all cartographers used the same combinations, it was almost universal to find Delaware, Maryland, West Virginia and Virginia on a single map, and New England nearly always spread across two sheets (Maine-New Hampshire-Vermont and Massachusetts-Connecticut-Rhode Island). Likewise the Carolinas and the Dakotas were usually paired although the common Washington-Oregon union may have been partly to prevent them gaining greater prominence than California which usually occupied only a single sheet, despite its size and importance.

Figure 26: Shell In an' out Utica 1931 [623]

To counterbalance this, firms began producing and giving away city or metropolitan area maps. Some of the earliest examples came from Socony-Mobilgas (Citigraphs of New York or New England cities [636]), or Shell's very basic "In an' out" maps (Figure 26 – this measures just 150 x 115 mm) [623]. Another type emerged in the 1930s – the World's Fair event map. With motorists often driving hundreds of miles to attend there was an opportunity for oil companies to gain their business at the regular fuel stops by providing maps along the way. The first great event for which companies published large numbers of maps was the Chicago "Century of Progress" exhibition (World's Fair) of 1933-34. Among the companies obtaining custom maps for the event were B Square (Bareco), Cities Service, Conoco, Deep Rock, Diamond, Gulf, Mobilgas, Phillips 66, Pure, Shell and Standard (Indiana). Some, such as Pure, took a pavilion at the show from which maps were dispensed for use by

drivers on their way home; its map focused on the Fair itself. Others concentrated on suggesting routes to and from the Fair, such as Gulf's at the small scale of 1:5 million [570], although to some extent they were limited by what was available (or they were prepared to pay for) from their regular cartographers. The later Golden Gate Exposition in California generated far fewer maps, possibly owing to the state's tendency for multiply branded gas stations, but numerous firms issued maps for the 1939 New York World's Fair.

Canadian gasoline marketers were slower to issue maps than their sibling companies south of the border. With the only known exception of a couple of issues in 1924/25 by Fundy gas, the earliest Canadian issues appear to have been around 1928, when White Star – which straddled the border between Michigan and Ontario published its first, cross-border maps – and 1929, when the large marketers Imperial Oil (Standard New Jersey) and B/A joined in. During the 1930s, the Canadian situation began to look more like the USA, with all significant operators, including Shell and Sunoco, issuing roadmaps. Maps generally had a similar look and feel to their US equivalent, but were sometimes produced by local cartographers using designs licensed from the big three US firms.

Initially the situation in Mexico was not dissimilar to Canada. Much of the retail market was controlled by US or international companies, sometimes operating through subsidiaries using local branding. Maps can be found from Pierce Pennant (Sinclair), Huasteca (Esso), Aguila (Shell), and Conoco, with cartography most commonly by HM Gousha. However these ended with the nationalisation of the entire Mexican oil industry in 1938, and the new monopoly, Pemex, only started issuing its own maps after the war.

3.4. Europe in the 1930s – Germany

Growth in oil company maps in Europe was slower. With little coordination between different national subsidiaries of the multinational brands, such as Shell, Standard, BP or Texaco, it appears to have been at the discretion of local country managers whether to commission road maps or not. In turn, this depended upon the local market and the availability of existing maps from local cartographers and publishers, including automobile clubs.

The one country where oil company road maps became commonplace was Germany. Although there are virtually no issues until around 1934, the next five years saw a sudden plethora of maps from the main companies involved in the market: BV-Aral (Figure 27), Standard (later Esso; Figure 32), Olex-BP (Figure 29), and – above all – Shell (Figure 33). The simultaneous appearance of maps from these companies is almost certainly no coincidence – on 23 June 1933, Adolf Hitler signed into law an organisation called the "Reich committee for tourism" (*Gesetz über den Reichsausschuß für Fremdenverkehr*) within the Ministry of Propaganda, marking the first step in the coordination of

commercial tourism by the Nazi party. The aim of the policy was to foster tourism as a way of encouraging national pride - a racially purified, loyal and patriotic national community (Senner, 2005). Coupled with the development of fast and highly engineered autobahns, there was a need for motorists to be able to obtain inexpensive roadmaps.

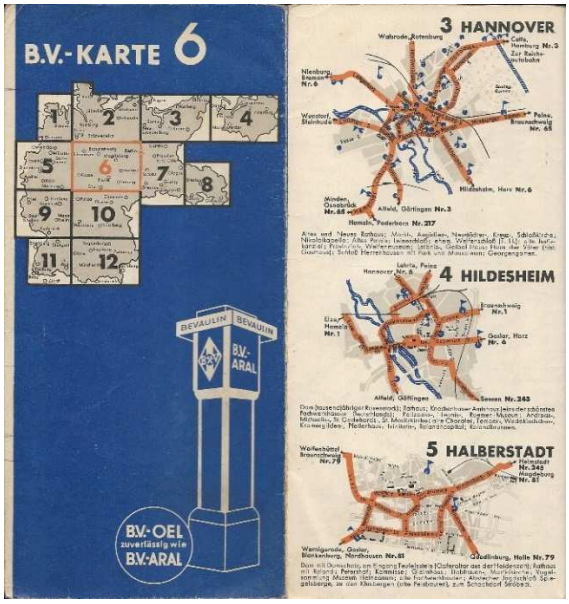


Figure 27: BV-Aral map 6, 1937 – cover and town plans

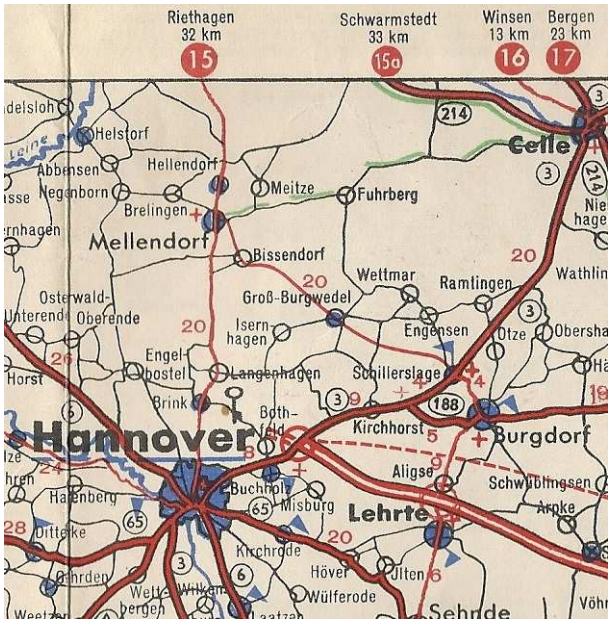


Figure 28: BV-Aral map 6, 1937 – extract (actual size) [523]

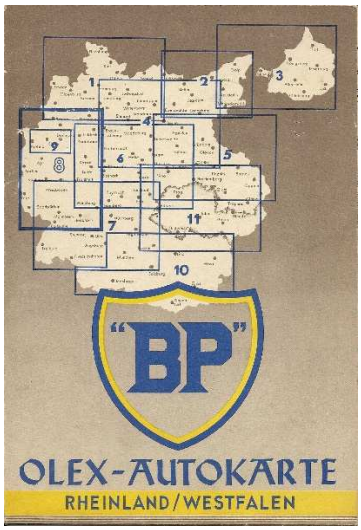


Figure 29: BP-Olex, Section 8, 1939

Figure 30: Westermann, for BP-Olex, 1939 extract [534]

Figure 31: Dr. Güntzsche Stiftung atlas for Nitag, ca1938 [591]

Some of these maps do not give a wholly neutral representation of the country. Of the four main brands those from BV and BP appear relatively neutral, although within them there are inset street plans that have been updated to carry the names of Nazi heroes, such as Horst Wessel, or of the Führer himself. In contrast, the Shell maps focus on painting a picture of the Reich as a largely rural idyll, portraying a very specific view of the country. However it is from the US-controlled Standard that we see the most explicit Nazi references, sometimes on the illustrations around the maps, but also in an occasional sketch of an attendant giving a Nazi-style salute with one arm while holding the petrol pump nozzle in the other.

Figure 32: Extract from Deutsch-Amerikanische Petroleum-Gesellschaft (Standard) Plan 21, Niedersachsen, ca1934 [640]

Standard's maps appear designed to impress the authorities or those looking at the map at home, rather than to create an immediately functional map for a driver or navigator. They used the concept of a *Luftbildkarte* (loosely translatable as aerial picture map) using cartography by H Bruckmann of Munich, which portrayed the country as if from a very high altitude aircraft (Figure 32). The maps were densely filled in with green and brown shaded hills; minor roads and towns are quite difficult to distinguish. Each map was surrounded by a pictorial panel in halftone showing some of the points of interest in the area covered by the map. The reverse was given over to descriptions of points of interest. The covers were relatively plain and uniform showing the area of the country which each map covered. It was only at the end of the decade after the Standard name was replaced by Esso, that photographic covers were used for the first time, replacing the *Luftbildkarte* with more normal cartography, but retaining the gazetteer on the reverse. These maps were recycled after the war but in some cases had elements of Nazi propaganda in the gazetteer overprinted with simple slogans recommending the use of Esso lubricants.

Shell's maps deserve a special mention. In the early 1930s Shell had issued a couple of series of small scale maps, before moving to a larger number of sections at a more usable scale for motorists. Updated regularly they used five different cover designs spread across an initial 20 maps, although this rose to 26 by 1940 after the annexation of both Austria and Czechoslovakia (Figure 35). Within each basic design each section had a different cover. These were augmented by a series of 88 city maps (93 after the

Annexation of Austria) with watercolour covers featuring a landmark from the city (typically of historic buildings, although sometimes selecting a modern building such as the *Deutschlandhaus* in Essen, or the *Rathaus* in Oberhausen, Figure 36).

Figure 33: 1938 Shell map 7, Hannover [611]

Figure 34: Extract from 1938 Shell map 7, Hannover

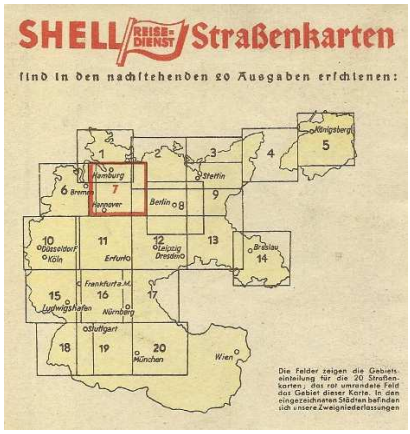


Figure 35: Key to sections from 1938 Shell maps showing annexation of Austria

Augmenting the conventional road maps were a vast series of touring maps, each containing photos and limited descriptions of points of interest and a simple map inside a dramatic watercolour cover by Jupp Wiertz. The initial series ran to at least 147 tours, probably published in 1935. They were then repackaged into an extended series of double tours numbered from 202 to 404 (Figure 37); more were promised after the annexation of Austria. Two further series provided additional maps for the German tourist. One was of nine river basins and the other of 18 scenic tourist areas. Both included a considerable number of sketches of points of interest on the map which utilised relief hill shading against a uniform beige background.

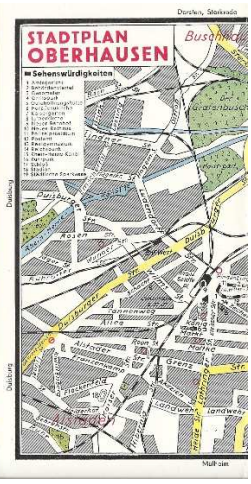


Figure 36: ca1935 Shell Stadtkarte 28, Oberhausen featuring the town hall [609]

Figure 37: Shell Tourenkarte 306/307 [610]

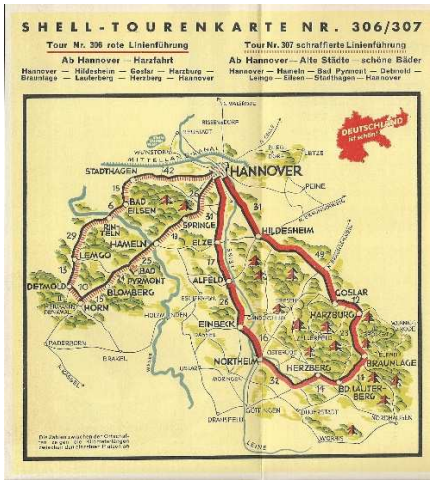


Figure 38: Tours 306 and 307 from Hannover on Shell Tourenkarte

The smaller Leuna company, controlled by the IG Farben industrial conglomerate, also took a relatively straightforward approach to its maps, but in 1939 [502] was a co-sponsor (with the Agfa camera and film company and the Ford Motor Company) of a pair of *Heimat* maps of the *Traditionsgau München-Oberbayern* (the part of Bavaria that was claimed as the spiritual home of the NSDAP [Nazi party]).

Smaller German petrol suppliers also provided maps; many used a quite complex softback road atlas containing 13-15 pages of maps at the scale of 1:1,000,000 produced by Dr. Güntzsche Stiftung of Dresden which could be customised for clients (Figure 31 [591]); examples are known from Nitag, Boie, Derop, Varol, Kraftstoff and A. May, but similar atlases were also made available through the Uniti trade association to its member companies. The entry level Uniti atlas provided a version with a generic cover on which the company's contact details could be printed. Uniti replaced this by a cheaper single sheet map of the country in 1938 or 1939, with covers which were also customisable in a similar way to US sheet maps, but the larger independents retained the atlas format – a 1938 or 9 Nitag version, which described Germany as the land of beautiful motorways (*Das Land der schönen Autostrassen*) went so far as to staple into the rear cover a map of the "*Gau Ostmark*" (in effect, Austria).

3.5. Europe in the 1930s – France and elsewhere

If the situation in Germany appears to have been driven largely by political considerations, that in France appears to have been much more commercially oriented.

CIP, the *Compagnie Industrielle des Pétroles*, which was owned by the US company Socony (and so the precursor of Mobilgas) had regional maps initially produced by Blondel la Rougery (Figure 39), but later switched to Michelin designs (Figure 40). Both were overprinted to show its locations at the scale of 1: 1 million and although lacking much detail were stylistically quite different, as the two 1934 maps show, with the Michelin map being much more selective in detail.

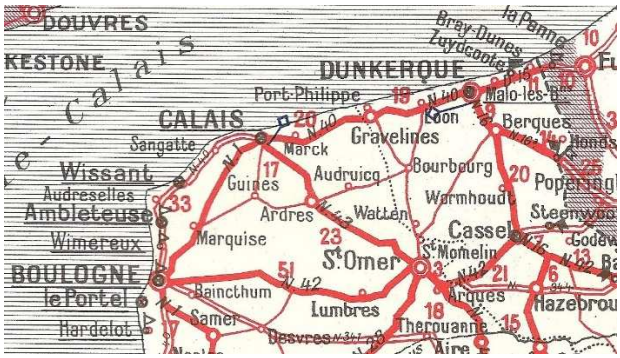


Figure 39: CIP, France Nord-Est, 1934 Blondel la Rougery [117]

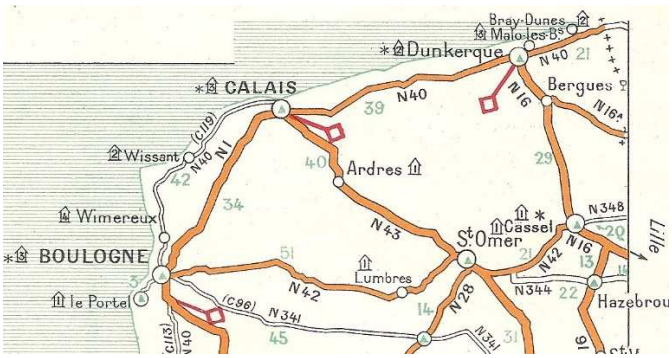


Figure 40: CIP, Région Nord-Ouest, 1934 Michelin [116]

Energic, which was a name used by BP in France in the 1930s, produced a couple of series of yellow and green sectional maps. Serco, *la Société Les Consommateurs de Pétrole*, produced a series of maps and later booklets, generally designed by E. Girard/SCIP-Paris and again designed primarily to help

customers locate its service stations. Standard started off by producing a complex A5 booklet for a couple of years that also listed its stations, but then moved to the opposite extreme, mainly producing a very simple map that covered the entire country at a small-scale; just before the war this map was also produced in Esso format. Shell produced no maps between the 1930 EPOC series referred to above, and the Foldex ones (Figure 45 below).

Figure 41: 1930 TCI sheet 1 (of 10) of Italy, with adverts from Shell, Texaco and (inside) Standard and Touring Oil

Elsewhere in Europe, the situation varied. In some countries the automobile touring clubs worked with one or more of the oil companies. So, for example, in Hungary maps can be found jointly produced by the Magyar Touring Club and Sphinx (another precursor of Mobil) or Shell. In Austria and the Netherlands the local club again worked with Shell.

In Italy the Touring Club Italiano (TCI) [657] produced some quite complex booklets or cloth folders containing maps with a wide variety of mainly lubricating oil sponsors, such as Oleoblitz, Shell and Texaco (Figure 41), while the rival RACI produced sheet maps often carrying the logos of both Shell and Esso. Multiple adverts also appeared on Finnish auto club maps with sponsorship from Shell, Esso and Mobiloil.

In Belgium Gulf was sometimes a sponsor of automobile club maps but sheet maps from the commercial publisher Polstobb carried advertising from a range of companies, including petrol brands such as Shell or Texaco.

Despite this, there are some examples of maps produced by, or for, a single oil company. Examples are known from Denmark, where Shell published hardback atlases for several years in the 1930s, BP a very simple sheet map, and DDPA/Standard an immensely complex production of maps and booklets. Even in Italy, the American company Atlantic produced a map in 1932 that was mailed out to its customers. In Switzerland, Shell produced a couple of booklet maps but the strong local cartographic tradition appears to have limited oil company issues.

The only other country known to have had an extensive series of sheet maps similar to the German style is Czechoslovakia. BZ Benzin, the largest company from the Czech half of the country, issued a set of 35 sheet maps in the late 1930s covering the entire country (Figure 42).

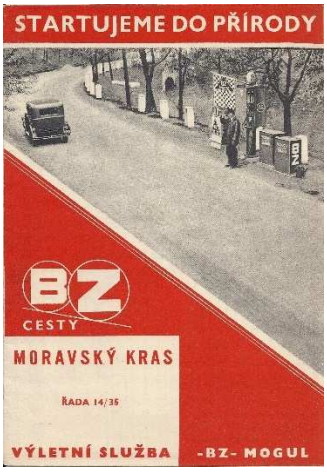


Figure 42: BZ section 14/35. Moravsky Kras [536]

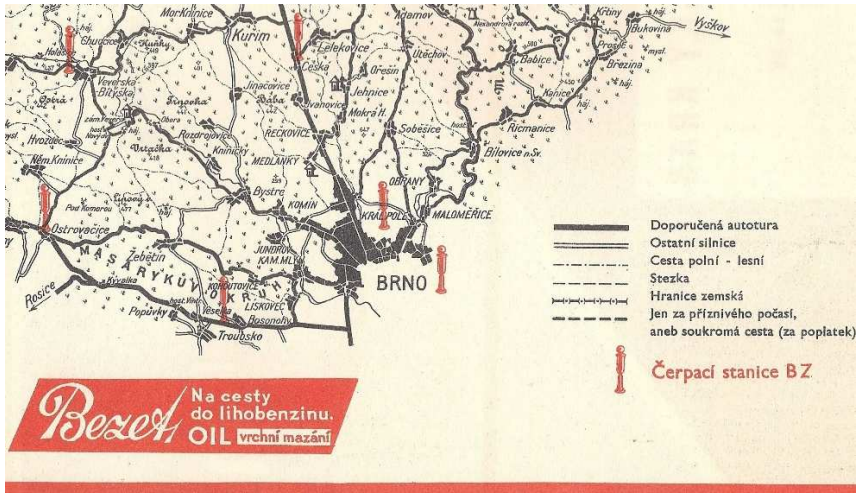


Figure 43: Extract from BZ sectional map

3.5.1. Shell and Foldex

Towards the end of the decade, Shell adopted a completely different approach to its maps, standardising design and publisher between countries. In 1935, a Frenchman named Réné Costard had patented a new means of folding maps that was intended to make using them easier (Figure 44), especially within the confines of a motor car. His method was called Foldex, and Shell acquired the rights for its use across Europe. Foldex-style Shell maps are widespread (if scarce) from the 1930s and were generally pasted into red card covers; this allowed them to be printed on thin, easily folded paper. Cartography was often attributed to Foldex, but some maps also credit a local firm, such as Emil Moestue in Norway, or (on the early French sectional maps) the Service Géographique de L'armée. Foldex's own cartography tended to use more conventional signs that most maps – the example in Figure 45 distinguishes between lighthouses with white, green and red lights, for example, and English maps had a plethora of signs for different eras of historical monuments. Shell/Foldex produced a full series of 10 sectional maps of France (excluding Corsica) at 1:400,000, but had only partly completed their British series when the War broke out. Many Foldex maps are undated, but as a general rule if main roads are grey, then it is pre-war; if they are red it is post-war. Unlike most oil company maps, Shell/Foldex maps were often sold internationally through regular book stores, typically carrying an additional price sticker for the country of sale.

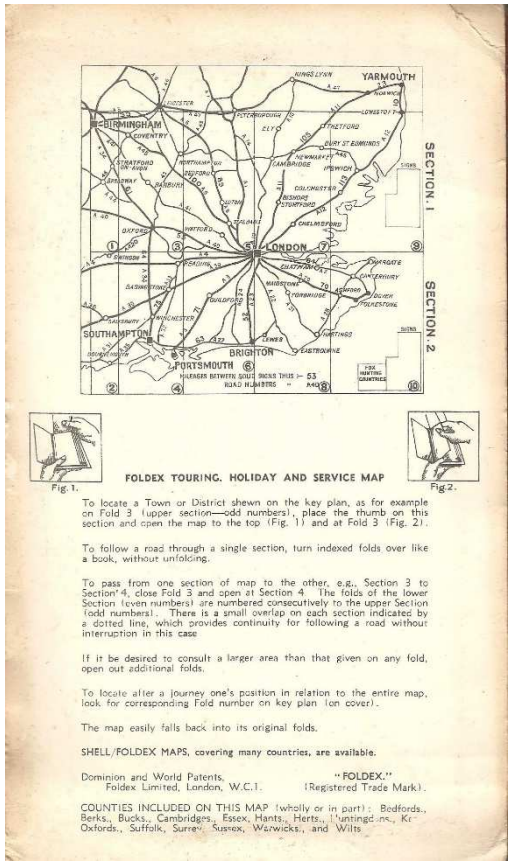
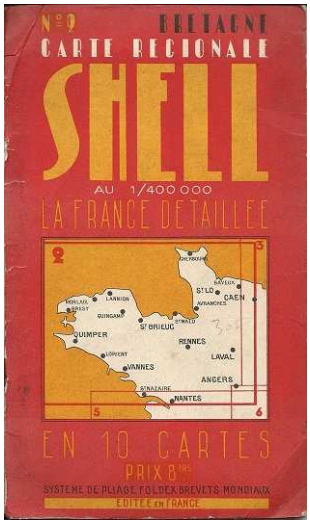


Figure 44: Explanation of Shell/Foldex system from 1930s map [5]



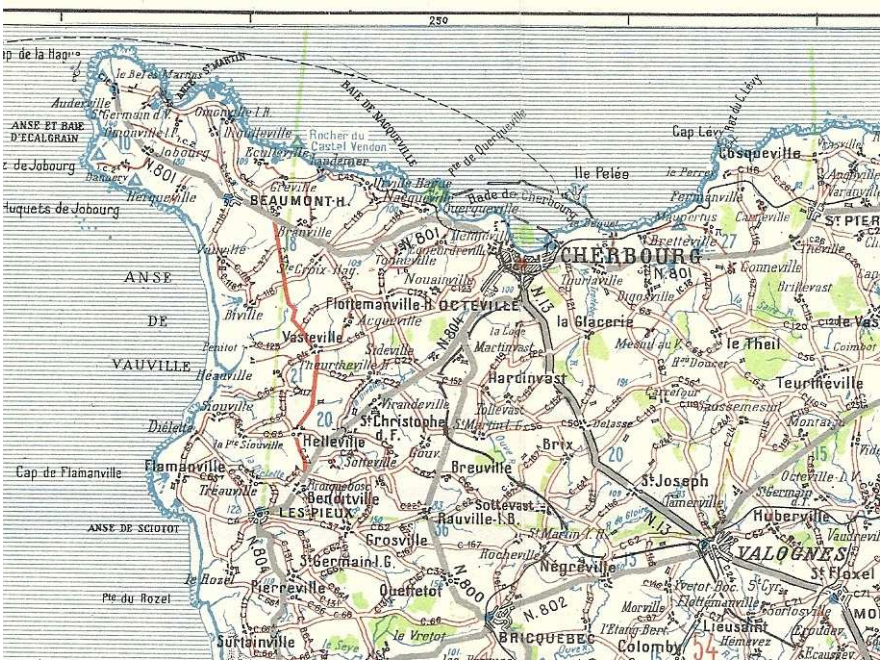


Figure 45: A 1936 Shell/ Foldex map of Bretagne (left) Front card cover (right) Extract from map [121]

3.6. Global expansion: Australasia and elsewhere from 1927

Further afield, petrol companies were active in issuing maps in Australia despite service stations typically selling several competing brands of fuel (as in the UK and California). Australian cartography was generally influenced by that of Britain (Cartwright, 2017) although that is not apparent on early oil company maps, which are often much simpler (Figure 47) than British equivalents. Pre-war maps from the country are rarely dated, but it is possible from print codes, style, cars named in motor oil lubrication tables and road construction to estimate dates. It appears that for several of the companies present in the market the first maps or road books were produced in the mid-late 1920s.

Sheet maps from are known from Vacuum/Plume, Union and Atlantic. Union's earliest maps are probably of Victoria with an HEC Robinson map code suggesting production in 1925. Changes to the cover design and cars in the lubrication chart enable the one in Figure 46 [248] to be tentatively dated 1928. The simple map was printed solely in black, or blue in 1929. Union also issued a map to celebrate the opening of the Sydney Harbour Bridge in 1932.

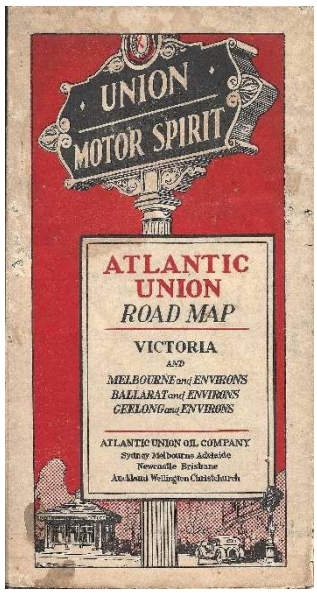


Figure 46: Union, c1928, Victoria [248]

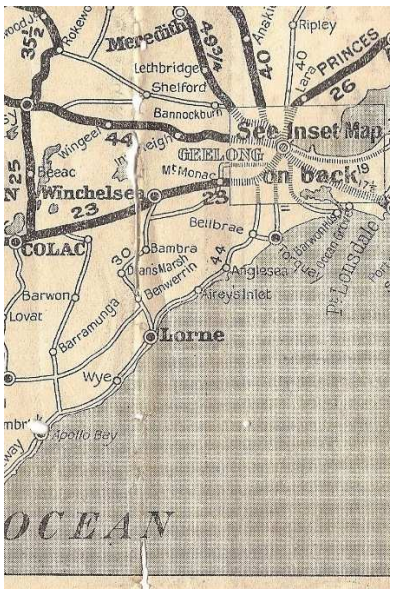


Figure 47: Union, c1928, map extract of area round Geelong [248]

In some states Shell produced hardback road guides which carry a copyright date of 1929, and Shell's productions vary widely between states suggesting a degree of autonomy and local decision-making not found elsewhere. Shell's Motor Tour books vary between a substantial hardbound volume of Victoria, and quite small paperbound booklet for Tasmania, but both have a combination of useful information and foldout maps. Shell also published interstate route maps, such as those connecting Melbourne with Adelaide or Sydney.

It was similar in New Zealand, where pre-war maps can be found from Atlantic Union, Vacuum and, more rarely, Shell, with the addition of Texaco. In both Australia and New Zealand, cartography was from local companies such as Clive Barrass, although many early maps are anonymous.

Elsewhere, pre-1940 maps issued by or for oil companies are rare. In common with Australasia, some titles can be found for the Dominion of South Africa from Texaco or Vacuum. Figure 48 shows Plate 5 (of 12) from Route 4 (of 7) strip maps issued by Texaco [653]. Carrying English text on the reverse of each map, these are undated but have 1931 census data: Oudtshoorn is reported has having a White population of 5,599, Coloured 5,095. Shell may also have produced titles in South Africa, although the only sub-Saharan issue known is a single map of West Africa [625]. Shell's historical ties to south east Asia, where it was initially established, are evidenced by sectional maps of Malaya, and Java while it was still part of the Dutch East Indies. There are also a couple of Socony Mobilgas maps of Shanghai and the adjacent region of China, and a Texaco map of the Baguio gold mining area in the Philippines. Maps from more obscure areas are likely to have been produced in small numbers if targeted at colonial administrators. Early Asian or South American maps are rarely seen by collectors, so for example it remains unknown if there were 1930s' issues from Japanese domestic oil companies.

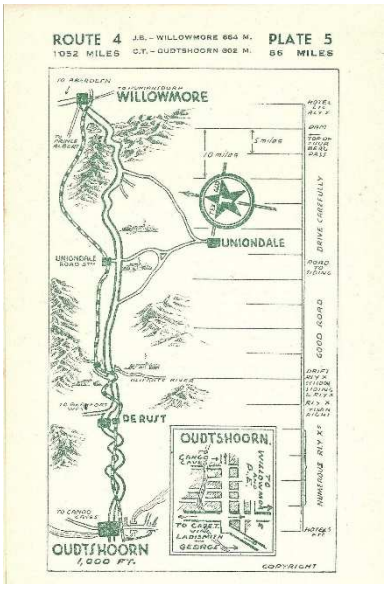


Figure 48: 1930s Texaco Strip map Cape Town-Johannesburg via Garden Route [653]

3.7. Wartime

With the outbreak of the Second World War, Governments rapidly placed constraints on maps. In Germany, prohibitions were put in place in January 1940 that prevented display or distribution of maps, especially topographical ones (although the ban was extended in 1943 to postcards with aerial or panoramic views including those of local landmarks, after an escaping French prisoner of war was found with a tourist brochure). The initial ban was also partly due to a severe paper shortage, mirroring the message on US road maps a couple of years later. (Semmens, 2005:160)

As an initially non-combatant nation, US oil companies continued issuing and ordering road maps until the attack on Pearl Harbor in December 1941. The three main cartographers continued to meet orders for 1942 maps, although drafts had to be approved by the U.S. Office of Censorship in case the newly printed maps fell into the hands of an invasion force or saboteurs. Depending on the exact date that maps were reviewed, there was a jumble of maskings of airfields, military bases and other facilities, with the initial Codes restricting the marking of "*ammunition dumps or other restricted Army or Navy areas… or forts and other fortifications*" issued to cartographers on 15 January 1942. (Smollar, 2015). As the war progressed, motorists were regionally subjected to gasoline rationing, although this was largely due to imbalances between refinery supply and the need to reconfigure plants to produce synthetic rubber, rather than an overall shortage of oil. The journalist Alastair Cooke, writing in 1942 while touring the USA noted "*Neither the consumer nor the bewildered gas-station operator can quite understand the connection between this abundance and this rationing*" (Cooke, 2006).

Figure 49: 1945 Texaco map of New Jersey with Pennsylvania [651]

Figure 50: A patriotic cover: 1944 Esso War Map II featuring Fortress Europe – The World Island – Invasion Edition [547]

Figure 51: 1943 Shell Mapa de vias de communicacion Venezuela [624]

Nevertheless, some maps were published during the war. Smollar (2015) has analysed the records in the Library of Congress and Newberry Library to find that although General Drafting Co and HM Gousha published no road maps, three oil companies (Texaco, Gulf and Union) were permitted to issue a limited range of maps using the services of Rand McNally. As Texaco was the only company that operated coast to coast and Union and Gulf between them also covered the country, it is likely that they were selected for coverage rather than due to any commercial imperative. Texaco's maps tended to group states less conventionally, requiring few sheets to cover the country. For several years after the war ended, they still reminded users that "*Paper is Precious! Please do not throw this map away*" (Figure 49).

Although not road maps, the cartographers did however produce maps for oil companies to give to their customers charting the progress of the war. Indeed this had started before the US joined hostilities, with titles such as “World-wide News Map” (Richfield New York, 1940 [601]), or “News Map Europe and Near East” (Sinclair, 1941 [630]). After Pearl Harbor, they became much more explicit and patriotic about the War, with titles like “War Map of the World” (Phillips 66, 1942 [593]), “Victory News Maps” (Skelly, 1943 [633]) or “War Map II Invasion Edition” (Esso, 1944, Figure 50 [547]). These maps were no longer neutral observers of the conflict but designed to draw motorists into a theatre of war in faraway places that many would never have even heard of five years earlier.

Very few regular maps were issued elsewhere in the war years. Two examples are known from Venezuela: a Shell Map, with Copyright 1943 by the Caribbean Petroleum Company (Figure 51 [624]) and lithographed in the USA, and a 1944 Esso map [558]. These may have been needed by staff engaged in oil exploration and production as secure supplies of crude oil were sought by the Allies.

3.8. Post-war maps: North America 1946-73

By 1945, it was clear that the USA was not about to be invaded and all three big cartographers re-commenced producing maps for oil companies, sometimes simply reprinting the final pre-war issues, complete with masked military facilities.

Figure 52: Texaco's touring service was shown on the rear of its New York City maps [652]

Over the next two decades map programmes were steadily extended, adding cities where the cartographers had maps available. More companies established a touring service for their customers, commonly accessed by mailing a postcard that could be requested at the service station. However some companies also opened a physical location in major cities where anyone could walk in and request maps. Texaco's main Touring Center was in New York City at 300 Park Avenue (Figure 52), described as being opposite the Waldorf-Astoria Hotel, presumably to add status to its operation, although there was a satellite touring service office just 5 blocks away in the Chrysler Building. They published a special version of their New York City map that could only be collected from the centre in person. Its rear cover showed a picture of the centre, and promoted it saying that the center "*is part of the Texas company's nation-wide service to the public. A trained staff provides country-wide touring information and maps for motorists as well as cruising charts and information about coastal and inland waterways for private yachting*." (Texaco 1955 [652])

Roadmaps were seen as an important and integral part of the service to oil company customers, and attempts to change this quickly met with consumer resistance. In the early 1950s, Shell moved away

from the state maps used by all other companies to a series of sectional maps, produced by HM Gousha at a near uniform scale (varying from around 1:1,450,000 to 1:1,950,000 – a much narrower range than typical for state-based map series), leading to a loss of detail around major urban centres (Figure 55) when compared to the contemporary single state map of California issued by Chevron (Figure 53).

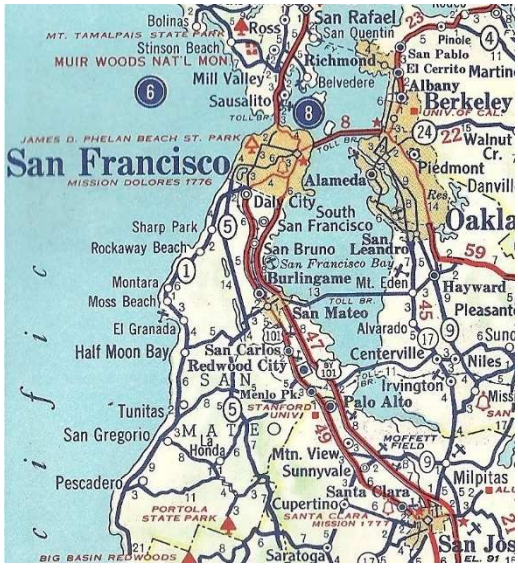


Figure 53: San Francisco Bay area from 1951 Chevron map of California [60]

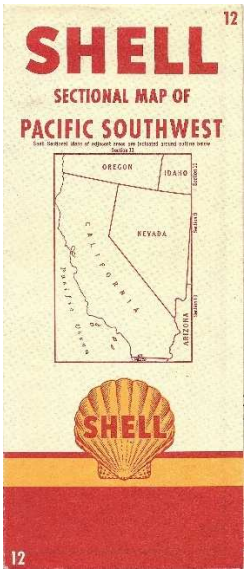


Figure 54:1954 Shell Pacific SW [62]

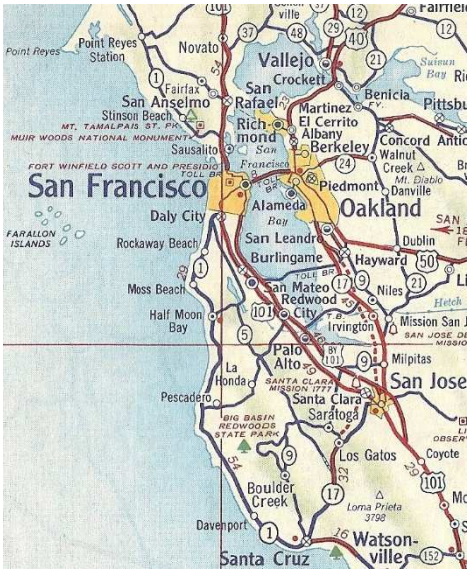


Figure 55: San Francisco Bay area from 1954 Shell map [62]

An article in a 1953 Shell marketing magazine reveals this was not popular with customers. "*You asked for them; your customers asked for them; now you're getting them – your Shell state maps. They have the same use, the same scale as the maps you used to get, but they're better than ever. We've overhauled them – brought them up-to-date. ... Sectional maps supply all the information most tourists need, but occasionally a motorist will want greater detail. That's the time to hand out the state map. You'll be supplied with maps of your own state. When a tourist asked for a map of an adjoining state, explain to him that he can get one from any Shell dealer in that state. That means he'll stop at another Shell dealer's station; gives that dealer the chance to make a sale.*" (MacLaggan 1953). The same article clarifies how dealers were able to obtain roadmaps. They were given a number of postcards "*Determined by gallonage, tourist volume, highway use and similar factors.*" Each card, when returned to the head office, resulted in 50 maps being sent to the dealer. Shell were clearly keen that maps were not handed out too freely. Dealers were advised to keep them in the desk drawer and not in a rack near the door, where they could be picked off the rack by schoolchildren and hitch-hikers who "*won't make any sales*". Despite the concern about distributing maps too freely, some companies offered bespoke touring services available to customers who wrote to them requesting information, or – in the case of Esso – visited a centre in New York or several other cities in South and East USA, Canada and Europe. Esso affiliates also made international maps available on request: customers were clearly meant to be impressed by the global reach of the firm that was also supplying their local service station.

The most comprehensive touring service, though, came from Denver-based Conoco. From the mid-1930s to the late 1950s produced "Touraides", large format ring-bound booklets containing maps and information about a route requested a customer. Each Touraide came in light green covers with as many maps as necessary; a 1939 example for a customer travelling from York, Nebraska to the Golden Gate International Exposition near San Francisco, California contained 31 maps [541]. The importance of maps in attracting customers can be seen as even small firms gave them away in the 1950s and 60s.

Figure 56: Generic Rand McNally cover design, used by Hicksatomic in 1958 [571]

Figure 57: Extract from 1958 Rand McNally/Hicksatomic map

Small companies were able to buy maps from Rand McNally with a simple, generic cover in several different designs, on which their details could be overprinted. The rear cover was normally left blank so that more information could be provided about the company concerned, often including a list of their service stations. These generic designs used Rand McNally's most basic cartography, generally at the same scale as regular maps, but often using a two-colour red/blue palette, irrespective of the colours used for the cover printing. The big three cartographers maintained their stranglehold over the oil company roadmap market until the 1960s. Over 95% of map issues came from these three firms, with only minor differences in design and symbology:

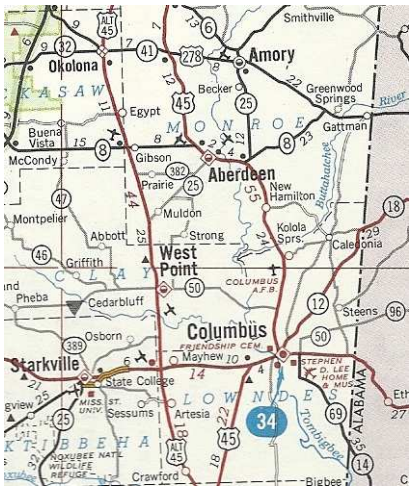


Figure 58: HM Gousha, customised for Conoco (one gas station is marked with an inverted triangle), 1969 [542]

Figure 59: Rand McNally, for Apco Oil Corp (standard design), 1971. Unpaved roads are still marked, e.g. from Strong NNE towards Aberdeen [513]

Figure 60: General Drafting Co., for Exxon, 1975, used a slightly simpler design [560]

The main cartographers provided mapping of every state, and almost all the top 50 US cities. The few exceptions tended to be in Ohio where cities such as Dayton and Toledo were unavailable. In order to provide maps of some smaller cities, additional cartographers were used, most notably Thomas Bros on the West Coast and J Foster Ashburn in the Midwest. Only three significant oil companies chose to use minor cartographers in this period – Union 76 used Jeppesen for several years, Michigan-based Leonard Refineries bought in its maps from the state mapping agency, and the New England firm Jenney distributed large format atlases of its area produced by the National Survey Company.

In the mid-1960s this dominance began to change with two new entrants (Ristow and Bahn 1964). From 1963 Diversified Map Corporation began to work with companies such as the Standard Oil Company of Indiana (American/Amoco) and DX. A couple of years later RR Donnelley & Sons, a long-established Chicago printer, also entered the map market (Figure 61). Just as the supply side became more competitive, oil companies started to question the value they obtained from their map programmes. By the mid-1960s they were giving away over 250 million free maps each year to US motorists; inevitably companies started looking for ways of using them as an additional revenue stream. Charging for maps was seen as unacceptable, although it had been done on a small scale by Sohio for its Ohio city atlases. Instead some companies started looking for advertising revenue from third parties. Standard Indiana went furthest down this route, creating a division called Tempo Designs to sell advertising maps, including to competitors (see below, Figure 104). In the late 1960s 3M Corporation, through its National Advertising Co subsidiary, produced strip maps of the main interstate highways that could be customised to show which exits hosted an oil company's service stations, but after the 1973 oil crisis advertising dried up and the product was abandoned.

Figure 61: RR Donnelley cartography for Shell, 1968 [77]

In Canada, the situation was similar, with free maps distributed based on provincial boundaries, except generic maps were not available for smaller companies to use and from the late 1960s city maps carried a cover charge. HM Gousha and the General Drafting Company both produced maps for use North of the border, and the cartographic division of printer Rolph Clark Stone formed a joint venture with Rand McNally (see Chapter 7.4). Gousha also worked with a local partner from the 1960s onwards – Grant-Mann. The big three were joined by Creative Sales Corporation in the early 1970s (Alder 1974).

3.9. Europe 1948-1973

The need to rebuild infrastructure, food rationing and a lack of available hotel rooms limited tourism after the Second World War (Kopper 2009) so oil companies were slower than in North America to re-start issuing roadmaps. There were exceptions: the commercially focused Shell-Foldex operation re-commenced relatively quickly, and in Germany Esso initially overprinted stocks of pre-war maps. In Switzerland, unaffected by direct conflict, tourism was quicker to recover, with Esso producing its first new map as early as 1948, working with the US General Drafting Co.

3.9.1. Central Coordination: European Touring Services

For most of the 1950s Shell's coordinated map programme continued to rely on Foldex (see 3.5.1) although where Foldex was unable to provide maps, Shell utilised local cartography, sometimes printed in the UK or the Netherlands. Not all countries bought into the coordinated programme. In Germany Shell continue to issue inexpensive sectional maps, though using fewer sections to cover the western part of Germany than it had used before the war. Shell continued to publish numerous city plans using a common style, extending beyond Germany to Italy, Belgium and Denmark, for example.

The largest companies (notably Shell, Esso, BP and Fina) ran free European touring services in the 1950s and 1960s. The combined Paris and Brussels offices of the Esso Touring Service handled 595,612 enquiries in the peak year of 1959 (General Drafting 1983). A minor proportion of European enquiries were to provide US maps and vice versa, but most were for cross-border tourism within Europe: in 1966, 9 million West Germans holidayed abroad, with fewer than 15% on package tours (Kopper, 2009). The overall costs and benefits of the touring services were probably never fully analysed by the companies concerned, although a detailed internal review was conducted by Esso during 1955 showing the outputs since its inception. Company records show an annual cost exceeding $500,000 in the later years of the service; both offices were closed in 1962.

Where it was available to motorists, the Esso Touring Service was free, as explained on British leaflets promoting it. Customers could fill in a postcard at their nearest Esso Dealer that "*will bring through the post all the maps you require for your tour, with suggested routes. No charge, of course – it's part of the Esso service*". Esso added that it was not meant to replace the services of the large motoring organisations ("*i.e. the A.A. and the R.A.C., etc.*").

Figure 62: Undated (c1952) Esso leaflet promoting their touring service to UK customers

3.9.2. United Kingdom

This free touring service contrasted with the sale of domestic road maps in the UK, which included the Republic of Ireland. Esso sold a series of eight sectional maps (Figure 65), mainly at five miles to the inch, and prepared for them by Edward Stanford Ltd. Section 1 covered London, and section 8 the entire island of Ireland. Although most maps were produced locally, designs were checked and coordinated by the General Drafting Company in New York (Figure 63).

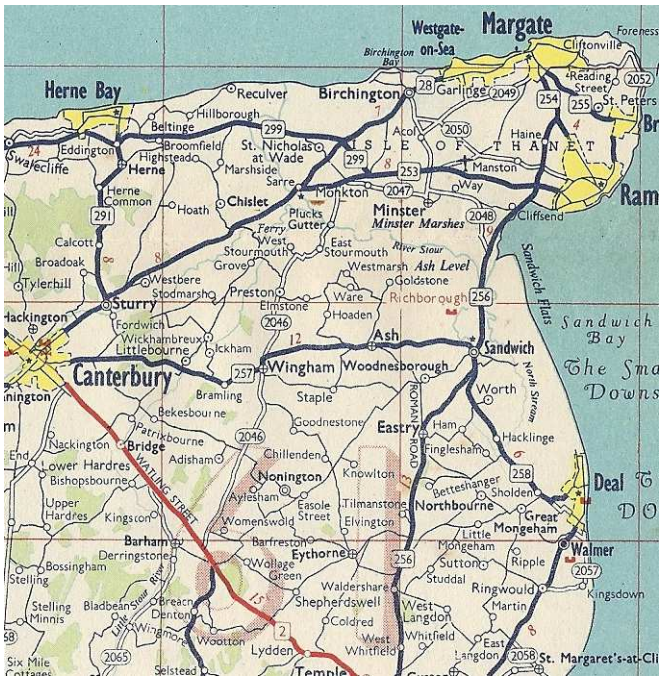


Figure 63: c1949-54 Esso map – extract of East Kent; Edward Stanford 1:316,800 [6]

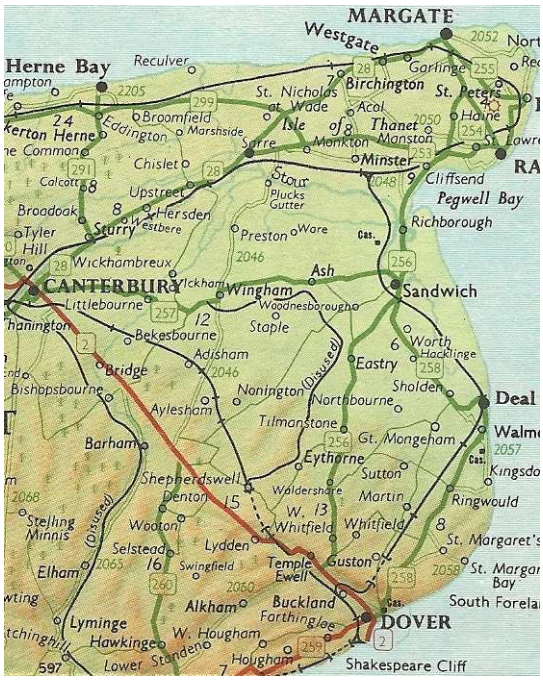


Figure 64: c1951 Shell map – extract of East Kent; George Philip and Son 1:380,160 [10]

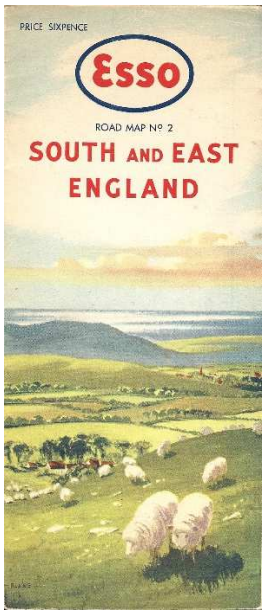


Figure 65: Esso 1949-55 [6]

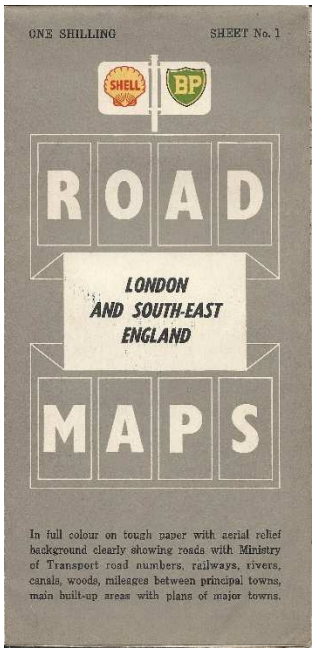


Figure 66: Shell-BP 1951 [10]

Figure 67: Mobil, c1955 [11]

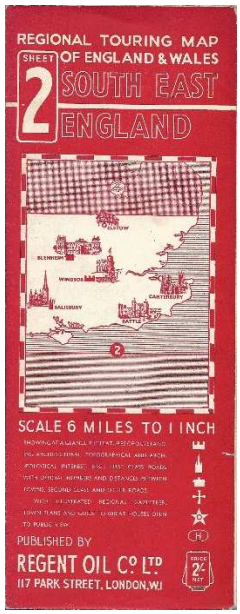


Figure 68: Regent, c1953 [7]

In the UK, where Shell and BP operated in a joint venture (Shellmex-BP), the company was slow in responding to Esso's sixpenny series of sheet maps. Branded petrol sales did not return until February 1953, when the wartime pooling arrangements were ended, and initially most filling stations continued the pre-war practice of selling several brands of fuel. However, new entrants into the UK market, such as Mobil, signed up so-called solus stations, creating a need to differentiate between brands. Shellmex-BP's response was to commission a series of six maps (Figure 66), each covering a slightly larger area than Esso's and using a combination of hypsometric tinting and hill shading to show landforms (Figure 64), whereas the Esso designs were against a plain background, except for wooded areas. Initially just over 1.5 million copies were printed with the largest number for the Greater London map (310,400) and the smallest for Ireland (156,000). The first printing, ordered in late 1951, carried the dual branding of Shell and BP; it was not until 1954 that reprints for a further 1.5 million maps carrying the logos of the individual companies were ordered for use at the increasingly common single brand stations. Although the cartography could be seen as being more attractive on the Shell-BP maps, it was less practical for use by a motorist than the plainer design from Esso, especially after dark or in low light levels (Consumers' Association 1963). These maps also sold at twice the price per sheet of the Esso maps, and a lack of reprints suggests that sales were sluggish, compared to the Esso maps which had attractive watercolour covers and at least annual revisions; sales exceeded 10 million over the same period. The Shell and BP maps were attributed to George Philip and Son, which by that time also owned the Edward Stanford imprint. It is presumed that as the two largest suppliers to the UK market, Esso and Shell/BP did not wish to appear publicly to be using the same cartographer.

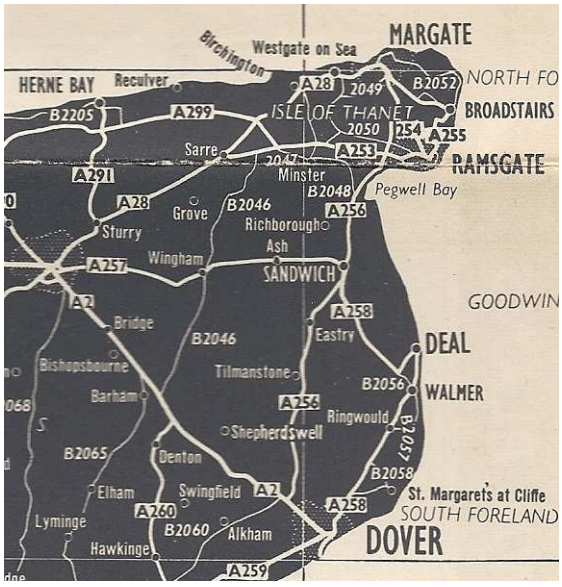


Figure 69: Mobil, c1957 extract of East Kent; Roadfinder maps, ~1:500,000 [11]

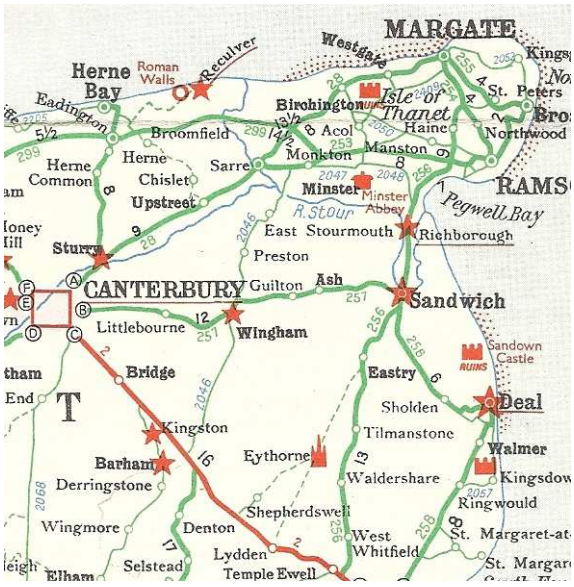


Figure 70: Regent, c1953 extract of East Kent, Geographia, 1:380,160 [7]

Other companies present in the UK market also started selling road maps. Mobilgas, which had only entered the retail petrol market after the ending of the pool arrangements, used an unusual design with

white roads on a dark background (Figure 67). Such maps were marketed by suggesting that users could highlight the routes that they intended to use, although in practice, based on surviving maps, this appears to have been done infrequently. In 1957 Shellmex-BP acquired National Benzole, which had initially been established to sell fuel blended with a by-product of the coke manufacturing industry. It was only after this purchase that National commissioned its own maps, initially using different designs from other group companies. The other two main suppliers to the market both focused on small and relatively inexpensive road atlases. Regent, which was largely controlled by the American firm Texaco, regularly issued a small-scale atlas of Great Britain with a metal spiral binding, similar to atlases produced by the Texaco/Chevron joint venture Caltex in several other European countries. However It had also issued a series of sheet maps covering just England and Wales in small quantities produced by Geographia with unusually clear marking of points of interest by red stars (Figure 68). Geographia's maps also owed much to the simplified US style rather than traditional British cartography. In contrast, Petrofina exclusively used road atlases in the 1950s, using typical British cartography, initially by W and AK Johnston, but later from George Philip and finally, in 1960, a hardback atlas from Bartholomew.

3.9.3. West Germany

In West Germany, the pre-war streetside *zapfstellen* pumps were rapidly replaced during the 1950s by increasing numbers of purpose built service stations, each retailing a single company's fuel, and often to a standard architectural design, akin to the US model. It appears that road maps were seen as an important part of the brand image creation, with all significant operators in the market issuing series.

Figure 71: c1968 Aral map of Germany [518]

Figure 72: 1959 Esso map of Hannover [550]

Figure 73: 1956 Gasolin Panorama map 2 [566]

Figure 74: c1962 JRO map of West Germany for TS [658]

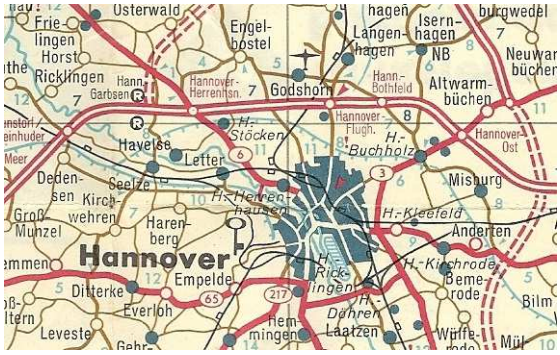


Figure 75: Extract from c1961 [IV/6] Aral sectional map 3 (Busche, 1:400,000) [517]

Figure 76: Extract from Gasolin Panorama map 2 (Hans Wolf/Bruckmann, 1:350,000) [566]

BV-Aral emerged after the war with the largest chain of filling stations; it was controlled by a consortium of German oil explorers and refiners, although the US company Mobil had a minority stake. Initially it published a series of 13 sheet maps, each covering a relatively small area, but it soon reduced this to 7 maps covering West Germany. Uniquely, the cover still showed the pre-war German borders until the mid-1960s, including East Prussia, even though the national sheet extended no further east than Berlin (Figure 71). Cartography on sectional maps has always been undertaken by Busche of Dortmund using a colour scheme linked to Aral's own colours – all places with Aral service stations were marked (Figure 75). Around the end of the decade, Aral started adding some larger scale touring maps of principal holiday areas carrying attractive watercolour covers similar to those published in the UK for National Benzole. Aral's main offering had a degree of continuity with its pre-war maps, and this could also be said of the BP sectional maps, which kept the same format as its 1930s maps, although changing to the green and yellow used universally in post-war marketing by the company (having initially been adopted in France in 1922 [Ferrier 1986]).

As in Britain, Esso issued sectional maps of the country independently from the Touring Service. The German series, starting around 1952 to replace the older overprinted pre-war maps, used five sheets, but these were soon replaced by a series of three covering just the north, centre and south of the country. With attractive colours and issued in very large numbers, these maps set a standard for other companies to follow. Esso also issued occasional maps of tourist areas, an enlarged map of the Ruhrgebiet, and a very small number city maps, including Hannover (Figure 72 [550]).

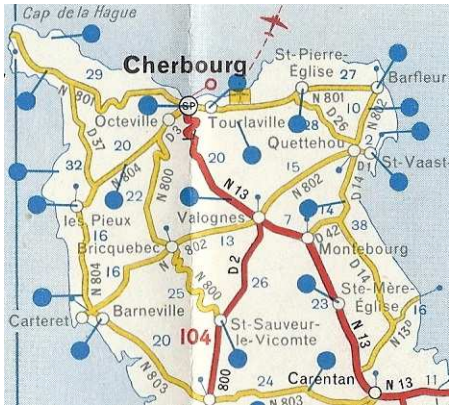
The fifth main operator in the market, Gasolin, which had inherited the Leuna marketing assets and absorbed the Nitag chain in the mid-1950s, abandoned the pre-war atlas format in favour of sheet maps, additionally sponsoring an attractive series of panorama maps. Unlike the regular sectional maps, the 10 panorama maps only covered around 75% of the land mass of West Germany; they were drawn

by a Hans Wolf, but printed by Bruckmann in Munich. Figure 76 [566] shows how the resultant map was still just about usable as a road map, although in some areas it was dominated by a T symbol for Gasolin's service stations (*Tankstellen*).

The smallest of the main fuel retailers in the country, DEA, used a completely different approach, mainly providing a small format cloth-bound "atlas" (a cleverly cut and folded Falk-plan of West Germany) augmented by similarly small sheet maps. The diversity of approaches reflects the large number of available cartographers in West Germany: these included Karl Thiemig (Esso), JRO (BP), Mairs (Shell), KG Lohse (Gasolin), Busche (Aral) and Falk (DEA), and Hans König which worked for Petrofina and Caltex. JRO had traditionally been a publisher of globes and world atlases, but sold a range of sheet maps to many of the smaller independent companies. These could either have the entire front cover customised or simply have their details overprinted in a small panel on a stock JRO map. Among the many firms which took advantage of this were Kraftin, Varol, Hettöl and Lotherol, which all paid for custom covers. Tramin, Veedol, Klaus Salm, and the three outlet Tankdienst Sengeisen (Figure 74 [658]) selected the presumably cheaper overprinting option. Both styles allowed firms to list their service stations printed on the rear cover or use it for advertising lubricants.

3.9.4. France

The situation in France was somewhat different, as the market for inexpensive sectional maps continued to be dominated by Michelin; their national maps (998/999) were used by Fina (Figure 77), Mobil, Caltex and Avia. Although Shell did produce a few sectional maps in the early 1950s, mostly the petrol companies relied on a single map or booklet covering the entire country.



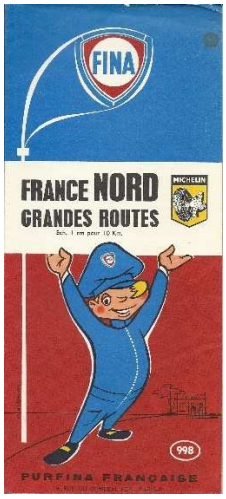


Figure 77: (a) Extract from 1960 Fina map by Michelin; blue pins locate one or more Fina service stations (b) map cover [564]

Esso, in keeping with other European countries, used the standard design originated by General Drafting Co. in the US, using cartography by Blondel la Rougery; a city map of Paris was also produced, but only in 1958 [564]. Perhaps conscious of French nationalism and a mistrust of US corporations, Esso's pictorial cover for several years showed an idyllic picture of an oil drilling rig in a lagoon near Parentis, where a tiny amount of oil had been discovered in 1954 (Figure 78 [134]). One of the most regular issuers was the domestic firm of Azur, which produced several different editions of a map booklet also listing its principal service stations. But the most notable change came in 1958, when Shell, in conjunction with

its regular cartographer Foldex France, started freely distributing low-cost sectional maps called Cartoguides (Figure 79). These had attractive colourful covers and, although at a relatively small scale, were potentially more useful than the single sheet coverage provided by its competitors. The reverse of each Cartoguide listed points of interest to tourists. The basic series contained 13 maps plus a slightly smaller one of Corsica, and they continued to be issued by Shell into the 1980s. Additional Cartoguides were sometimes produced for special purposes, such as to show camping sites or a boating map. Although freely distributed, the maps could also be bought in a wallet as a complete set.

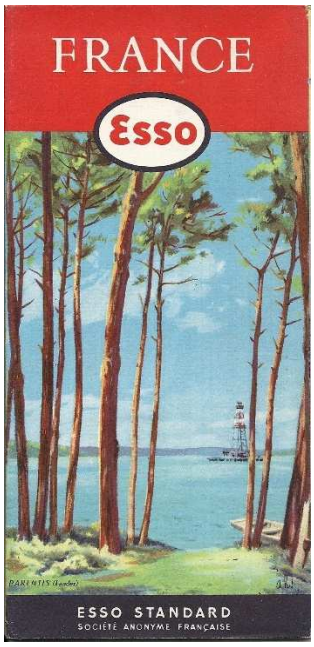


Figure 78: 1957-9 Esso map of France showing oil exploration in Parentis [134]

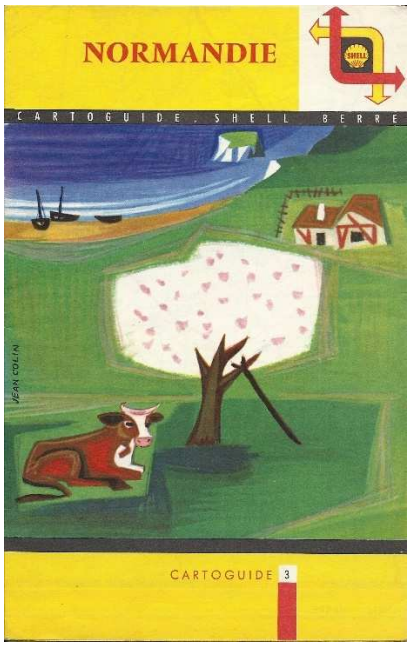


Figure 79: 1959 Shell cartoguide 3 of Normandie – (artwork by Colin) [135]

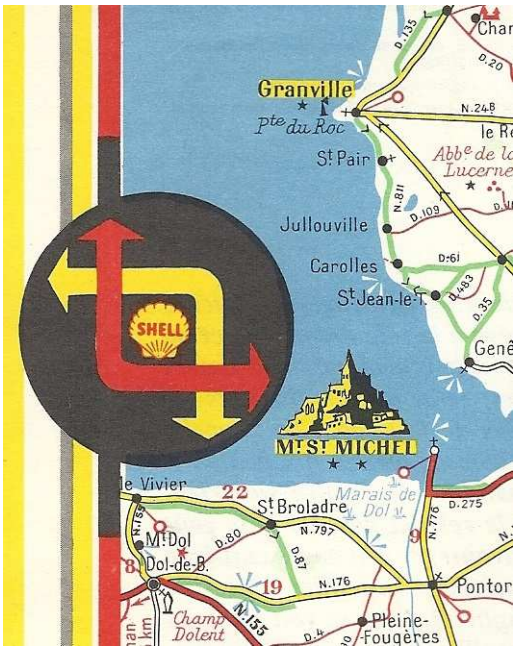


Figure 80: Extract from 1959 Shell cartoguide of Normandie. Cartography by FF (Foldex France) after IGN [135]

3.9.5. Italy

As the fourth largest fuel market in Western Europe, the main companies also produced roadmaps in Italy. The Italian market was largely dependent on small street-side stations, so it is possible that marketing budgets may have been limited.

Esso's maps followed its international style; for a few years in the mid-1950s, its single sheet of the country was updated remarkably frequently – four times in 1956 and three in each of 1957 and 1958. In 1959 Esso advertised – and published – a map of Sardinia (Figure 81), but although this was reprinted for the 1960 Olympic year, it was subsequently discontinued.

Figure 81: Cover of 1959 Esso Sardinia map [554]

The press advert for Esso's Sardinia map showed the entire map at a reduced scale but in black only; unlike the real map it was overprinted with service station locations. Esso did however produce a special map of Rome for the 1960 Olympics, in addition to a Europe and Northern Italy map for visitors.

Other firms also took advantage of the Olympics to procure special maps, including BP and Petrol Caltex.

As in several other countries Shell produced a number of sectional maps supported by maps of key cities, including Venice, where there were hardly any roads (or service stations) to show.

Figure 82: 1959 advert for Esso's new Sardinia map

The local market leader, Agip, mainly produced single country maps, although it did occasionally produce sectional maps. The local firm Aquila, which was associated with FIAT before being acquired by France's Total in 1955 issued a few spiral-bound road atlases, but also a series of around 100 individual city street plans.

Figure 83: Wallet, sectional map 30 and rear cover showing sections from BP Italia in 1964. Note logo is only on the rear [532]

The largest series of road maps came from one of the later entrants into the market, BP. In the early 1960s they sold a series of 37 small format maps, available either individually or in three vinyl wallets - even Sardinia required three sheets (Figure 83). In one respect, however, the situation in Italy was very different from Germany or France – most of the cartography appears to have been undertaken by just two companies – Agostini and Vallardi, although Esso relied on the German company Karl Thiemig in the 1950s.

3.9.6. Other countries

Oil companies also became involved in sponsoring or publishing roadmaps in the other countries of Western Europe, excluding Spain where the market was under the control of a government monopoly, Campsa. In smaller countries a single sheet usually sufficed, and this even extended to larger but lower density lands such as Norway and Finland. Sweden tended to be divided into two sections – north and south. Where sectional maps were produced, these most frequently came from Shell. It periodically produced a series of inexpensive sections of Austria, and divided Switzerland into four, along the lines of the French Cartoguides. Shell also produced maps of Jutland, Sjaelland and Zeeland independently within Denmark.

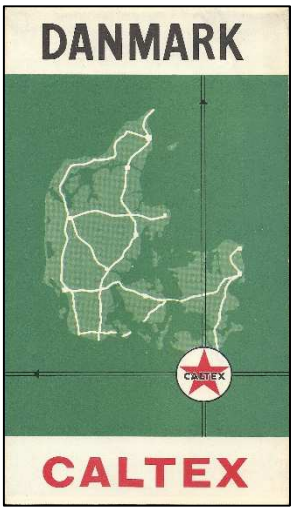


Figure 84: Caltex, Denmark, c1961 (At 1:505,000 to avoid the Kort Stempel *tax [537]*

Figure 85: Chevron, SE Germany, c1968 [539]

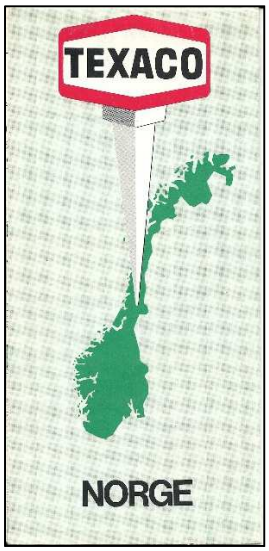


Figure 86: Texaco, Norway 1973 [648]

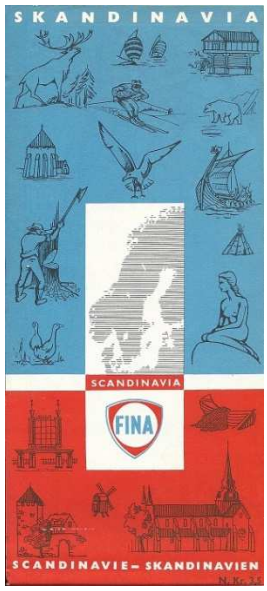


Figure 87: Fina Norge, Scandinavia, c1964 [565]

Other companies also exercised a degree of coordination in their mapping programmes, even if it mainly extended to cover designs. Caltex used a uniform outline map on a green background (Figure 84); after its operations were divided between its joint venture parties of Chevron and Texaco, the former used a not dissimilar design but in blue. The Chevron example shown in Figure 85 is transitional; it was printed with a Caltex logo, but then had a Chevron sticker placed above it. Texaco retained the red and green of Caltex (Figure 86), while Purfina/Fina (Petrofina) used a mid-blue series of covers with sketches of landmarks from each country (Figure 87). Mobil used several common layouts (see Figure 98 for an example from Nigeria), which unusually extended across most continents including north America, Africa and Asia. However there was little consistency in the cartographic designs used by these companies.

3.9.7. Eastern Europe

Although international brands of petrol were unavailable in the Comecon countries or Yugoslavia, most sought to attract tourists from the West as a way of generating hard currency. Fairly basic maps of the country were supplied through tourist offices, marking service stations that would accept coupons or currency, but in most countries there were occasional issues bearing the imprint of the national monopoly petrol distribution company. In Romania, a 1973 PECO issue dispensed with either the country name or "map" on the cover, despite being internally in Romanian, English and German, preferring to use a clichéd image of a pump attendant (Figure 88).

Figure 88: Peco Romania 1973 [592]

Figure 89: 1987 Minol map of East Germany (DDR) [585]

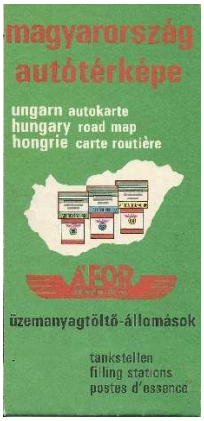


Figure 90: 1974 Áfor map of Hungary [503]

Figure 91: Extract from 1974 Áfor map of Hungary [503]

Figure 92: 1980 JP map [579]

In East Germany the state cartography house of VEB Hermann Haack produced large numbers of maps for domestic use. Possibly because the country discouraged Western tourism, several versions were produced for the state fuel monopoly, Minol (which had inherited the pre-war Leuna refinery), between 1960 and 1990, normally folding down to A5. The friendly Minol mechanic bird belies the run-down state of its retail filling stations; later maps alternated between Minol and Intertank branding – Intertank were service stations selling higher octane fuel for hard currency.

Hungary had allowed a single Shell station to operate from 1968; in the 1970s it allowed three Western firms (Shell, BP and Agip) to open a handful of stations in a joint venture with its monopoly, Áfor, and the Agip and Áfor stations are both shown on a 1974 map (Figure 91 [503]). Yugoslavia's version of decentralised communism permitted each constituent republic to operate its own petrol company, and as they were allowed to operate outside their home republic, the market had a semblance of limited competition. This may explain the variety of maps from firms such as Petrol (Slovenia), INA (Croatia) and JP-Jugopetrol (Serbia), among others. In common with many Yugoslav maps, the cartography of the

JP map (Figure 92 [579]) was provided by Avto-Moto Slovenije, suggesting that there were fewer competent cartographers than oil distribution companies.

3.10. Internationally 1948-73

The global reach of the leading international petrol companies was at its peak in the 1960s and 70s. Outside the overtly Communist states, almost all markets were supplied by Shell and Esso or Mobil, with BP, Caltex/Texaco and, especially in Francophone areas, Total (Compagnie Française des Pétroles) also often present. This ubiquity is reflected in their roadmaps. The inventory of the Richard Horwitz Collection donated to the Osher Library in Portland, Maine lists Shell maps from approximately 74 countries from the 1960s and 70s, including 18 in Latin America, 18 in Europe, 23 in Africa, seven in Asia (plus Burmah-Shell maps from India and Pakistan) and four from Australasia. An inventory of the General Drafting Company archive drawn up in 1983 shows that they had Esso maps from 16 countries in Latin America, 15 from Europe, three from North Africa and just Ceylon in Asia. This inventory, however, omits domestically produced Esso maps such as those from Japan, Australia or the Edward Stanford issues in the UK. The absence of sub-Saharan Africa and most of Asia is due to those parts of the world having been assigned to Standard Oil Company of New York (Mobil) or the Atlantic Refining Company when the Standard Oil trust was initially split in 1911. This also accounts for Esso having fewer countries in Europe, as Mobil not Esso operated in Southeast Europe and Portugal.

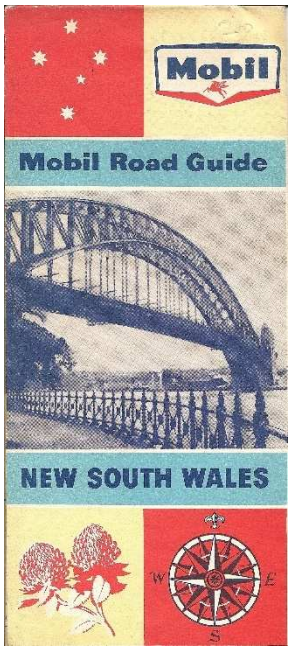


Figure 93: 1962 Mobil New South Wales [260]

The post-war situation in Australia was not dissimilar from that of the UK and Europe. Prior to 1950 most service stations had sold multiple brands of petrol, but as in the UK there was a move to solus stations. The main operators all produced or distributed single state maps, although the Northern Territories were usually combined with South Australia, with the larger firms also producing issues for the main cities. BP, which until the mid-1950s had traded under the C.O.R. brand of Commonwealth Oil Refineries, initially used a more expensive medium format paperback atlas but later published sheet maps covering quite small areas of tourist interest. From time to time Shell and BP also distributed strip maps of the main routes connecting major cities or other destinations such as Shell's 1965 map of Bowen to Mossman [607]. As elsewhere, Shell's regular map programme became among the most extensive, with city environs maps including Adelaide, Brisbane, Canberra and the Snowy Mountains, Melbourne, Perth, and Sydney.

Intermittently, additional maps were issued for destinations such as Cairns, Rockhampton and "Across the Nullarbor" (which was essentially a strip map from Ceduna to Norseman, with copious information on where water and other supplies could be found). In addition to the major international oil companies of Shell, BP, Mobil, Caltex and Atlantic (Esso), the domestic firms of Neptune (which was controlled by Shell), Ampol and Golden Fleece also operated extensive map programmes, and newer short-lived entrants into the market such as Total and Phillips 66 also felt it necessary to distribute branded maps of the states in which they operated.

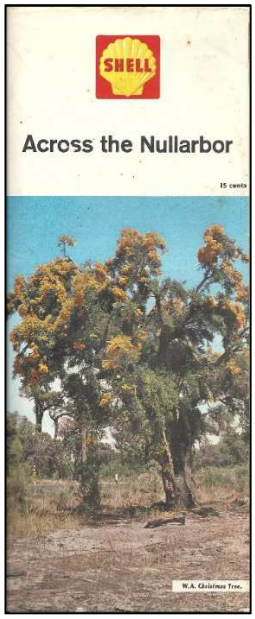


Figure 94: 1967 Shell "Across the Nullarbor" [608]

Figure 95: ca1964 Total map of New South Wales [654]

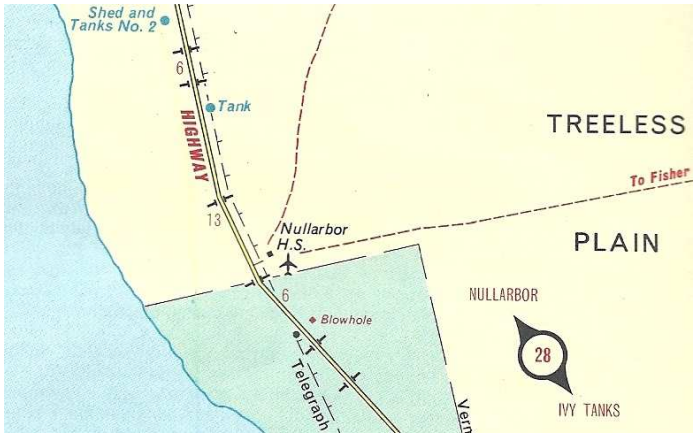


Figure 96: Extract from 1967 Shell Nullarbor map [608]. Dog fences are marked where they cross the Eyre Highway; the green area is the Yalata Aboriginal reserve.

The pattern in New Zealand was slightly different, with some firms, such as Atlantic/Mobil and Caltex, concentrating on sheet maps of North and South Island and others, such as Shell or Europa, preferring map booklets while BP just placed the entire country onto a single sheet.

Fewer maps were distributed in Africa or Asia. Although there was a wave of optimism in the newly independent countries within Africa, leisure motoring was still out of reach for most of the indigenous population. The few maps issued followed European or American models coordinated by distant head offices. Outside South Africa, most issues came from Shell, Mobil or Caltex (in East Africa), with Esso and Agip also in Nigeria.

Figure 97: 1953 Afrikaans language Caltex map of Southern Africa, including Rhodesia & Nyasaland, with black attendant [538]

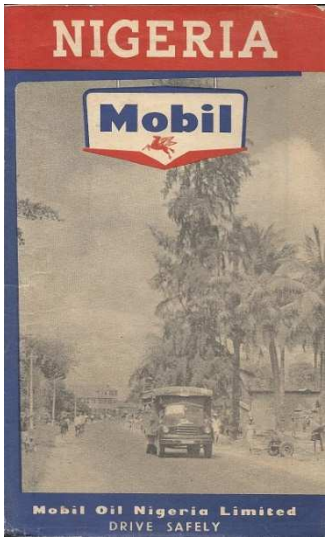


Figure 98: 1955 Mobil map of Nigeria [588]

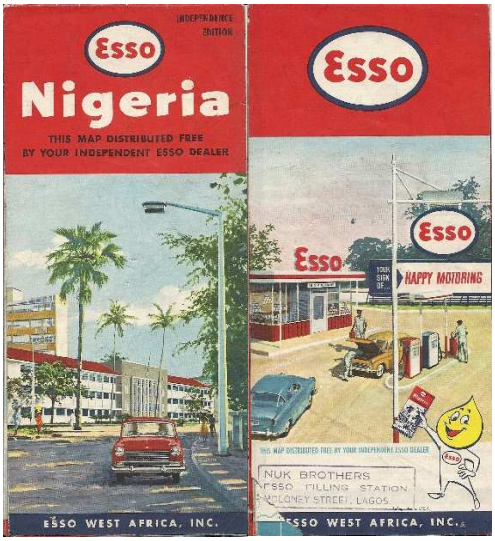


Figure 99: 1960 Esso Independence edition map of Nigeria [559]

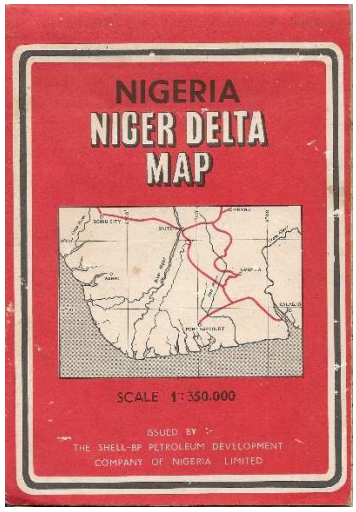


Figure 100: 1971 Shell-BP map of Niger Delta [629]

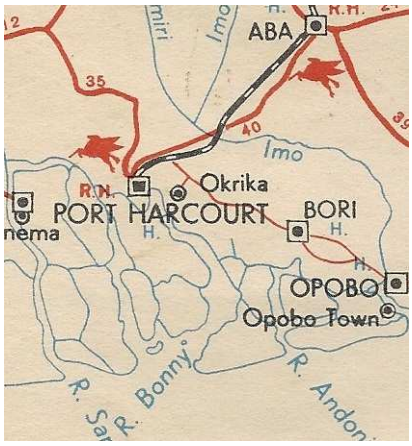


Figure 101: Extract from 1955 Mobil map [588]

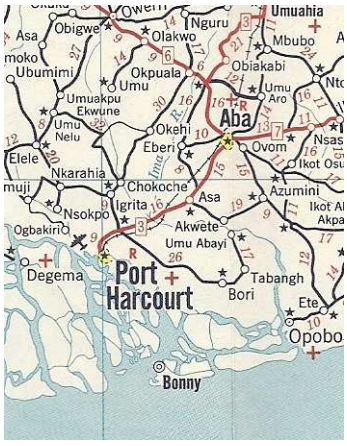


Figure 102: Extract from 1960 Esso map [559]

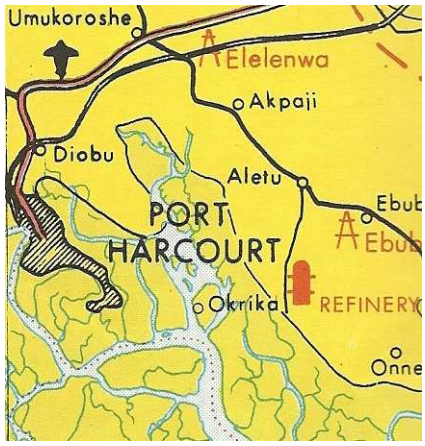


Figure 103: Extract from 1971 Shell-BP map [629]

The 1955 Mobil map followed the usual Mobil cover style of a black and white photo, albeit with a notably dull image. Internally, the map was quite basic, but clearly showed motorists where they could find fuel supplies. In contrast, the 1960 Esso Independence edition map of Nigeria was brimming with confidence. A car drives along an empty road flanked with palms, in front of modern offices. The rear cover, which in line with most Esso maps of the era shows an idealised service station has "Happy" the Esso mascot holding a copy of the map – a car is being attended to by station attendants (and there is not a white person in sight). Inside the area is shown as full of roads and villages – in common with General Drafting Co practice elsewhere, there's no indication of surface condition. An inset (not shown) maps overland connections to Nigeria, implying that the main decision about travelling from Kano to Tunis would be whether to take the route through Tamanrasset (Algeria) or Murzuq (Libya). The Sahara Desert appears to have been unworthy of mention. By 1971, though, the spirit has started to change. The Shell-BP Petroleum Development Company map is a working document at a much larger scale (1:350,000 compared to 1:2,500,000 for Esso). Unlike Mobil's service stations, it exists to show the

Niger Delta oilfields and refinery outside Port Harcourt. All three maps represent a reality chosen by the oil company, but Shell-BP have a warning "*The positions of the State Boundaries shown on this map are not accurate. They have been plotted from Gazette Notices where available, and from various other sources*". This may of course relate to the fact that the Niger Delta had been at the heart of the Biafran war, which had only ended 12 months before the map was published.

Most of this activity was to change with the 1973 Arab oil embargo. Although the response was not immediate, many centralised map programmes were cut, especially in North America, although some more commercially-focused programmes, such as the Aral-Busche and Shell-Mairs (General Karte) tie-ups in Germany, and the major brand sectional map series in the UK and Australia continued for at least another 15 years, albeit with higher cover prices and shorter print runs.

3.11. After the Oil Crisis – the long decline

On 17 October 1973, President Nixon requested Congress to make available emergency aid to Israel for the conflict known as the Yom Kippur war. Two days later, the Organisation of Petroleum Exporting Countries (OPEC) announced an oil embargo on the United States and a series of production cuts. Together with a related embargo on the Netherlands, which had become Europe's principal petroleum refining centre, the effect was to lead to a fourfold increase in the price of crude oil, expressed in dollar terms, and severe shortages in many western countries. Against this background, oil companies reduced their marketing and changed its nature. When there were queues outside petrol stations it made little sense to encourage demand for more oil through promoting tourism by car.

Although the embargo lasted for less than six months, the price rises held and led to a greater awareness of companies' cost bases and the need to ensure that all aspects of the business, including downstream operations, were profitable. The effect of this on oil company roadmaps varied greatly between countries, depending partly upon whether they were seen as a marketing benefit for customers, or as a profit centre for owners of service stations.

3.11.1. North America

In North America, some oil companies had already been cutting back on free map programmes before the oil price shocks of 1973 led to a renewed focus on controlling costs. Although some US firms maintained reduced map programmes into the 1980s, almost all the main operators in Canada had given up publishing maps by 1975 (see 7.3.

Figure 104: 1976 Citgo Bicentennial map prepared by Amoco (A.O.C.) [540]

Figure 105: 1977 Amoco map of Arkansas, Louisiana and Mississippi [509]

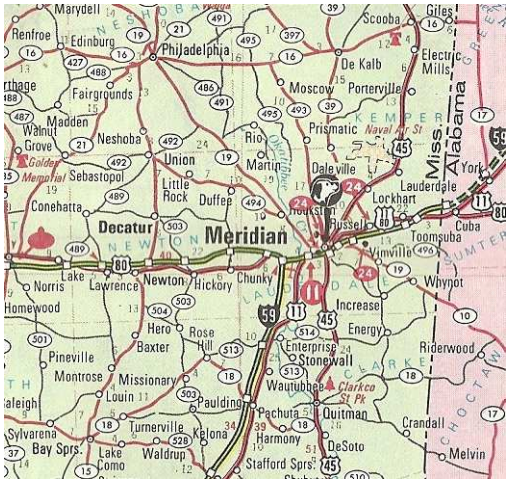


Figure 106: Extract from 1977 Amoco map – marking 24 hours stations, one near a highway (left edge) and Coachman dealer (dog). Cartography by National Survey Co.

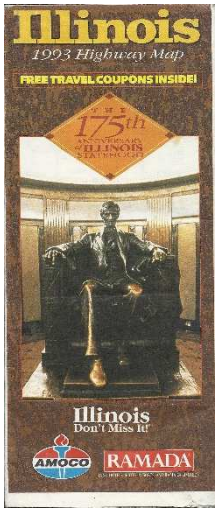


Figure 107: 1993 state highway department state map of Illinois [511]

The Standard Oil Company (Indiana), which operated under the Standard brand in the Midwest and Amoco elsewhere, tried to fund its maps through advertising. The scale of its maps was reduced and panels around the border were used for advertisements by selected service stations within the chain, as well as third parties. Regular advertisers included Pick Hotels, Coachmen Recreational Vehicles and the Encyclopaedia Britannica. This approach was facilitated by Amoco having purchased its map producer, Tempo Designs, and being able to call on several cartographers to provide the base map, including Diversified Map Corporation (whose designs were updated latterly by the National Survey Co.). In the Bicentennial year of 1976, when more companies issued maps as the domestic travel market had returned to normal after the price shocks, Amoco went so far as to produce maps for two other companies – Vickers and Citgo (Figure 104). In a late example of sponsorship, Amoco joined with the Ramada hotel chain to sponsor the 1993 official state map of Illinois (despite its name being "Indiana", its headquarters were in Chicago, Ill.) Other companies occasionally sponsored or advertised on commercial maps in the 1990s, principally of cities. The link to an official state map was much rarer; only Leonard Refineries had used local Department of Transportation maps regularly in the 1950s and 1960s.

Two other companies operating in the West and Midwest of the US also maintained substantial map programmes. Conoco continued issuing maps marking its service station locations until the 1980s (and, exceptionally, of Wyoming and the Yellowstone National Park into the new millennium), and Phillips 66 (which was to merge with Conoco some 20 years later) ran its map programme until 1983-4. Slightly further East, Ohio-based Marathon remained faithful to the free oil company roadmap as late as 1987. The final surviving player was however Exxon, as the Standard Oil Co (New Jersey) had renamed itself in

1972, replacing regional brands such as Esso, Enco and Humble. They continued to provide maps to customers until around 1994, even after their long-time partner General Drafting Co. had been acquired by the German Langenscheidt company in 1992; final issues carried a suggested retail price on the cover, so were no longer freely available.

A few companies tried selling road atlases of the USA in various formats ranging from tiny pocket-sized atlases up to large format large print atlases. With the exception of Mobil and Marathon, most of these atlases came from newer, smaller marketing companies such as Mapco Express, Meijer, Racetrac (Figure 108 [597]) and Petro truck stops.

Although Rand McNally produced road atlases with clients such as Wal-Mart, most of the oil company examples came from a new entrant into the market, Universal Map, which also provided large print atlases with limited detail (Figure 109; cf Figure 17ff and Figure 58ff.) and pocket sized state maps for Exxon in 1997-9. The structure of the cartography industry was also changing. HM Gousha was acquired by Rand McNally; and as noted above General Drafting Co lost its independence. Competition in the market had moved away from relatively low-cost sheet maps into higher added value products such as state atlases and the emerging market for electronic mapping.

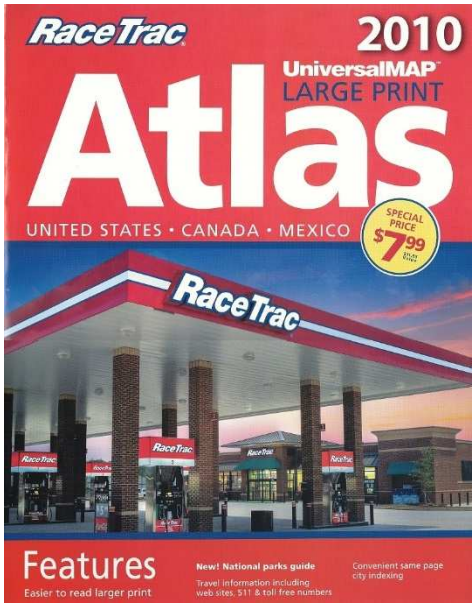


Figure 108: 2010 RaceTrac large print atlas [597]

Moreover, long journeys were now undertaken on the completed Interstate highway system reducing the need for detailed mapping showing all the towns and villages along the way. With the appearance of satnav systems, the average American motorist no longer needed to keep a sheet map in his/her glove box.

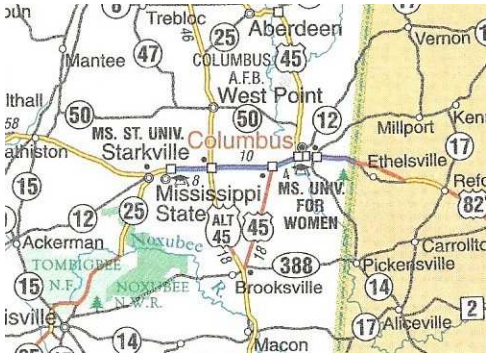


Figure 109: Limited detail on 2010 large print atlas

3.11.2. Europe: UK

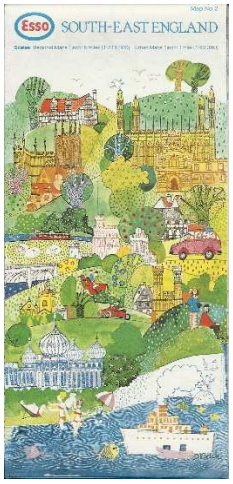


Figure 110: 1979 Esso, South-east England [553]

Outside North America, it is not possible to generalise about oil company roadmaps over the past 45 years, other than to note that there has been virtually no central coordination by companies operating in several different countries. Even within countries, the response of the different marketing companies has varied significantly. Where roadmaps have been seen as a profit centre, they continued to be sold, although after around 1990 less frequently carried oil company colours. However this is not universal, as in Scandinavia free maps underwent something of a resurgence in the 1990s, as cheap colour printing facilitated simple "locator" maps. Over the past decade, all forms of paper map have become much rarer, as motorists increasing the move to satnav or online mapping – few service stations sell any paper maps.

In some countries it appeared as if the 1973 oil crisis had never happened. For example, in the UK the main companies – Shell, Esso, BP, National, Texaco and Mobil continued to sell series of sheet maps essentially unchanged from those in the 1960s. These were discontinued after 1987, 1985, 1985, 1981, 1980 and 1984 respectively. But even then, the companies experimented with new series, sometimes changing cartographers.

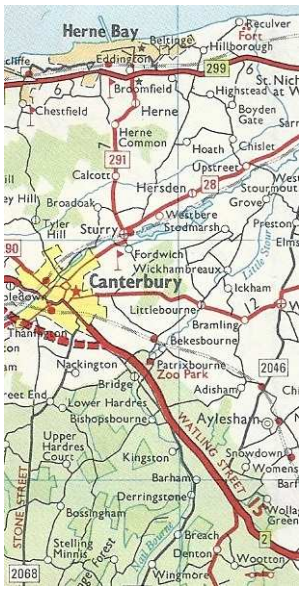


Figure 111: 1979 Esso (George Philip Printers) [553]

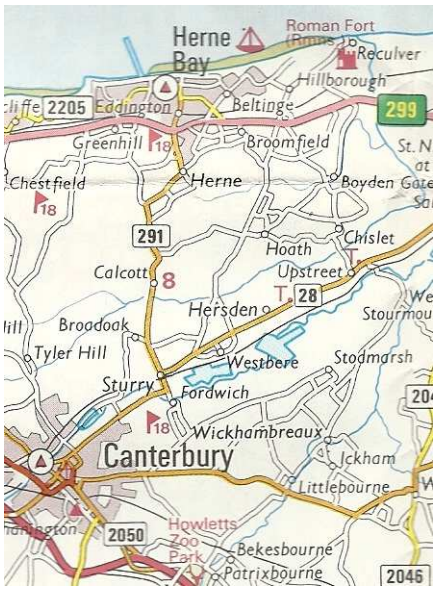


Figure 112: 1985 Shell (George Philip Printers) [615]

Figure 113: 1990 Shell (Automobile Association) [38]

In the extracts above, Esso's map is a clear derivative of the original General Drafting Co. designs used by Edward Stanford/George Philip Printers. Its cover (Figure 110) utilised an attractive design showing local landmarks drawn by the Canadian artist Suzanne Dolesch who had first worked for Esso on its Canadian city maps. One unlikely change is the addition of railway stations with red dots. In contrast Shell's cartography, using George Philip's own design, had been substantially modified several times; the

scale had expanded from 1:316,800 through 1:253,440 to a metric 1:200,000. Esso went through a couple of editions of a series produced for them by Geographers A-Z in 1986 to 1989; Texaco moved away from its traditional cartographer of Geographia to publish a series with George Philip in 1987. Two companies that had never before produced sectional maps experimented too. Burmah issued a couple of series in the late 1970s and Amoco uniquely selected John Bartholomew for a high quality series of maps in 1975 and 1977. Other mainstream petrol companies issuing maps in this period included Chevron, Fina, Q8 and Total. Around 1990 Shell, Esso, and BP all branded an AA series of maps at 1:200,000 – the extract (Figure 113) is from a Shell map [38] but they looked very similar.

The selling price for these maps rose much faster than general inflation. Although they were no longer pre-printed with prices after the mid-1970s, an Esso sheet map that would have sold for 6d (2½p) in the 1960s was selling for around 95p 20 years later; German maps also raised prices at several times the general rate of inflation. Profits on maps were still small; so to justify stocking them, they had to be useful for motorists – carrying a minimal amount of company advertising – and in the UK never located that firm's service stations.

Although the main series of sheet maps did not show service station locations, several companies experimented with road atlases in one format or another that did. Shell commissioned an A5 format atlas from the AA in 1993, and – although independent companies – Gulf and Fina teamed up to produce a similarly sized atlas for the period when they shared a common loyalty scheme, shortly before Gulf's UK operations were sold to Shell. One company, the relatively small Murco chain, produced a large format atlas annually from the early 1990s until 2008, and usually listed its service stations on the rear cover.

Towards the end of the 1990s supermarket petrol stations rapidly expanded both the numbers but, more importantly, their market share, to the stage where they account for almost half of all fuel sales. Keen to promote their locations to motorists, the main supermarket chains (Tesco, Sainsbury's, Asda and Safeway) produced basic locator maps of the country at some time.

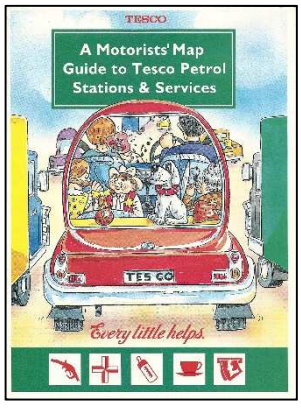


Figure 114: 1995 Tesco Motorists map guide to Tesco Petrol Stations and Services [646]

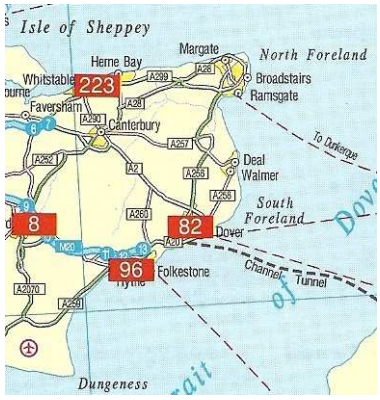


Figure 115: East Kent from 1995 Tesco map (Cook Hammond and Kell). Inset maps were provided for Channel ports/Ashford

After it acquired Safeway, Morrisons published a large format road atlas of Britain for several years.

3.11.3. Germany and Austria

In Germany, where in the 1960s many companies had been persuaded to add their branding to roadmaps, the market narrowed down with just seven companies continuing to produce sectional maps on any scale. Of these, Fanal was the least frequent issuer, reflecting its status as a smaller chain cobbled together from the former Gulf, Frisia and Stinnes Fanal chains. BP, Avia, and Texaco/DEA all produced occasional map series throughout the 1980s while Shell, Esso, and Aral all regularly produced maps. Esso's were in card covers usually containing maps by RV, Ravenstein or Hallwag. Shall retained its long-standing close relationship with Mairs of Stuttgart, generally branded as Die General Karte. Aral continued its association with Busche of Dortmund, although it too moved towards selling its maps in complete sets or alternatively, singly, in card covers. Although Esso abandoned its sheet map series around 2000, Shell and Aral continue to sell them until the mid-2010s. Esso occasionally sold softback atlases of Germany at a very low cost, competing with slightly more expensive products from its rivals such as Shell, Aral and DEA. A similar low-cost atlas was sold by a new entrant to the market, Star, owned by Poland's Orlen.

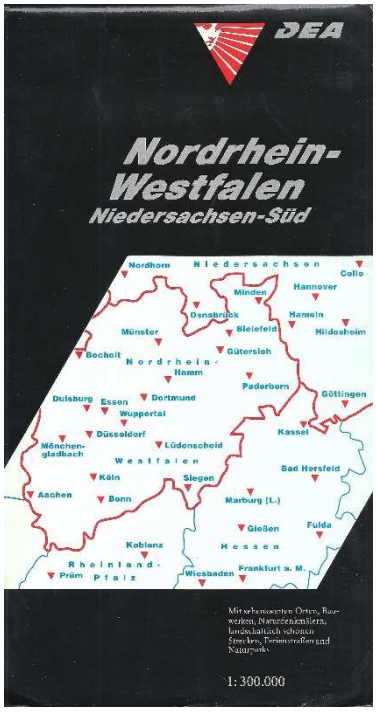


Figure 116: 1993 DEA Nordrhein-Westfalen; RV cartography [201]

The situation in Austria was similar to that in Germany. Shell and Aral both produced substantial numbers of maps in the 1990s, with the national champion brand OMV also producing some titles. Unusually, some of the smaller names also produced either sheet maps or atlases including A1, Avanti, Genol and Doppler (which mainly supplied BP-branded service stations but also controlled the Turmöl and Arriva brands).

3.11.4. Eastern Europe

With the fall of the Berlin Wall in 1990, new markets opened in Eastern Europe, with the leading western oil companies establishing operations with mixed success. As good quality roadmaps had historically been difficult to obtain in those countries, new cartographers – such as Daunpol in Poland and Shocart in the Czech Republic – were quick to market their clear computer-based cartography to the arriving oil companies. This led to a relative explosion of petrol company maps from the mid-1990s. Many of them were from familiar names, especially Shell, BP, Aral and Jet (which had infrequently branded roadmaps in Western Europe). Other entrants included OMV from Austria and Russia's Lukoil. The newly independent national oil companies, formed from the rump businesses of previous state monopolies also put their covers onto stock maps from the new cartographers. Among the locally-based brands that appeared on maps were MOL In Hungary and neighbouring countries, Petrom in Romania,

Slovnaft in Slovakia, and – more rarely – INA of Croatia, Nis of Serbia, Istra-Benz of Slovenia, and Benzina from the Czech Republic.

Figure 117: Shell, Zakopane, Poland, 2003 [619]

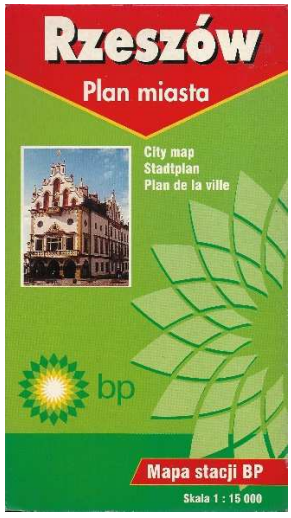


Figure 118: BP, Rzeszow, Poland, 2000 [533]

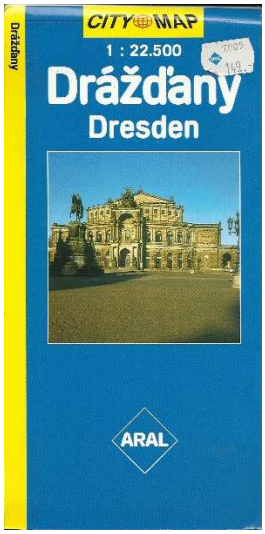


Figure 119: Aral, Dresden (Czech edn.), 2002 [520]

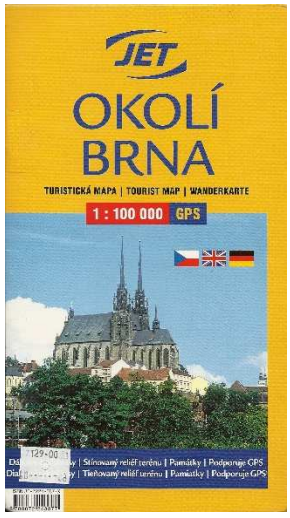


Figure 120: Jet, Brno environs, Czechia, 2002 [577]

Several firms issued a selection of city plans and maps of neighbouring countries or, occasionally, cities in neighbouring countries (Figure 119). In Poland, Shell issued maps for over 30 cities, with BP and Jet (and Lukoil after it acquired Jet) also selling a wide selection. Aral and Shell adopted a similar programme in the Czech Republic – extending to Czech versions of plans for major cities just outside the country, such as Vienna (Vídeň) or Dresden (Drážďany). Elsewhere most companies restricted themselves to a plan or street atlas of the capital city (and Brno in Czech Republic).

3.11.5. Scandinavia

Scandinavia moved in a different direction after the oil crisis, with some companies producing extensive ranges of maps for sale, and others focusing on free or very low cost maps or locator booklets marking service station locations. This may have been in part due to the lower population density in most of the Nordic countries, with correspondingly greater distances between service stations, although this would not apply to Denmark or southern Sweden.

Scandinavian companies often provided separate station locator booklets alongside their sheet maps, sometimes containing usable road maps of the country overprinted with service station locations, but in a relatively small format. In the three examples below, the cartography in the HydroTexaco booklet (Figure 121) is the same as on the regular 1:500,000 maps of Denmark sold by the company. DK's map (Figure 122) is at 1:1,000,000 – both are usable maps prepared by Folia/Legindkort. In contrast the smaller firm Haahr simply gave away a sketch plan of the country (Figure 123), marking its service stations but not even showing Copenhagen.

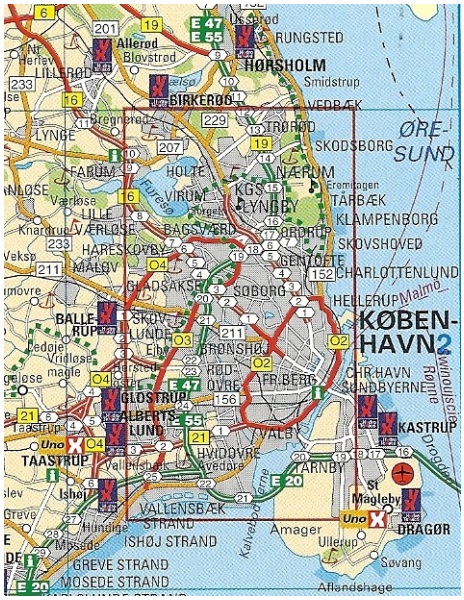


Figure 121: HydroTexaco and Uno-x locator map booklet, 2000 [574]

Figure 122: DK locator map booklet, 1999 [661]

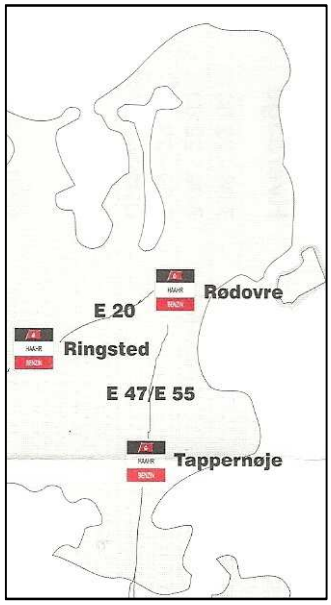


Figure 123: Haahr locator map booklet, ca2000

Figure 124: Cover from 2002 Jet map of Scandinavia [578]

In the late 1990s, Jet (Conoco) took the concept of service station location maps to the extreme, adding a small town plan for every locality where their automated stations could be found. A large single sheet provided a usable map of the whole of Scandinavia, with the reverse covered by 168 plans by the 2002 edition.

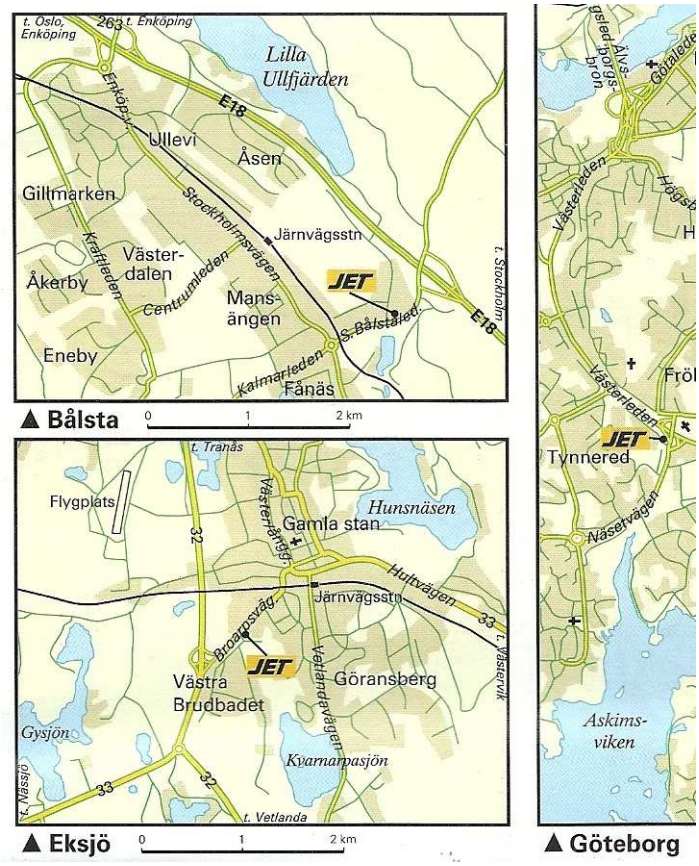


Figure 125: Town plans from the 2002 Jet map; note each has its own scale bar

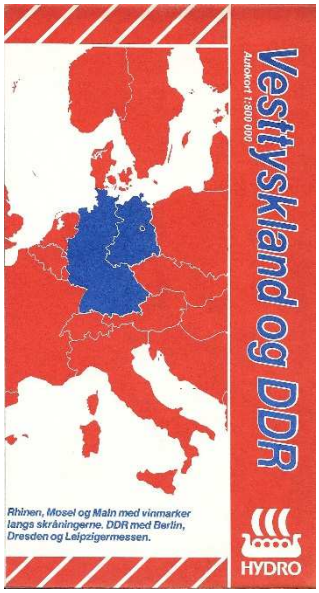


Figure 126: ca1988 Hydro map of Germany [573]

Where companies expanded their mapping programme to cover remote countries, this could lead to outdated maps remaining on service station shelves for many years. Some examples found by the author include a Q8 map of Yugoslavia still on sale in a small Danish service station in 2001 and a Hydro map of West Germany and the GDR (East Germany) in another Danish service station as late as 2005, almost 15 years after the GDR had ceased to exist. The price sticker on the map suggested it had been on sale since 1994, but from road construction marked it appears to have been printed by Cartographia in Budapest as far back as 1988.
In Scandinavia, as elsewhere, the almost universal use of smart phones and companies promoting apps that enable drivers to find the nearest service station, paper maps eventually disappeared.

One of the final paper maps in Sweden came from the merged OKQ8 company listing its locations in 2016. Across the Baltic Sea, Virši-A offered an A3 map of Latvia in 2019 (Figure 150 [659]), but no later maps are known.

3.11.6. Rest of Europe

Elsewhere, the situation was mixed. Some companies continued to produce maps in the Irish Republic, decoupled from the former UK mapping programmes, including relatively new entrants to the market such as Norway's Statoil and Campus Oil.

In Belgium, most of the maps were inexpensive editions for free distribution, marking service station locations, from companies such as Total, Fina and Octa+. However the latter did carry forward an edition of city plans that had previously been produced by Burmah. In the 1990s, there were also occasional issues from very small players in the market adding their custom covers to stock maps, typically produced by Geocart or Ravenstein.

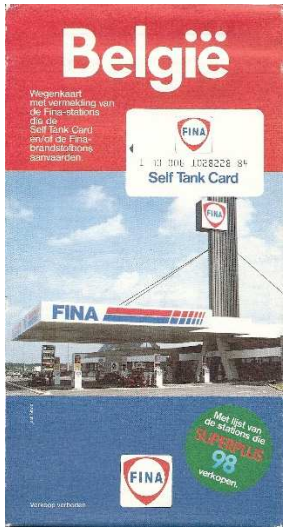


Figure 127: Fina 1991 map primarily to show locations (Carto) [562]

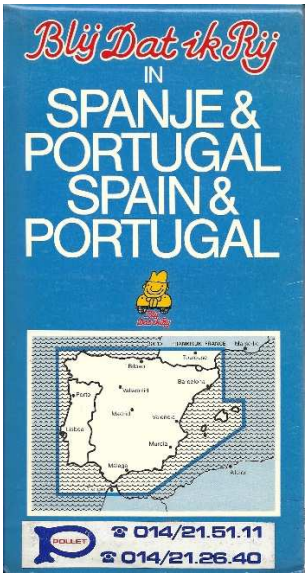


Figure 128: Stickered RV Reise (Spectrum) map for Pollet [595]

An unlikely series of maps came from the small Belgian firm Pollet, which supplied under 100 small service stations, yet added its card covers with a service station photo, or added stickers (Figure 128), to stock maps covering most of the main European countries. In the Netherlands several firms produced maps into the 1990s but they subsequently became very infrequent, with occasional issues from Texaco and regular sheet maps of the country from Shell until 2014, marked as its 36th edition.

In France relatively few maps were produced after the oil crisis apart from the Shell Cartoguides and a short lived series of sectional maps from Mobil. As in the UK, the new hypermarket stations rapidly ate into the market share of the traditional operators. In France, too, supermarket chains such Système U, Radar, Intermarché and Leclerc produced inexpensive locator maps of the country for free distribution.

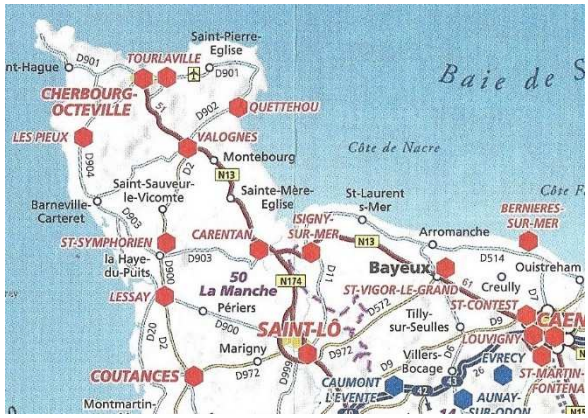


Figure 129: Excerpt from 2005 Intermarché map by Bottin at 1:1.7mn; a list on the reverse showed that almost all supermarkets in the chain sold fuel [576]

Spain had had a government owned monopoly in the retail petrol market since the late 1920s. When, under pressure from the EU, the market was liberalised, the monopoly was split three ways, with Repsol, Cepsa and BP inheriting parts of the chain. Unlike Eastern Europe, this did not lead to a plethora of branded roadmaps. In contrast Repsol, which had acquired the rights to the Campsa name and the majority of its service stations, continued to publish an expensive spiral-bound road atlas of the country. In some years, this was sold in a slipcase with other products such as an interactive CD-ROM or a guide to the wine regions of Spain. The primary branding on the atlas was changed to Repsol in 2009, and it continued to be sold through service stations and bookstores. For a few years Cepsa retaliated by sponsoring (and having its service stations marked on) a rival large format road atlas under the name Mapamax.

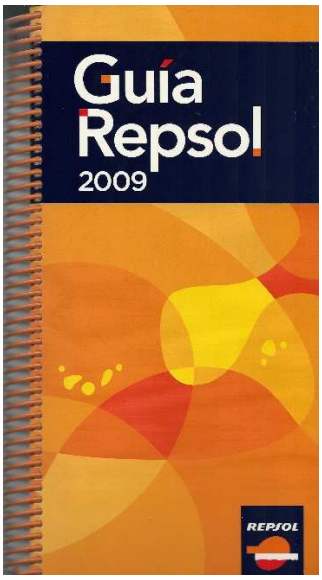


Figure 130: The 2009 Repsol guide ran to 3 volumes (one focusing on wine) in a stout box, weighing 2.3kg [600]

In Portugal there had always been limited competition in the retail petrol market and few branded roadmaps. This did not change significantly after 1973, although the market has become more liberalised and names such as Galp, Repsol, Cepsa, BP and Shell occasionally issued sheet maps or atlases.

Across the Mediterranean in Greece and Italy the situation was similar. Both countries retained numerous small filling stations with limited shop facilities; consequently although both have seen irregular issues of maps by a variety of players, there have been no consistent programmes. And finally, in Switzerland, with its very strong tradition of topographical and commercial cartography, the retail petroleum companies have had a very minor role in map publishing since the oil crisis, although the Migrol cooperative has produced an occasional locator map.

3.11.7. Rest of world

In Australia, oil companies continued to sell tall format maps of each state, generally produced for them by Universal Press/Gregory's or Penguin Books Australia, with the cover price outstripping general inflation, as in Europe. Most of the main petroleum distributors remained active until the 1990s, when they were briefly joined by a new entrant, Liberty, which in 1996 also produced a map series.

In New Zealand, there continued to be a relatively small number of issues, either as a sheet map of the country or, for Shell and Europa, a softback atlas.

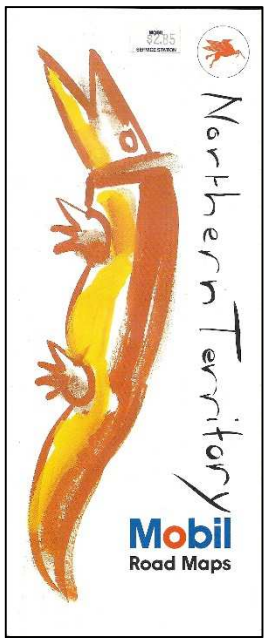


Figure 131: 1994 Mobil map of Northern Territory [586]

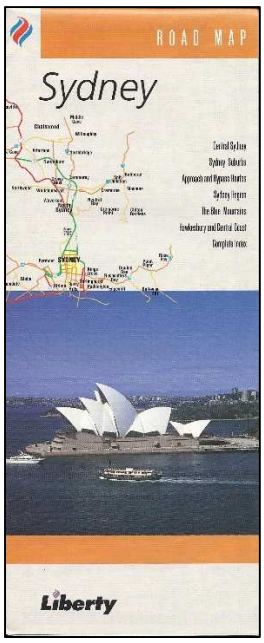


Figure 132: 1996 Liberty map of Sydney [583]

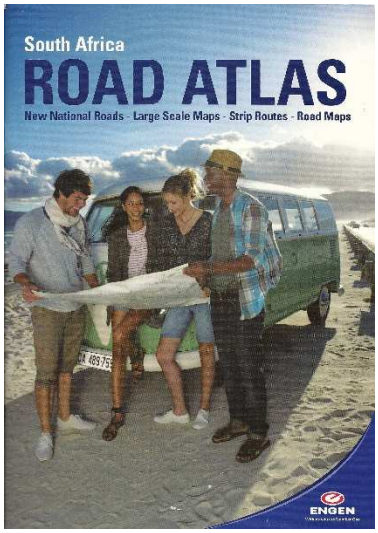


Figure 133: Engen's 2012 South Africa atlas promotes a racial ideal [546]

In Africa the centrally coordinated mapping programmes from Shell and Mobil stopped in the 1970s: only occasional local issues remained. These included some isolated maps, such as those from BP or Shell in East Africa or BP in Zambia. Most post-1990 maps have come from South Africa, where several companies including BP, Total, Shell and Engen continued to issue medium format road atlases, or its near neighbours, notably Namibia. Shell has sponsored several editions of guides to the Botswana national parks produced by Veronika Roodt.

Likewise, there appear to been very few maps published by or for petrol companies in Asia. Among the few exceptions are countries where commercial mapping has historically been less widely available and

where a single oil company has worked with the national government to produce a map or atlas. So, for example, there have been a small number of maps or atlases produced by Shell in Brunei Darussalam, Shell in Oman, and Total in Cambodia. They have also been occasional issues in Thailand, Singapore and the Philippines from companies including Shell, Caltex and Petron.

There has been more activity over the past 40 years in South and Central America. Some of the smaller Central American countries lacked much by way of commercial mapping, and petroleum company issues – most frequently from Texaco – helped fill the gap. In South America, although there have been some oil company issues in Brazil and Uruguay, there have been rather more in Chile.

Most Chilean maps have come from the local market leader, Copec, which produced a softback atlas and guide to the country annually. This is supported by nine detailed regional maps – and these are still being published as of 2023. Other companies published maps from time to time in Chile, including Shell, Petrobras and the short-lived Apex.

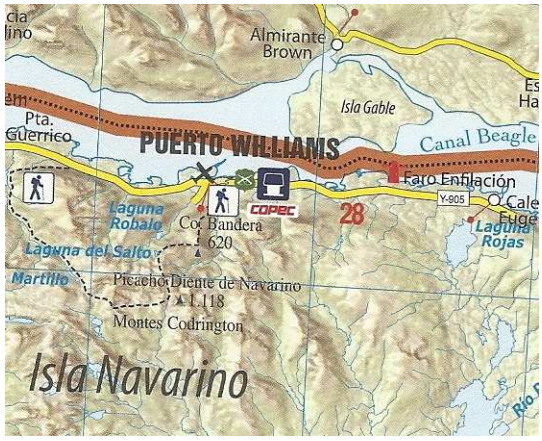


Figure 134: Map extract from Copec section 9 Tierra del Fuego y Antártica. Base mapping by IGM at 1:550,000 – the Antarctic side has no roads

Figure 135: 2013 Copec map 9 cover [543]

Across the Andes, the market leader in Argentina is YPF, and they too have issued national and regional guides containing maps. Finally, in Venezuela where all Western operators – including Shell and Esso – were nationalised, the replacement national brands (including Maraven, Lagoven and Corpoven) continued to produce similar maps, along the US pattern.

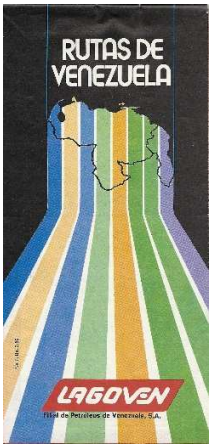


Figure 136: 1980 Lagoven map of Venezuela [580]

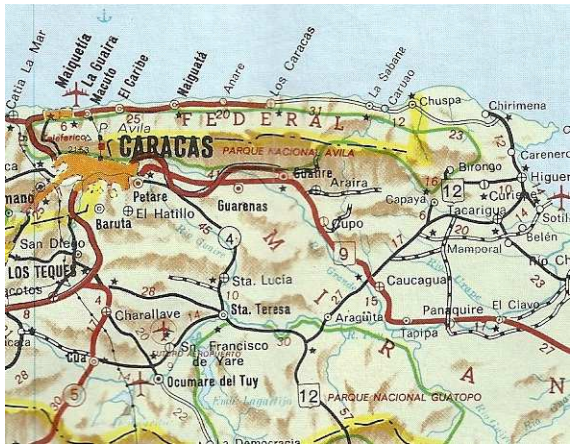


Figure 137: Caracas from 1980 Lagoven map. Although cartography is by Aeromapas Seravenca CP, it is a derivative from General Drafting Co. designs

3.11.8. Summary – the past 45 years

In summarising the more recent developments in the area of maps issued by or for petrol and oil companies, it is apparent that national conditions are the main driving factor – including the availability of competitive commercial maps. There is also a clear split between relatively expensive high quality maps, often in the form of an atlas containing additional tourist information, but occasionally still as a series of sheet maps, and low-cost locator maps designed primarily to help customers find their service stations. It is perhaps surprising that the latter were not more common, given the use of loyalty cards to encourage motorists to stay with a single brand, and the simultaneous decline in the number of branded service stations in most major markets. With the very wide use of smart phones by car owners, allowing free access to Google maps and similar products, and the ability to generate low-cost apps and to add service station locations into commercially available satnav systems, the demand for paper maps in the future is only likely to fall.

The focus of this thesis covers the period to 2005, but this chapter has stretched to the current date, essentially for completeness. At the time of final editing (2023) I am aware of only one series of branded maps still available – those from Copec in Chile. Since the thesis started, the remaining German maps/atlases (from Shell/Mairs and Aral/Busche) have been de-branded, and the once ubiquitous Scandinavian locator map booklets have gone online. Many bookshops and service stations sell no paper maps at all.

I will leave the final word to a petrol station attendant in the Paradise Rest Area in Nsutem, Ghana, who when asked in April 2023 if he had any maps for sale, replied "*Why don't you just goggle (*sic*) it?*"

Figure 138: Nsutem from 1962 Shell road map of Ghana Southern section [616]

Figure 139: Nsutem on Google Maps, accessed 22 July 2023. At smaller scales the village disappears.

In the next chapter we shall see if academics are equally dismissive of the printed road map.

3.12. Conclusion

This chapter has provided a brief overview of the oil company road map, from its first appearance before 1930 to its demise since 1980. Although the maps highlighted have largely been drawn from my own collection, so may suffer a degree of selection bias, it has shown that there was a great diversity of

map styles, with only a limited degree of commonality. To some extent this may already have answered the research question about common features negatively. However, Chapter 5 will develop a methodology for a more formal analysis, which will then be applied in Chapter 6 to a stratified sample of the maps, to answer this more definitively.

The chapter has shown that oil company road maps were initially produced only sporadically, and that coordination across national boundaries by the large multi-national companies only developed after World War II (and in some cases did not last more than 20 years). This period coincided with the start of mass tourism by motorists on self-drive holidays across borders in Europe, when several companies introduced free or low-cost touring services. After the first oil "crisis" in 1973, a greater focus on cost led to the almost total ending of free oil company road maps in North America: in Chapter 7 a case study will show how one cartographer (Rolph McNally) sought to retain at least some oil company business. In Europe, where maps had often already been sold, providing a profit centre for service station operators, oil companies persisted with road maps and a degree of coordination much longer: in Scandinavia some companies (e.g. Q8, Statoil and Hydro) continued to sell cross-border issues into the 1990s, and this was also commonplace in some of the newly liberalised East European countries. However, as the final section of this chapter notes, competition from the electronic delivery of maps, including on smartphones, has led to the almost complete disappearance of the paper road map in many markets.

The next chapter will move away from the autoethnographical approach and review the literature on cartography and mapping in general, with a focus on the ways maps are used to communicate. This will include the groundbreaking deconstruction of the North Carolina state road map (Wood & Fels 1986) which, in some ways, is similar to a "typical" oil company road map, and will influence the analysis in Chapter 6.

Chapter 4:

Literature Review

4. Maps and Users: a review of the literature

Chapter 2 introduced some of the research that has been undertaken around road/highway maps, including concepts of how users perceive and interact with such maps. This chapter goes further into the existing literature around these concepts of cartographic theory, and the development of paradigms around communication between map creators and users, mediated through the physical map. It is arranged in a broadly chronological order, starting with the earliest theoretical work in the 1940s through to some of the more diverse views of the past decade. The chapter also includes a brief review of some of the research around user interactions with maps, and the aesthetics of maps.

4.1. Development of Map Paradigms and theory

It is widely accepted that maps are not just about creating a two-dimensional spatial representation of the real world, but are a mix of objective realities and subjective elements (Wright 1942/1966). How this happens is open to interpretation and the imposition of a conceptual structure: there are no hegemonic approaches among academics. Kitchin *et al* (2011) suggest that this lack of a common understanding might imply that cartography is not a science. Improvements in the techniques of map production, including surveying and printing, led to a focus on improving the quality of maps – Crone (1953) saw development solely in terms of increasing accuracy through characteristics such as distance, direction and detail. Underlying the theory to this point was the positivist notion that the study of cartography was essentially about ensuring that in some way the newest maps should also be the "best".

This positivist-scientific consensus was challenged by Robinson, who first produced his communication model in 1952; developing through the following decades it formed links with cognitive science and behavioural geography. Maps communicate additional information, which a user can then add to his or her cognitive realm (Morrison 1976, Kitchin 1994, MacEachren 1995) Early maps served as a reminder or a record of spatial stories, possibly recording and sharing a cognitive or mental map (Kitchin *et al* 2011). Such early maps lacked a common language, and were based very much upon the skills of the cartographer or the specific requirements of those who had commissioned the map (Brotton and Millea, 2019). Board and Taylor (1977) warned against emphasising cognitive or mental maps as they do not communicate information beyond the map reader. Numerous attempts were made to map the process of communication, sometimes using complex flow charts (Koláčný 1968), mainly in English or German speaking countries. In contrast the French approached the question the direction of semiology, focusing on the signs and symbols used, drawing on the work of Bertin (1983, originally published in French in 1967). After its translation into English in 1983, there were attempts to blend the two approaches, culminating in MacEachren's key text 'How Maps Work' (1995). Edney (2019:66) refutes the idea that

maps communicate ideas from a map maker to a user, arguing that it is the reader who gives the map meaning.

A focus on semiology and cognition downplayed the importance of values; so some cartographic theorists took ideas from French philosophers – notably Foucault and Derrida – to identify maps as social constructions. In particular, Harley (1989, 1997) saw maps as existing to promote the interests of those who produced them, or more strictly commissioned them. Although initially in the context of national power structures associated with the conquest of the Americas, the same argument could be applied to more mundane maps and this deconstruction of maps was picked up by, among others, Pickles (2004), and Wood and Fels (1986) who notably applied it to the official State map of North Carolina. The 'Power of Maps' to influence user perceptions was becoming recognised and displacing notions about straightforward communication or semiology. A deconstructive approach may help identify the comparative power of those oil companies that played an active role in commissioning maps, rather than passively accepting products offered by the large cartography companies.

There was something of a backlash against overtly academic critical cartography (Monmonier 2016), as fewer practising cartographers engaged in the discourse. Most cartographers make maps for a living, and doubts were raised about how relevant some concepts, such as deconstruction, were to them. There have also been attempts to try and bring the theories closer together, as cartographic communication, sign systems and social constructions are all rooted in representational ways of thinking (Crampton 2001, Kent and Vujakovic 2011).

4.2. Rise of cartographic theory

Writing in 1985, but significantly edited in 1996, Keates (1996:184) notes that cartographic theory had only developed over the preceding 50 years. The initial impetus came after the Second World War, which had considerably changed cartographic methods. Hitherto, universities had seen cartographic techniques as a skill in support of geographers, and commercially those responsible for putting together publications such as maps and atlases were not themselves cartographers, but utilised cartographic editors (Keates 1996).

Technological changes in the 1950s, such as those instigated by Carl Mannerfelt at Generalstabens Litografiska Anstalt, Esselte (which he had joined in 1942 and headed from 1949), led to modernised map design in Sweden and elsewhere. Mannerfelt was also instrumental in establishing the International Cartographic Association (ICA) and the development of cartography as a subject separated from geography or surveying (Keates 1996:185; ICA 1981). Until the early 1960s when, for example, the *Cartographic Journal* and *Cartographica* both began publication, research was typically practical and not theoretical. Only a minority of early articles in the *Cartographic Journal* came from academics (Keates

1996); in contrast of the 26 papers in Volume 55 (2018), 24 came from academics, one from a librarian and only one from a scientist at the US Geological Survey (who had also been a university professor earlier in his career).

The second meeting of cartographers prior to the establishment of the International Cartographic Association (ICA) was hosted by Rand McNally in Chicago (Keates 1996:186). This was at the time that Rand McNally were the largest commercial publisher of road maps in the USA and, almost certainly, the world, largely through their work for oil companies. It was also a time of great change for the free road map; Rand McNally undertook a complete re-organisation of their titles in 1956-7 and started moving more widely to four-colour printing at around the same time.

This split between academic and practical cartography is seen by Keates as a concern. He criticises Morrison (1976:84) for claiming that the cartographic communication paradigm is accepted by cartographers from many nations, on the grounds that the cartographers referred to were a "*small academic group which attended the same meetings and published in the same journals. The thousands of practical cartographers were never consulted of course.*" The same criticism could apply to the burgeoning number of map collectors and amateur historians of cartography, who applied their own interpretations and published through non-academic journals such as *Imago Mundi*, *Sheetlines* from the Charles Close Society or, in the USA, the *Legend* from the Road Map Collectors Association.

Petchenik (1985:8) picks up on the point about practising cartographers by noting that "*they are so busy earning their livings by making and selling maps that there isn't 'free' time or energy left to be expended on research…as a result their point of view is not accurately reflected in the literature.*" She further observed that there is a disproportionate academic interest in symbol design, as this are easier to deconstruct than selection criteria for a map. She noted that most maps are issued either commercially or by government agencies (this was written well before Open Street Map and the widespread availability of inexpensive mapping software) and that research has tended to focus on how things are mapped, rather than what is included or omitted. She goes on to ask "*what drives map-making…why do we map, what do we map and (ultimately) who pays for it?*" Petchenik (1983:65)

4.3. Cartographic Communication Paradigm

Oil company maps may be viewed in the light of post-war developments in cartographic theory, specifically the Cartographic Communication Paradigm advanced by Robinson (1952) based on the more general 1949 Shannon & Weaver communication model (Peterson et al 2023). Robinson's dissertation in 1952 called for objective research and by the 1970s cartography was seen by most academics as a communication science. This view was advanced by Robinson and Petchenik (1975) who started their paper with the simple yet bold statement "*Just as most writing assumes a reader, most map making*

assumes a viewer to whom the map will convey information". They preferred the term "map percipient" to "map reader" or "map user" (or the constructed term "cartoleger") as it implies a broader attempt by the user to understand the geography rather than just to look up a single place; in this thesis I will generally refer to map users, recognising that most oil company maps are used for practical purposes and not pleasure (or armchair travelling). Citing Koláčný (1968), Robinson and Petchenik note that cartographic theory has been centred on the production of maps, not the users. In contrast, MacEachren (1995) saw the communication paradigm as being largely superseded but he noted that Robinson's insight was to view maps as functional, rather than artistic. In doing so he led a movement to view maps from a positivist scientific viewpoint.

MacEachren observed that even award-winning artistic maps may not meet their functional aims (citing the 1970s New York subway map) and that Robinson's conclusions were that maps should either use standardised symbols or that they should use objective rules for symbolisation based on a study of user perceptions.

By the 1960s and 70s, the theorists had become interested in cartography as graphic communication. At its simplest this might be shown by a flow of information from the geographic environment through the cartographer's interpretation in producing a map that is then processed by a user. Robinson saw this as a dissemination of knowledge. MacEachren credits Koláčný with advancing the theory; this was through introducing Venn diagrams to show the overlaps between reality as drawn by the cartographer and as perceived by the user – crucial differences may relate to prior knowledge and intelligence. The theory was beginning to recognise that not all users approach a map with the same initial knowledge. Although not stated, this could explain why only some users of the New York subway map got lost when asked to use it for wayfinding.

Since the 1970s there has been a rise in more post-modern approaches. These include taking an experimental approach to analysing map users for route finding or interpreting symbols on maps (Sheppard and Adams 1971, Medynska-Gulij 2003, Skiles and Howarth 2012), although there is a danger that when testing map usability authors may select groups, such as geography students, that are unrepresentative of the wider population. A positivist approach may omit the importance of art or aesthetics (see also 4.14 below) in a creative process (Petchenik 1983; Kent 2005, 2018) and a wider philosophical view that it is not possible to create a map as an objective representation of reality.

MacEachren's objection to the earlier approach (including his own work at the time) was that researchers had placed too much emphasis on the function of maps, and ignoring the fact that many may have a predetermined message which limits functionality. Wood and Fels's analysis (1986) found a rhetorical message in state highway maps, and in commercial maps there may be an implicit message

from the sponsoring company, not the cartographer. As an example, the scale of a map showing service station locations can be selected by the publisher to give the impression that the map user is never far from one. Maps may be designed to allow a user to construct that message, even if the detail (mileage indicators, or a scale bar) provides a factual counter-message that service stations are widely dispersed. However with online mapping, the user has gained the ability to choose the scale at which s/he views the map.

The Cartographic Communication Paradigm has also been criticised for its links to behavioural psychology, and the view that humans respond to stimuli rather than process information. If the former were true it would theoretically be possible to construct an optimal map. Although behavioural psychology may be useful for predicting behaviour, it does not explain perception. MacEachren (1995:8) goes further to argue that in its purest form the Cartographic Communication Paradigm can be "quite sterile". He again cites previous knowledge of the user as a reason, and the way that it is not possible to assess different cartographic styles scientifically which draw on art to communicate as in Imhof's work on cartographic relief presentation. Artistic analysis also requires more critical examination, supported by scientific theories (eg. on perspective, colour) as promulgated by Bertin (1983/2011).

4.4. Deconstructing the map

A more postmodern approach to deconstructing maps has been taken by Harley (1989) and Wood (1993) among others. They find "subtle propaganda" (MacEachren 1995:10) on the maps they study and that cartographers create an "epistemological myth" (Harley 1989/2001), and suggest that an analysis more akin to literary criticism could be undertaken taking account of the sociocultural framework around the map and users, although caution would be needed when considering maps that might have diverse users such as those produced by, invariably Western, oil companies in Africa.

Possibly the single most influential article came from Harley (1989/2001:150-168). He starts by saying that the problem is that most people still accept, uncritically, that cartographers tell us what maps are supposed to be. He observes that whether cartography is defined as being the art, science and technology of making maps, or of analysing and interpreting geographic information, both definitions implicitly assume that the creation of maps can only be seen as a progressive science. In contrast, Harley wishes to start with the map and – taking more of a postmodernist approach (his term) deconstruct following the methods of Derrida for texts, while at the same time taking the views of Foucault to show the map as a discourse and how it works as a form of power-knowledge.

Using a definition from Blocker (1979) that a discourse is a system of possibility for knowledge, Harley asks what rules have governed the development of cartography. He answers this by dividing them into two – at least for western cartography – with the first the use of a standard scientific model. This has as

its object the production of a correct model of the land covered, and draws from a tradition of surveying, adding classifications and signs to provide more detail. Art becomes increasingly unimportant over time; the aim is for a professional product. Cartographers believing they follow a scientific discipline to create a mirror of nature would "probably shudder at the mention of deconstruction" (Harley 1989/2001:154). Instead, they strive for objectivity, accuracy and truthfulness, wishing to eliminate any decorative elements that are not a planimetric image. In some ways this standard is seen on road maps, stripped of unnecessary detail; deliberate error (whether copyright traps such as those inserted by the Ordnance Survey or omissions on Soviet maps) are seen as being wrong.

His second set of rules, however, recognises the cultural context of map production. Thus world maps will tend to be centred on the location where they have been created ("ethnocentricity") or of a culturally important place (Jerusalem, for example). The selection of features through conventional signs also follows: churches and mansions may be marked but not private homes: this is described as a "hierarchicalization of space" (Harley 1989/2001:158). In so doing, he has already moved towards his next step – deconstruction.

Before approaching the deconstruction of the cartographic text of a map, Harley needs to test whether it can be seen as a text – and concludes that it can be a cultural text, and text is a "better metaphor for maps than the mirror of nature" (Harley 1989/2001:159). However, he recognises that not every aspect of the map can be explained and that there may be some parts of the cartographic text that are undecidable. Quoting Norris (1987) he urges the reader of maps to look for blindspots or moments of self-contradiction, and then to look at what is in the margins of the text. This leads to a section praising the work of Wood and Fels in their deconstruction of the North Carolina State Highway Map. Harley's contention is that the users of the map are not only the "ordinary motorists" but that the state has "appropriated its publication … as a promotional device". At one level this ought to be obvious: otherwise why would it fund the distribution of "millions of copies"? He may be guilty of hyperbole here – 1975 data shows that only 600,000 copies were printed. Not only is it an instrument of sovereignty but it also "constructs a mythic geography, a landscape full of 'points of interest'". (Harley 1989/2001:161). Harley does allow the counter-argument that it can exaggerate the road network to show points of interest to motorists as it is not a scientific map, but a derived map. Channelling Derrida, Harley then suggests that the metaphor has changed so that the cartographic facts are also symbolic – in essence it has become rhetorical. He sees this as being universal on maps: propaganda maps may use rhetoric to an excessive degree, but although on other maps it may be concealed, it "is always present". Going further, Harley claims that "the steps involved in making a map – selection, omission, simplification, classification, the creation of hierarchies and symbolization are all inherently rhetorical" (Harley 2001:163).

For the third section of his essay, Harley returns to Foucault and considers both internal and external power of cartography. As maps became essential to the maintenance of power in Western society, whether by the church, state or for commercial reasons, they were frequently censored, kept secret or falsified. However cartographers create internal power for maps in the cartographic text, in their compilation, selection, generalisation and rhetorical choices. Maps are moulded to produce a standardised product; the effect is to create a difference between the map and the real landscape. Here, Harley again looks at contemporary American maps with reference to the widely available commercial road atlases. He claims that "*Once off the interstate highways the land dissolves into a generic world of bare essentials that invites no exploration*". This seems to be over-emphasising the difference between the single state promotional map and a road atlas: there are late twentieth century examples of the latter that have their margins filled with images of the areas covered, just as there are stripped down atlases (especially so-called large print atlases) that show little extraneous information. But both are usable by motorists and may be described as "road atlases". In this section he returns to silences on the page, covered in an earlier article for Imago Mundi (Harley 1988/2001:84-107). He may here be too influenced by the US experience; European road atlases are often more lavish productions, sometimes with tourist information before or after, or on pages facing, the maps themselves.

Summarising, Harley justifies a deconstructivist approach through:

1. Challenging the myth of cumulative progress to always produce better maps;
2. Allowing the historical importance of maps to be redefined and read as sometimes competing discourses; and
3. Setting map history in the interdisciplinary study of text and knowledge.

His conclusion is that Foucauldian discourse and Derridian notions of metaphor and rhetoric offer enriching challenges to the reading of maps.

4.5. Silences on Maps

In a second key paper entitled "*Silences and Secrecy*", Harley (1988/2001) explores the notion of what is not shown on a map as being almost as important as what is included. Prefacing the article with a quote from E.F. Schumacher noting the absence of "living" churches from a Soviet era map of Leningrad, a criticism that could also apply to many oil company maps, which only show those of great architectural merit, the paper distinguishes between omissions due to ignorance, lack of data, error, or design or scale limitations, and those that are "political silences" – he uses the term silence to distinguish these deliberate omissions from mere blank spaces. These can be incorporated at any stage of production.

While Foucault's idea of power-knowledge is useful for understanding maps as a tool of state (or oil company) control, imposing its rules on what should be included on a map, Foucault's ideas on the

episteme may help us understand any unintended silences. Intentional silences are closely linked to censorship and concealment for reasons that may be military, religious or commercial.

Although wars may have been fought less often in the twentieth century than in the sixteenth or seventeenth centuries (Harley's era of focus) and with a wider dissemination of cartographic knowledge the state no longer has a monopoly over power-knowledge, even road maps can contain information of military value, especially if commercial considerations led to their being more frequently updated than state sponsored maps. The US Office of Censorship distributed a voluntary code to the main US cartographer and journalists in early 1942 asking publishers to remove details such as locations of ammunition dumps, forts, and other restricted Army or Navy areas (Smollar 2014); see 8.1.3 for an example. However, correspondence with General Drafting Company noted that the US War department did not object to maps showing the location of Army posts, camps and stations, providing that no indication was given of the strength of the military forces and that military airfields were not shown (Smollar 2015). The companies complied with these requests with most maps issued after March 1942 masking military facilities. Despite this, there appears to have been no attempt to withdraw earlier maps from distribution, and where a cartographer worked for several oil companies, there is the anomalous situation that 1942 maps of a particular location for some firms were masked, but for others were not, dependent on the exact printing date. This worked both ways; because oil companies' maps were not all printed at once, several brands, including Shell and Conoco had some states with censored maps and others without. A rapidly implemented plan did not work perfectly; Gousha maps of California for the Rio Grande Oil Company had names of facilities removed, but the actual airport locations were still shaded in grey (Smollar 2015).

In Europe, the wider availability of topographical maps, such as the one inch to the mile maps of the Ordnance Survey, means that smaller scale commercial maps, including those issued for petrol companies, appear not to have been considered as of use to invaders or possible saboteurs. In any event, with the total shut-down of tourism and fuel rationing much earlier than in the US, European petrol company maps disappeared right at the start of the war. No evidence has been found of any pre-war censorship on, say, the numerous German maps published in the late 1930s.

Even in peacetime, certain facilities have been deemed too sensitive to appear on maps. The Ordnance Survey consistently omitted several military sites that were obvious when viewed from nearby (Wheeler 2013). Some highly visible sites appear only to have been added to published OS maps after widespread internet mapping rendered their omission anachronistic. In 1948, Ordnance Survey also modified at least one map using aerial photographs as its base layer after it was initially published, to remove an aircraft factory and associated facilities near Heathrow (Brotton and Millea 2019:170-4).

A second category of silence relates to commercial secrecy. In the late Middle Ages, newly discovered lands offered countries – or more specifically royalty – the chance to acquire assets; severe measures needed to be taken to protect these from other countries (Harley 1988/2001). For road maps, the converse is true; the commercial benefit comes from telling users about businesses which may profit from their custom. Yet, although adding sponsored facilities happens on some free tourism maps, typically of large cities, this is less frequently found on road maps, including those given away without charge or sold below cost. For oil companies this may come down to an assessment of cost/benefit; a stock map from a third-party cartographer, perhaps modified to include the company logo and an advertising panel or two, was easier to commission and cheaper to produce than one marking their service station locations. Moreover, the absence of locations may itself be telling users "Look, we don't need to show you where we are, because we are ubiquitous". Locations only became necessary for smaller companies (and it was easy enough to update a list printed on the cover, rather than to change the plates to update locations), or when large ones needed to show customers something out of the ordinary – locations next to motorways, those selling diesel (in the days when few filling stations did so), or ones with RV (recreational vehicles) disposal facilities, for example. There were exceptions – both by company (Conoco and Skelly in the US, Aral in all its markets e.g. B.V.-Aral 1935 [165], Aral 2013 [209]) and by geography (pre-1939 France and Germany, post-1990 Scandinavia), but generally companies appeared to accept the silence about their locations (see also the section on 1360 Motoring/other facilities).

The selection and depiction of map elements is at the heart of this thesis. But the non-selection – the omission, the silences – is just as important when determining the extent to which they may have influenced cartographic design or users' comprehension of maps more generally.

4.6. To deconstruct or not to deconstruct?

What approach should be taken? MacEachren (1995), opts for a blended one based on treating cartography as creating interpretable graphic summaries of spatial information (representations) with a goal of producing more functional maps, but accepting that there is no single correct approach, whether scientific or non-scientific. Following V.A. Howard, a visual scientist, he sees a three level approach – lexical, functional and cognitive. The lexical level looks at how symbols (map elements) achieve their meaning, and corresponds most closely to the deconstructivist approach of Wood and Harley. The functional level asks about the relation between symbols and how they provide their meaning. The cognitive level looks instead at the user and their cultural and communication processes. Moving through the levels from lexical to cognitive goes progressively from the public to the private realm. While there are benefits from seeking to understand representation at different levels, some of these distinctions are quite narrow. The public-private realm split – between how maps are designed to

promote a message and how they are perceived is possibly more fruitful (and indeed, MacEachren splits his text into two main sections, broadly following this division: “How meaning is derived from maps” and “How maps are imbued with meaning”).

Conversely, Keates (1996) is strongly critical of Harley’s deconstructivist approach on numerous grounds. In particular, he objects to Harley’s assertion that all maps have a hidden agenda, claiming instead that in most cases it is obvious or stated, citing nineteenth century Ordnance Survey maps of Ireland as an example where it was made public that they were to enable taxation, or that cycling maps started to be published in large numbers when the ‘working classes’ (his quotes) had sufficient leisure time to explore the countryside around their home towns. While sympathising with Keates, his explanations sometimes fall into the same trap as Harley of stating facts without supporting detail. In the case of OS maps of Ireland, Parliament may have authorised their production to clarify boundaries for taxation purposes, but private map users (if, indeed there were any in Ireland at the time) may not have known this “hidden” agenda. And while cycling – or motoring – maps may have reflected a greater opportunity for exploration requiring maps, there was a hidden agenda in that publication was supported by railway companies wanting to maximise use of their services at weekends , and the profit motive of the entrepreneurs, such as WH Smith & Sons, producing or retailing the maps (Parry 2002, Nicholson 2004).

Keates (1996) also believes that the split between art and science is creating a false divide. At some levels, all maps – if they are to be of use – must be accurate; a map cannot say “I think it may be over there”. Even if maps have a purpose of overtly misleading the user, they need to be accurate about where things are *not* located. Keates sees cartography as a blending of art and science, and Harley is again criticised for being too rooted in philosophical concepts based solely on language. Maps are not read in the same way as a linguistic text; users seek specific points of interest to themselves, such as the roads connecting places A and B.

Perhaps Keates’s strongest objection to the approach of Harley and others is around the notion that maps have a moral or ethical dimension and that by omitting certain features, such as toxic waste dumps or areas of deprivation, they are in some way holding back the ‘struggle for social improvement’. Keates’s view is that most map users do not need to know where these are, and that extraneous information will only hinder their primary purpose, such as find out how to get to a specific location.

Yet ultimately, Keates and Harley agree that maps reflect society; the question is whether cartographers should have an active role in changing it. Harley is accused of being more influenced by American sensitivities, especially around place names. Although identified as an issue by earlier authors, as late as 2011, Henderson quotes Monmonier as identifying “*three most offensive place names that can still be*

found on some maps". This was a consequence of US topographers who named and measured geographic locations relying on local input; these were subsequently codified by the act of being on the map. The same approach was used by the Ordnance Survey in Ireland a century earlier (Hewitt 2010).

Turning specifically to road maps, and writing before the introduction of web mapping, Keates (1996) comments on Wood and Fels' (1986) analysis of the North Carolina state highway map that it should be hardly unusual that the selection of emblems, messages, flags, etc. advertises the product (North Carolina) in the most favourable way. Equally, Keates is not surprised by the dominance of roads on a road map, although Harley (1989/2001:162) would have regarded this as a "stock response" given that it is a derived rather than a scientific map..

Road maps also are highly selective, offering both a physical description (eg. surface, width, divided or not) and "appraisive, describing a class of road within a hierarchy" (Keates 1996:198). In contrast they do not normally describe traffic, driving regulations, etc. Keates' conclusion is that unless road maps are 'accurate', they are useless.

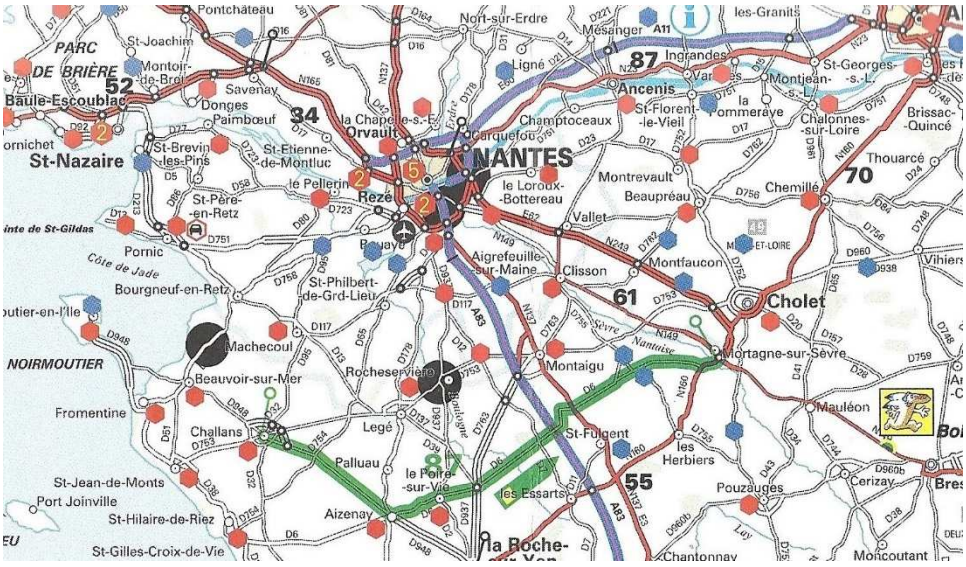


Figure 140: Bison Futé Itinéraires bis, from 1997/8 Intermarché map. Black discs are likely areas for traffic jams; the green route is an alternative route; red and blue hexagons locate Intermarché stores [575]

However, there have been occasional attempts to create maps showing low-traffic routes, most commonly in France (e.g. Shell, 1965, where a planning map of France at 1:1,500,000 was backed with a map of '*Routes Parallèles'* , and the state-sponsored Bison Futé maps first issued in the mid-1970s (Figure 140) and which are now published online). As such, Keates asks where the hidden agenda is, but then suggests it may be that road maps could be seen as reinforcing the antisocial nature of motor vehicles and associated pollution. However, he sees the problem (if any) as not being with the map, but wider society. This view does not consider the use of road maps as a tool for encouraging discretionary travel – especially tourism: as exemplified by the North Carolina state map, of course, but also by oil

companies' travel services and support for the 1960s "Discover America best by car" campaign. Yorke and Margolies (2000) saw the latter campaign, though, as being a response to competition from airlines even as interstate highways cut driving times.

4.7. Maps as social constructions

In 2001 Crampton made an important contribution to the development of cartographic theory. Robinson (1952) had intended to move the discipline forward to a more scientific basis, where the design of the map was to be driven by its function. However, in the 50 years since Robinson had first developed his cartographic communication paradigm, Crampton observed that cartography had moved from this communication model to one where the power relations had changed, and knowledge was constructed from the map, rather than simply being communicated.

4.8. Cognitive Maps

One strand of interpretation of how users approach maps is by hypothesising the existence of cognitive maps. In essence these are created through individuals acquiring, storing, recalling and decoding information about relative locations (Downs and Stea 1973/2011, Kitchin 1994). They do not require study of a physical map in advance, as there is evidence that many animals from rats to pigeons can maintain such maps (Tolman 1948; Perkins et al 2011:299). Actual maps may however enable people to extend or improve their cognitive maps (MacEachren 1995, Lloyd 2000). Information from different maps of a single area may thus be combined into a more complex structure enabling a richer understanding of where places are located or what a place is like. For a motorist, there may be some advantage in creating a cognitive map by referring to multiple maps, assimilating the subtle differences of emphasis between, say, a Shell map produced by George Philip, HM Gousha, Foldex or Mairs, with an Esso map broadly following the simplified design principles of the General Drafting Company. Many commentators, from Robinson (1952) to MacEachren (1995) recognise that the design of maps affects their cognition. The danger for a user is that conflicting information may lead to confusion or the loss of a cognitive map completely.

4.9. Map user vs. map producer – is a binary approach correct?

Del Casino and Hanna (2010) refute the notion of an implicit duality between (among others) author and reader, or production and consumption, that had been in the earlier work of many critical cartographers (Harley 1989/2001, Wood 1993). Instead they choose to adopt a more performative approach, taking full account of maps' use in a post-production phase. This undermines Harley's assertions about the authority or power invested in the cartographer; instead the printed (or web) map provides one of multiple entryways into the space they seek to represent. With the move towards online mapping, the hegemony of cartographers over the mapping process will fall still further; this was written before the

arrival of OpenStreetMap (OSM) with its focus on collaborative cartographies. Although Del Casino and Hanna see this as requiring user participation in the production process (and GIS can permit this), it can be argued that post-production activity – adding annotations, marginalia – enables the user to customise the map to meet their needs or expectations more fully. If we are to deconstruct such a map, we should look not only at the aims of the original cartographer, but also those of the user. Even this can be partial; text (on maps or elsewhere) values what is written over spoken or other sensual experiences.

Oil company maps can be a rich source of such annotations, providing evidence of user map interpretations. Mass-produced maps that are free or carry a low cost may be valued less than more expensive productions encouraging users to modify the map freely. This can also be seen as a chain of representation: the cartographer produces a map that is modified for its customer (the oil company) which may or may not specify customisations such as a bespoke cover or the addition of service station locations; this is then sold or distributed to their customer (the service station) which may or may not add limited customisation – typically just a rubber stamp with basic details (name, address, phone, perhaps a logo or identification of other services such as car sales), but more rarely an indication of the station location, a route or a point of interest for their customer; and finally the end-user (motorist) may add their own customisations: their target location, a record of events or places visited, or changes to the road network since the map was printed (**Error! Reference source not found.**). Occasionally the map may end up in the hands of a collector, who may add further commentary, such as a decoded date. One special type of annotated map deserves mention: the maps from oil company tourism services, often showing a highlighted route, with rubber stamped annotations such as "Scenic Route". Some of these, notably those from Conoco in the 1930s-50s were bound into a bespoke volume (Touraide) for the customer, and included a page for "Mileage and Expenses Records".

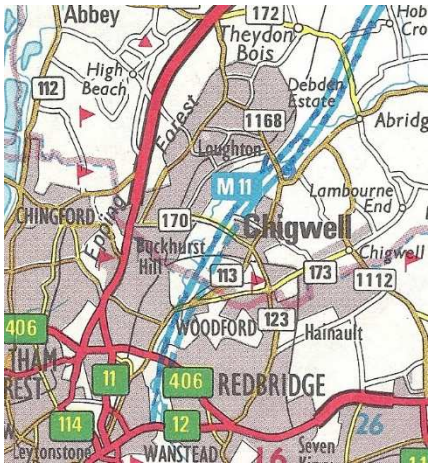


Figure 141: My 1975 Shell map of S & E England, updated (c1979) to show the opening of M11 and A1168 junction [614]

Most of the literature on user annotations focuses on digital annotations, where multiple users can add data to a map, such as points of interest, sometimes called Volunteered Geographic Information (VGI). Mummidi and Krumm (2008) looked at this in the context of adding points of interest to online maps of Seattle, and found over 39,000 data points. Many provided additional explanations (eg. expanding "Parking" to give the name of an associated elementary school), but others were purely ephemeral ("This is where Jill will drop you off and pick you up") or personal ("Home Sweet Home"). This is borne out from the much smaller sample of annotated oil company maps on paper.

In the context of GIS, there is nothing "natural" about the separation between map producers and users (Del Casino and Hanna, 2006/2010). Actor-network theory can break down presumed boundaries between the two, and technical objects such as maps can be seen as actors that complement human actors. Poststructuralist theories may enable the discovery of ways in which the map relates to what lies outside it – power, interpretations of the real world – but go beyond a binary approach of reality and representation of that reality to consider and deconstruct all the "tensions" within. They are less interested in the how truth or reality is intended to be communicated, because those using the maps will apply their own context and representations to the map.

Del Casino and Hanna (2006/2010), take their approach in part from feminist performance theory of Judith Butler. They use identity theory to illuminate the emergence of map spaces, combining representation and performance, and traces of "excluded others" that introduce ambiguities. This links the actual space, and experiences of that space – which may be sensory or physical, such walking, driving or viewing by users – to the producers of the map: they deliberately do not attempt to prioritise map producers over map users.

Figure 142: Extract from 1968 Esso map cover showing attendant with road map [74]

Moving from their abstruse theory, they give a practical imagined example in terms of the use of a tourism map offered at a Visitor Center in Fredericksburg, Virginia. The sequence of interactions between the tourist, visitor councillor (who provides and explains the map) and the actual historic site is in many ways analogous to that of the motorist, service station attendant and territory of an oil company map. In both cases, the user and offeror of the map have elements of both map user and producer. And although unsaid by Del Casino and Hanna, in neither case is the offeror/provider of the map the original creator or commissioner – at Fredericksburg the City Council would have commissioned a cartographer or artist. For a service station, the oil company and cartographer determined the map content, not the attendant offering the map. This analogy can, of course be pushed too far; in the tourism example, the visitor councillor actively attempted to explain the map to the tourist; in a service station it is more likely that the motorist would simply remove it from a rack and offer it for payment, or take it back to his/her car if freely available (Gulf, 1934). This simplified transaction is at odds with the imagery of a friendly service station attendant offering and explaining the map to a customer (Texaco Belgium c1930 [647] Figure 15, Sinclair 1937 [632] Figure 20, Esso 1968 [74] Figure 142).

4.10. Maps as rhetoric

Muehlenhaus (2012) asserts that "*all maps are rhetorical devices; some are better rhetorical devices than others"*. Observing that many maps are created with the singular purpose of attempting to change or reinforce an audience's opinion he goes on to define "persuasive maps" as representations "*created with the purpose of eliciting one particular interpretation or argument over competing ones*". The author created four maps, designed to demonstrate different rhetorical styles, in order to assess their impact, accuracy and memorability. Using a 2010 paper of his, the styles were:

1. Authoritative, designed to look "scientific, official, and magisterial". Although they follow norms on cartographic design, they may break them on data classification and generalisation.
2. Understated - minimalist. They appear to present facts and are restricted in their use of data, typically only showing few themes (or just one) on a map. Symbology is typically geometric, not mimetic.
3. Propagandist, created to communicate certain policies, agendas, ideology or jingoist messages succinctly. Propagandist maps rarely have any accompanying illustrations. They tend to have high visual contrast using colour and often highlight a single theme.
4. Sensationalist, often found accompanying advertising, opinion pieces, news agencies and non-profit publications. They can overwhelm one's senses with a plethora of, sometimes irrelevant, data and visualisations, typically including illustrations, photographs, oblique perspectives, emotive icons and symbols.

Testing these maps with a self-selected online group he found propagandist maps were most likely to be recalled; authoritative ones were most likely to be trusted (but the simple propagandist ones came next), and that there was no clear favourite in likeability. Gender differences were insignificant. From the analysis in Chapter 6, oil company maps from Europe would often be considered authoritative, but elsewhere tend more towards minimalist designs – even for locator maps, which might be expected to be propagandist.

It is possible to take the concept of maps as rhetoric to an additional level, taking the five elements of classical rhetoric, as espoused by Cicero or Quintilian, and mapping them onto cartography (Keates 1996:157-167). While *inventio*, the informative aspect, and *elocutio*, the use of a sign system, can readily be mapped in this way, creating a correspondence with the other elements is more problematical, although at one level even the most functional of road maps should be able to please – if not delight (*delectare*) – its users. Perhaps it is in the opposite, where a badly drawn or poorly laid out map can lead to a more positive dislike of an unsuccessful map.

4.11. A new Communication Model?

Kent and Vujakovic (2011) put forward the proposition that it is possible to create a map-language analogy, although this has fallen out of favour since the 1990s. Over time, there has been an evolution in symbology "*and with it the progression of human understanding about the environment*" - illustrated by the development of hill symbols (Wood 1993). Symbols, whether iconic or conventional, do not describe individual things, but represent them by signs which place them in concepts, classes or categories (Keates 1998) on a scale of iconicity that may vary from geometric, through associative to pictorial (Wu and Qiao 2022), and this is a key way in which a map differs from a picture or diagram.

Symbols may differ between countries. Kent and Vujakovic (2011) propose that this may be due to cultural influences, as in the UK's standard tourism symbols so that:

> "*an elephant has the exotic connotations we might associate with a zoo, the duck might connote local wildlife, and the propeller an older aircraft or a particular historical event such as the Battle of Britain*". However, "*these symbols are not as likely to produce the same connotations in a different (perhaps non-European) cultural context*" and "*the same sign-vehicle may be used to denote a different referent (e.g. the propeller may be used to signify an aerodrome)*" or "*the same referent may be denoted using a different sign-vehicle (e.g. a monkey to signify a zoo)*". They add "*Therefore, a map symbol cannot be guaranteed to produce a universal, standard interpretation*".

Over time, state symbolisation (e.g. through the widespread use of Ordnance Survey 1 inch or 1:50,000 mapping) has become more extensive. Revell, who was an employee of the Ordnance Survey, observed that "*due to the popularity, longevity and iconic nature of the Landranger product, the 1:50k specification is to a certain extent 'owned by the nation', and thus is difficult to modify without good reason*" (Revell 2005). Attempts to standardise symbols between nations have been less successful, such as the ill-fated International Map of the World, proposed in 1891 and worked upon until the 1980s, in part because it "*attempted to use a standard set of symbols for producing topographic maps to cover the globe … [but] any attempt to superimpose the symbols used in temperate countries directly onto the maps of tropical nations is, in most cases, inappropriate*".

Within a wider cartographic language there can still be dialects and accents. Accents take a common symbol, and vary it slightly, e.g. in colour, size or orientation; a change in the symbol to indicate a minor difference (eg. a church with tower or spire) can be regarded as an accent (Kent and Vujakovic 2011), although linguists also encounter problems distinguishing between accents and dialects. Dialects represent a more fundamental change in character of a symbol, while keeping within a general cartographic language. Some signs tend to self-explanatory; as Cruse, (2000:7) puts it "*Iconic signs are*

those whose forms mirror their meanings in some respect; signs with no natural analogical correspondences between their forms and their meanings are called arbitrary". However, even iconic symbols may appear to be arbitrary or ambiguous, such as the use of a cross for a church but also to indicate a general location.

NATO (STANAG 3675, 2000) has attempted to standardise symbols, to ensure that in a time of war its troops were able to share maps (Kent and Vujakovic 2011); the Soviet Union also developed a standard symbology for its military maps (Davies and Kent, 2017, Davis 2018). Yet at most international levels, symbols have not been standardised; instead GIS metadata has been the focus (the EU INSPIRE Directive, and ISO 19117 (ISO 2012) which rejects a role in producing common symbols, instead focusing on "*specifying a conceptual schema for describing symbols, portrayal functions that map geospatial features to symbols, and the collection of symbols and portrayal functions into portrayal catalogues.*").

Orienteering provides a rare example of the use of globally standardised symbols; there are separate sets for forest and sprint (urban) orienteering (IOF, 2019). Nonetheless, even standard orienteering sets require some loosely defined "special symbols" – generally simple ones such as a black x or open circle that may be used as appropriate for features such as benches, hides, statues or other public artworks.

Although oil companies such as Shell, BP and Petrofina, often had standardised cover designs, this did not extend to the internal cartography. An exception was Aral, which generally applied the style set by Busche to its international maps. And although not an oil company, Michelin maintained its distinctive cartographic style over many generations, applying it to occasional maps from at least a dozen oil companies over a more than 60 year span. Conceivably a more neutral style, such as that for the International Map of the World (IMW) while influencing others would be harder to copyright or market to motorists as a unique product.

Among oil companies, Esso used the same basic design established by the General Drafting Co. in almost all its marketing territories in the 1950s-60s (see Figure 143 to Figure 148). It is notable that Esso's common designs were first used internationally at around the same time that Robinson (1952) published his work calling for more standardisation. However, the common design failed to last; by the late 1960s distinct national variations were coming into use, and comparing a mid-1970s Exxon map from the USA – which kept close to the original version of the style – with similarly aged Esso maps from the UK or Germany shows significant divergences.

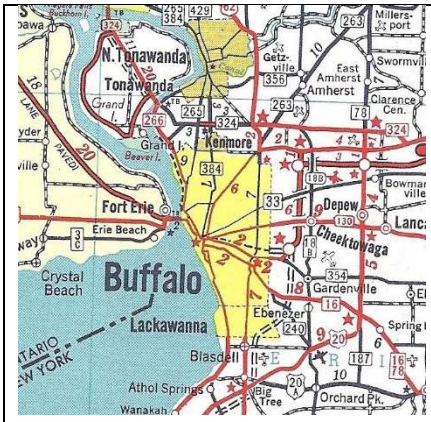


Figure 143: Esso, New York, 1955 [63]

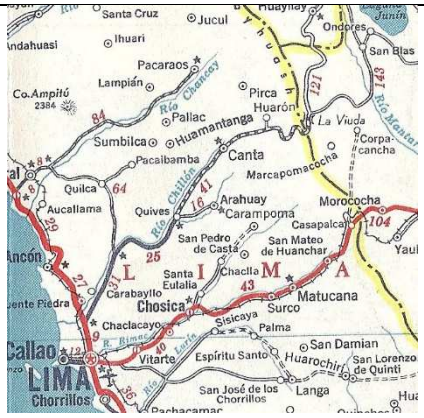


Figure 144: Esso, Peru, 1950 [556]

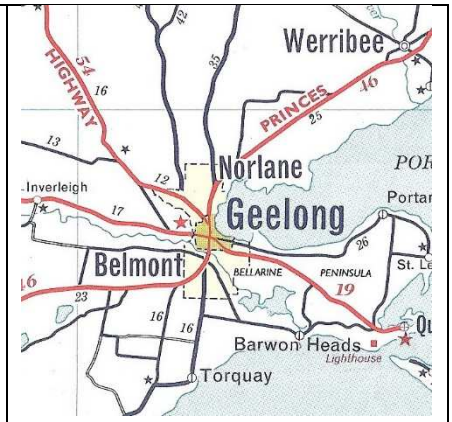


Figure 145: Esso, Victoria, 1966 [263]

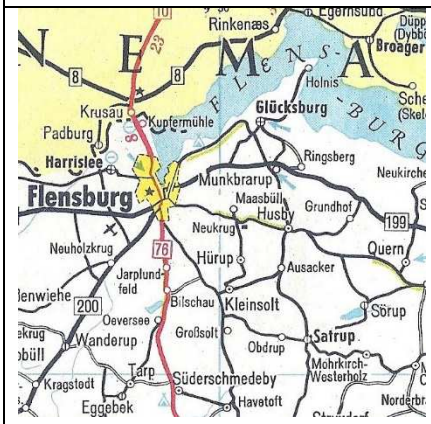


Figure 146: Esso, Deutschland Blatt Nord, 1958 [178]

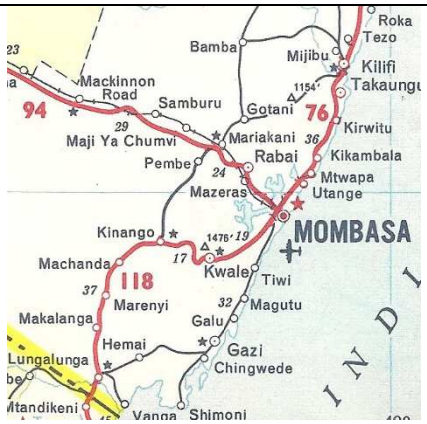


Figure 147: Esso, Kenya Uganda Tanganyika, 1963 [551]

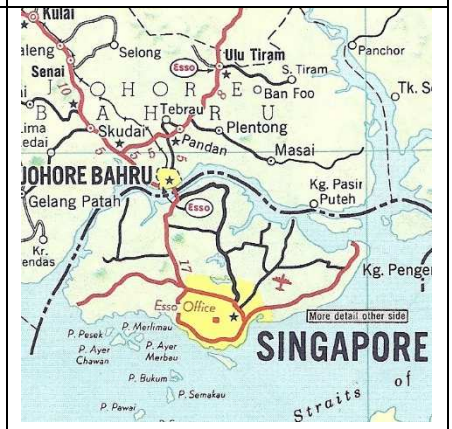


Figure 148: Esso, Malaya, Singapore, Borneo, Brunei and Sarawak, 1963 [555]

As these maps became less frequently published, the old sign rules fell away almost completely, and were not transferred to subsequent publishing partners, such as A-Z in the UK or Hallwag in Germany. Had GIS become available a little earlier, it may have been easier to reproduce styles across cartographers.

4.12. A post-representational view of maps: Embodying the Map

Drawing on Casino and Del Hanna's Beyond the Binaries, Rossetto (2012) sought to research how tourists can experience a 'flirtatious', intentional and enriching encounter with their destinations, rather than "*passively enacting or subverting cartographic representations*". The theoretical stance seeks to move beyond looking at maps in either a representational or post-representational way, but instead to go beyond the tourist gaze into a multisensory experience of the location. Maps are not seen as being ontologically secure representations of reality, but more fluid or relational.

Urry (1990) developed the concept of the "visual gaze" which by 2009 had been expanded to other senses and, especially, the body. Dodge et al (2004: 224) believe that visual studies often marginalise or even ignore maps and mapping, and focus on photography, either by tourists, mediated by their

cameras (this was written before smart phones were widespread) or in brochures, guides, etc. Otherwise, cartography may be associated with an immobile space as, or as a rectilinear grid around which actors move, rather than a space "*where people and places are in process*" (Coleman and Crang, 2002: 11).

Rossetto (2012) continued "*After the long predominance of the so-called 'critical cartography', whose primary purpose was to deconstruct the politics of representations and the power of maps, the debate has been enriched by innovative theorisation, including the post-representational approach."* She ascribes the latter to Kitchin (2010) developing earlier arguments of Dodge (Kitchin and Dodge, 2007), by looking at maps as being engendered through practices and being recreated every time someone uses the map. Perkins (2004) argues that all mapping can be seen as starting with action, rather than being based on power or control. I am personally more inclined to the critical approach although Rossetto's argument was made in the context of a visit to Berlin (which she sees as being unusually responsive to maps as performance owing to its history).

Rossetto also observes that Hanna and Del Casino (2003) were among the first to have highlighted the limitations of the critical, deconstructive reading of tourism maps as representations that rigidly construct tourist spaces, serving the interests of those holding power. Subsequently Del Casino and Hanna (2006), clarified their view that challenging critical cartography was not simply a move towards a 'non-representational' theory of maps and mapping, but suggested defining maps as 'representational practices', searching for strategies that can go 'beyond the binaries' of representation/practice, production/consumption, authoring/reading, sociality/corporeality and power/resistance. They introduced the concept of 'map space' to demonstrate that maps cannot disentangle their visual representations of space from their practical or mobile spatial performances.

4.13. How Meaning is Derived from Maps

MacEachren analysed how the brain processes images and, in some cases, relates this to the use of symbols (in their widest sense) on maps. He started by considering Marr's model for stages of vision – in effect sequentially (hierarchically) processing information from a flat image on the retina, identifying the main boundaries, then adding orientation, distance, surface reflectance and illumination to construct a "2.5D sketch" before filling it out into a 3D representational model. This allows users to recognise things as falling into a general class without having seen the individual example before. In terms of map symbols he notes that this may allow a user to focus on a subset of the symbols used, filtering out ones unlikely to be relevant (the example is looking for a campsite symbol on a National Park Service map - MacEachren 1995:31) but this relies on the user having some preconception of standard signs.

In terms of oil company maps marking service stations, this would work with a user assuming that either a petrol pump symbol might be used, or a variant of the company logo – but a simpler geometric shape would require explanation in the legend. MacEachren also highlights the difference between default (stored) and elaborated visual descriptions and how the former can be acquired through frequency of use. For example, on oil company maps, a novice user might not associate an older style pump symbol (showing a globe atop a tall pump) with a petrol station given that pumps have had a significantly different design for at least 35 years.

MacEachren goes on to discuss the Theory of Graph Comprehension put forward by Pinker, and the work of Bertin, as well as the Gestalt theory of grouping, and citing the primacy of place (positioning) over shape. In general it is easier to comprehend multiple maps showing the same symbol to represent different things than to overlay several symbols onto a single map (MacEachren 1995:37); this ties in with more recent research on clutter (Korpi and Ahonen-Raino 2013, Dumont et al 2016) and complexity (Fairbairn 2006). Dumont et al's work was based on comparing largely urban areas from national mapping agency maps (including French IGN) at various scales, and identifies a tendency for clutter to be at its greatest on maps of around 1:1 million, which is typical of a smaller scale or national road map.

Pinker's model uses a graph schema to mediate between knowledge representations (memory) and the visual description required. In terms of cartography, MacEachren refers to Olson who applied a hierarchical model to map reading tasks: (1) assess symbol characteristics (shape, size); (2) assess symbol group characteristics (pattern); (3) use the map for decision making. He criticises Olson for being intuitive and not in matching more recent theories of visual cognition, preferring Eastman (1985) for being more conceptual. Eastman's approach splits properties into local chunks, using eye tracking to support his assertion, while Pinker focuses on the global whole.

Another view attributed to Eastman (1985) is that maps are facilitators rather than communicators of information (in contrast to Robinson's paradigm). The relatively low capacity for storing information in short term memory and how it is affected by knowledge stored in long-term memory needs to be considered. MacEachren describes his theory as the Ganter-MacEachren model which pays more explicit attention to imagery. Their model recognises that images of maps can be formed and stored and retrieved from long term memory.

Peterson (1987) suggests that both maps and images are products of spatial thinking. He creates a flow chart similar to the one below:

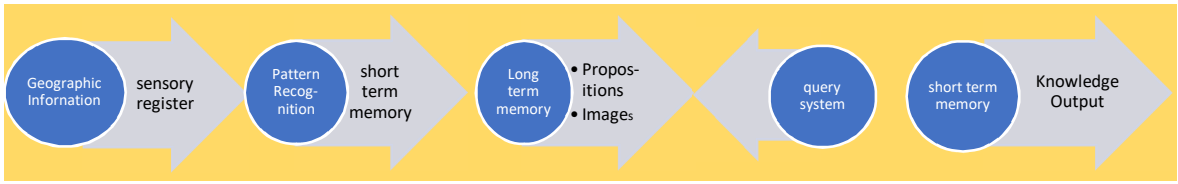


Figure 149: Mental processing of map information, after Peterson (1987)

For simplification, I have omitted some of the feedback arrows relating to long term memory, but one of his conclusions is that good map designs must prompt accessible memory image representations. User perceptions of categories and family resemblance are also important – and most regular users could quickly distinguish between a topographical map (such as from the British Ordnance Survey) and a road map, without necessarily being able to explain why. Potié et al (2022) investigated this further on road maps by asking users to identify whether a selection of maps contained a 'ring road' around a town.

4.14. Art and aesthetics in cartography

Over the past thirty years, there has been significant academic consideration given to symbology – both at a functional or usability level (does the symbol work?) eg. by MacEachren (1995), Kent and Vujakovic (2011), Wu and Qiao (2022). This has spilled over into wider questions of aesthetics (Kent 2005; Field and Demaj 2012a, 2012b; Brannon 2009; Muehlenhaus, 2012; Kent 2018) but more rarely to an explicit link to art, although Keates (1996) sees this link through the *delectare* concept within rhetoric.

Woodward's 1987 collection of six essays, drawing on exhibitions that had been held in Chicago in 1980-81, focused largely on the links between renaissance art and antiquarian maps, although did make a temporal excursion to National Geographic maps (which may be seen by some as pseudo-antiquarian in style) and Jasper Johns' 1961 Map. In his introduction, he noted art historians were increasingly interested in antiquarian maps (and saw them as worthy of display), while graphic designers were taking an interest in how maps represented the spatial environment. Historically, the relationship with art had divided into two phases: a decorative (early) and a scientific (current) phase. *Imago Mundi*, the leading journal on the history of cartography, had had a policy of not going beyond "the dawn of accurate modern survey". Art was often seen largely in terms of ornamentation on maps: the cartouches, *putti*, sea monsters and marginalia that made maps eminently attractive to modern collectors. However, Woodward observed, art can go further to the actual map representation including colours, letters and symbol design. In his own essay, Woodward observed that lettering was highly dependent on regional and historical style trends – a feature that can be seen on oil company maps, even in some cases when issued by a single oil company. In summary, the style of the map is a composite of graphic elements that may reveal the cultural context of its production.

As maps became more accurate spatial representations, it became possible to analyse maps by considering them as a form of scientific illustration. Woodward saw three types: descriptive, interpretive and imaginative. The first places great value on accuracy, and includes orthophotomaps (photographs corrected to a grid). Interpretive maps, by contrast, place great store on simplification and intelligent generalisation. It is with imaginative maps that artistic elements come to the fore – exemplified by medieval *mappa mundi* but also in the work of artists such as Grayson Perry (Brotton and Millea 2019:152-157, Kent 2023). However, even with regular maps, if a single person controls the process, then it creates opportunities for a greater artistic input – Woodward attributed this to a more direct link with the potential viewer. More specialist and atomised production has led to a loss of creative freedom, increasing predictability and consistency, but isolating any individuals from the origins and meaning of the process.

Woodward (1987) also identified that many artists produced maps, citing Leonardo da Vinci and Albrecht Dürer among others. Cosgrove (2005/2010) picked up on Woodward's recognition that most maps studied were from the pre-modern period, and tended to focus artistically on decorative elements. He addressed this head-on, by looking at the twentieth century – which is, of course, the period largely covered by this thesis.

Cosgrove (2005/2010) notes that using images, including maps, can undermine science as being analytical, independent and reportive. In the terminology of Bruno Latour, a map can be an "immutable mobile" – a medium for transferring information from one site to another, preserving the validity of that information.

Aesthetics and art can be separated, with many twentieth century artists moving away from "bourgeois" concerns like beauty and aesthetics in favour of the avant-garde or modernism: this can involve maps or mapmaking. The same influences led to an upsurge in pictorial mapping, sometimes influenced by Pop Art (Cosgrove 2005/2010). A very recent example of this sort of map are the city maps produced by Discovery Maps International, for free distribution by franchisees, who fund them through on-map advertising sales.

Cosgrove (2005/2010) points out that the move – especially in France – to avant-garde or subversive art forms was taking place while cartography was embracing scientific practices, in areas such as projection, scale and nomenclature, in a quest for truthful representation. Although he identifies engagement of some (such as futurists with their use of aeroplanes to provide fractured images), he misses the influence of avant-garde art on map covers – notably in the USA where the five panel cover offered greater opportunity for arresting artwork, as exemplified on 1930s US maps from Deep Rock, Shell and Standard (Indiana) among others, and more rarely in Europe from names including Agip (Italy).

Cosgrove digresses into maps drawn as art, focusing on Jasper Johns' 1961 "Map" – essentially a distorted map of US states, rendered in primary colours using thick oil paint. In the art book "Map: Exploring the World", this map intentionally faces a 1962 Humble Oil pictorial map of the United States (Phaidon, 2015). Cosgrove then moves on to consider pictorial maps – both war maps, largely through a series produced for Californian newspapers during World War II, and pictorial maps in popular culture. By focusing on a single artist – Charles Owens – he misses the breadth of these maps, both geographically (his examples are all from California) and stylistically. He does however note that the automobile turned California's coasts, deserts and mountains into scenery for visual consumption.

4.15. Reasons behind map creation

As part of his attempt to create a model of cartographic communication, Board (1982/2011) reviewed competing flow charts of the map creation process, although he did not repeat his contention that maps may be initiated to illustrate the cartographers' arguments about distributions and relationships (Board and Taylor 1977). He tacitly accepted that most arise from a more mundane need, such as to meet the requirements of the military, local authorities, users of road maps, nautical and aeronautical charts, or even tax collectors (Keates 1996, Hewitt 2010:239), or simply to develop an attractive product for sale to advertisers or consumers (Dillon, 2007).

Keates (1996:133) attempts to classify the decision to initiate a map as having come from one of five categories of actors:

1. Map users or their representatives
2. Map makers, in anticipation of a need
3. Map authors, seeking a need for explanation
4. Scientific bodies, seeking to add to the body of information
5. Individuals wishing to express themselves.

Although potentially useful, this list is open to criticism: map authors could easily be individuals wishing to create their own map, and scientific bodies can be a seen as a special category of map users. Arguably, the list omits propagandists, wishing to influence others. In the context of oil company road maps, the users are the motorists; their representatives the oil companies, and the map makers generally independent cartographic companies. But the initiation decision would not come from the users: a request for a new road map of X might be heard by an oil company, but evidence in the Rolph McNally or Edward Stanford archives (in Chapter 7) suggests that the decision to create a new map was often taken with no participation by end-users. In contrast there are two known cases when an individual cartographer successfully approached Shell with an idea for a new map that they could sell –

leading to the creation of Foldex sheet maps in the 1930s and the Dutch Stratenboek in 1984 (Byrne 1998, de Raat 1996).

4.16. Conclusion

The preceding parts of this chapter have identified a number of cartographic paradigms, in a broadly chronological sequence. Although not generally seen as a paradigm, until the 1940s there was an implied positivist-scientific view of maps; the main academic focus was on how they could be made more effective. Comparative analysis of maps focused on the "what" (as in Olson & Whitmarsh (1944) for example), to improve comprehension by users, rather than on the "why" or any sociocultural study. Over time, scholars expanded their theoretical basis for cartography to extend being the ontic (descriptive) level, to a more ontological (constructivist) analysis of the map. Azocar & Buchroithner (2014:89) attempt to place conceptions of cartography into three eras. Jumping over the earliest purely representational and scientific approach to mapping exemplified by Eckert, they see modern cartography as starting with Robinson (1952) with the cartographic communication paradigm, with maps objective, scientific representations and as being ideologically neutral, but revealing truths. MacEachren's work is seen as a natural extension of this as a form of cartographic visualisation, blending cognitive and semiotic approaches, and so moving closer to a post-modern cartography.

Post modern cartography essentially started with Harley (1989) who saw maps as cultural texts that are ideologically laden. Using deconstruction as a tool, this regards maps as being historical products and constructions, in turn, this led to Wood & Fels' assertion that maps are propositions. With maps being seen as more fluid or mobile objects whose meaning emerges through practices (del Casino and Hanna 2006), constantly being remade by users, this opened the way for post-representational cartography, such as that espoused by Dodge, Kitchin or Pickles, in which maps are unstable texts or practices.

With the introduction of computer-based cartography and graphical information systems, there have been attempts to create new paradigms, such as that of cybercartography introduced by Taylor (Taylor 1997, Taylor & Pyne 2010, Azocar & Buchroithner 2014:53-6). Moreover, digital maps are mutable and transient. Unlike paper road maps, they disappear the moment the application is closed, often to be forgotten by the user; as the landscape is traversed, so the digital map re-configures itself around the user's latest position (Hornsey, 2016). Consequently any cybercartography paradigm focusing on interactivity is outside the scope of this thesis, except insofar as it influences the understanding of older paper maps, given that maps as an artefact can be virtual or physical (or both).

In the decade since Azocar & Buchroithner was published, there has been no single dominant thread. There has been some renewed interest in aesthetics and the overlaps between art and maps (Muehlenhaus 2012, Hornsey 2016, Kent, 2018, Kent 2023). There has also been a continued interest in

map usability, sometimes driven by the need for increasing integration of the military or civil response forces across borders (Bianchetti et al 2012, Davis 2018). However potentially the most influential scholar in the field is Edney, who asserted on the first page of his key book on Cartography that "*There is no such thing as cartography, and this is a book about it*" (Edney 2019:1). Edney's argument is in essence that there are a multiplicity of mapping practices and there is a need to understand the processes that give rise to them; there is no single normative approach offered by the ideal of cartography. He sees "mapping" as the representation of spatial complexity, and the map as the text resulting from the process. In turn, this multiplicity of mapping processes leads to multiple forms of maps, and a "descriptivist" approach to explain how specific types of maps (for this thesis oil company road maps) are produced, circulated and consumed (Edney 2019:236). In the next chapter we seek to develop an analysis that can be applied to road maps more generally, while also seeking to identify elements that are potentially more specific to those from oil companies.

Chapter 5:

Research Methodology

5. Research Methodology

As stated in the introduction, this thesis has two main objectives: to determine if there are characteristics that are specific to oil company road maps, and to investigate the relationship between the oil company, its cartographer and its immediate customers (service station operators).

The first objective will be met be undertaking a quantitative analysis of a sample of maps. Two key decisions need to be made: how a sample of maps can be selected that may, in some ways, be seen as either representative or influential, and how the analytical work will be undertaken. The second objective, which is more qualitative, will largely be met through archival research, but will also look at primary documents, such as flyers, price lists and marketing materials. However before looking at the practicalities of the methodology, it is necessary to consider the philosophical basis of this research.

5.1. Philosophical approach to map analysis and selection

As has been shown in the previous chapter, over time critical cartographic analysis has taken a broad arc from purely objective explanations and comparisons of the conventions, symbology and associated text (Olson and Whitmarsh 1944), through various iterations of a cartographic communication paradigm seeking to explain the transmission of information from map to reader (Robinson 1953/1978, Koláčný 1969, Robinson and Petchenik 1975, Board 1982/2011) leading into a more deconstructivist approach (Wood and Fels 1986, Harley 1989) which then opened the way to the post-representational epistemology of Pickles (2004), Del Casino and Hanna (2006) and Kitchin and Dodge (2007) among others. There is a danger, though, that in searching for hidden meanings on a map and never considering the process of a map as being complete but only as part of an ongoing practice, the researcher can get caught up in "*new and not so new epistemological crises in cartography*" (Azócar and Buchroithner 2014:110) to the extent of no longer knowing what a map is, or what is meant by cartography. In the meantime practical cartography had moved into digital space through GIS and web mapping, and many academics were contributing more straightforward analyses to the multi-volume *History of Cartography*. Kent and Vujakovic (2011) recognised that the critical reading of maps had also to consider the effects of cultural differences among similar genres of mapping, in addition to how different cartographies construct their meaning; they saw this in the context of a need for a new language paradigm for understanding topographic maps. This approach is however applicable to a critical analysis of any genre of map: it has been used successfully for tourism maps, emergency relief maps, and Soviet city plans, and is used in this thesis for oil company maps.

5.1.1. Approach

In essence, then, this thesis will take a scientific-empirical approach towards the analysis of oil company maps. Although this is essentially positivist and inductive based on the samples of maps analysed, a degree of interpretivism will inevitably creep in: my own value judgments – as a user of maps in general

and oil company maps in particular for over 50 years – cannot be completely forgotten. I havehad to make some ontological assumptions about users – sometimes they are referred to as "motorists" in the context of oil company road maps, on the grounds that a customer of an oil company presumably has access to a vehicle (owned or rented) that is powered by a petroleum derivative. But as shown by the example in the introduction, a well-designed oil company map may be usable – and used – by a wider range of actors, including pedestrians and cyclists (Figure 10), and potentially by groups as diverse as other cartographers (seeking corroboration of geographical features), foreign governments, tourists or purely armchair travellers. In any communication paradigm, the map user should be given an equal value to the map creator, but cannot be seen as a single type of user.

However, before I can consider how the map will be analysed, I must first explain the strategy for finding and selecting the maps that were analysed.

5.2. Map Selection Strategy

The introduction identified that vast quantities of oil company road maps were produced, running into several billions. By including maps as diverse as early road atlases of England and Wales (Pratt's 1904 - Figure 7 to Figure 10) and recent maps of Latvia and Chile (Virši-A 2019 - Figure 150 [659], Copec 2020), these maps span a period of in excess of 115 years. Over 1,250 companies or brands are listed as having been named on maps in North America (RMCA 2023), although this list includes many cases of minor corporate name changes, with around 200 brands listed in Europe on my petrolmaps.co.uk website (Byrne 2020). A selection strategy is therefore required.

Figure 150: Above and right - a fairly basic locator map of Latvia for free distribution from Virši-A published in May 2019

In order to understand fully the entire map (see the section below on maps and perimaps) it is essential that the physical map should be accessed and analysed – a scanned image or catalogue entry will not be sufficient, other than perhaps to confirm existence of a map. This is not as difficult as it might sound at first, as I personally have access to a large sample of oil company maps, with in excess of 9,000 in my

personal collection, and indirect access to many thousands more through other private collections or lodged at the Newberry Institute in Chicago. Indeed, given these numbers it would be easy (but wrong) to fall back into a purely quantitative survey of oil company maps. This would not however go further than answering "what" and "when" questions around the maps, and would not address the "how" or "why". Moreover, there is a need in the methodology to keep the wider questions of lasting influence (if any) in mind. Certainly some quantitative elements are required, to determine how representative maps selected for analysis were, and also to help identify potentially "interesting or important" outliers. However, there was a clear danger of being too focused on quantitative – raising the "so what?" question.

However, the converse is also true. As oil company maps have received relatively little attention – indeed, commercial road maps as a category have been only lightly researched – it would be wrong to pick a few "interesting or important" maps and focus on them, without placing them in a wider context.

5.2.1. Finding Oil Company Road Maps

The Virši-A map shown above (Figure 150) is unusual in that it was acquired during this research from a service station. Most oil company maps are by now over 50 years old, so in order to examine maps it is necessary to find libraries or collections that hold a representative sample; it is unlikely that any single collection will be globally representative of the universe of oil company maps. Having acquired the bulk of the archives of the Big 3 US cartographers, the Newberry Library in Chicago has the most complete collection of maps produced by those firms; it also has a large collection of North American maps not issued by oil companies including tourism maps, brochures and guidebooks. However, although numerically quite large, its non-North American holdings are less comprehensive and largely depend on past donations. Although the Newberry has around 500,000 cartographic items in total, only 85,000 were included in its final full cartographic catalog and only 59,000 of these entries have been migrated online; this is more or less complete for the Rand McNally holdings, but has large gaps elsewhere among twentieth century maps. For example, none of the 25,000 items from the General Drafting Co. collection are currently catalogued, and only 6,000 of the 100,000 in the HM Gousha collection are covered (Newberry 2020). The Osher Library at University of Southern Maine (USM), having acquired the Horwitz collection, may possibly be better balanced between US and international oil company road maps, but is less easy for a UK-based collector to access; I have the Horwitz collection catalog but this is only part of the Osher's wider holdings. And just like collectors, any library that relies on donations risks being atypical/non-representative of wider population of maps. It is also worth commenting that any map analysed must have have survived to the present day. When the print runs for some of the individual North American titles exceeded a million in the 1960s, the maps are still relatively

commonplace; in contrast the George Philip and Son corporate archive records a Shell map of Scotland from 1939 for which only 700 copies were printed – no copies of this are known to exist today.

Most other libraries suffer from an additional shortcoming, that copyright libraries may only obtain one base map from the cartographic publisher – which may not be a problem in terms of design and symbology – but do not receive variants produced for different oil companies, with differing perimap details. The base map may not even indicate that it was produced in any version for an oil company. Such libraries may also not receive "non-programme" maps produced in small quantities and only distributed locally. A further problem lies with library catalogues: many include only the basic title of the map (e.g. South-East England) and the publisher or copyright owner (e.g. George Philip and Son Ltd). They may completely ignore that the map in question was issued as part of a series of (say) Shell, BP, National or Jet maps, and even if they do, it may be relegated to a free format field in a database, and not fully searchable. (As an aside, many catalogues seem unable to list the brand "Mobil" correctly, adding an erroneous final letter "e".)

None of the other potential sources of maps would be wholly representative either; they can be dependent on donations or, for private collections, an individual's acquisition strategy, and may well be even more atypical/non-representative of the wider global population.

So I have inevitably drawn largely on my own personal collection; despite having around 9,000 oil company maps, it is not the largest private collection (some have over 20,000 road maps, but are focused on US issues) but it is believed to be one of just two that are globally more or less balanced (the other is not fully catalogued). It would still not be possible to analyse every map from the 9,000 available, except at a highly superficial level, which to some degree I have already done in my database index. The question remains as to how to produce a broadly representative subset. One approach might be to take a rigorously random approach to sampling the maps, such as every fiftieth acquisition, but this would almost certainly lead to the inclusion of near-duplicates and the exclusion of some "significant" or "representative" maps. Figure 155 includes some basic analysis on my entire collection, but with the proviso that this is itself skewed towards maps that:

- are readily available to a collector living in the UK with many collector friends in the USA (but fewer in Europe) – i.e. to UK and North American maps
- can be readily sourced via online auction sites (mainly eBay, but occasionally Delcampe and Tradera) – in practice ones covering mainly the UK, USA, France, Germany and Italy
- are affordable (so my collection has fewer maps from the 1910s and 1920s)
- meet my personal collecting desires and prejudices

- "Attractive" covers that changed design regularly (such as Esso or Chevron maps from 1949 to 1965, or Shell *cartoguides* of France)
- Maps showing service station locations
- Ones issued by, or carrying the logo, of small or obscure oil companies
- Of smaller cities, more unusual locations, and the like.

Providing I accept that there are inbuilt biases, and consciously seek to minimise or describe them in drawing conclusions from the research, it is probably better to start with a large and reasonably representative population of maps that I know well, so that I can select suitable examples for more detailed study.

In conclusion, I chose to construct a stratified sample, to eliminate as many of the known biases (and near-duplicate maps) as possible, and then to select from it to produce a basic quantitative analysis of the symbology and features on the maps (in Chapter 5).

The map sample was then subjected to two forms of analysis: a broadly quantitative analysis of the map elements (cartographic and non-cartographic), and an interpretive study of a smaller number of maps concentrating on three characteristics of oil company maps worthy of a greater depth of study.

5.3. Selection of Geographical areas

Maps for detailed analysis were chosen from countries with the largest oil products markets. As peak production of oil company road maps appears to have been in the late 1960s, selection was based partly on those countries with the largest downstream petroleum markets in 1970:

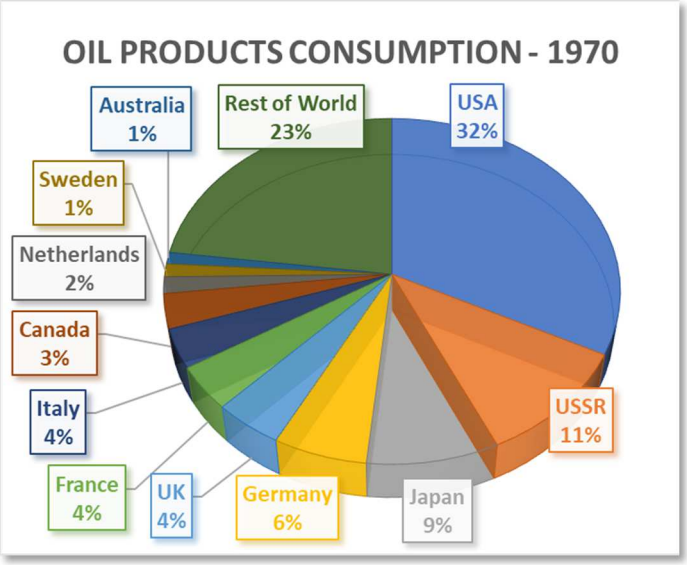


Figure 151: Oil Products Consumption, 1970: data source BP, 2021

As shown in Figure 2 at least some oil company road maps were known to exist for almost all countries (either from my collection, or the Horwitz collection at the Osher Map Library[2]). Two countries will however be omitted at this stage: the Soviet Union was still a closed market with a state monopoly for fuel distribution and very limited domestic mapping undertaken by a single concern, GUGK (Postnikov 2002, Davies and Kent 2017) using somewhat different

[2] Exceptions in those two collections are Afghanistan, Albania, Belize, Bolivia, Guyana, Iraq, Laos, Mali, Mauretania, Niger, North & South Korea, Suriname, the UAE and Yemen. Few Polynesian states have oil company maps.

cartographic conventions. Soviet tourist maps have been reviewed using a similar methodology by Byrne 2022b.

In addition to fuel sales, it is necessary to consider availability of oil company maps:

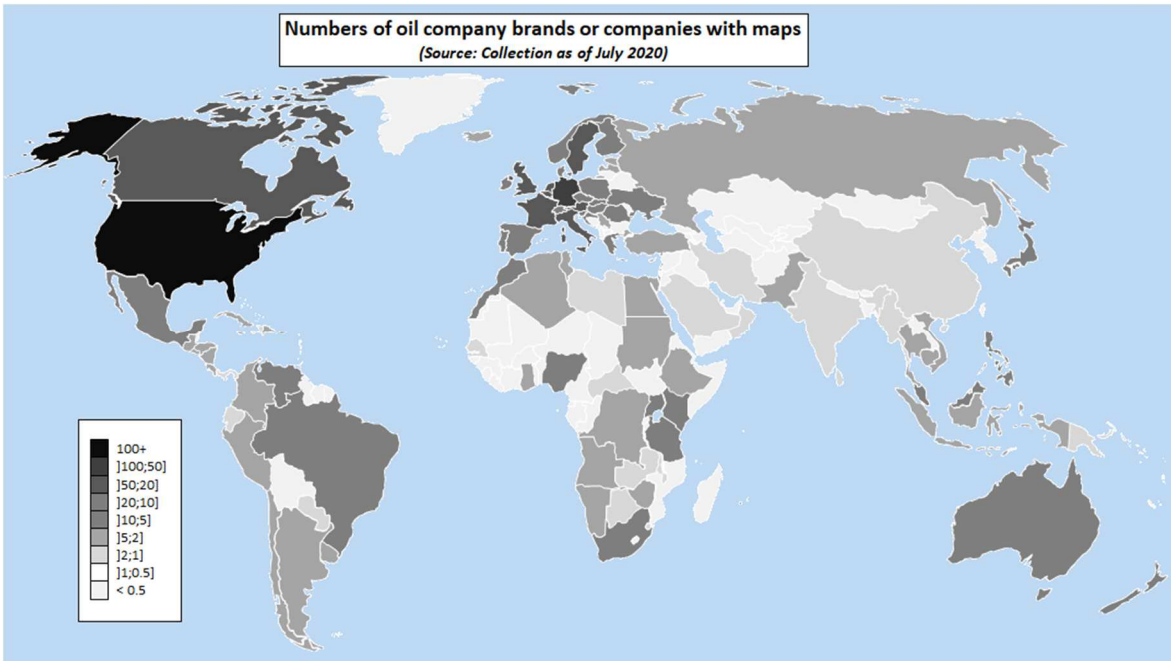


Figure 152: Maps available for study, by number of brands

The third largest market, Japan, had some road maps published by oil companies but these are rarely seen outside Japan. Neither the researcher's own collection nor that of the Newberry or Osher Libraries have more than a handful of such maps, with occasional issues known from Shell, Esso and domestic names such as General (an affiliate of Mobil), Kyodo, Mitsubishi Oil and Daikyo. Small numbers of maps are also known to have been produced in Bangladesh, South Korea and the UAE. The Sahel countries are included in some West African regional maps (e.g. Shell [625]).

Two more countries lacking a competitive downstream oil industry in 1970 were each responsible for just over 1% of global consumption, so are part of "Rest of World" in Figure 151. Like the Soviet Union, China had a state monopoly, and was still suffering from the effects of the cultural revolution: it is unlikely that any road maps were in public circulation. Spanish consumption was slightly higher than that of Australia, but at the time Spain still had a domestic fuel monopoly, Campsa[3]. The most common Spanish road maps were produced by Firestone, the tyre company, using a design similar to those of Michelin in France.

This would appear to leave the focus on seven countries: USA, Germany, UK, France, Italy, Canada and the Netherlands. There was some doubt about whether Italy was worthy of inclusion or not. More than

[3] All three countries (China, Spain and the Soviet Union) liberalised their downstream fuel markets in the 1990s.

in any other major country, Italian road maps issued by petrol companies are dominated by a single cartographer – Istituto Geografico De Agostini (IGDA). Agostini were responsible for well over half the maps in the parent population, with no other cartographer have as many as one tenth the number of IDGA maps. Vallardi was a distant second, having worked for 5 companies in the 1960s and 70s. The only other significant contributors were both German cartographers – Karl Thiemig, which worked with Esso to create maps of Italy using their standard General Drafting Co design; and Aral which generally used its regular partner, Busche of Dortmund, to prepare its maps – it is not known how widely these would have been distributed at the Aral service stations, which were concentrated in Northern Italy. It is notable that Volume 6 of the History of Cartography (2015) has an entry for Agostini, but not one about Italian cartography in general. Established in 1901, Agostini's name became synonymous with maps and atlases among the Italian general public. Although IDGA developed an international business, it lost most of this in 1935 (Giordano 2015), so its global influence on oil company maps was small with few non-Italian issues known (exceptions being a Shell map of Turkey [621] and an AGIP map of France [506]).

Unlike Hitler in Germany, Mussolini does not appear to have encouraged domestic tourism and the production of road maps. Fascist influences on cartography were more focused on justifying an ethnological basis for being European, and leant heavily on atlases produced by the Touring Club Italiano, TCI (Company i Mateo, 2014). TCI did produce sheet maps during this period, often in expensively produced folders carrying advertising from Shell or lubricating oil manufacturers such as Globoil, Touring Oil, Oleoblitz or Texaco (Figure 41). TCI's rivals at the Reale Automobile Club d'Italia (RACI) regularly produced sheet maps in the 1930s showing road conditions, often bearing adverts from the three main companies of Esso, Shell and Agip; this may be why the companies chose not to procure maps of their own. RACI's post-war successor continued to produce road maps and these may have been used by many Italian motorists in preference to the less detailed efforts from petrol companies.

Canada was initially omitted as its market is similar to that of the US in terms of the major oil companies operating and the cartographers. However, it was subsequently added as the maps showed some interesting divergences from those of its Southern neighbour, and the operations of Rolph McNally are summarised in Chapter 7, revealing influences from both the US joint venture owner, Rand McNally, and oil companies themselves. Although possibly not justified in terms of market size for fuel, Australia was also reviewed as, like the USA, it was a market where the oil company map was commonly used by motorists. And although Australia's oil consumption was 10% lower than that of Sweden, much of the Swedish consumption would be of heating oil, so the road fuel element in Australia was almost certainly greater; it may also have been higher than the Netherlands, despite total oil consumption being 29%

less. Given that oil company road maps appear to have played a significant role for Australian motorists, with several active cartographers, the country was included in the final selection.

Consideration was given to the inclusion of a Latin American (or Caribbean) country to provide a better balance between hemispheres. However examination of the maps available showed that many Latin American maps served a dual purpose of local distribution and provision to enquirers from US touring services. Numerically, those available were dominated by ones produced in the 1950s or 1960s by General Drafting Company in New York for Standard Oil Company (New Jersey) (Esso and its Venezuelan affiliate, Creole). Moreover, the local demand for such maps was likely to have been limited: a General Drafting map of the Americas dated 1948 includes a table of "road mileages" for Latin American and Caribbean countries. This reported 3,004,000 in the USA, 564,438 in Canada, and just 593,835 across the other 29 countries listed, with only Argentina (253,000) and Brazil (142,000) exceeding 100,000 each (Standard Oil (NJ) 1948).

A similar consideration was given to inclusion of an African country, but there only appear to have significant numbers of oil company road maps produced locally in just one country, South Africa, and many of the examples available were relatively recently produced road atlases rather than the sheet maps selected in other countries.

To provide at least one example of a non-Western market, Thailand was added to the country list. Thailand has a long tradition of "royal maps" (Phasuk and Stott, 2004) and was never colonised by a European power, so was seen as a distinct space from other Asian countries (Edney, 2007), even though its fuel retailing was dominated by the Anglo-American majors.

The next group of European markets – including Sweden, Belgium and Switzerland, would be worthy of future study. In all three petrol companies had a long history of selling branded road maps, with occasional issues right up to the 2010s.

With the exception of Thailand, all the selected areas are broadly "Christian" in heritage, and this may be reflected in both a certain rational approach to cartography and in the choice of symbols. So many maps have "churches", "cathedrals", "monasteries" or even "convents" or "sanctuaries" marked; most are however seen as being tourist attractions, rather than as active places of worship. Of course, visiting operational places of worship has long been a feature of Western tourism (Jerome 1891). The most recent Thai map has categories for Wats and Limestone Pagodas (*Prasat*), but it is not clear the extent to which these are active religious buildings, tourist attractions, or – most likely for marked wats – both.

The distinction between "working" features and heritage sites is not limited to religious buildings. When a map marks a "tower" is it because tourists can climb the tower and enjoy the view, or is it an

orientation feature that might help the hopelessly lost? In most cases, it would appear to be the former, but motorists would not have been welcome at the radio masts and TV towers shown on 1960s' Dutch maps by Falkplan or Bootsma. This ambiguity can also extend to water features. Waterfalls marked on a road map are almost certainly there as potential tourist attractions; but dams and weirs may not be, and pumping stations (also found on some Dutch maps) are almost certainly functional.

To help provide valid comparisons for countries that often produced sectional or regional road maps, an area was selected that is not atypical – East Kent (SE England), the Cotentin Peninsula (Normandy, NW France), and the region around Hamburg and Hannover (N Germany) for detailed analysis and many of the figures in this thesis. Only in the USA were diverse locations chosen to represent a range of topographies, encompassing coastal, mountainous, urban, agricultural and wild areas (or those under public management such as the National Park Service).

5.4. Selection of Oil Companies (Branding)

There are no reliable estimates of the number of oil companies that distributed branded maps, nor of the number of brands displayed on such maps. As one of the aims of the research is to look at the influence of these maps, it is logical to focus on the largest companies, but to be mindful of potentially influential maps from smaller brands.

5.4.1. The USA: a plethora of brands

The RMCA website (accessed 27/12/2021) has a table for US and Canadian companies that lists 1,192 names in the US alone, but this table includes multiple entries for companies that have changed their corporate legal entity over time, or have a brand name that is distinct from the corporate name. It also includes numerous examples of what collectors call "generic issues" – maps created by a cartographer and then subject to a simple overprint with a company name or logo. Although there is a fine dividing line between such maps and issues specially printed for oil companies with a greater degree of customisation, these maps can be viewed collectively as they are wholly dependent upon the publisher-cartographer. In the US, most such maps were produced between the late 1940s and early 1970s by Rand McNally. However the concept was also used in the 1930s by MWM, which would often issue a basic map carrying advertising from numerous businesses overprinted in a "compliments of" panel on the front cover. It appears that each edition would be made available with an overprint for each advertising business – typically these were hotels, but they also commonly included small oil companies (often with no indication of the brand of fuel distributed) or individual service stations – which again, confusingly, often carried a corporate name of "XXX Oil Company".

US maps were also produced by trade associations and then overprinted for each of their members – the two most widely cited examples of these are the Ohio Petroleum Marketers Association Maps,

1927-1930 and maps produced for members of the Society of Independent Gasoline Marketers of America (SIGMA) from 1967-71 (Spaid 2016a, 2016b). Spaid lists 34 brands known to have been overprinted onto SIGMA designs produced for them by Rand McNally, although most of those brands are also known to have had either specially printed or other generic overprint issues. He also names 100 companies in SIGMA not to have known to have had similar overprinted maps, but examples of a few of these have subsequently reported by collectors.

A third source of overprinted US maps arises from the situation where independent companies, known as "jobbers" distributed fuel on behalf of a larger oil company, using its brand. In most cases, the company appears to have simply handed out maps from the larger firm, but in a few cases it sponsored or procured its own maps, often covering a small geographical area, using bespoke cartography from a local company. However there are also maps from the larger company overprinted with the jobber's corporate name – these are most commonly maps from Richfield Oil Corporation of New York (Figure 153); the RMCA website (accessed 27/12/2021) lists overprints from 20 companies, but many more are likely to exist as most libraries and collectors do not record this information.

Figure 153: Richfield/Webaco (overprint), New York, 1933 (rear cover) [602]

5.4.2. Rest of World

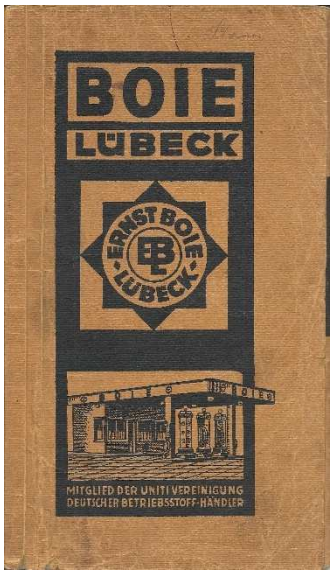


Figure 154: Uniti-Boie atlas of Germany, c1937. [528] Euco used a near identical design.

In contrast to the USA, most countries only have a few brands seen on road maps and, except in Germany, lack generic maps with simply overprinted corporate names or logos. The German exceptions include maps and softback atlases produced by the Uniti trade association in the 1930s, post-war maps produced by the AVIA cooperative but overprinted with a member's name, and regional or national maps from JRO with a plain cover design incorporating a panel that can be used to add a corporate name or logo.

Otherwise, branded maps tended to be produced by or for the main petrol and oil distributors in a country, and it is these that this thesis is focused upon. They were generally produced in larger numbers and were the maps most commonly seen and used by everyday motorists. As such, they will have been the ones with greatest influence on users' map reading and interpreting skills. Although collectors seek out obscure brands, just as philatelists seek out rare stamps, their lasting influence will have been less.

5.4.3. The Seven Sisters

In practice this means that the maps selected for analysis will come from a handful of brands – those internationally available during the heyday of the oil company roadmap, augmented by a number of large national or regional brands – although these too often developed cross-border operations in the expansionary years of the 1960s. The starting point has to be Mattei's "Seven Sisters" (Frankel 1966:20, Tugendhat 1967:4, Sampson 1975, Odell 1975:11): Esso, Shell, Mobil, Gulf, Texaco, BP and Chevron, to give them their most commonly used names (the ordering is based on gross dollar sales value in 1956 (Bamberg, 2000:11) – all seven were in the top 25 companies globally). Although they were dominant up to the 1960s, by 1972 their combined market share had fallen to 54% (Hellema et al, 2004).

These companies were of course all Anglo-American and exclude Total (Compagnie Française des Pètroles) and Mattei's own company, AGIP (E.N.I.) which was trying very hard to match – or even surpass in the downstream market (Sampson 1975:162) – the longer established seven. For its importance in Germany and neighbouring countries, Aral has been included in the list of companies considered in this research, too – as a wholly downstream entity 30% owned by Mobil in the 1960s and 70s it is sometimes overlooked, but from a cartographic viewpoint is influential owing to the wide distribution of its distinctively styled maps produced in close collaboration with the cartographer Busche, and for the longevity of its map programme, running from around 1930 for almost 90 years. And Amoco – like Total sometimes regarded as the eighth sister – will also be considered: its lower international reach kept it off Mattei's listing, although ironically, after Mattei's death in 1962, Italy became its largest international retail market.

To keep numbers of maps manageable, not all these brands were considered in all the markets examined. Some issues from other brands were added where they provide an example of work from a large cartographer that would otherwise not be covered by the sample. Even this extended list omits some names worth considering: Conoco, which in its near 70 year run of US maps outlasted all competitors and was responsible for some unusual maps of Scandinavia in the late 1990s produced by its Jet subsidiary; Phillips 66 which claimed to be one of only two marketers present in every US state, maintaining a single station in Alaska to support its assertion (Henderson and Benjamin 1997); Fina, the Belgian based multinational that also ran a Touring Service for European motorists in the 1960s, but was ultimately acquired by Total in 1998; and Austria's OMV, which was one of a small number of brands to develop maps in the newly liberalised Eastern European markets.

Main Brand	Other group brands included
AGIP	ENI
Amoco	American, Pan-Am, Standard (Indiana)
Aral	BV
Avia	Boie, May
BP	Olex, National Benzole, Supertest
Caltex	Elf (France)
Chevron	Standard (California)
Esso	Exxon, Enco, Oval-E, Carter, Pate, Oklahoma, Standard (NJ), Cleveland, Home
Gulf	Purity 99, Royalite
Mobil	Mobilgas, Vacuum, Socony, Standard (New York), General, Wadhams, CIP
Shell	Neptune, White Rose (Canada)
Texaco	Red Indian (McColl-Frontenac), Regent
Total	Azur, OZO

Table 1: Subsidiary or former brand names of major international oil companies

In the table above, the main brands were independent of each other for substantially all of the main period of map issuing, and are represented by the branding most widely used in the early 1970s. Caltex is a joint venture between Chevron and Texaco. Smaller acquisitions are omitted from the grouping, as the map programmes rarely influenced the acquiring company. Subsequent mergers and takeovers are ignored (e.g. BP-Amoco-Aral; Chevron-Gulf-Texaco (and hence Caltex), Exxon-Mobil). Underlined brand names were only used more recently. Elf acquired the French Caltex operation (and is grouped with Caltex); it was later acquired by Total. National Benzole was jointly owned by Shell and BP from 1958 to 1975. Regent was initially owned by Caltex, but acquired in stages by Texaco. Azur and OZO are the two largest precursors of the Total brand. Conoco and Fina are italicised as they were ultimately omitted from the main sample. Note that this does not attempt to show all acquired brands, but only those that issued road maps in the nine selected countries. It also omits acquired brands in selected countries where the acquirer was omitted as being of relative low significance (for example, BP's USA maps were not included in the sample).

The maps used for detailed review were all selected from the researcher's personal collection, although other maps have been examined over the research period. The maps available (as of January 2020) were broken down as:

5.4.4. Proportion of selected brands in selected markets

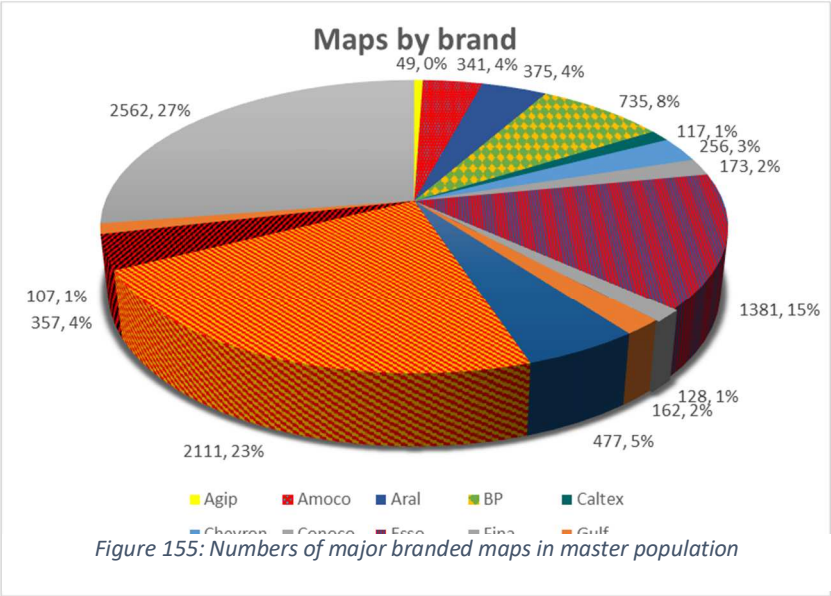


Figure 155: Numbers of major branded maps in master population

Brand group	
Agip	49
Amoco	341
Aral	375
BP	735
Caltex	117
Chevron	256
Conoco	173
Esso	1381
Fina	128
Gulf	162
Mobil	477
Shell	2111
Texaco	357
Total	107
All others	2562

Table 2: Maps available for study by brand name (all countries)

The charts in this section show the percentage shares of the numbers of petrol stations supplied by the respective companies at, or approximately at, 31 December 1970. Most data come from the 1971 National Petroleum News Factbook (NPN 1971) with UK numbers from the March 1971 edition of Petroleum Review and additional data from the *ErdoelInformationsDienst* website accessed in 2000. Certain numbers are estimates based on contemporary observations made by the researcher (notably in Italy in 1968 and Netherlands in 1974) where data for two companies (Chevron and Texaco) was not reported to NPN. Estimates for other brands have been created from similar sources – generally working backwards from an estimate of the total number of service stations and deducting brands listed by NPN. The charts match the numbers shown in Table 3.

Some brands marketed in the selected countries, but were omitted from the sample, generally because they supplied a relatively small number of service stations or produced only a very small number of maps, including Aral, Texaco and Amoco in Italy, and Total in the USA.

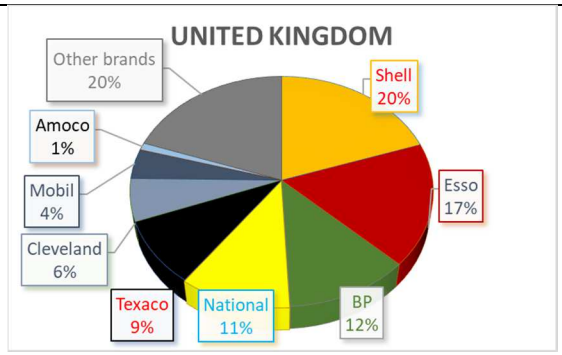
Approximate numbers of service stations by brand in the nine selected countries at end-1970

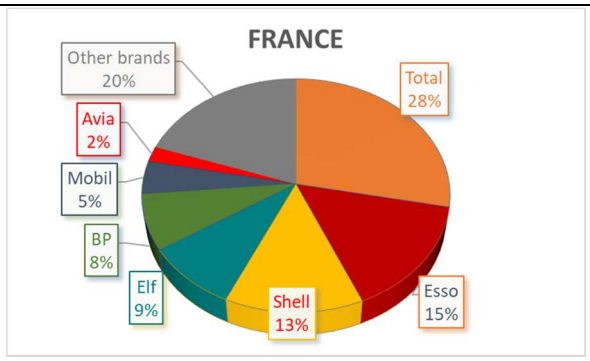
United Kingdom	**35883**	**France**	**45900**	**West Germany**	**43358**
Shell	7100	Total	12913	Aral	9500
Esso	6200	Esso	7080	Shell	6406
BP	4350	Shell	6093	Esso	6100
National (BP)	3900	Elf	4153	BP	4640
Texaco	3300	BP	3521	Texaco	2700
Cleveland (Esso)	2150	Mobil	2124	Avia	1165
Mobil	1500	Fina	2105	Fina	953
Fina	1479	Avia	1000	Fanal	795
Total	710	Other brands	7000	Total	755
Amoco	360			Gulf	725
Gulf	255			Agip	560
Chevron	160	**Ireland**	**4000**	Adler (Amoco)	380
Other brands	4300	Texaco/Caltex	700	Other brands	8679
Italy	**33100**	**Netherlands**	**11500**	**Thailand**	**2000**
Agip	6500	Shell	2962	Esso	600
Esso	4610	Esso	1985	Shell	480
Shell	4311	Chevron	1450	Caltex	313
BP	3186	BP	926	Mobil	150
Total	3066	Fina	615	Other brands	450
Mobil	1973	Mobil	461		
Gulf	1929	Gulf	377		
Fina	1868	Total	280		
Chevron	1850	Texaco	250		
Other brands	6900	Other brands	3400		
USA	**350000**	**Canada**	**31000**	**Australia**	**19000**
Texaco	40230	Esso	6752	Shell	4372
Gulf	30450	Shell	5856	BP	3682
Esso group	29105	Gulf	5723	Mobil	3100
Amoco/Standard	29041	Texaco	5000	Caltex	2258
Mobil	24600	BP/Supertest	3249	Esso	1470
ARCO/Sinclair	22778	Irving	3000	Amoco	462
Shell	21217	Fina	1559	Total	417
Chevron/Standard	20275	Sunoco	1192	Fina	25
Phillips 66	20169	Chevron	607	Other brands	3200
Sunoco/DX	17165	Home (Esso)	275		
Sohio/BP	13565	Other brands	3000		
Fina	3926	*Sources: See text. Numbers for other brands are rounded, so totals will not add up exactly*			
Other brands	77500				

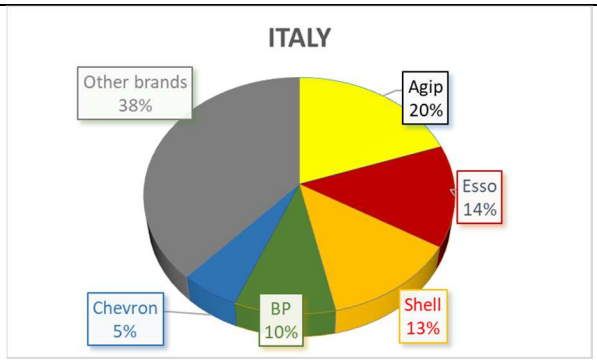
Table 3: Relative size of main oil companies in countries in sample

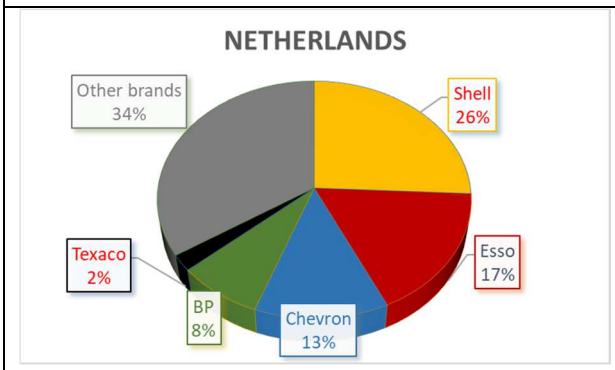
Figure 156: a-i - pie charts showing 1970 service station distribution by brand

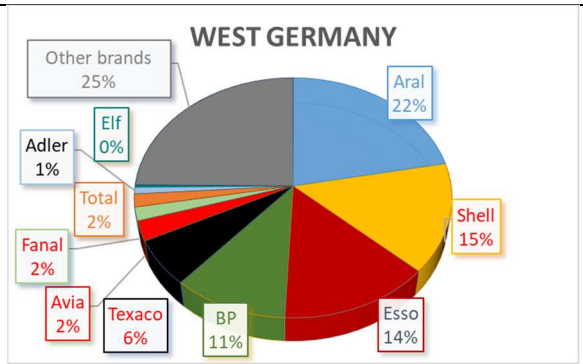
Selected brands are shown in these pie charts; a consistent colour scheme has been used for each company in each country. The grey category for other brands includes brands that may have been selected a different country.

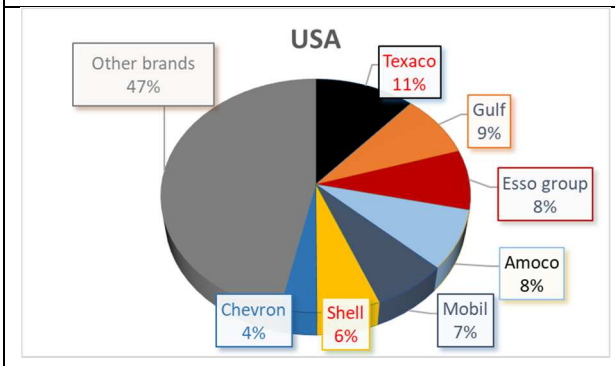


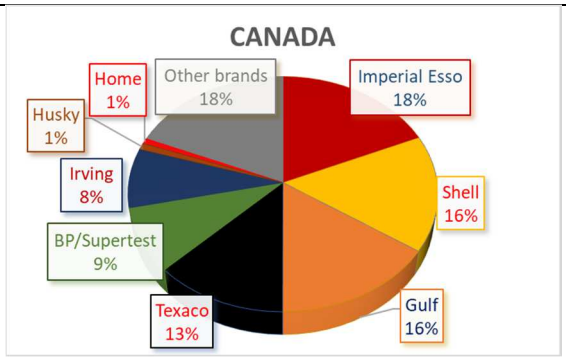


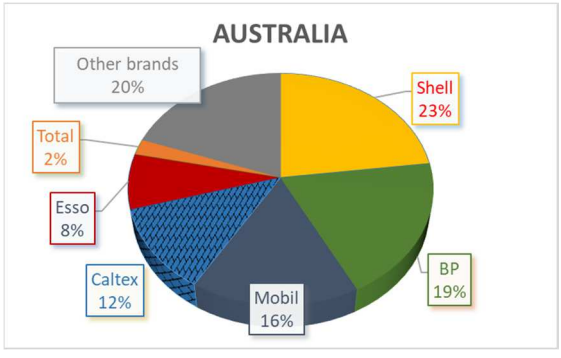


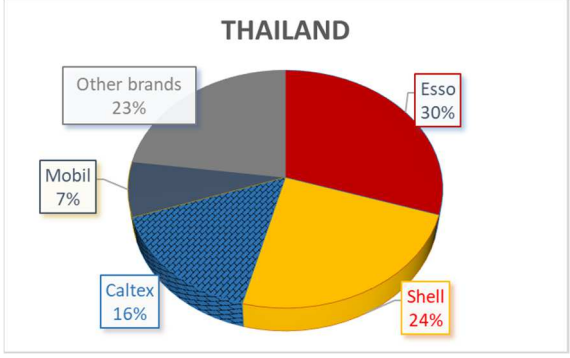












5.5. Cartographers

This thesis attempts to draw together the three protagonists: the end user of the maps, the sponsoring oil companies, and the cartographers/publishers who created the maps. In undertaking the research it has become clearer that the companies and cartographers' roles could be quite fluid – sixty or eighty years after the maps were produced it is not always obvious which was driving the process – did companies go to cartographers and ask for maps, or did the cartographer approach the company with a proposal? In truth, it was both, and the Rolph McNally case study in Chapter 7.3 shows some insight into the interplay. Unfortunately, most surviving corporate records are quite bare: minute books may – at best – refer to the signing of a new contract but the personalities and motives behind it are missing. In the US, Carroll (2010a, 2010b, 2012, 2015, 2021) as a former employee of HM Gousha managed to interview some of the founders or fellow employees of the US commercial cartographers, to shed light on their marketing methods; corporate websites at best list achievements.

Contemporary records can help illuminate the division of roles, but oil companies were apt to promote every initiative as being theirs, and theirs alone. Where they maintained touring services, in most cases they influenced the work of the cartographers, and in a few cases may have created the maps in-house. This appears to have been the case at least part of the time in Australia; so in the 1950s PC Grosser may have printed the maps for Shell, with the Touring Department developing them. At late as 1980 maps carry the statement that the maps were "designed in Australia by the Shell Touring Service", but also that "compilation, cartography and printing by Alexander Bros Pty Ltd" (Shell Queensland, 1980 [270]) which may be taken at face value. BP's Australian maps are often quite anonymous except for a printing code such as "PP 1 73" [266], taken to imply printing by Premier Press in January 1973, but most likely using designs provided by the oil company.

This can occasionally be explicit outside the main markets: a handsome folder containing four sectional maps of Nigeria at 1:1,000,000 and a town plan of Lagos explains that it is "a new topographical map compiled and published by the Shell-BP Petroleum Development Company to commemorate Nigeria's independence"; the corporate connection is underlined by the fact that the maps were printed in The Hague, the headquarters of Shell and the named cartographer was Jan Hoving, a Dutchman. A reliability diagram also reveals that although some of the map's sources were from the Government, some of the base 1:100,000 maps were from Shell-BP, and parts of the country had only been surveyed by aerial photography.

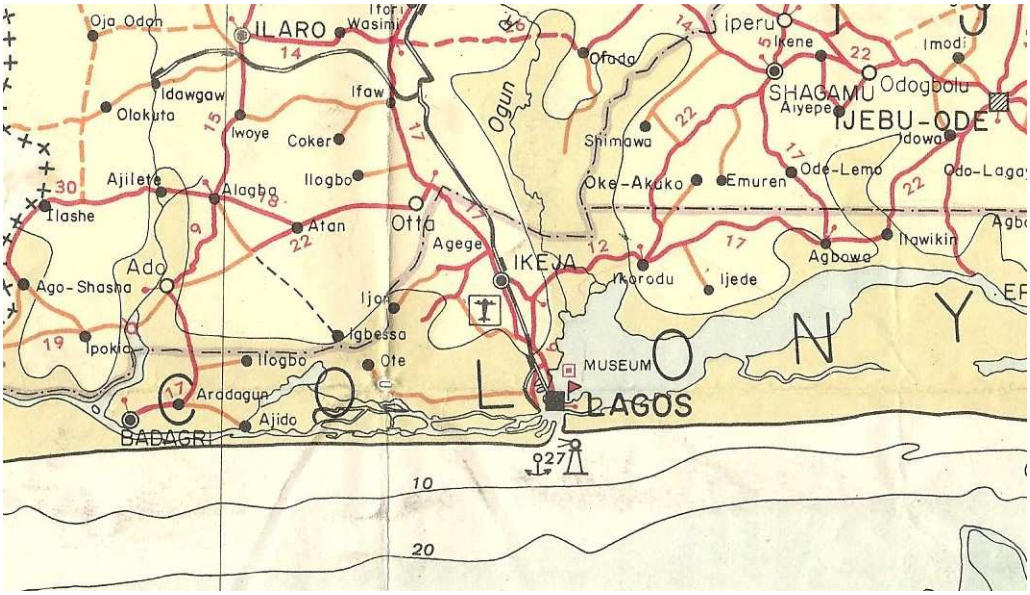


Figure 157: Lagos area from 1:1,000,000 Shell-BP map of Nigeria, 1960 [628]
Note design is more like a topographical map than a typical road map.

In recent years this map has been criticised for omitting Lagosian settlements as it perpetuates "*the idea of the importance of European civilisation, or conversely reaffirms the view of African forms of civilisation as inferior to that of the European*" (Yemitan, 2017). Esso also produced an independence edition of Nigeria (Figure 99); this utilised cartography by its regular collaborator, General Drafting Co., based on Federal Surveys, but in a style that was identical to its maps of North America of the same year.

5.5.1. Multiple Cartographers on a single map

There are a few cases where more than one cartographer was engaged by an oil company on the production of a map, although none in the main sample of maps examined. As an example of a split-cartographer map, Home Oil Distributors retained the copyright for the "Home Gas Road Map British Columbia and Canada" published in 1951 [291]. The BC side attributes "Original by L.N. Peace" while the Canada side states "Prepared by Challenger Cartographers Ltd". Stylistically the maps are similar, using a common palette, although the fonts differ and are generally heavier on the Canada side, which covers the entire country except for British Columbia. A second example was the 1968 Leonard Refineries map of Michigan, on which most cartography came from the Michigan Highway Commission, but around half the rear was given over to a map of Detroit and Vicinity by HM Gousha. Other cities continued to use the stylistically dissimilar, less detailed official state cartography. These examples show the map to have been commissioned by the oil company, and not merely acquiring a ready-made design "off the shelf".

5.6. Age

Recognising the need to keep the sample size manageable, it was decided to restrict the sample to one "representative" map from each brand in each of eight time periods. At the start of the process, when testing the methodology on the first thirty or so maps, there were some cases where two or even three maps from each time window were selected – these were not discarded, so the total number occasionally exceeded eight. However the overall pattern should still reflect the variety of maps from each country. On a timeline, the maps appear as below: the area of the bubbles reflect the number of maps (one, two or three) in any single year, irrespective of branding:

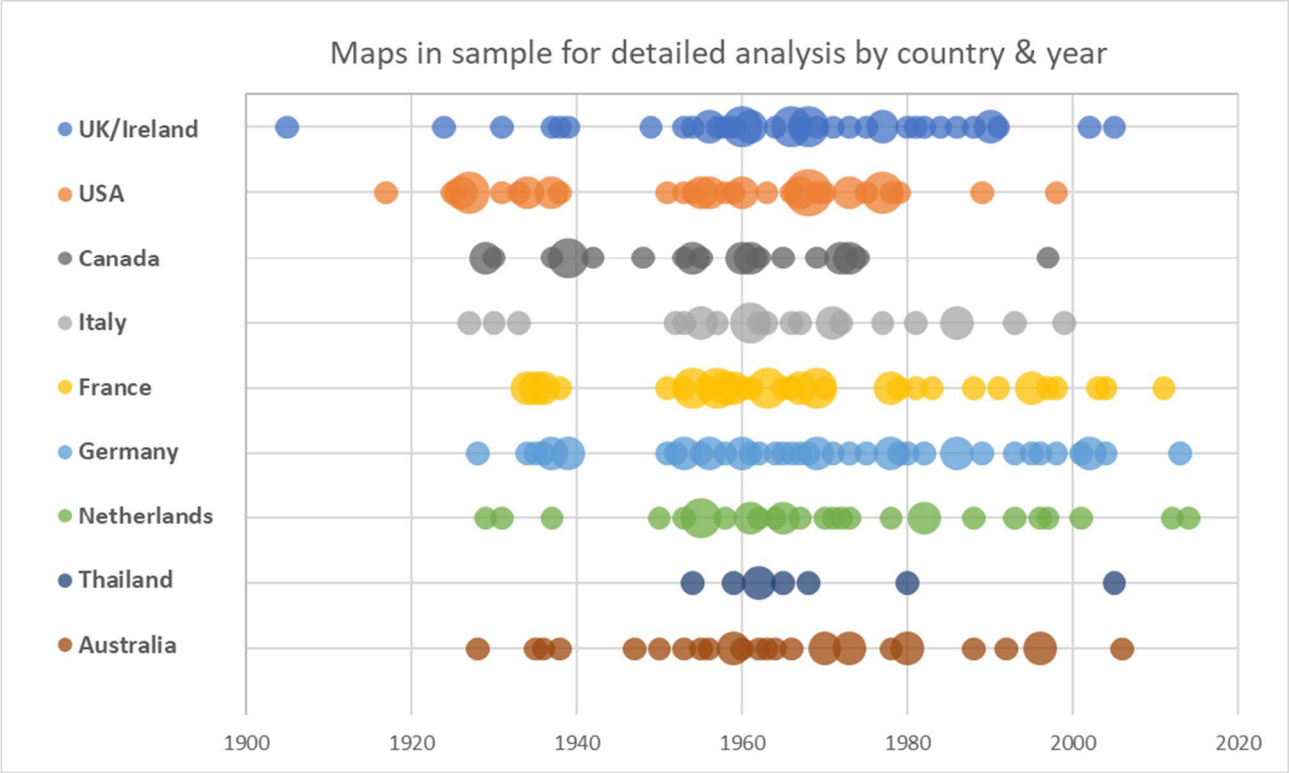


Figure 158: Bubble chart showing sample maps by country and age

The rest of this chapter will look primarily at the quantitative analysis of the cartographic language, including the theory behind the cartographic/non-cartographic (map-perimap) split. Appendix 3 lists underlying data by age band in Table 8.

5.7. Analysis of Cartographic Language

Much of the past research into comparative analysis of contemporaneous maps has focused on either state-sponsored maps (topographical maps from national mapping organisations [NMOs] such as the Ordnance Survey, SwissTopo or IGN; or Soviet mapping) or else on narrow thematic maps (military, railway or tourism). To a degree, road maps are broader in scope and variety, as in most Western countries there have been competing cartographers, even if they draw much of their underlying cartographic information from their respective national mapping organisation. In turn this has led to a

greater diversity of cartographic styles, especially in European markets where road map styles have been influenced by NMOs, entrepreneurial cartographer/publishers, and maps imported from other countries that may reflect a very different mapping tradition. This seems to be especially true among oil company maps in Europe, where there was definitely cross-fertilisation of design resulting from the activities of the international oil companies – most notably Esso with its global use of designs derived from the US General Drafting Company, which are investigated further in one of the case studies, but also Aral's consistent use of Busche's style across the continent, Total's preference for the distinctive cartography of Michelin, and Shell and BP's occasional export of cartography by George Philip or Bartholomew. A desire to be different, at a relatively low cost, may also have led to some of the more experimental cartographic approaches such as Mobilgas's use of white on black maps from Roadfinder in the UK (Mobil [UK] c1955, Figure 67 [11]), mirrored by Motul's white on grey maps in France (Motul 1956 [590]). In contrast, North American maps show much less variability in style or design, owing to the dominance of three main US cartographers (Rand McNally, HM Gousha and General Drafting Co.) all of which used a broadly similar set of design parameters; except for a few locally produced issues, smaller competitors tended to keep within these same parameters (Akerman 2002:182).

Most analysis of cartographic language, or of the degree of success of maps in cartographic communication, has tended to take one of two approaches – an analytical approach, starting from what is on the map, or an experimental approach, testing maps for user acceptability.

Either general approach will typically follow three stages of assessment: determining its subject and purpose, selecting the criteria and techniques, and then undertaking the assessment and evaluating results (Wabiński and al, 2021).

5.7.1. Analytical approach

The first approach is analytical – looking closely at the features depicted, the choice of symbology, rules and generalisations on maps, and has then drawn observations on the apparent success based on the analyst's own expertise. To some extend this has focused on the methodology as much as on the results; the latter can be tabular (Olson and Whitmarsh 1944) or expressed in a variety of graphical forms such as cartograms, pie charts, scatter diagrams and star charts (Kent 2008, Kent and Vujakovic 2009, Bianchetti et al 2012, Davis 2018). An analytical approach need not ignore cultural variations (Korpi and Ahonen-Rainio 2010) or the impact of aesthetics (Kent 2005). If it is not to become merely a statistical analysis, this approach may require greater reflectivity from the researcher as he or she brings their experience and biases to bear on the analysis.

Any analysis of more than a handful of symbols needs to find some way of breaking them down into categories, typically using a card sorting approach to produce a hierarchy or tree (Kent and Vujakovic

2009, Roth et al 2011, Davis 218) having previously sorted them into mental categories (MacEachren 1995:151-5). Although an analysis of only limited aspects of a map may need only one level, such as the four classes used by ANSI on emergency response maps (Robinson et al 2011), more complex analyses may require two (Davis 2018) or three (Kent and Vujakovic 2009) levels. Each level may have different numbers of subordinate classes, typically varying between one and six.

Kent and Vujakovic's (2009) analysis, with its focus on topographical maps, split between land cover and land use:

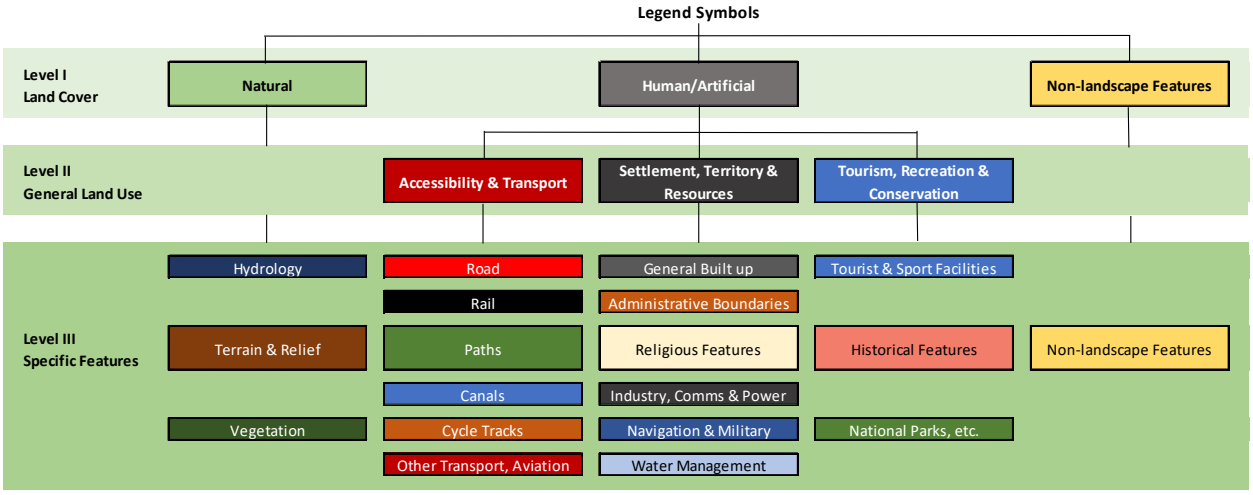


Figure 159: Three levels of Card Sorting (after Kent and Vujakovic, 2009)

In contrast, Davis took as his starting point the existing nine categories from the 1968 Soviet publication of Conventional Signs for Topographic Maps, and split the largest – industrial, agricultural and socio-cultural objects into 5 new categories:

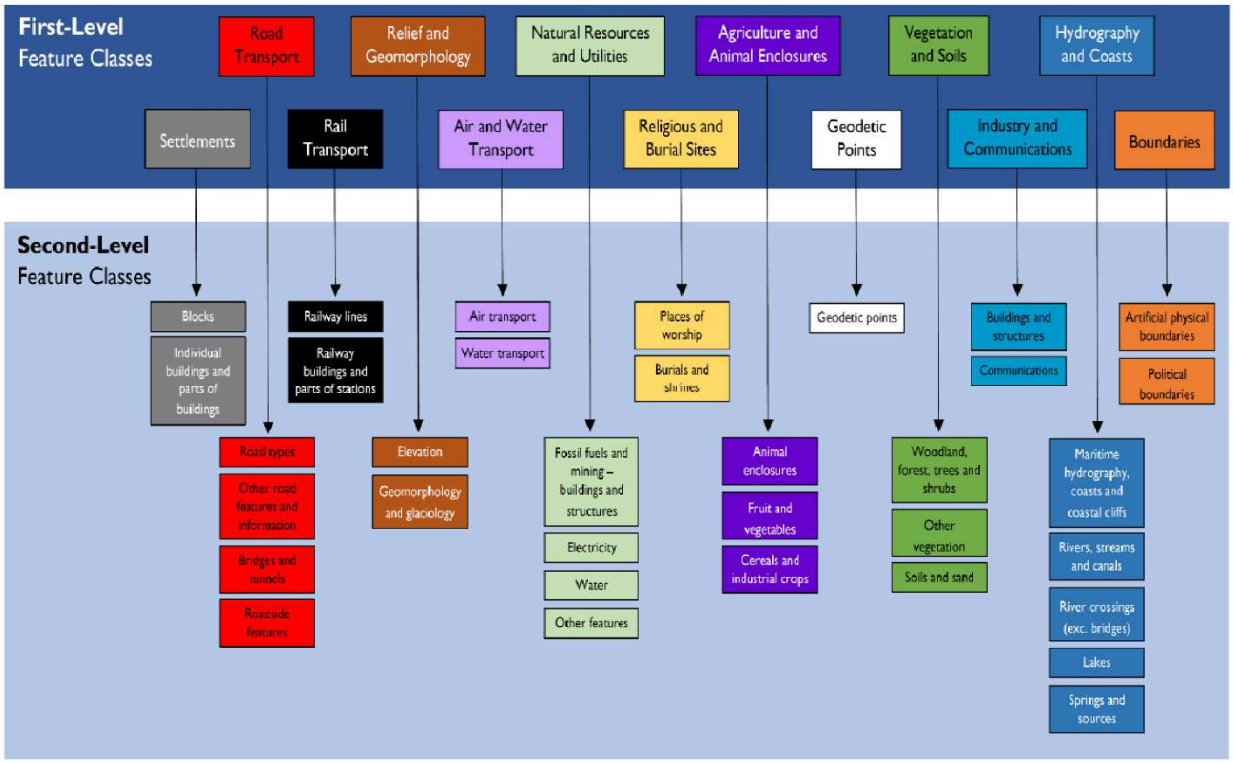


Figure 160: Thirteen classes for analysis in Davis, 2018

The analysis of oil company road maps in this thesis will extend beyond the map image to include non-cartographic elements such as covers, advertising and textual information for tourists. Consequently the key division (a level 0, as it extends above cartographic analysis) must be between cartographic (map image) and non-cartographic (other printed or physical) map components. This can be seen as an acceptance of the map-perimap division (Wood and Fels 2008) which will be discussed later. In practical terms this results in three levels; for convenience the middle level is described as a Level I/II in line with Kent and Vujakovic's 2009 schema which also had three levels.

In the UK, the Ordnance Survey has also published sets of ontologies, including a "50k Gazetteer" which is divided into the following 12 classes:

- Antiquity
- City
- Farm
- Feature Type
- Forest or Wood
- Hill or Mountain
- Water Feature
- Named Place
- Other
- Other Settlement
- Roman Antiquity
- Town

Its "administrative geography and civil voting area ontology" lists 24 classes (Ordnance Survey 2020).

5.7.2. Categorisation of Oil Company Road Map Elements

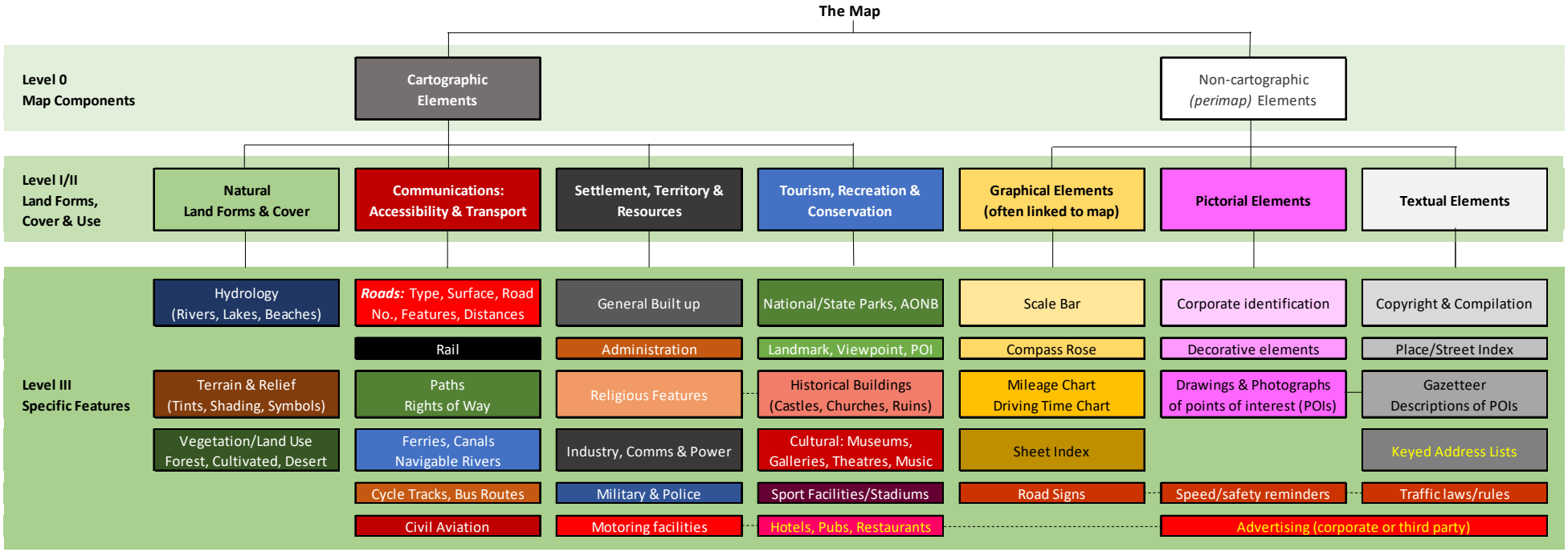


Figure 161: Oil Company Road Map categorisation

This structure is used in the analysis in the following chapter. The four left-hand columns draw closely on the work of Kent and Vujakovic (2009), although with their levels I and II combined, and some simplifications and expansion of level III, and their column 5 (non-landscape features) essentially being covered by the non-cartographic elements. Columns 5 to 8 are new and represent three broad categories: graphical (some of which may be in the Legend or on the map, but do not represent spatial features on the ground); pictorial (which can be purely decorative or in support of tourism or other information); and textual. There can of course be overlaps and links: advertising is typically both pictorial and textual, and the sheet index may be overlaid on the main map image or form a separate inset map of its own. Items such as weather data or distance charts may utilise text in a graphical layout, while some tourist information may be laid out in a table of mixed text and graphical symbols, with the latter potentially tied back to their location on the map. Additional sub-level III categorisation is sometimes necessary for specialist or thematic maps (including some road maps).

Finally, it is worth noting that this structure is content-based and not based on the physical characteristics of the map – some of the non-cartographic elements may be printed on the main map sheet; but some may be on a card cover pasted onto the map, or even in a booklet tipped/stapled into the cover. Although designed primarily with sheet maps in mind, the structure should be flexible enough to copy with road atlases, maps printed on cards, or web-based mapping – whether applied to a single HTML rendered page or a complete website.

This analytical approach does not attempt to make an objective assessment of the usability or aesthetics of the map, nor will it consider the graphical load, but the thesis does – on occasion – identify examples that are perceived by the author as being notably good or bad examples. For example, increasing the size of symbols may increase the graphical load but simultaneously improve the legibility of the map for an average user (Wabiński and al, 2021).

5.7.3. Experimental Approach: “User” testing of map usability

A second approach to analysing maps is more experimental, testing the maps on a – generally small – number of users for usability, ideally (but not always) drawn from the target user group (Consumers’ Association 1963, Sheppard and Adams 1971, Gill 1993, Yan and Lee 2015, Mulazimoglu and Basaraner 2019). It too is not without bias; the researcher has to select the subject group and all too often appears to fall back on students in a university geography faculty who are probably neither representative of the map’s intended users, nor of the public at large. Two of the examples cited above (Sheppard and Adams 1971, Gill 1993) were based around a wayfinding test on road maps, utilising a large enough group of British “drivers” to produce statistically significant results, but ignored selectivity (which can affect legibility) and qualitative judgments such as aesthetic value. The third early study of British road maps

("motoring maps" – Consumers' Association 1963) was much wider ranging but based on analysis by six "experts".

This thesis broadly follows the first, more analytical approach. The research questions are primarily historical in nature, about the contributions of oil company maps to cartography, and are not seeking to assess them, favourably or unfavourably, with other maps, past or present. The aim is instead to draw out features and innovations that continue to influence the design and use of maps today, and to contribute towards an historical grounding for twenty-first century cartography.

5.8. Non-cartographic elements: - around the map: Perimap and Epimap

Figure 161 has introduced a level 0 and three level I categories for the main map components – Wood and Fels designated the non-cartographic elements as a "perimap" (Wood and Fels, 2008). Their analysis focused mainly on the Legend, and the signs and messages therein. But as Wood noted in *Rethinking The Power of Maps,* the complete map may contain "*a crowd of signs: titles, dates, legends, keys, scale statements, graphs, diagrams, tables, pictures, photographs, more map images, emblems, texts, references, footnotes, potentially any device of visual expression*" (Wood, 2010:97). Wood saw this *pot pourri* of signs as creating a *proposition* (his emphasis). The map and perimap, together form a paramap, and – for oil company maps – this is the main product for customers. Unlike topographical maps, it is insufficient to study the map alone, or even the map and the legend, in order to understand the proposition – just as in the case of Soviet city maps the accompanying text (the *spravka*) has also to be seen as part of the paramap worthy of study (Davis, 2018). It is perhaps surprising then, that although this concept of a perimap is picked up, for example by Koch (2008) and allied to an even wider "epimap", including the physical article in which the map may be presented, there has been relatively little formal analysis of the component parts of either the perimap or the epimap.

Edney (2019: 37) finds the terms "epimap" and "paramap" unhelpful as they imply that the map stops at edge of the paper. He notes that maps are semiotic texts and hence dynamically open; maps may be read (as texts) or used (as objects). Maps may be bought, sold, kept, discarded, discussed or ritualised; no single map can be seen as self-contained. He also gives the example of a map tipped into a book – Hubbard's History of King Philip's War – as far back as 1677, where the key to the map is contained within the book by using numbers; without the book the loose map would itself be almost meaningless. Essentially, though, maps are seen as a process or in a "state of becoming"; it is not possible to view the map independently of the wider ethnographical context in which they are found.

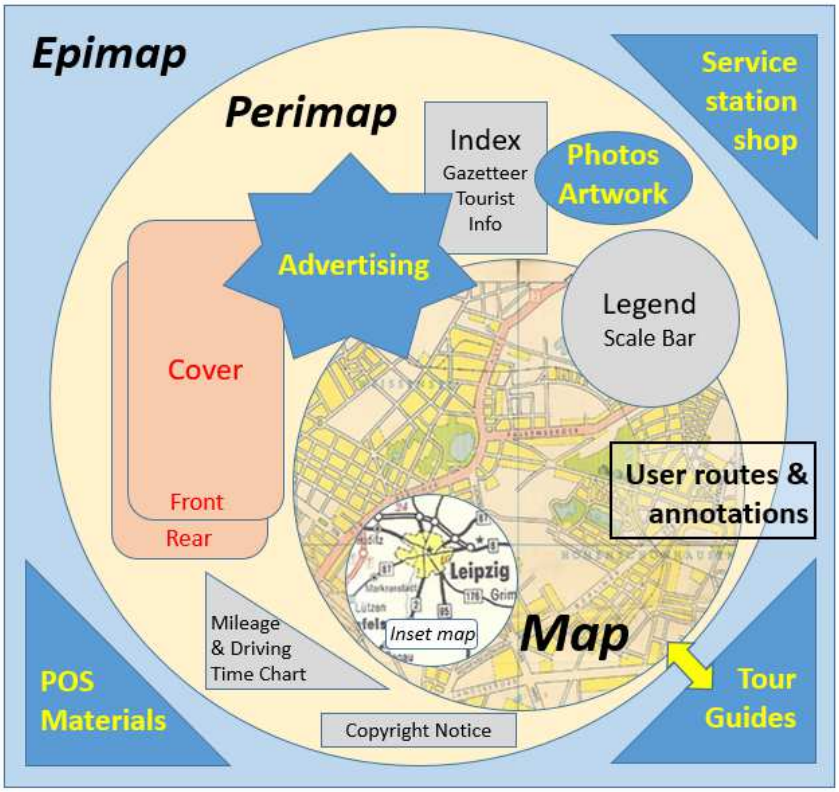


Figure 162: Schematic representation of Epimap–Perimap–Map

"Maps" need not contain all the elements shown in Figure 162 , and may include other items, both graphic and textual, such as road signs or driving regulations. In this schematic, the light salmon colour represents the physical manifestation of the "map", although it may be bound into a tour guide. The elements constituting the perimap form the primary study of this thesis. The Map and Inset in this representation are taken from a 1957 Esso map of Berlin [549] – although inaccessible to motorists based in Berlin during the Cold War era, Leipzig was seen as an integral part of the wider environs of the city. Some elements have no fixed position: the date of the map is most commonly found in the copyright notice, but may appear in the Legend or on the front or rear covers. Sometimes the date is missing altogether, or hidden within a cartographer's code; occasionally the only way to date a map is by a reference in an advertisement, through a user annotation or by stylistic elements. Covers (and any index or gazetteer) may be integral to the map, or pasted on to it.

Despite the reservations of Kitchin (2008), Edney (2019) and others, this thesis will present a novel approach to the analysis of the perimap, creating a categorisation of the components, and sub-analysing the non-map elements in a logical hierarchy. It will also touch upon the epimap, at a "level -1". Epimap elements can include – but should not be seen as limited to – features such as guide books, touring service packages, envelopes, map display racks, and adjacent advertising. Arguably, the epimap could even extend to the place where the map is sold, such as a service station, or bookshop. It is conceivable that a map sold through a large reputable city centre bookstore, which has clearly curated its choice of maps, could be seen as having greater authority to the user than the same map sold by a neighbourhood petrol station, which may be assumed to have been told by the oil company to put the maps out for sale, with no choice of cartography. This can work both ways; for example after Mairs

acquired CartoTravel Verlag in 2007 (Hoffmann 2007) it rebranded some of the former ADAC (German Automobile Club) titles as Shell *Regional Karte* or *Urlaubs Karte* by simply adding different cardboard covers, but not changing the actual maps, which had been printed in 2005. In some less developed countries, and after the ending of the iron curtain, internationally branded filling stations are (or were) among the few modern well-maintained buildings, and so the explicit link to the "temple of modernity" may indeed add value to the map itself. This is supported by the concept of the petroleumscape (Hein 2018, Sedighi and Albader 2019) and the place-product-packaging of Jakle and Sculle (1994: 59).

Edney's process around a map is rarely evidenced directly. Oil companies themselves idealised the process, through cover art showing a smiling service station attendant (invariably male) offering (Associated, USA 1949 [526]), or sharing, a map with an equally idealised customer – often a young couple (Texaco, Belgium c1930 [647]) or nuclear family (Gulf, Florida 1934 [570], Esso, USA 1965 [557], Esso, NY 1968 [74]) or more rarely a lone traveller (Sinclair, Texas 1936 [631], Ashland, Ohio 1965 [525]), sometimes female (Standard, California 1931 [638]}, or even a mother, daughter and dog (Sinclair, Miss. 1937 [632]). Just occasionally the attendant is missing – the happy recipient returns to his automobile to greet his wife with the exclamation – "Look…they gave me a map!" (Gulf 1934). It is noteworthy that all these examples come from the USA – the sole one from Texaco Belgium shares its design with US and Dutch maps from the same era; European (and other) oil company maps tended to be less overt in their sales messaging.

Figure 163: Shell 1931 New Hampshire-Vermont [622]

Shell's 1931 US cover art is meant to convey the advantages of using their information, compared to unreliable locals. An earnest motorist is being given advice by a somewhat shifty looking sheriff, with a crooked hat and a pipe pointing at a second motorist consulting a Shell Travelaide showing the weekly road conditions for May 9, 1931. "'You can't go wrong!' – if you check with Travelaide for weekly road conditions at Shell Service Stations" runs the caption, implying strongly that even the local sheriff needs to use the Shell service (Figure 163).

There are however two elements of the epimap that were officially added to maps: route markings from touring services, and service station identification stamps. The former evidence a direct connection between the map as an artefact and the wider process of distribution through centralised touring services. This is not the place to go into the role of touring services other than to note they were operated by most of the main companies in both North America and Europe; in the US they were active in the 1930s and then again after the war with the last vestiges of the services (rebranded as a motorists club) not really disappearing until the 1990s. In Europe their life was much briefer, and more limited, with Shell, Esso, BP and Fina the main players.

Service station identification maps are one of the few direct links with the third actor in the map process chain (cartographer-oil company-service station-end user). Although service stations are often depicted on map covers (again more commonly in North America than elsewhere) their direct appearance on maps is limited mainly to maps pre-printed with locations, or the humble rubber stamp, as can also be seen on Figure 163. (Occasionally, a price sticker will also identify the station by name.) Some oil company maps had a space left for such a stamp; in other cases it was up to the individual dealer to choose a place – either white space on the cover or more rarely vying with the corporate logo as a way of drawing attention to the source of the information.

Customer annotations to a map provide additional evidence of the process around a map. Almost by definition, handwritten adjustments will be unique (a limited exception might be if a map was being sent to attendees for an event, for example, and the event location was highlighted). These too can include route markings, providing detail on a trip taken long ago, or planned to be taken. A few maps include space for users to add their details, such as an expense record; but these are more commonly bound into booklets provided by oil company touring services. On a case by case basis, maps may reveal a wider purpose: a 1966 Minol map of the GDR [584] carries neat rulings through addresses of selected filling stations in Berlin, Fürstenwalde and Senftenberg; the purpose of these is lost but the map was acquired from a relative of a former employee of the company, suggesting some official purpose.

More commonly maps contain basic annotations: a town name circled or underlined; arrows pointing at features or alongside a road; a name or date in the margin; or an address or telephone number. Some give clues as to the use of the map, but others suggest only that it may have been a convenient piece of paper on which to scribble a hurried note. Rarely do users add their own legend or explanatory note, identifying the trip taken or purpose. Finally there are the defacements; doodles filling in letters, or childish drawing or scribbling across the map.

Categorising epimap features would therefore require a distinction between formal elements (marketing and advertising, touring service materials, and potentially even service stations) and informal

elements added by map users – and the latter are likely to be uncategorisable. However categorising perimap elements is both necessary and possible in order to understand these maps in context: indeed the entire analysis could be seen as an attempt to create a *pericartographic* approach to analysing maps.

There is a danger that this type of analysis could simply turn into a cataloguing exercise; indeed some of the analysis may draw on standardised cataloguing structures such as those in AACR2r Chapter 3 (1998), or a simplified form of the MARC 21 data scheme maintained by the US Library of Congress (Library of Congress 2020).

5.9. The philosophical basis of this research: Positivist vs. Interpretivist

The initial approach was to simply consider this research as a study of maps as physical objects, which meant taking a positivist and quite scientific approach: documenting, counting…but also assessing. Inevitably value judgments were being made – "What makes a good map? Why do I say Map A is 'usable' (by motorists, assuming they are the intended audience), but Map B 'only' serves as a locator map, for identifying service station locations?" And if my assessment that a map is primarily a locator map, would the original publisher have agreed? Might a map be marketed to an oil company as a locator map, to justify their investing in it, but to end users (motorists) as something rather more useful, so that they valued[4] and kept it, while subliminally noting the location of the company's service stations.

The latter argument may also apply more generally to oil company sponsored maps. The cartographer, printer or (independent) publisher would be selling the map to the oil company as being low-cost, high-value, pointing out its promotional benefits. But the company itself might have a quite different marketing message, focusing on the high value (usefulness) while still being low-cost (or free) to customers. So although my approach is largely ontological, based on the maps themselves, it is important not to lose sight of how the other stakeholders would have viewed them.

Much of this research is based on empirical evidence from primary sources (with 9,000 maps of my own, plus access to other collections and a much smaller range of other source material). However it has been necessary to make generalisations – about differences between countries, companies or eras – applying both inductive and, to some extent, deductive reasoning.

The inductive approach is inherently risky when dealing with artefacts for which only a small proportion have survived. As an example, 25 years ago I might have said that "all post-war German Aral maps were by Busche" before I discovered a series of tourist area pictorial maps by Witzel, or the *Links und Rechts der Autobahn* booklets, also by Witzel. And I have been unable to determine if there was a corporate link between Witzel and Busche. Even then, this might lead to the wrong deduction; for how would I

[4] Outside the selected sample, I have several "locator maps" which were sold, not given away freely.

account for the very occasional dealer-sponsored urban issues, such as the 2001 map of Freiburg overprinted on a Stadte-Verlag town plan. Is this even an "Aral map" as it was sponsored by the dealers and not by the parent company (Figure 164)? So am I defining an oil company map to match the evidence – had I asked users of the map in question, would they have told me that it was different from the main blue-covered Aral road maps? I suspect so; but there is less likely to be doubt about the 2003 Tankstellen-Verzeichnis booklet which used cartography by kartenwelten.de/Kober-Kümmerley+Frey, replacing the Busche cartography used two years' earlier. Had I made my assertion in 1999 that all Aral maps were by Busche/Witzel, I might then have been right. So there is a second risk in making assertions about an object category that is still being produced, albeit in low numbers.

Figure 164: A map with Aral advertising, not an "Aral map" [519]

However when it gets to a wider view of the purpose of these maps, it becomes more deductive. I see that locations are marked on maps, so I presume (deduce) that it was the primary purpose of the maps, as part of a marketing strategy. But how do I know if the oil company had a strategy? Could it just be that a clever salesman from the cartographers told the company "We can add your locations to the map at little extra cost?" How much was it companies following the herd? And, before digitisation of map production, could a company have even asked for a low-cost map showing its locations other than by requesting a list to be printed on custom covers?

In conclusion although my basic approach is positivist (perhaps from my scientific background), it also needs to be interpretivist – when I am making value judgments about the quality of the maps, or their most likely users, for example.

5.9.1. Quantitative vs. Qualitative – Mixed Methods

The previous paragraphs note that with direct access to over 9,000 oil company maps, and indirect access to many thousands more through private collections or lodged at the Newberry Library in Chicago, it would be easy to fall back into a purely quantitative survey of oil company maps. This would not go further than answering the "what" and "when", and would not address the "how" or "why". Certainly some quantitative elements are required, in order to determine what is on a representative road map, and also to help identify potentially "interesting or important" outliers. However there is a danger of being too focused on quantitative – raising the "so what?" question, especially as these maps are primarily (recent) historical with relatively few titles published over the past two decades and almost none currently available.

However, the converse is also true. As oil company road maps have received relatively little attention – indeed, commercial road maps as a category have been only lightly researched – it would be wrong to just pick a few "interesting or important" maps, without placing them in a wider context.

5.10. Other selection considerations

5.10.1. Format

Maps were selected, where possible, to be folding sheet maps. In some cases – especially among the oldest and youngest examples – only small format road atlases are available for a particular country. The coverage to some extent depended on the norm for the country, leading to selecting:

- National maps in Thailand and the Netherlands.
- Maps covering one or more states or provinces in Australia, Canada and the USA.
- Numbered (and frequently named) sections for the UK and Germany.

In France and Italy a more pragmatic approach needed to be taken, selecting regional maps where available, but national maps otherwise as there was less consistency between companies on coverage.

5.10.2. Is a control group required?

Taking a relatively scientific, objective view to the analysis raised the question of whether a control group was necessary and, if so, what should it contain. Potential maps for comparison included AAA and official state highway maps in the USA; Ordnance Survey (at various scales), Bartholomew's and various commercial maps in the UK; IGN, Michelin or Taride from France, and Continental or Ravenstein from Germany. However many of these firms contributed cartography, sometimes modified, to oil company maps, and their style and content changed over the century just as did the oil company issues. Given their very different circumstances, Soviet road maps at a similar scale were also considered – but there were few equivalent sheet maps: most were either highly specific tourism maps (schemes) covering a defined route, or small scale road atlases. Other types of locator maps, for businesses as diverse as campsites, car dealers, and fast-food restaurants were felt to be too similar to their oil company equivalents, but available in lower numbers. After reflection, it was decided not to use a control group – as that too would suffer from a potential sample selection bias, as there is no "typical" road map.

5.11. Summary

To answer the main research questions, a pragmatic approach was required. The analytical objective has been met by taking a sample of physical maps that were available from my personal collection. To minimise the risk of bias, maps were restricted to nine countries which had substantial motor fuel sales, a competitive downstream petroleum industry with several international brands on sale, and a reasonable number of sectional, regional or national road maps available from a variety of

cartographers, spanning much of the twentieth century. In effect, this developed a stratified sample. Analysis was then undertaken on the selected maps using a modified version of the approach pioneered by Kent and Vujakovic (2009), extended to include the 'perimap' of non-cartographic elements around the map plane. No control sample of maps was deemed necessary. The analytical approach is not just around the "what" but has taken into consideration potential reasons why a map may exhibit (or lack) specific characteristics.

The second objective, to investigate the relationship between the oil company, its cartographer and its immediate customers (the operators of service stations) took a qualitative approach, based on primary source materials (leaflets, adverts, price lists and other marketing materials) and some sources in publicly accessible corporate archives, including minute books and correspondence.

Chapter 6:

Analysis

6. Analysis of Oil Company Road Maps

The first research objective is to determine if there are characteristics that are specific to oil company road maps which transcend national boundaries and/or differ from other contemporaneous maps. This chapter addresses that aim by summarising the findings from the detailed analysis of the maps included in the stratified sample. As described in the methodology chapter, 302 maps from 9 countries were analysed, with the intention of providing a broadly representative selection from the main marketing companies in each country, and the full range of publication dates. After reviewing the format and scale of maps (which were determined as part of the stratification) it undertakes a content analysis divided between cartographic and non-cartographic (text or pictorial) elements as in Figure 161. Appendix 2 lists the sampled maps, and shows key characteristics of each (area, age, format, cartographer, type).

6.1. Format

Maps were selected, where possible, to be folding sheet maps. In making the selection priority was given to regional or sectional maps, although these were not found for Thailand and only to a limited extent in the Netherlands and France, leading to 81 maps (just over one-quarter) being classified as "national" in scope. Where sheet maps were unavailable, atlases or map booklets were selected – with 28 examples (10%), although there was a greater risk that these would simply be commercial products re-badged for an oil company. Five maps (four from France) were characterised as a "locator" map – essentially a national map, often with more limited detail, but giving prominence to locations of filling stations supplied by the oil company, although these could also be used as route planning maps.

Figure 165: A21 from Esso autostrade map: note direction of North arrow [112]

One map in the sample primarily covered Italian *autostrade* (Esso, 1986, [112], that had 27 motorway and 10 city maps around a basic planning map - Figure 165). Another map was categorised as an urban area map – a 1977 Texaco Route Map of Greater London [31], which was included in the initial trial sample and could, perhaps, have been omitted from the final sample. Almost 99% of the folding maps, and all the atlases, were in portrait format when folded. Arguably the use and design of map racks meant that once this format was established, it discouraged changes. The median width was 111mm; the median height slightly more than twice that at 229mm. Conversely, when the maps were opened out a majority (63%) of sheets were in landscape format, although some double-sided maps had mixed orientation. For example, several of South and East England had the area South of the Thames in landscape but East Anglia in portrait, including the BP/George Philip issues [20, 27, 33, 34] but not the BP/AA one [37]. The Gulf New York/New Jersey [67] similarly split orientations.

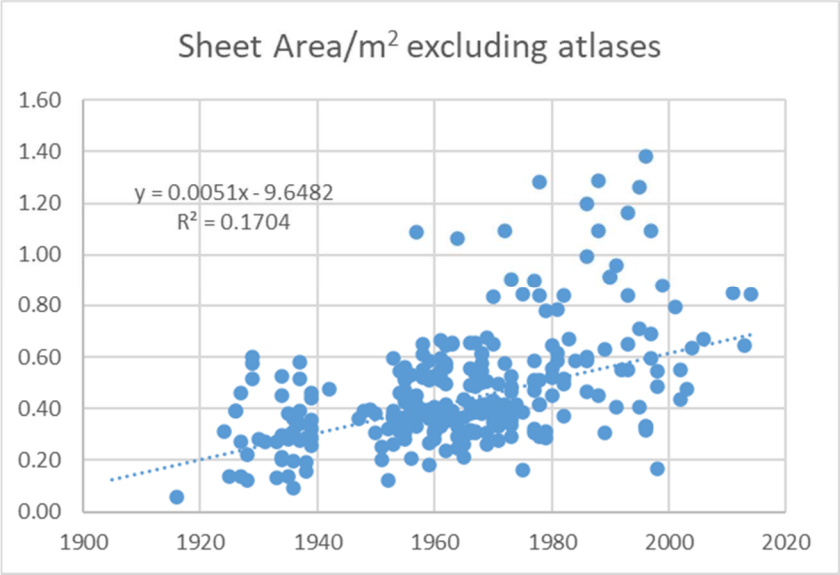


Figure 166: Sheet size plotted against age

Excluding atlases, sheet sizes varied considerably from 61cm^2 (Gulf, New York, 1916 [46] which simply unfolded to three times its cover size) to 1,381cm^2 (Shell General Karte, 1996 [203]); eleven maps exceeded one square metre when unfolded. These split almost evenly between France, Germany and the Netherlands. The median size was notably smaller at little more than 400cm^2; the clustering reflects a general uniformity among US/Canadian maps. Most of the larger sheets were sold by oil companies rather than freely available, and tended to be relatively recent issues, often using stock cartography in bespoke covers. Figure 166 shows there was only a weak correlation between sheet size and age.

Unlike many topographical maps from national mapping agencies such as Ordnance Surbey or IGN, three-quarters of the sample had maps on both sides of the paper – in some cases the title map only appeared on one side, with the reverse given over to urban area maps, or a planning map of the United States, plus additional text-based information. In these cases, the reverse was often printed in just one or two colours, even where the main map was full colour. There were some national variations: all the Australian maps were double sided but only one of the five Irish maps was – the others carried additional information such as town plans, touring suggestions and road signs on the reverse. In terms of national distinction, it was French maps which were most likely to be printed on one side of the paper (25%) – this reflects the prevalence of those sourced from Michelin, which has always tended to print single sided. Dutch maps were most likely to be printed on both sides, but to have solely text on the reverse (43%) – again this appears to be cartographer-led, with Falkplan typically using this format, often coupled with very large sheet sizes.

6.2. Scale

This thesis has intentionally focused on "road maps" aimed at motorists driving between cities or other destinations rather than on larger scale street maps or town plans, or topographical maps typically issued at scales of 1:25,000 to 1:100,000. There is no consistency of scale descriptions (Dorling and Fairbairn 1997:25); the road maps analysed would mainly be considered as "small-scale" by the British Ordnance Survey (Ordnance Survey 1947:2-3), but "medium-scale" by others (Edney 2019:173) and in

Triades VI-VII in Allent's 1831 table (Edney 2019:207). Nationality must have a role – the British conception of small-scale reflects generally smaller extent of mapped areas and a denser network of roads and settlements than in North America. However the purpose of the maps was the same and the scales reflected differing local conditions (physical and economic).

The actual choice of scale can be driven by other factors. For inexpensive or free maps, the size of the paper can be a constraint – this can be seen clearly on US state maps, where scales vary between sides of a map covering more than one state. Although physical sheet size does vary amongst maps, these were sometimes arranged to enable optimal use of uncut rolls of paper in the printing process.

The projection of the earth's curved surface onto a flat map, especially at smaller scales, means that scale varies across a map (Robinson et al 1978:48, Edney 2019:174-6). No road map sheets seen explicitly show a variable scale, and as most maps that state one use a Lambert conformal conic projection, the distortions are relatively minor.

Unlike national mapping agencies, which appear constrained to produce maps at a fixed scale, commercial road maps are free to select a scale that may be affected by factors such as population and paper size (or cost). Consequently there was a wide variety in the scale of maps examined; for all but 5 maps, a main map scale was either quoted (231 maps, 76%) or able to be estimated (generally from a scale bar). The median scale was 1:800,000, but this varied greatly with examples ranging from 1:63,360 (one inch to the mile: Atlantic Esso, Blue Mountains, c1959 [257]) to approximately 1:4.450,000 (Total, SE Australia, c1973 [267]). That both these are from Australia is partly as result of the sampling selection – more large-scale maps would have been included had it been decided to include some of the city maps widely found in the USA, Australia and Germany. Despite this inherent sampling bias, the median values for the 9 countries are meaningful:

GB/Ireland	1:316,800	Italy	1:1,000,000	Netherlands	1:387,000
USA	1:1,250,000	France	1:1,000,000	Thailand	1:2,090,000
Canada	1:1,160,000	Germany	1:450,000	Australia	1:1,862,500

Table 4: Median scales by country group

The British Isles and Germany reflect the widespread distribution of sectional maps at a single scale, in the case of the UK at 5 miles to the inch, although by the 1970s the larger metric scale of 1:200,000 became more common, before the scale typically reduced slightly as cover prices rose. As the Netherlands is of a similar area to a British or German sectional map, its median scale is similar.

In contrast, US, Canadian and Australian maps tended to follow state or provincial boundaries, with a wide range of scales within a single map series. US maps did not always cover a single state; for example, Delaware, Maryland, Virginia and West Virginia were usually grouped together, as were the six

New England states – although these were sometimes split across two maps (eg. Gulf, 1968 [75]); in many cases the two sides of the map were at significantly different scales. More sparsely populated states, such as Kansas and Nebraska, or Washington and Oregon were also often combined. More *ad hoc* groupings occasionally appeared, especially before the 1930s and on Texaco maps – a 1955 map in the sample is described as "E Texas-Oklahoma with New Mexico-W Texas" [64]. Canadian maps also tended to group provinces, with the default arrangement being BC/Alberta; Saskatchewan/Manitoba; Ontario; Quebec; and the Atlantic or Maritime Provinces. The sparsely inhabited Yukon, Northwest Territories and Labrador were often omitted or shown only as very small scale inset maps (eg. of the Alaska Highway).

France and Italy differ. In France, except for Shell's long running series of *cartoguides* (1958-1984 – [135/147/150]) oil companies tended to eschew sectional maps, presumably to avoid head-to-head competition with the popular Michelin maps at 1:200,000. Most maps were either of the whole country or divided it into four quarters at a relatively small scale. In Italy, road maps at larger scales appear most commonly to have been sold by the Touring (TCI) or Automobile (ACI) clubs; although some oil company sectional series did appear (including a series of 39 small format maps at 1:300,000 from BP/IGDA, available singly or in three regional sets); most of the main companies did publish national maps of the country from time to time. Italy also seems to have suffered from a paucity of cartographers willing to produce inexpensive road maps; IDGA (Agostini) dominated the market (Giordano, 2015) with limited numbers from rivals such as Vallardi.

Australia's vast size lends itself to smaller scale maps, as does Thailand which, as a less developed market, relied on single sheet maps or atlases of the country.

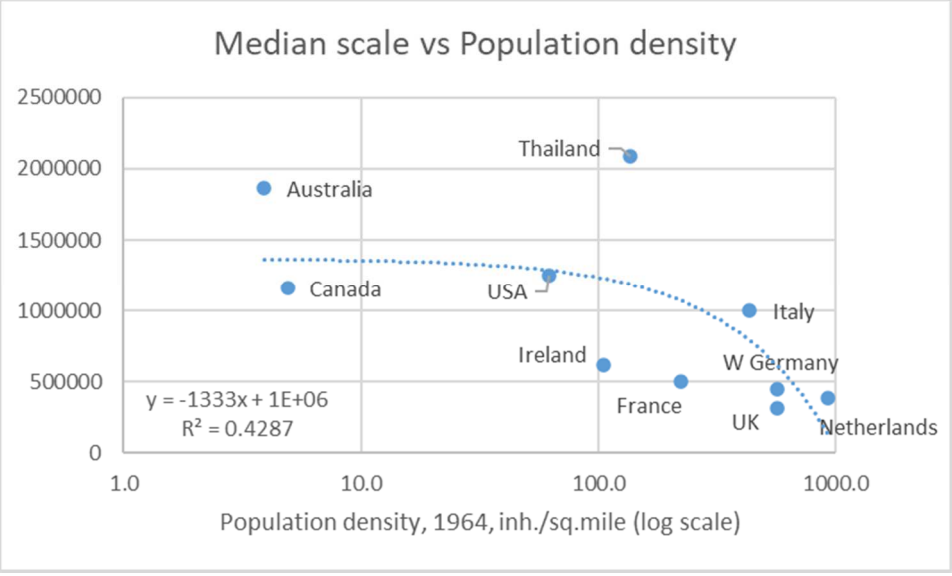


Figure 167: Median scale and Population density for selected countries

This offers the possibility that the scale might be related to population density – in the above chart the latter is taken from a 1964 encyclopaedia, presumably based on 1960-1 census data. Ten data points (UK and Ireland were separated) are insufficient to provide a statistically significant result, but this does suggest that there may be a negative correlation between population density and scale. Logically, the linear dimension (scale) might be expected to be more closely related to the square root of population density, but this showed a weaker correlation for the maps in the sample.

Finally, scale was plotted against publication date. This showed an almost perfectly random distribution (the ones appearing as zero were either not drawn to scale, or maps with numerous scales):

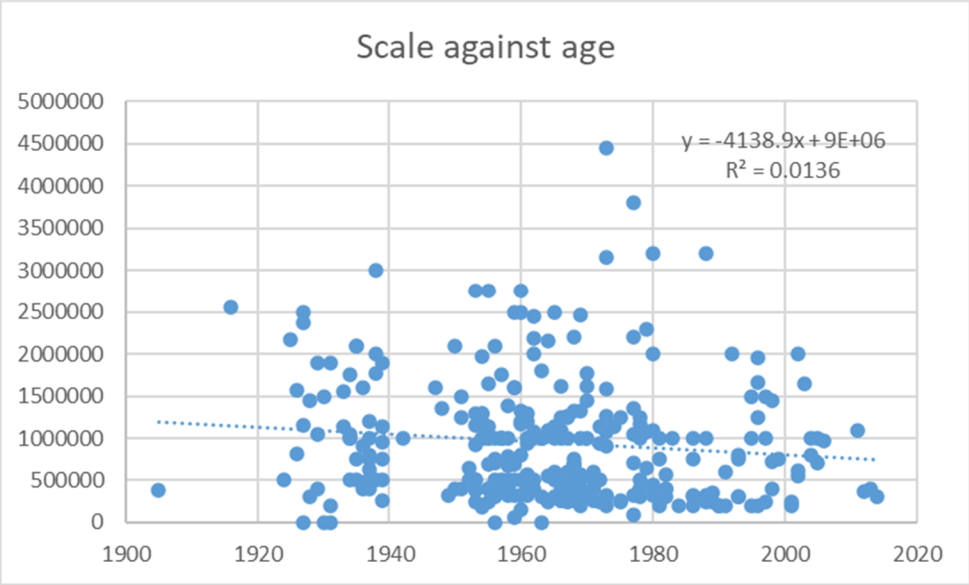


Figure 168: Scale plotted against age for 302 maps in sample

6.3. Cartographic Elements

Much of the following work is based on an exhaustive review of the symbols used on the 302 representative maps. Having additional symbols does not necessarily improve the quality or usability of the map; over a century ago Close (1905) observed that conventional signs are "undoubtedly an evil" and "as a general rule, the more pictorial a conventional sign is the better" expecting that a windmill should look like a windmill.

Note: The four digit codes are used to group like features in the analysis.

6.3.1. Natural Land Forms and Cover (1100)

Land forms provide a context for road maps, even though they may not be necessary for successful navigation. Arguably, the ability to better show physical characteristics more clearly is a justification for the continued existence of paper maps in the era of GPS and widespread online mapping.

1110 Hydrology (Rivers, Lakes, Beaches)

Although hardly essential for motoring, almost all the road maps examined (99%) had some hydrological elements – the three exceptions were an early booklet map of the Central Southern counties of Britain (BP, c1931 [3]), a sectional Blondel la Rougery map of NW France (CIP, 1934, [117]) and just one post-war sectional map of Britain (Mobil, c1957, [11], Figure 67). This last is from a series printed in a single colour with dark blue land mass and all other elements in white: any linear features other than roads would have been confusing. All three of these maps did mark coastlines. A further four maps lacked any bodies of water and seven lacked rivers – six of these were pre-1935 maps printed in a single main colour where a river could easily have been confused with a road. The exception came from the early 1960s, where a three-colour single sheet covering Britain prepared by Geographia used blue for county boundaries and motorways – the lack of rivers helped keep the sheet uncluttered while including most classified roads (Amoco, c1964, [19]). In contrast Canadian maps were often notable for the detail of the lakes shown, sometimes including a specific index to lakes, even where these were many miles from the nearest road or tourist facility. MacEachren (1995:200) points out that most map users have a mental schema and that this would include a blue connecting line as representing a river, so it is logical that they are included on most road maps, as well as on topographic maps, even if they are of limited practical use to a motorist.

Few maps distinguished between lakes and reservoirs, with very few explicitly marking dams that might help identify the latter. A minority of maps of the USA (from California) and Australia distinguished between year-round and seasonal or dry lakes. At the scale of a road map, any sort of feature on rivers were uncommon (6%), with the most common being waterfalls – although these were sometimes only marked if considered a point of interest. Foldex maps, used widely by Shell in the late 1930s and early 1950s often added an unusual level of detail, largely irrelevant for the average user. Their early 1950s French series included specific symbols for isolated bridges, cyclist's ferries, and aqueducts (Shell, c1953, [124], Figure 169), leading to a map of high intellectual complexity (Fairbairn 2006, Touya et al 2016).

Springs, wells and boreholes were even rarer, at under 1%, with examples from Australia – where they might conceivably be of use to a motorist in an arid area – and Thailand. Bathymetric data was extremely uncommon; in the sample it was only found on two British maps, both in the format of road atlases.

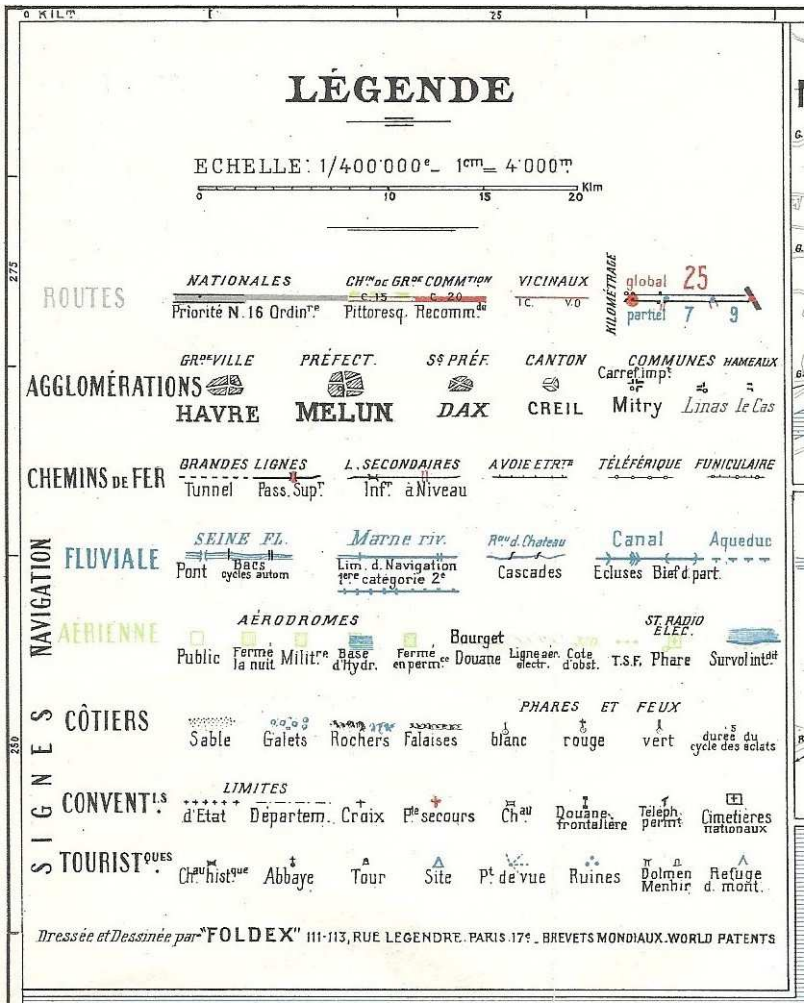


Figure 169: Legend from c1939 Shell map of Brittany

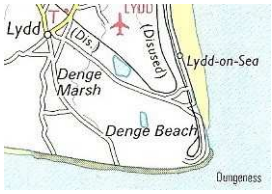


Figure 170: BP [24]

Beaches were also surprisingly uncommon, as they might legitimately be expected to be of interest to some users. Typically these were shown by a point symbol, such as a stylised beach umbrella, except in the UK where Philip's and others highlighted beaches along the coastline (eg. BP 1968 [24] Figure 170, 1971 [27]) distinguishing between those that were sandy or sand and shingle. In Figure 170 the yellow sand at Lydd-on-Sea gives way to a short distance with no defined beach, then shingle round Dungeness. Again, the Foldex-derived maps had extra detail, showing coasts that were sand, pebbles, rocks or cliffs (Shell, c1953, [124]).

1130 Terrain and Relief (Tints, Shading, Symbols)

In contrast to topographical maps, many road maps are "flat", with a uniform colour (sometimes left uncoloured) for the landmass. The most common indication of relief is by marking peaks (162, 54%), often accompanied by their height. Overall, 192 maps (64%) had some spot heights marked – the discrepancy largely being on British maps, especially those produced within the George Philip Group for Shell, BP or Esso that marked heights elsewhere. Although this might be linked to difficulties with early motor cars in climbing hills, these maps also carried symbols for steep hills making the absolute heights less valuable. A minority of North American maps carried elevations next to city names – these were separately recorded under category 1315.

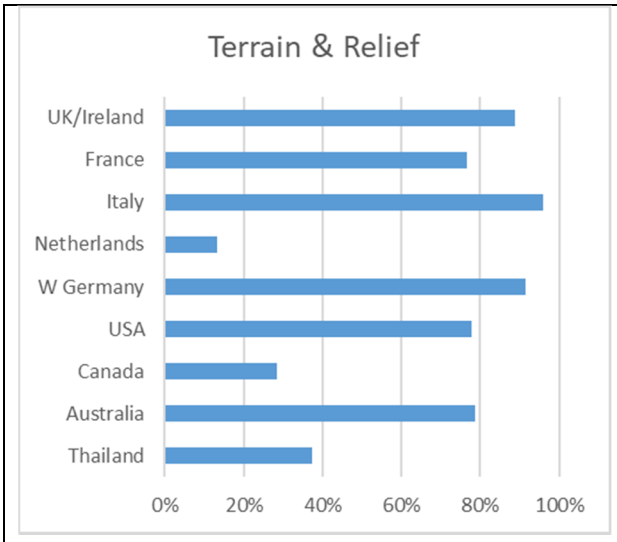


Figure 171: Terrain and Relief by country

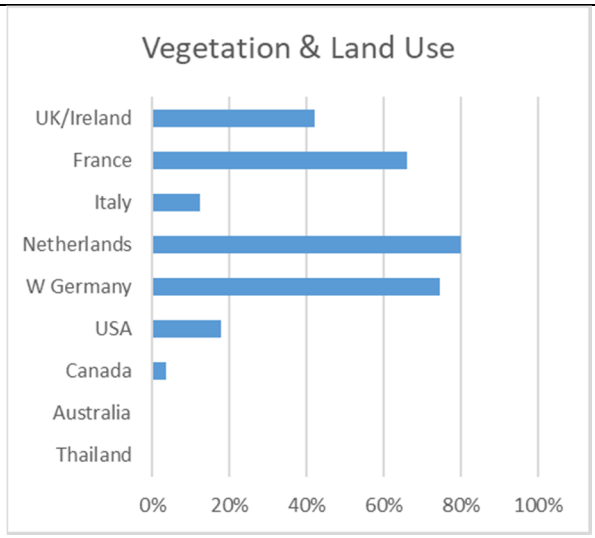


Figure 172: Vegetation and Land Use by country

Hill shading to depict relief was used on 89 maps (30%), most widely in Italy and on later German maps, but occasionally in all countries except, naturally enough, the Netherlands. Although the quality varied, in most cases it gave a clear sense of ranges of mountains and hills. (North) Italian maps commonly marked glaciers separately from hills. In addition, some Australian examples (and the Esso *Mitteldeutschland*, 1952 [172]) showed land forms looking like amoeba or worms snaking across the page. The count may have been higher if more mountainous map areas had been selected for analysis; hill shading was only rarely identified in the legend.

Relief techniques more commonly associated with atlases or large-scale topographical maps were rarely encountered. Just 6 had hypsometric tinting, of which 5 were from the UK or Ireland, and the sixth a small road atlas of Thailand produced in London by George Philip. The Thailand example and the earliest map selected, the 1905 Pratt's atlas, were the only ones to have a full range of colours as might be found in a typical school atlas; but the 1950s Shell-BP maps (again by George Philip) combined this with subtle hill shading to good effect, although at the expense of losing clarity on the minor roads. Outside the sample, a 2007 BP atlas of South Africa, produced by Map Studio, used a fully graded range of tints for altitude, incrementally changing in 100m elevation bands up to 3400m. No maps showed contours without tinting.

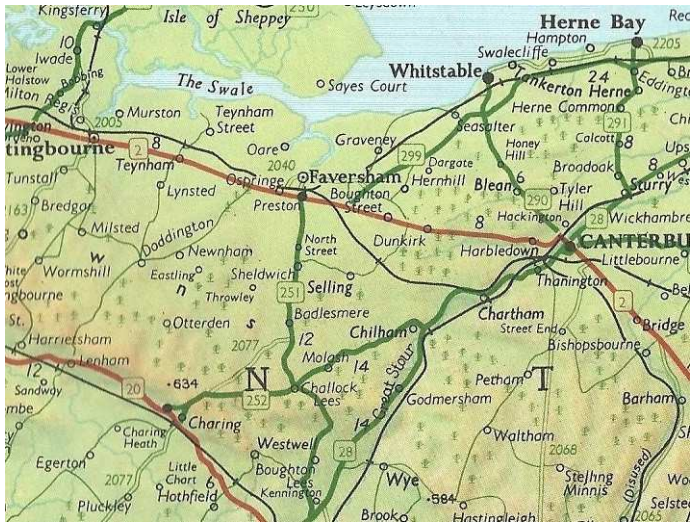


Figure 173: Relief on 1954 Shell-BP maps [10]

Early cars could find even modest hills a challenge. Recognising this, the 1905 Pratt's atlas [1] included eight pages of road profiles for main routes, but these appear rarely on post-1930 maps (and in none of the sample):

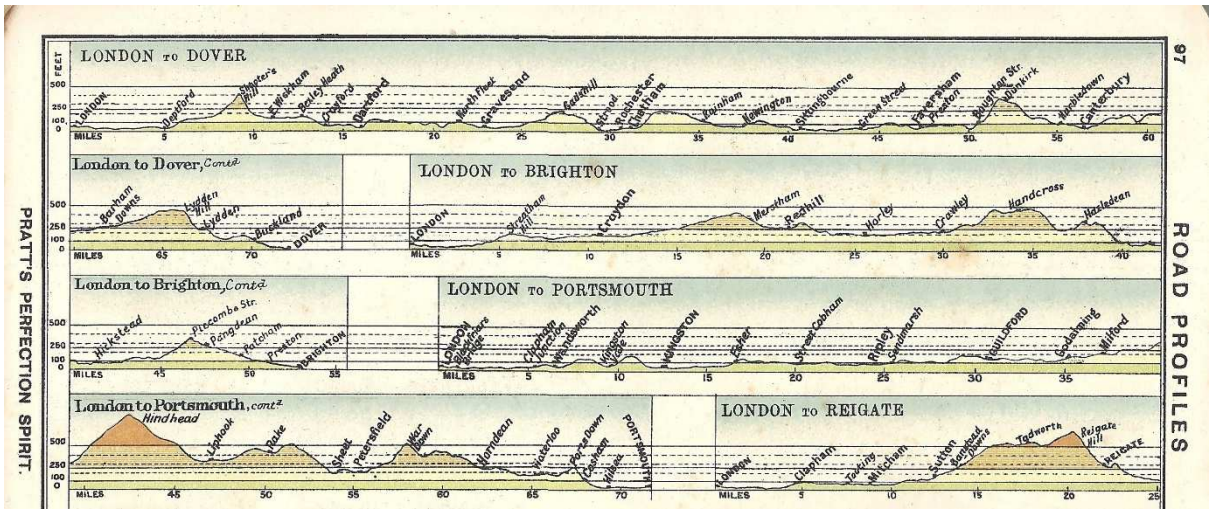


Figure 174: Four road profiles from 1905 Pratt's atlas [1]

1140 Vegetation/Land Use Forest, Cultivated, Desert

Although a mainstay of topographical maps, road users have less need to know land cover, as areas of unusual amenity interest are often separately marked as national or state parks or forests. This may explain why only one North American map showed tree cover – and this is the sole late example from Canada, produced by the Alberta Environmental Protection Resource Data Division for Husky: it is likely that they would add forested areas by default. No maps at all from Australia or Thailand showed any form of land cover. In contrast a majority of European maps showed wooded or forested areas, although few did from Italy as the prevailing cartographic style with detailed hill shading would have led to clutter at the scale of national maps. Most maps simply coloured wooded areas a light green, but where the landmass was already coloured, as on the 1950s Shell-BP maps of Britain (Figure 173, [10]) tree symbols were also used.

North German maps commonly showed wetlands, but Dutch maps showed the widest variety of land cover – typically indicating heaths and dunes as well, possibly compensating for the lack of hills. Dutch heaths were often colourful ranging in shade from pink to lilac and purple. By the 1990s, when Esso was repackaging larger scale maps from RV Reise (Esso, Schleswig-Holstein Hamburg, 1995 [202]), its German sections showed a wealth of detail including dunes, heaths and mud flats (but not marshes; drainage channels are carefully marked in the flat lands).

One-sixth of US maps showed deserts; this was restricted to maps of California in the sample, and appeared widely across different cartographers and companies.

No road maps in the sample showed any agricultural land use, although it is known from the parent population that orchards are occasionally distinguished from other woodlands.

6.3.2. Communications: Accessibility and Transport (1200)

This category is arguably the core purpose of a commercial road map – if it fails to mark roads adequately, then it must, by definition, be considered not to have met its objective. Oil companies did occasionally sponsor maps that had other purposes, including nautical charts and pictorial plans or panorama maps, as well as special issues commemorating an event, such as the Olympic Games, World Expo or the bicentenary of George Washington, but such maps have been excluded from this analysis.

1210 Roads: Type, Surface, Road No., Features, Distances

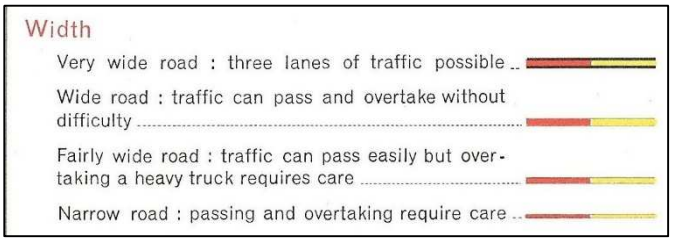


Figure 175: Width from Michelin/Caltex, France, 1957 [131]

Some very early maps treated any road equally, as a simple red or black line on the map. At the scales on the sampled maps, none accurately represented their road space on the ground – all were symbolic. Most maps distinguished between types or the relative

importance of roads (other than by their selection for inclusion) but the width of their representation did not necessarily relate to the relative width of the actual road, except for those derived from Michelin cartography (e.g. Caltex 1957 [131] - Figure 175, Esso 1997 [158]). French maps often had multiple width indicators – up to six on some more recent issues (and the MonteShell/Hertz of Italy [113] used the same cartographic convention). There is no reason to suppose that the French need this information more than other nations; it is just that once Michelin had established a style it was perpetuated. As the UK map selection kept to Southern England, no examples of maps with distinct symbols for single track roads with passing places were in the sample, but these were widely used on maps of Scotland.

In general, the representation reflected the thematic context (category) in preference to its spatial context (Mocnik and Fairbairn, 2018), but also used a colour palette to indicate importance. This means that the various line styles generally need to be explained in the legend (Olson and Whitmarsh 1944); on some older maps the legend contains little information apart from road categorisation, as recommended by Close (1905). Just under one-third of the sample showed some width indicator: in Figure 176 most non-Michelin distinction of road width is simply between single and dual carriageway roads which became common from the 1950s in North America and around 1970 in Europe. On some North American maps these are described as four lanes or wider, to include non-divided highways e.g. Mobil 1970 [82], Standard 1978 [86]). In this analysis, motorways were not regarded as a width element unless the maps distinguished between those that are single or dual carriageways.

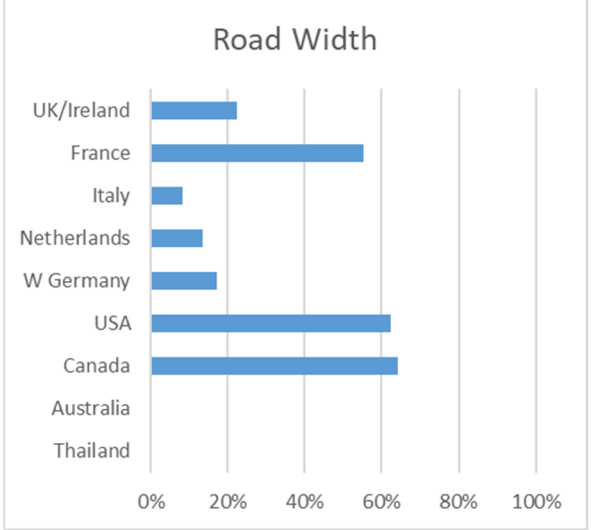


Figure 176: Road Width by country

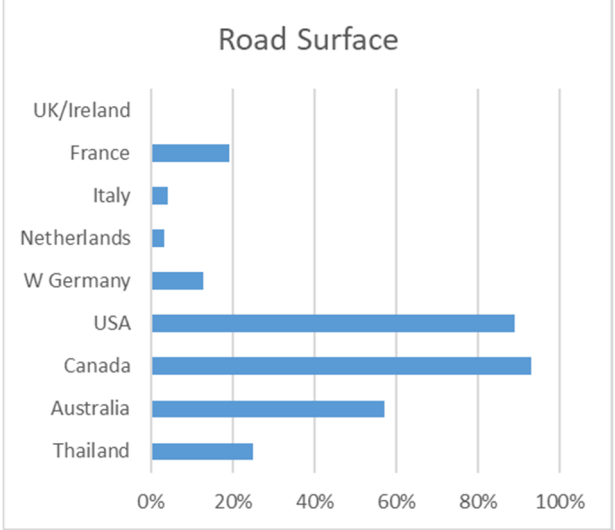


Figure 177: Road Surface by country

Formal classifications can help motorists identify faster roads, as well as width. Road numbers or official classifications were shown on 86% of the sample. In part the absences reflect countries in which

road numbering was introduced relatively late, with Italian and Dutch maps only showing numbers after around 1955, and Thai maps a decade later.

Road categories were typically distinguished through a combination of line width and colour. Main roads were most commonly red, with secondary roads black, yellow, or simply narrower red, but there are some national or brand variations – so more recent UK maps sometimes have green for primary routes to match road signage (Gill 1993). The introduction of motorways must have posed a problem for cartographers – although at first they often took the same colour as the main roads, they later assumed different colours such as blue (UK, Germany) or green (North America). Where they existed, toll roads were generally shown in a different colour from free roads of equivalent quality (such as motorways). Toll booths were occasionally marked on stretches of road. Toll roads also featured prominently on strip maps that were excluded from the primary map sample.

Younger maps typically showed more classes – this may broadly be attributed to the introduction of additional numbering systems for motorways, and the pan-European E road numbers (not marked on domestic UK/Irish maps, but often shown on cross border issues to the detriment of the actual numbers displayed on road signs). Canadian maps added the unique symbol for the Trans-Canada Highway as soon as it was designated in 1962. Most maps also showed road numbers across territorial borders, sometimes distinguishing between the national systems in the legend. The highest number of different classifications was shown on a 2004 AVIA booklet of Germany [208] with 11 – at this level it becomes difficult for a map user to recall what each symbol means.

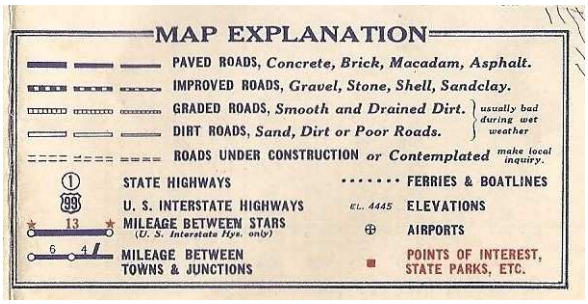


Figure 178: Legend from 1931 Standard California [53]

National circumstances also affected the depiction of surface. Most maps in North America and Australia showed different road surfaces, accounting for around a third of the sample, with the former often split into four: paved, improved, graded and dirt. Figure 178 shows how even using a single colour can show 12 combinations of road importance and surface; this legend was also the earliest example to include a specific symbol for airports (Standard California 1931 [53]). In contrast few European maps (and none at all from the UK) made this distinction – most roads are metalled even if they are only single track. Some cartographers only showed primitive surfaces for secondary roads, but others had as many as 16 line symbols to match four road surfaces with four road types. Only freeways or equivalent were assumed by default to be hard surfaced.

Road construction tended to be shown in greater detail on later maps, typically distinguishing between motorway, main road and other construction, but sometimes using a style matching each road style – so

another German map, a Shell/Mairs *Pocket General Karte* edition from 2001 had 10 symbols for roads under construction, exactly matching the 10 types of road. In Britain it was common to distinguish between roads that were projected or under construction – with the former providing some motorway routes that were far removed from their final alignment (Figure 179).

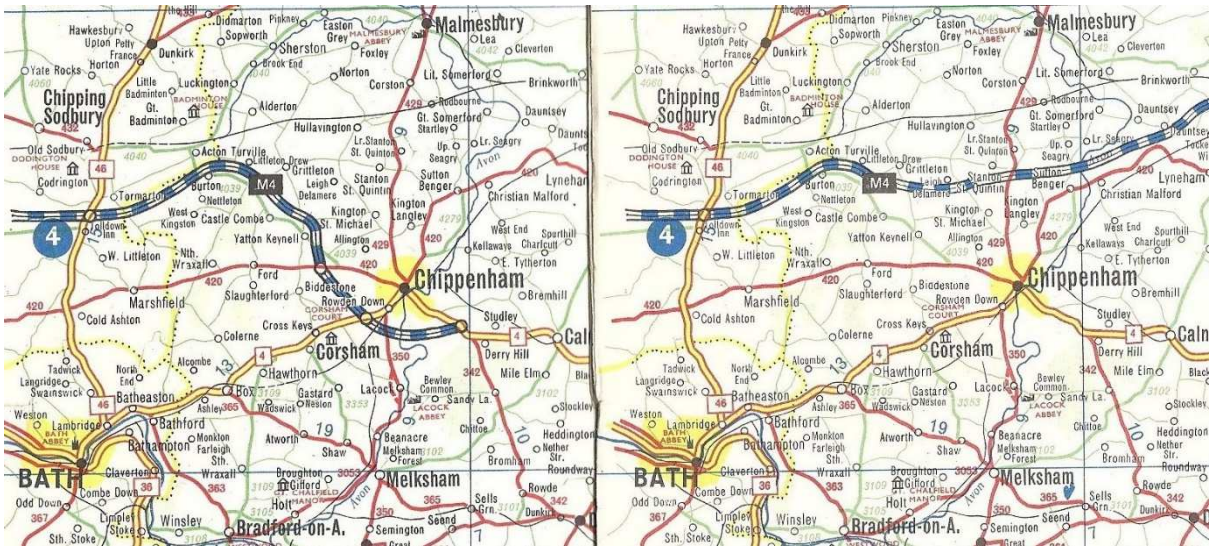


Figure 179: Proposed routes for M4 near Chippenham from c1965 and c1968 Regent maps of Southern England [599 & 25]

On rare occasions maps of construction could stretch into propaganda; in the 1930s AGIP (in Rome) published a map of Ethiopia [505] with the title "Impero Etiopico Le nuove strade tracciate dal Duce" in letters up to 40mm high. Planned roads were shown in bold black lines radiating out from Addis Ababa with little heed to the underlying topography; apart from one case in Asmara, all existing routes were shown with narrow black dashed lines, emphasising the implied technological superiority of the Italians. The choice of black for the new roads on a full colour map may be significant, reflecting also the influence of Fascism, in the same way that red roads have been attributed to British imperialism on Boer War maps (Dorling and Fairbairn 1997:154), although the same colouring system was used on the International Map of the World.

Figure 180: 1930s AGIP map of Ethiopia [505]

Slightly more maps depicted either gradients (isolated steep hills), passes or both. However these were more prevalent on European maps, notably the UK, with isolated hills graded by degree of steepness

(and conventionally showing the direction of the gradient). North American maps generally just showed passes, often with their elevation; the low incidence in Canada is more the effect of the sample containing mainly Eastern Canadian maps where the there are few formally designated passes, but not all the routes across the Rockies were identified as such.

Around a quarter of maps showed some other form of danger or limitation. This commonly included roads that were marked as being closed or level crossings – a 1964 BP Netherlands [222] divided level crossings between those with flashing warning lights or ones which are unguarded. Very few in the sample had any height or weight restrictions, although the 1920s BP map of the North of England [2] distinguished between road bridges over railways and "Railway bridge over road or level crossing", presumably for navigational convenience rather than as a hazard. There is a small sub-genre of truckers' atlases not included in the sample that are highly focused on such dangers.

Scenic routes were marked on 18% of maps; they were only commonly shown in Germany (55%), typically by sidelining the road in green or, rarely, orange dashes (Mobil, New York, 1968 [76]). The absence of such markings suggest that maps were primarily seen as utilitarian, and may not have been explicitly trying to encouraging pleasure motoring using the sponsor's products.

Over 92% of maps showed some distances on the map itself, as opposed to in a separate mileage table (a non-cartographic element covered in group 2130), and 56% had more than one level of distance indicator. Unlike larger scale Ordnance Survey maps in the UK, which only indicated distances by linking them to mile posts or milestones (Oliver, 2022), smaller scale road maps mark distances between useful point features, typically settlements or road junctions. Almost all explained this in the legend; some maps showed distances between all settlements and road junctions, but most used a specific symbol, such as a star or pin, to indicate distance points. Typically smaller distances were in blue or black, and larger distances, restricted to main roads, were in red. 7% had a third level of distance indicator: typically this was text-based above a road indicating distances between two named locations – this was most common on North American maps from HM Gousha, but also found on some German maps.

An unusual feature was incorporated into late 1970s BP maps [193] by Hans König, to identify routes likely to be congested – busy *autobahns* and main roads are highlighted with blue dots (>35,000 or >7,500 vehicles per day respectively) or red dots (>10,000 or >2,500 per day).

1220 Rail

Half the maps in the sample showed railways (Figure 181), with a wide variation between countries: only one US map – a 1993 Amoco Illinois [89] produced in association with the state authorities – marked railroads. Few Canadian maps did so, despite the importance of transcontinental rail in holding the country together before the completion of the Trans-Canada Highway. Some European maps used

several symbols for railways, distinguishing by features such as gauge and use by freight or passengers; around half those showing rail lines also marked stations. One German map (AVIA, c1956 [176]) took the unusual step of underlining town or village names if they had a railway station.

Few maps showed features on railways other than the longest tunnels. In general Motorail options were not covered, apart from the Channel Tunnel on recent UK or French maps, and tunnels where trains could be used to take cars underneath mountain passes in Italy or France. A 1980 Esso map of Northern Germany [196] included a panel describing *Autoverladung* (Motorail) with six maps of loading points in major cities.

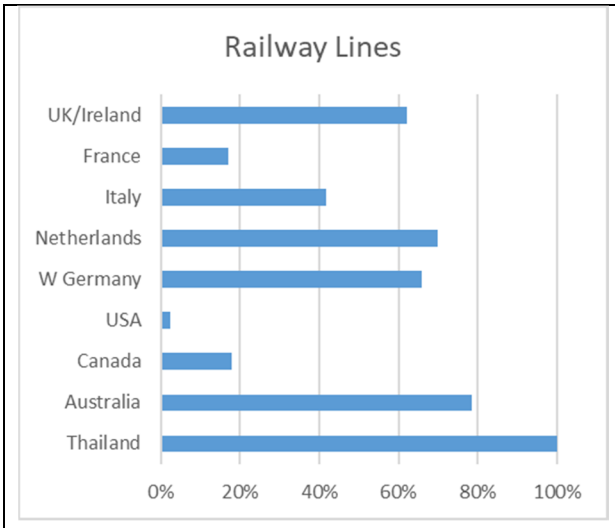


Figure 181: Railway Lines by country

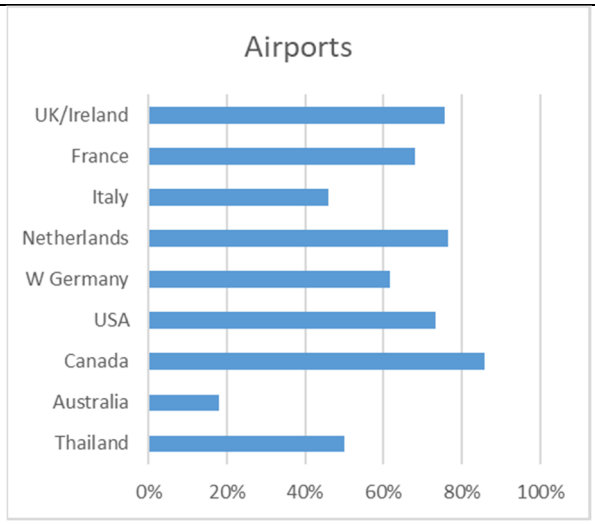


Figure 182: Airports by country

1230 Paths; Rights of Way

Unlike larger scale topographical maps, road maps do not indicate rights of way although some carried a disclaimer to the effect that inclusion on the map does not indicate a right of way. Tracks – not always motorable – were a notable feature on Australian maps (71%), but uncommon elsewhere. Only one map (the 1995 Esso/RV Reise [202]) identified selected private roads; another German map (Shell/Mairs, 1990, [191]) distinguished between *Fußweg* and *Wanderweg* in the (German language) legend, both of which were translated as footpath in the English legend.

1240 Canals; Navigable Rivers; Ferries

A third of maps distinguished canals or navigable rivers from other watercourses, most commonly in Britain and Germany. Where a special symbol was used for a canal, this was often not included in the legend. A small number of maps, principally from George Philip in the UK, show heads of canoeable [*sic*] navigation with a red C; navigable rivers are named in red with others are named in blue (BP, South and East England, 1971, [27]). Around 4% of maps marked associated features such as locks, weirs or (in the

Netherlands only) pumping stations. As these symbols are likely to be of limited use to most road users, they were probably carried forward from larger scale base maps.

Ferries and toll bridges were also included in this category. Ferries appeared on almost three-quarters of maps, and were widespread on all except those from Australia and Thailand. Ferries were sometimes split into those for vehicles or solely for passengers; some maps distinguished between shorter ferries and longer steamship routes. Most ferries were indicated by a simple dashed line. One map (Mobil, SE/SW England, 1980 [32]) used a solid blue line for hovercraft ferries. An extreme example is the 1931 Shell atlas of the Netherlands [211], which named 5 different types of ferry, each translated in the legend, whilst a 1972 Shell map of the country [228] showed the maximum weight per vehicle in tonnes as a number inside the symbol for internal ferries. The 1935 CIP map of *Région Nord-Ouest* (France) [116], is marked *Bac* where a ferry on N810 across the Seine near Quillebeuf, with no indication of what it is crossing, as no rivers were shown on this map. Text lists of ferries are treated as a non-cartographic element (see 2340). The 1980 Esso *Bundesrepublik Deutschland Nord* [196] has three additional inset maps – one showing ferry lines and two of ferry terminals.

Toll Bridges were often shown on North American maps (indicated by TOLL BR.) The BP South and East England, 1971, [27] stated "*Prices, where given, (for single journey for car 14ft long, unless otherwise stated) are a fair estimate*"; these are shown on the face of the map next to the bridge concerned.

1250 Cycle Tracks, Bus and Tram Routes

No maps in the sample featured cycle routes or bus routes on the main map. This is hardly surprising given that they were issued by petrol companies, and the sample was restricted to larger scale maps, not those of urban areas. An exception outside the sample is a 1995 Shell map of France *VTT et Randonées Cyclos* issued as part of a series of six thematic maps; this highlighted named "*circuits cyclotouristiques*". Four maps from Germany or the Netherlands marked interurban tram lines separately from conventional railways.

A map booklet of Glasgow, not in the main sample, produced for Shell and BP to tie in with the 1959 Scottish Industries Exhibition, had a separate "PLAN: Tram and Bus Routes, etc." accompanied by a text summary of routes in numerical order.

1260 Civil Aviation

This category covers both air routes and airports (which use a point symbol). Almost two-thirds of maps showed civilian airports, occasionally separating those with international or scheduled services from small facilities. Distribution was fairly even among the nine countries except for Australia where few

airports were shown (Figure 182). As with most other point symbols they were less commonly shown on pre-war maps, but almost universal from 1960, except on a few small-scale national maps.

A limited number of maps included heliports (Mobil SE-SW England, 1973 [28]) or glider fields (mainly in Netherlands and Germany) with a separate symbol; the British AA-derived maps from 1990-1 (BP [37], Shell [38], Esso [39]) had both, classing heliports under "motoring information" but glider fields as "tourist information". Shell's late Dutch maps from Falk-plan [233/236/239] all divided glider fields between those requiring or not requiring prior permission for use.

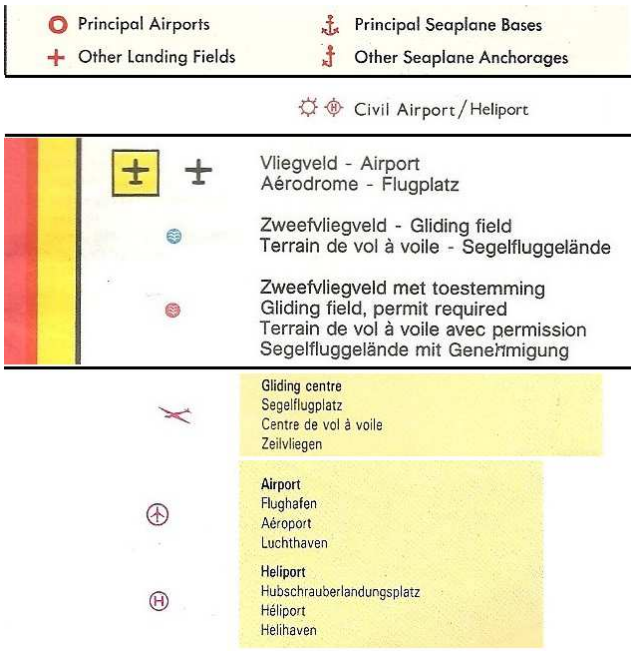


Figure 183: From top: Imperial 1948 [284]; Mobil 1973 [28]; Shell 1988 [233]; Shell 1990 [38]

Some maps from North America had a special symbol for seaplane ports (Mobil New York 1956 [65], Gulf New England 1968 [75], B-A Ontario 1939 [280], Imperial Eastern Canada 1939 [281] – described as "seaplane landings", and Imperial Esso Newfoundland 1961 [293]). One even used separate symbols for "Principal Seaplane Bases" and "Other Seaplane Anchorages" (Imperial Eastern Canada 1948 [284]).

Commercial air routes were not generally shown, although appeared on three Imperial Esso maps of Eastern Canada [281/293/297], showing links to Newfoundland. The less common air ferries for cars might have been expected to be shown, and were included on some French and Dutch maps – although the routes from Lydd or Southend in SE England to France, operating from 1954 until the early 1970s were not shown on any of the British maps in the sample.

6.3.3. Settlement, Territory and Resources (1300)

This broad category brings together most man-made features associated with the built environment and is an almost essential feature of a road map by showing destinations, unlike (say) atlas maps, that might solely show physical geography, or some walking maps or nautical charts.

1310 General Built up

Without exception, road maps mark at least some towns and villages. A minority (around 20% of the sample, mainly in Thailand and Australia) showed no further information, generally using undifferentiated (or unexplained) point symbols for all settlements, irrespective of size, although even these tended to use different font sizes or strengths to indicate importance. As with other categories earlier and later maps were also less likely to show additional information.

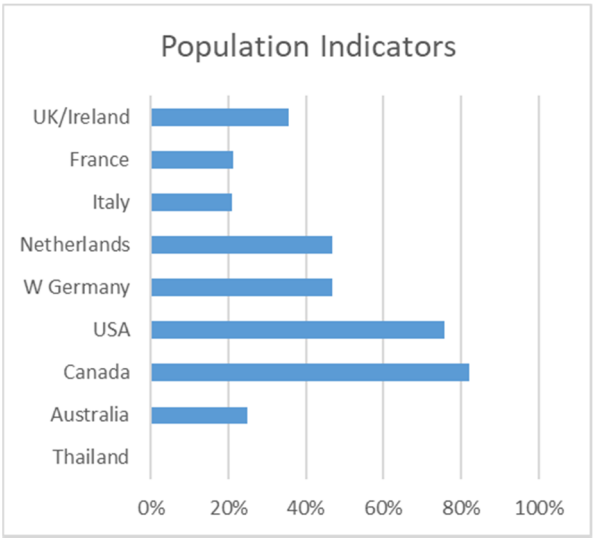


Figure 184: Use of Population Indicators by country

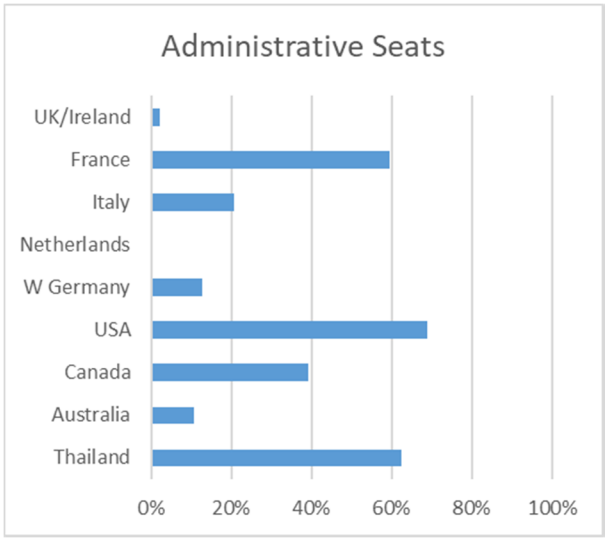


Figure 185: Administrative Seats by country

Population was the most common indicator of importance. Over three-quarters of North American maps used specific symbols to place cities into population bands, typically using up to 9 divisions, with smaller localities represented by a variety of point symbols and larger ones either a point symbol or colour combined with a delineated built-up area. German maps sometimes used font style or size in lieu of symbols, although this could also be used to indicate administrative status. Banding was not consistent between maps, even when produced by a single cartographer for a given year, but may have been selected to allow a reasonable spread – the lower limit could vary between 200 and 10,000 (Byrne 2022c).

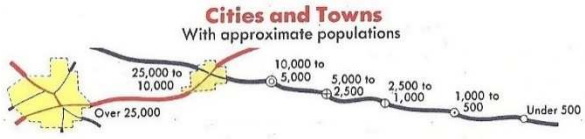


Figure 186: General Drafting Co/Esso standard symbols (from Esso 1955 [63])

The use of a block shading to show the approximate area of larger cities was not restricted to indicating population; this was widely done on European maps for all larger cities, irrespective of the exact population. Esso group maps, using designs initially created by General Drafting Co, used different colour schemes to indicate populations of built-up areas, with smaller towns generally using an orange/ochre, and larger ones a bright yellow; both colours permitted roads, place names and symbols to be overlaid (Figure 186). Yellow to orange tints were widely used on North American maps once they moved to a full colour process. In contrast, earlier post-war maps in two colours – typically red and blue – had often used a pink tint, while in the 1930s solid blue had been more common.

In Europe, even when pre-war maps were in full colour (as on Shell or BP-Olex maps of Germany), grey hatching was more common, with no variation for population (again, except on Esso group maps). Foldex, with its high level of detail, applied shaded built-up areas to even quite small towns; Michelin, in contrast, restricted its built-up areas on post-war maps of France to Paris (and Brussels) preferring to use symbols for administrative information; its pre-war maps used unfilled outlines for most significant

cities (CIP, 1934 [116]). On its common European design maps, BV-Aral used colour to indicate built up areas where its service stations could be found; initially in solid blue, around 1970 this changed to a light blue hatching for cities with Aral stations, and grey for those without.

Two additional indicators were sometimes added to place names. Elevation appeared occasionally as a number, mainly on North American and a few German maps (7% of sample, compared to 63% for spot heights), generally preceded on US maps by *EL.*, beneath the name. Around twice as many maps identified interesting or touristic towns, sometimes by underlining the place name, but also by adding stars beside it, or – more rarely – using a different font style (CIP, 1934, [117]). Again the decision to do this seems to be cartographer not oil company-led, so that most maps derived from Michelin cartography used their familiar stars system, which linked to the qualitative assessments in the green guides. Overall, interesting towns seem to have been a European phenomenon, shown mainly in France, Italy and, most frequently Germany – but in that case, mainly on post-1986 maps where increasingly oil companies were simply taking base mapping and adding their own stock covers. The fuel suppliers seemed less willing to pass judgment on towns than cartographers. In a few cases, identification of being interesting is then keyed to information in the margins or on the reverse of the maps, describing key tourist features.

1320 Administration

Almost all maps sampled showed administrative boundaries. The exceptions fell into two groups – maps with a limited palette lying wholly within a single country, such as the 1920s BP map of the North of England, or some pre-war German maps, or those where there was an implied boundary beyond which the mapping just stopped – seen on some of the Thai maps. Most maps showed national boundaries (where applicable) and the principal internal boundaries – states, provinces, counties or departments. US maps typically added a lower level (county) to the state and national boundaries. Later French maps reflected the growing importance of regions as well as departments.

Administrative seats (Figure 185) tended to be given their own symbols. In some cases – notably French issues with Michelin-derived cartography, which included prefecture, sub-prefecture and cantonal indications – these covered more than the areas delineated by boundaries. Symbolically this could be indicated by letters inside the town symbol (as on the Michelin maps) or a special symbol, typically some form of star, sometimes superimposed within a population symbol. Not all countries marked such centres, so county towns, for example, were never indicated on UK road maps.

Few other quasi-administrative boundaries were shown, except for time zones where applicable (mainly in North America). One German map (BP, 1986, Schleswig-Holstein [198]) showed postcode boundaries. Indian or Aboriginal reserves were marked on a minority of North American and Australian maps; this may have been at the choice of the oil company as they do not appear to have been consistently applied

by cartographers. These tended also to be on more recent maps, recognising historical land rights of indigenous communities, although a c1927 Texaco map of the Pacific Northwest [649] was an outlier (Figure 247 to Figure 250). Owing to the small scale of most road maps, few public buildings that were not in themselves major tourist attractions were shown. Inset plans of major cities commonly showed such buildings, or related features such as courthouses.

Largely due to the limitation of scale, educational facilities were only rarely shown. Sometimes they appeared on ancillary city maps, as in the two Thai examples (Shell [246] marks universities, but only on the Bangkok map forming the reverse; the Caltex atlas [247] marks most schools on its city plans except in Bangkok). In the US universities are sometimes included among general points of interest, but Rand McNally offered its customers the option of using a specific mortar board symbol for "colleges" at all scales – used mainly by Gulf (1956, [65]) and Mobil (1968, [76], 1975 [82], but dropped by 1989 [88]). Gulf's later maps (1968, [75]) limited these to ones "accredited by nation-wide or regional associations".

1330 Religious Features

At the scale of road maps (as opposed to town plans) few active religious features – as opposed to historic sites or buildings – are shown. A notable exception was the pre-war Shell-Foldex map from the UK, which had eight different symbols for churches, but these were architectural rather than denominational. A French Foldex map showed cemeteries; the most recent Thai map (a larger scale atlas, rather than a folding map) show wats and other religious sites. Outside the main sample, a softback Shell road atlas of Southern African (the most common format for South African oil company maps) produced by Map Studio in the 1970s [626] had 22 symbols for different religious denominations distinguishing, for example, between Anglican and Church of England in S.A. churches in its town plans section.

Cemeteries were generally only marked if they contain war graves and are included in category 1350 – the sole exception being a pre-war Foldex/Shell issue from France [121]. Outside the scope, recent UK atlases at 1:316,800 published by the AA show crematoria, implicitly recognising that these are rarely visited rarely by map users, who may therefore need directions.

1340 Industry, Communications and Power

This category has been sub-divided into industrial sites, mines/quarries, oil refineries and depots, pipeline and power generation (including newer features such as wind turbines and solar farms which have, for example, started appearing on British Ordnance Survey maps). Most were completely ignored – they are not attractions and could be seen as counter to supporting tourism. However national variations do exist. Although there are only 34 features marked (across 24 maps) in the sample, 22 of these features are on German maps. Surprisingly, few companies marked their own refineries or regional offices.

1350 Military and Police

Military facilities were mainly limited to three elements: aerodromes (notably on most post-war US maps), cemeteries, and restricted or danger areas. A small number of maps, mainly in North America, added state highway patrol or police stations (Gulf, 1968 [75]).

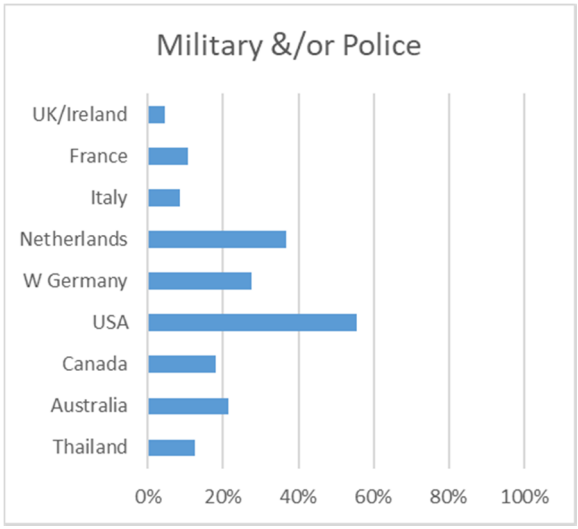


Figure 187: Military and Police by country

Cemeteries were quite widely marked: overall 7.6% of the sample included military cemeteries, war graves or other military-related facilities.

Examples found on some (but not all) Shell cartoguides were described in English as “Important military cemetery” (Normandy, 1969 [147], 1978 [150]) or “war cemetery” (Shell Italia Nord-ovest, 1971 [108]). They were also marked on several Dutch and later German maps, and intermittently on those from the USA. Although the decision seems to have been cartographer-led, the Dutch tall format issues using Falkplan cartography do vary by company, with Shell dropping the symbol for military cemeteries earlier than some other companies – for example it was retained on Texaco maps as late as 1993 [234].

Danger or prohibited zones, such as military reservations, were found on 12% of the sample, principally on maps from USA, Germany and Australia. These were often not included in the legend, but simply marked on the map plane – so the Shell Queensland map [265] had an area North of Rockhampton lacking the cream wash of the rest of the map described as “MILTARY TRAINING AREA (Entry Prohibited)”.

1360 Motoring/other facilities

Although these might be expected to be another major element of commercial road maps only just over half (53%) of the sample maps contained such items. Filling stations – generally restricted to those of the sponsor’s brand were most common (29%), with service areas, usually only on motorways next most common (22%). Outside the sample, Warsaw Pact country maps, where there were fewer service

stations, frequently showed locations of petrol filling stations (see, e.g., Figure 91), and in some cases, repair garages, sometimes accompanied by a text listing.

Both iconic (petrol pump or corporate logo) and arbitrary symbols (such as a star, flag or geometric shape) were widely used. Several added "accents" for minor variations, typified by Aral maps of the 1930s distinguishing between service station types and fuels available [167].

Service areas – which typically include a filling station, restaurants, public toilets, parking areas and limited breakdown facilities – only developed a distinct identity with the introduction of limited access highways (Figure 193). The earliest examples were in Germany, Italy and the US – Howard Johnson's are credited with the first US service areas on the Pennsylvania Turnpike, opened in 1940 (Swift 2011) with each location exclusively selling Esso gasoline (an undated map exists promoting the partnership). General marking of service areas has consistently appeared on German maps since around 1953, and on British maps since about 1966; they have only been shown on Dutch ones since the early 1980s. German maps typically used different symbols for the available facilities, most commonly a T in a circle for fuel (*Tankstelle*) or R in a circle for *Rasthaus/Raststatte*. Occasionally these can multiply: the 2002 Esso "Tiger on Tour" small format atlas [206] of Germany had nine different symbols, splitting the rest areas into those with and without motels, adding ones for *Autohof* (Truckstop) and baby room, and then colouring the four basic features (A/T/R/R) black instead of red if they have disabled WCs. Occasional German maps used a K symbol for rest areas with kiosks rather than restaurants (Fanal/Ravenstein, 1978, [194]).

North American maps rarely showed service areas. Two reasons can be mooted: many instead preferred to show their own branded stations at, or near, to Interstate access points (and so are just regarded as being filling stations in this classification), and secondly there are simply fewer service areas only accessible from the Interstate than in the European model – generally these only occur on toll roads. Starting from the mid-1960s, a proportion of US maps did however show rest areas, even though these are largely parking areas with minimal facilities other than toilets and a few vending machines.

The French situation is mixed. Despite most autoroutes bearing tolls, with infrequent access points, few regular maps showed service areas, although some companies including BP [145] and, most frequently, TOTAL commissioned autoroute strip maps – those highlighted the issuing brand's locations, but nonetheless showed all sites. And although Italian *autostrade* are also mainly toll roads, no maps in the sample showed service areas.

With the focus on all-encompassing service or rest areas, few other facilities were shown. Only one map in the sample (Esso Italy *Autostrade*, 1986 [112]) showed breakdown or repair facilities; this can be

attributed to their ubiquity, in contrast to maps from Eastern Europe or the USSR which usually showed where they could be found (Byrne 2022b). Emergency telephone boxes, in practice operated by the AA or RAC automobile clubs, were a speciality of British road maps with almost one-third marking them. No maps in the sample showed public WCs; these are more frequently found on town plans. Hospitals or roadside first aid posts were only rarely included, although did appear on the two most modern Thai maps; outside the sample official Canadian provincial maps often showed first aid posts.

A catch-all category was created for other facilities. A 1956 Texaco US map [64] showed Highway Department Information Bureaux (using simplified state flags), and 1970s Shell maps of the UK [30], produced by the Automobile Association showed four different types of AA breakdown and information services.

6.3.4. Tourism, Recreation and Conservation (1400)

This is a large category, as tourists were one of the principal targets for this sort of map, as contemporary UK advertising makes clear. These are mainly 'sights', deemed by the cartographer or oil company as being worthy to be seen, rather than 'sites', more widely applicable to mundane geographical locations, such as universities, factories or service stations (Meltzer, 2002).

1410 National/State Parks, AONB

National Parks form a key element of maps aimed at tourists, found on over 40% of the sample (Figure 188) including all Canadian maps, as far back as the 1929 British American map of Ontario [276], which named Parks and Reserves in red, using a simple black dashed line for their borders. These also occurred frequently on US maps back to the 1920s, as well as on post-war UK issues, and most recent French, German and Australian issues. However they appeared rarely on Italian and never on Dutch maps.

Regional or state parks (and the UK Areas of Outstanding National Beauty) were also frequently shown, sometimes linked to tables listing facilities. Smaller parks were often indicated by a point symbols (such as a tree), with variations depending on available facilities; these were most common on US maps but – perhaps owing to most parks being designated at a provincial level – not in Canada. US maps also commonly showed State Recreation Areas, a third tier of publicly accessible land. Around a third of British maps showed National Trust land, and German maps large-scale designated *Naturparken* or *Biosphärenreservaten*; the Shell/General Karte series additionally indicated smaller nature reserves.

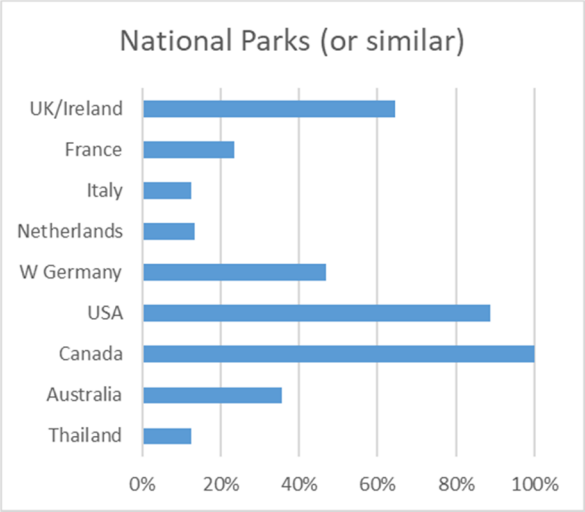


Figure 188: National or State Parks shown by country

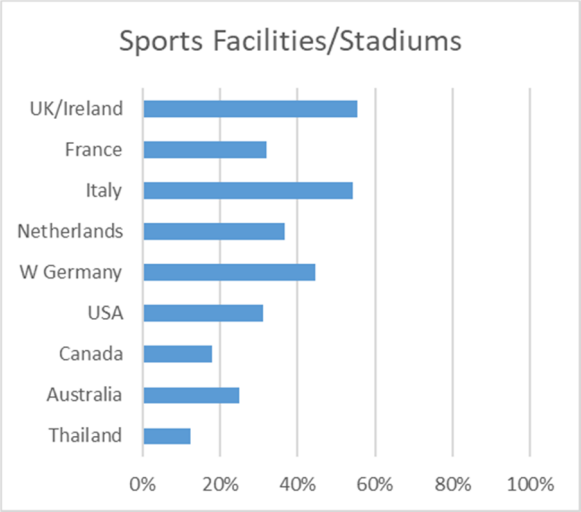


Figure 189: Sporting and similar facilities

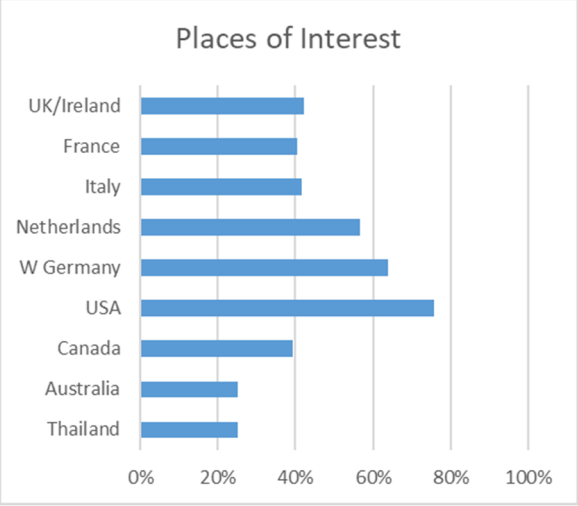


Figure 190: General points of interest, including mills, lighthouses, monuments and viewpoints

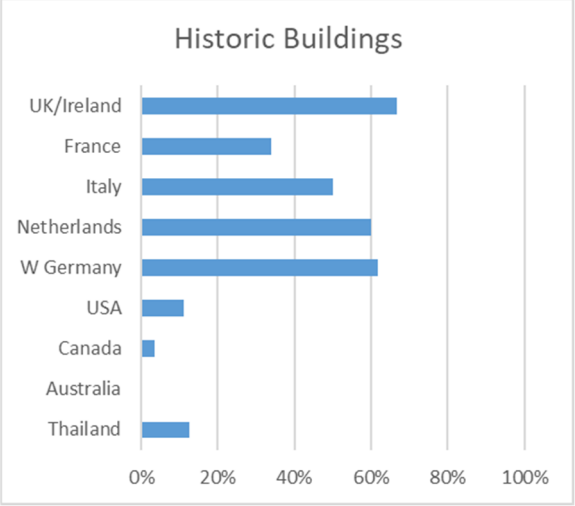


Figure 191: Historic Buildings (castles, abbeys, forts, ruins, ancient monuments, etc.)

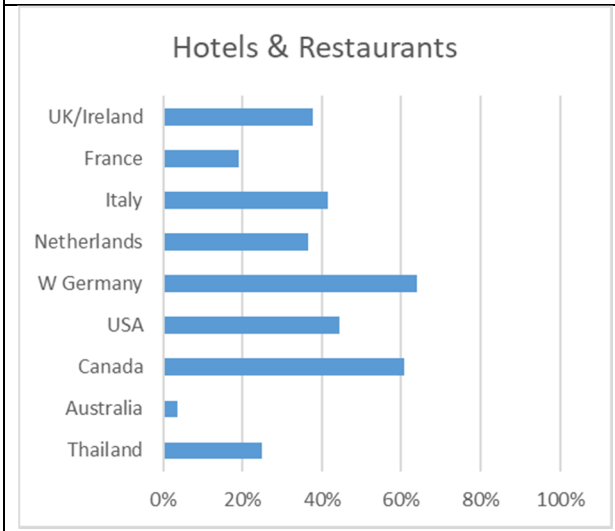


Figure 192: Hotels and Restaurants by country

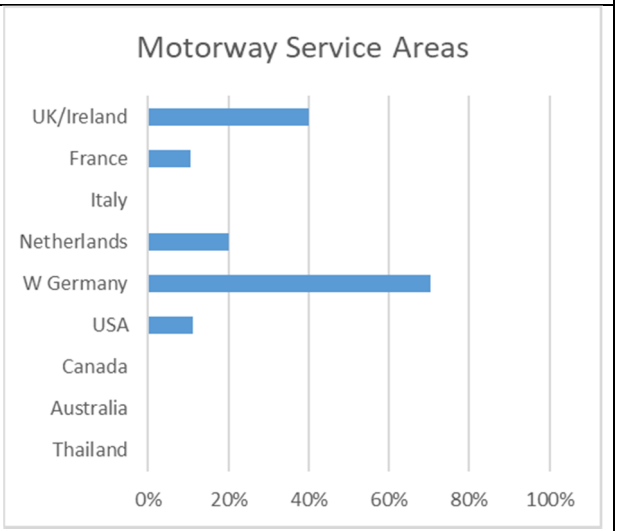


Figure 193: Motorway Service Areas

1420 Landmarks, Viewpoints, Other Points of Interest

In some cases, the distinction between this and the historical building category can be more or less arbitrary, but in general landmarks are elements that can be viewed externally, whereas the buildings are attractions that are viewed internally. So this category includes some working objects such as lighthouses and lightships (which appear surprisingly often on road maps), as well as purely visual elements like viewpoints. It also includes the catch-all "other point of interest" used by cartographers faced with an uncertain choice of symbol. For convenience, tourist information centres have been collected here, unless they are specifically linked to highways.

Marginally under half the sampled maps displayed one or more such features (Figure 190). There were less obvious national trends, although three-quarters of US maps had some, compared to only one quarter of the Thai and Australian maps. Often designated by a small red star or square and an associated name, Canadian maps tended not to differentiate between types of feature; US maps followed suit except for often adding a "monument" with a separate symbol. Monuments are also a notable feature of Soviet tourist maps which might indicate something about how the countries view their history (Byrne 2022b).

In contrast, British maps were focused on viewpoints, with most since the late 1960s showing a selection; although not a map (so outside the scope) there is even a Shell guide to Viewpoints of England (Hogg 1975). Only one UK map marked points of interest without marking viewpoints. However, the selection of viewpoints could be abstruse – those derived from Automobile Association cartography only showed "AA viewpoints" and – as Parker (2013:190) notes – there were none in Wales or the Highlands of Scotland at all. Indeed, although included in the legend, there appear to be none on the 1979 Shell Southeast section [30], and only one has been found on its 1990 successor [38], at Wittenham Clumps in the Thames Valley.

Dutch and German maps are particularly rich in these features. Starting with the pre-war German maps, Esso-Wegweiser 6 (1939 [170]) includes 38 different point symbols for features of interest (including several that fall into other categories), all printed in a light green that is hard to see on the map; each one on the map is keyed by a number to a list on the reverse – there are 223 listed, so it is likely that many of the symbols are not used on any given section. Among the less common points of interest that could be included are distinctive single trees (at a scale of 1:500,000!), excavations, water mills, glass museums, springs and quarries. After the war there was a degree of simplification, taken to extremes on the 1952 Esso series which simply used a numbered blue arrow for all points of interest, but as printing techniques improved more variety returned, with the Shell/General Karte series also using many bespoke symbols. Windmills and watermills also featured mainly on German maps.

The Dutch maps added information as scales grew larger through the 1960s and 70s; for example, a Falk/Bootsma map for Shell (1972, [228]), at the scale of 1:250,000, had symbols for coal-mines, TV transmitters and radio-pylons, with the last named usually also having the radio station name.

Although most French maps were modest in their use of symbols, those from Shell/Foldex were not. The 1936 Brittany [121] map had, for example, 4 different symbols for lighthouses depending on the light pattern (Figure 169); by 1953 [124] they had doubled that to eight (Figure 194).

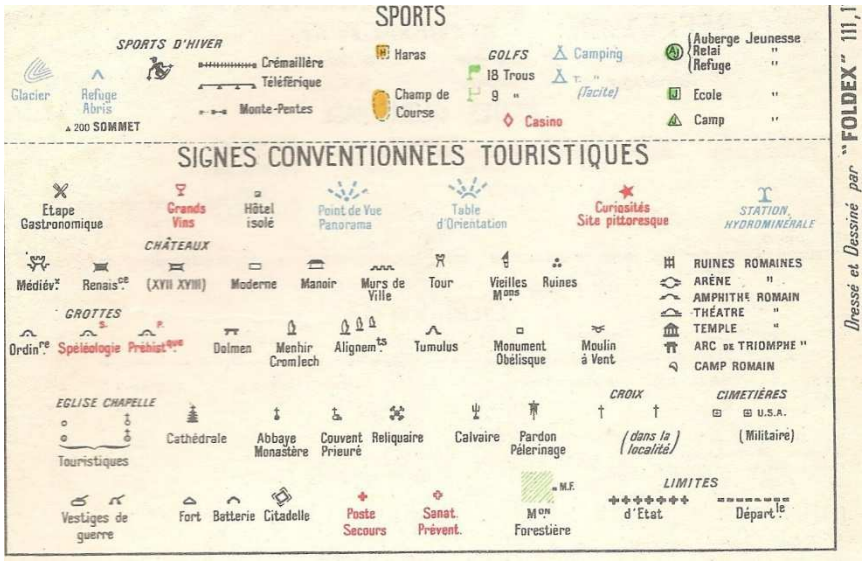


Figure 194: Extract from 1953 Shell/Foldex Bretagne [124]

1430 Historical Buildings (Castles, Churches, Ruins)

For analysis purposes these were split largely by type (e.g. castles, religious buildings, historic houses) but also by age or state (ancient, ruined…). In practice this meant there could be some ambiguity, especially where separate symbols were specified for castles and ruined castles, or ancient versus mediaeval forts (although ones still in use would appear as military/police).

Only 37% of maps used symbols in this group, with distinct national variations: no Australian maps, just one each from Canada and Thailand and a handful in USA (which relied instead on a catch-all "other point of interest" classification) were offset by between a half and two-thirds of maps showing symbols in Italy, the Netherlands, Germany and the UK. As with the other point symbol categories there was a general tendency for there to be more symbols used on more recent maps, especially since the 1960s. However, the c1939 Shell/Foldex map [5] from the UK had many composite symbols, especially around archaelogical (*sic*} and architectural sites and buildings – there were 8 symbols for each of structures and events by era, with an additional one for American historical associations, and non-ecclesiastical sites and buildings are split into 14 categories. This is a distinctively Foldex trait; the 1953 Shell/Foldex of Brittany [124] had a total of 34 different symbols in this category, including 10 for types of church, abbey, calvary or other place of pilgrimage, and 7 distinct symbols for type of Roman ruin.

Within the category overall, castles, then churches/abbeys/priories were most commonly found. British maps tended to have a single type of castle and one or two religious buildings; those from Germany tended to use multiple symbols. Dutch maps regularly showed castles and ancient monuments, but almost never religious buildings. Historic houses were a British speciality, often indicating if they were owned by the National Trust. Only 5% of the sample showed battlefield sites, all but one of which were in the UK (and mainly related to the Civil War), but had different US states been selected, examples may have been found there, too.

1440 Cultural: Museums, Galleries, Theatres, Music

This category appears most frequently on larger scale maps of urban areas but infrequently on road maps at 1:200,000 or smaller scales. Comparing percentages between countries would have required a larger sample size, but the features appeared most on European maps, especially the UK. Those identified included industrial heritage, such as preserved steam railways and zoos or wildlife parks, rather than more urban features.

Several of the North American maps that, due to limitations of scale, failed to mark cultural attractions on the main map, did however include selected features on inset city maps (which were not captured in the analysis) but without using distinctive symbols. For example, the Esso Atlantic Provinces issues [293, 297] with General Drafting cartography used a red square for cultural locations (gardens, theatres, universities) but black for primarily administrative ones: this distinction was not explained in the legend, which showed both as "points of interest". After Esso switched to Rolph McNally, cultural sites were dropped and only official buildings were marked in black [302].

Figure 195: Canterbury from 1990 BP/AA map

As a generalisation, later maps tended to carry more symbols, which would often require users to check the legend for their exact meaning. The extract from a 1990 BP map of South East England [37] uses AA cartography, shared by later Shell and Esso maps. Urban attractions are in yellow boxes, eliminating the need for them to be exactly located, but non-urban ones are in their exact positions. The plethora of symbols here included distinctive ones for zoos (an elephant, Howletts on the map), wildlife collections – mammals (a rhino, Brambles on the map) and wildlife collections – birds (a parrot, unnamed to the East of Highstreet). The duck beneath Highstreet denoted a more general nature reserve. Although museums (or art galleries) are shown, theatres are not. The middle two symbols on the top boxed row show Canterbury has both a cathedral and a ruined abbey.

1450 Sport Facilities/Stadiums

This is another category that was more frequently shown on larger scale maps or inset city plans, although over one-third of the main maps included some features – mainly skiing centres, golf courses and swimming pools. Here the sample selection affects the percentages – the German sectional maps were largely in the Northwest (Hannover to Hamburg) where there are no ski slopes – although some maps did keep them in the legend; mountain railways or chairlifts were considered in the skiing category (although they may also be used for summer hiking). So the c1956 AVIA map 1 of West Germany [176] only covered the country as far South as Hamburg, which is largely flat, yet included a symbol for "*Bergbahn, Berglift*" (mountain railways and ski-lifts). The extract of Canterbury shown above (Figure 195) includes a distinctively English County Cricket Ground; the legend also allows the possibility of separately identified artificial and natural ski slopes.

The Italian company AGIP has at least twice produced dedicated ski maps, apparently bespoke to the company – showing resorts and facilities, not the layout of pistes – of Italy [507] and the Austrian province of Kärnten (Carinthia) [504].

The social status of early motorists can be detected in the appearance of golf courses as far back the 1905 Pratt's atlas. Golf courses on maps were most common on British maps (40%), although they appeared in most other countries except Thailand and Canada. In contrast, more working-class pastimes such as football grounds appear less frequently, and on only on later maps. Total issued multilingual maps of France in two versions (EN/FR and EN/DE) specifically to show the locations of stadia for the France 98 football World Cup [159, 655], and there was a 2002 national map of Belgium co-produced by Genk football club and local Esso dealers that marked all the main Belgian football grounds [548]. This broadly accords with the view that football has only been socially acceptable to the middle classes since the 1950s (Holt and Mason, 2000, although challenged by Taylor, 2015). Contrastingly, oil companies have occasionally issued or modified maps for the Olympic Games; as the earliest example was for Berlin in 1936, where Leuna pasted a map of the stadium into their city plan [582].

Also aimed at fans, not active participants, British maps sometimes showed motor-racing circuits or horse-racing courses (40% in each case). Racecourses were first shown on the early 1920s BP map [2].

1460 Accommodation, Food

This final category is considerably open to commercial influences – no road map in the scales reviewed could reasonably be expected to show all accommodations or restaurants. In practice, accommodation is mainly restricted to campsites, appearing on almost one-third of maps in the sample, with only 10% showing any type of hotel (Figure 192). Despite the low density of settlements, Australian maps did not show accommodation or its rural "roadhouses".

Paid-for hotels appear on Standard (Amoco) maps produced in the 1960s-70s by its Tempo Designs subsidiary. These appeared as numbered blue discs, keyed to a list in the margins. Comparing the two such maps in the sample, both of Michigan, the number of hotels/restaurants dropped from 52 in 1967 [73] to 20 in 1973 [81]. Most were independent businesses, although those in the Albert Pick chain were always shown. Some Italian maps also marked chain motels – AGIP maps showed its own AGIP motels and Shell maps the third-party Jolly Hotels. In the 1960s Esso started a small chain of Esso Motor Hotels which operated in several countries, and these are shown on relevant maps. German maps tended to show isolated hotels such as mountain huts (AVIA 1989 [200], Esso, 1995 [202]), *Kurhaus* (Shell, 1956 [177]} or *Forsthaus* (Total, 1962 [182]), or accommodation on the autobahns. These would appear to have been selected by the cartographer and not as part of a joint promotion.

Restaurants are even rarer, but apart from motorway service areas (covered under roadside facilities) are more likely to be sponsored (again commonly on Standard/Amoco issues) or own branded. Aral took this to extremes in a 2004 A5 format atlas that solely promoted its Petit Bistro cafés [521], although it was still described as a *Tankstellenverzeichnis* (petrol station directory).

The absence of shared maps is possibly surprising, although some hotel chains (notably Best Western in several countries) and restaurants (McDonalds, in several countries, Little Chef in the UK) at various times issued maps showing their locations. The examples found in the sample were all oil company led, rather than giving equal weight to the two functions.

Campsites were more widely shown, especially on North American maps. These were often associated with national or state parks, but the 1997 Husky map of Alberta [303], using the official state cartography, also distinguished between federal or provincial campgrounds and those that were "commercial or municipally approved".

6.4. Non-cartographic Elements

Non-cartographic elements have been sub-divided into those that are graphical, including charts, pictorial – typically drawings or photographs – and purely textual. In practice, functions have been assigned to categories, with the mileage chart or table treated as a graphical element whether it is drawn as a schematic map, a table (triangular or square) or a simpler listing. Gazetteers, which were sometimes printed on the rear of the map are treated as a textual element, although the number of interspersed photos of sketches of place of interest are recorded under pictorial elements (usually under category 2230).

6.4.1. Graphical Elements (2100)

2110 Legend and Scale Bar

This grouping is used to describe elements to help the user interpret the map. Only four, early, maps carried no such information – one from the UK [BP, c1931 [3]), and the three pre-war maps from Italy [92-4].

For a map without a legend or any indication of scale, the 1933 AGIP map of Italy [94; Figure 196] shows

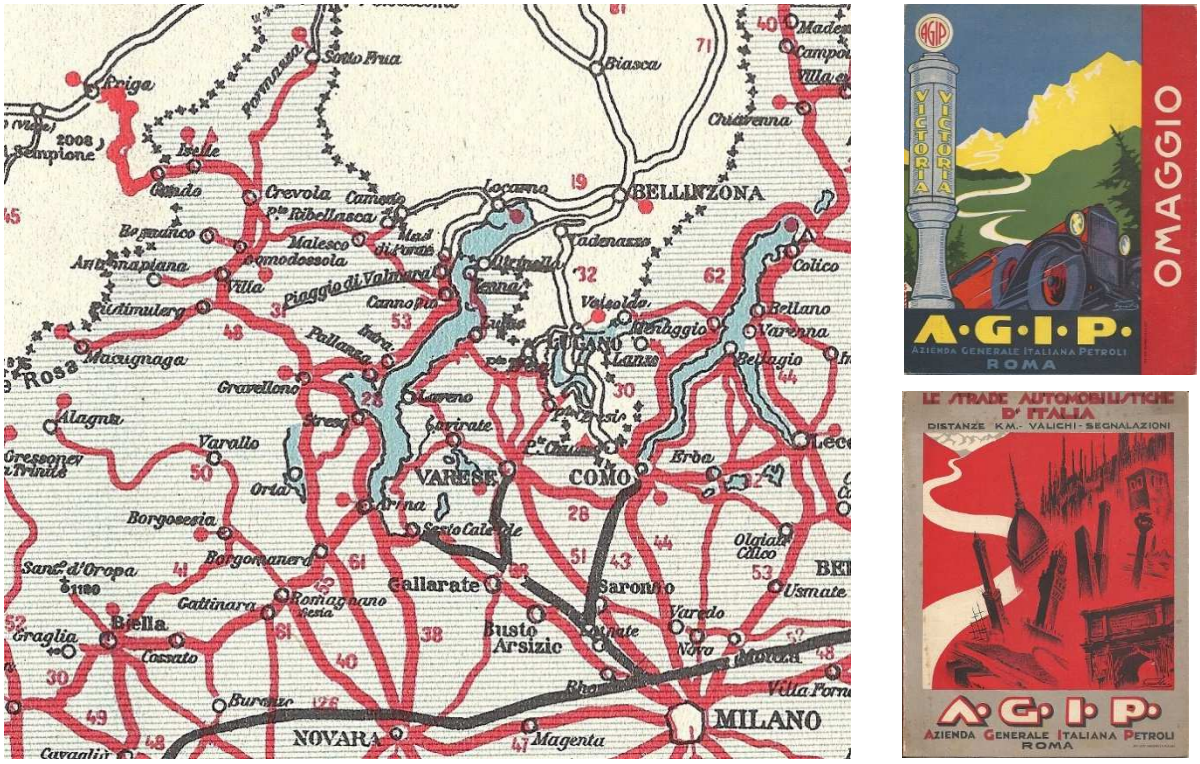


Figure 196: 1933 AGIP map of Italy - extract and front/rear covers [94]

an expectation of a degree of sophistication from its users. Primarily a road map, it shows three grades of road in Italy (major and minor in red, plus black *autostrade*), with two grades in Switzerland. Main roads have distances in kilometres between red flags and the national boundary has a clear linear symbol. The approximate areas of major towns are shown. Lakes are shown, but not rivers. Less obvious are symbols for mountain passes (the *Simplone* is named with its associated height of 2008m) and pilgrimage churches (*Sancº d'Oropa* is near the West edge of the extract, also with its altitude, and the symbol is repeated just to its South, sideways, beneath Graglia). This map, in its colourful card covers, was given away freely to the limited number of Italian motorists. The inside covers carried an advert for the five types of fuel sold by AGIP, and a panel depicting road signs, "light signals and policemen's hand signalling" in four languages.

On most maps where legends were provided, all symbols used on the map were explained, although water features shown on the map were sometimes omitted from the legend (eg. B/A Ontario 1929 [276], 1939 [280], 1954 [286]) and even a move to a natural legend in the 1960s [292] showed a

watercourse with a ferry and a bridge, but did not feel the need to explain the meaning of the actual water feature). In the 1960s Esso UK maps [21] included the linear canal symbol, but not rivers – but by the time of the 1991 AA cartography [39] explained both. As a rule of thumb, later legends carried more information than earlier ones, even when the symbol set was similar.

Natural legends also appeared selectively on later maps, such as in the example shown in Figure 197 from a 1961 B/A map [292].

Figure 197: Natural legend on a 1961 B/A map

Scale bars were commonly used, appearing on 86% of the sample, and almost all maps from USA, Canada and Australia. In contrast, fewer than 15% of the Australian maps stated an actual scale – possibly owing to the relatively large areas covered and projections used. Older North America maps more rarely quoted a scale, and were more likely just to express it in the format of 1 inch = nn miles. German, French and Dutch maps all preferred to quote a scale (generally in the format of 1:nnn 000) than to use a scale bar. North American scales sometimes translated to convenient metric scales, but were still expressed as (e.g.) "one inch equals approximately 25.5 miles" (Texaco/Gousha, 1970 [79]). British maps tended to be expressed as exact miles to the inch (typically 4, 5 or 6) until partial metrication in the 1970s, when Shell/BP maps, for example, switched to "1:200,000 Approx 1 inch = 3 miles" [33].

Languages

All maps examined had at least some text, so used at least one language. 35% used more than one, most frequently in the legend, although there were no such examples from USA or Australia, all of which were solely in English. All Thai maps were bilingual Thai and English.

All Canadian maps examined used English, with exactly half the sample also using French. Canadian maps could be inconsistent in their use of language; a 1957 BP map of Quebec [529] has an English language front cover and "mileage chart", uses both languages in the legends, but the list of sights is only headed in French as "*endroits intéressants*". By 1972 the cover was in French and all internal text in both languages. A similar pattern can be shown on Shell maps of Ontario: its 1930 edition [278] was wholly in English; by 1962 [294] it had become bilingual. No Canadian maps used any of the first nation

languages; although Inuktitut has been an official language of Nunavut since 2008 (Lepage, 2019), all known oil company issues predate this.

It was only in Europe that cross-border languages were sometimes used. These were most common in Italy and the Netherlands (both over 75%) and least common in the UK (9%). Italian and Dutch maps typically used four languages, each adding English, French and German to their home tongue. Within the UK, only the sole Bartholomew production (Amoco, 1977 [29]) and most of the AA editions had multiple languages, although the almost identical 1990 issues from Shell [38] and BP [37] differed, with BP's edition being monolingual.

With the rise of immigration from Eastern and Southern Europe, some post-unification maps of Germany featured as many as eight languages: the youngest Aral map [209] included English, French, Italian, Polish, Czech, Hungarian and Turkish. Aral worked closely with its cartographer (Busche) to produce a bespoke map so would have had a say in the choice of languages; however when it added its covers to a stock 2003 Mairs/Falk map of the Czech Republic [515], the cartographer's language choice was English, French, Italian, Spanish, Slovak and Dutch as well as the expected German and Czech; its Polish maps produced by Daunpol [522] were in Polish and the three main Western languages; and a 2000 Austrian Aral map [514] was just in English and German.

2120 Compass Rose/Grid lines

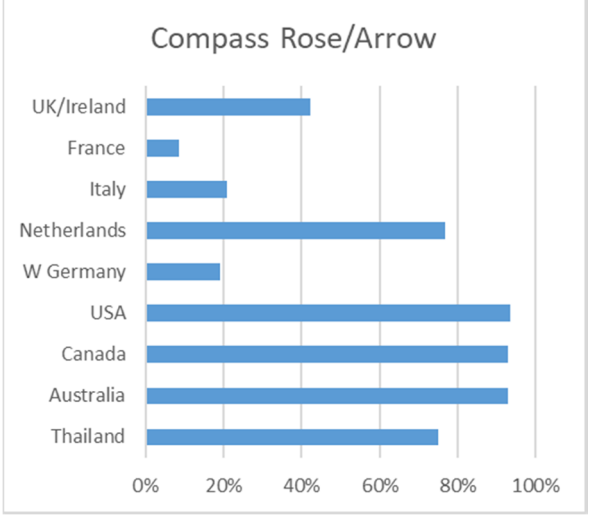


Figure 198: Frequency of Compass Roses

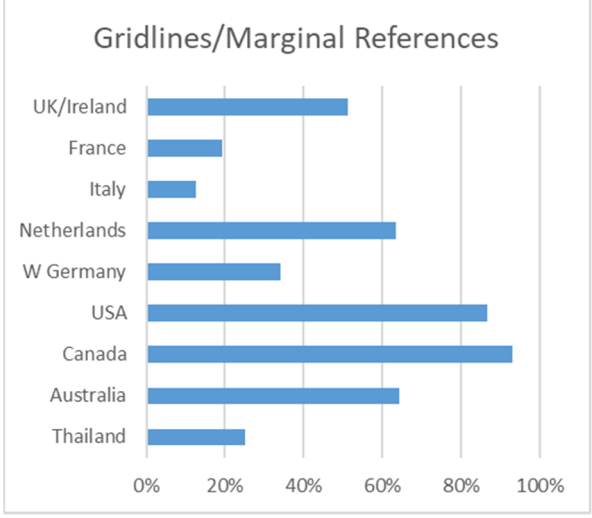


Figure 199: Frequency of Grid lines/marginal refs

Just over half the maps showed a compass rose or other form of North arrow. However this was another feature where there was a notable Europe/Rest of World split: over 90% of North American and Australian maps had this feature, but no more than a fifth of those from France, Germany or Italy (although three-quarters of Dutch maps did so). In part this followed the nature of the maps; those with inset city plans – common on state or provincial maps – tended to include multiple compass roses, not least because some of these insets were oriented to best fit a small plan, rather than with North

conventionally to the top. And where inset maps showed North, so too did most of the main maps. In contrast, sectional maps (most common in the German, British and Italian examples) tended to lack inset city plans and to be rigorously aligned to North.

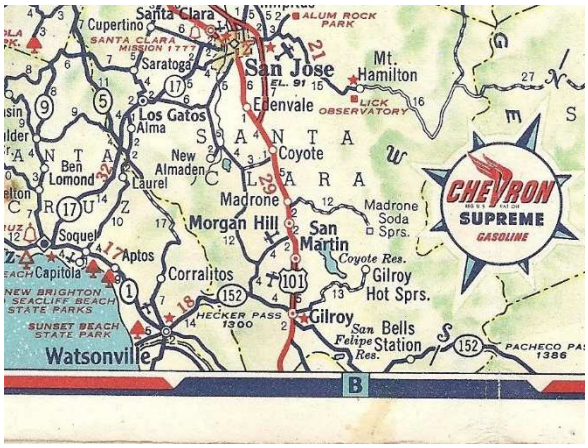


Figure 200: Compass Rose on 1951 Chevron California [60]

California posed a particular problem for US cartographers wishing to minimise paper use. As a result it was frequently broken in Northern and Southern sections laid onto a single side of a paper map to fit. Chevron's 1951 map in booklet form [60] gave each page a different orientation; however the large scale maps of San Francisco and Los Angeles both kept North at the top of the map. In the extract shown the "N" above the rose is almost lost in the bend of the minor road.

The three Shell maps in the sample that placed the entire state of California onto a single side used different orientations. In 1938, Gousha placed it slightly off North, but kept all text on a West-East line, so it appeared at a slight slant. For 1967, Diversified Map Corp North was strictly at the top of the sheet. By 1973, back with Gousha, North was almost 45° off true.

Grid lines or marginal markings were also commonplace – the Chevron map in Figure 200 is an example of the use of the latter without grid lines. In most cases the grid was purely Cartesian, but occasionally maps used lines of latitude and longitude instead (Caltex Ireland, 1958 [42]; Esso Italia Nord, 1962 [102]). Even where latitude/longitude were shown, they did not always align with the grid, but were sometimes just shown in the map borders. Before the ubiquity of satnavs, this information would have been of relatively limited use. Another less common system printed square references in the grid on the face of the map (Mobilgas/Foldex, NY [66]), rather than keyed to letters or numbers in the border; this approach was also used on some French and German maps. The earliest Esso UK

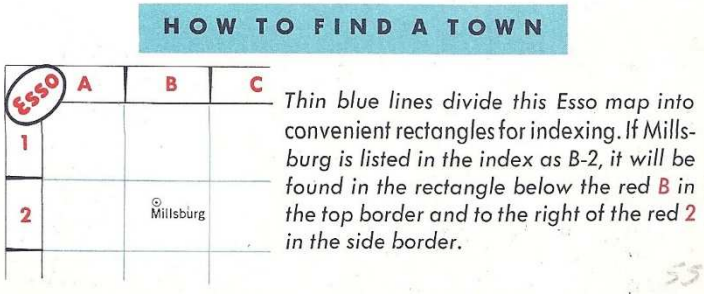


Figure 201: Explanation of using grid references were only rarely seen on maps (Esso, New York, 1955, [63])

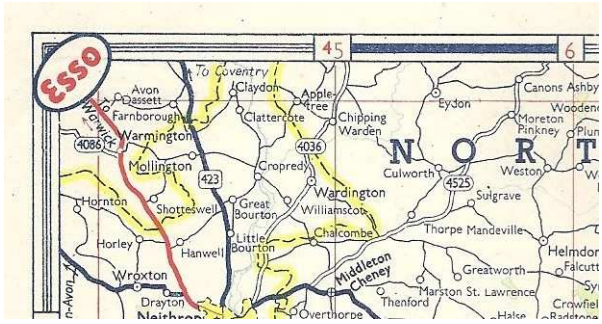


Figure 202: National Grid coordinates on UK Esso map [6]

maps (c1949, [6]) utilised the National Grid (and main grid square numbers were shown on the map itself).

No maps in the sample used a radial system, although this is known from a few German Shell atlases, where a clear plastic sheet printed with the radial coordinates could be overlaid on each map page.

2130 Mileage/Driving Time Chart

Distance tables (mileage charts) first appeared on maps in the sixteenth century (Deamo-Smith 2006). On oil company road maps there are four basic types of chart –

i. a graphical presentation with distances and/or times shown in a broadly spatial arrangement;
ii. the common triangular chart (distance table) with rows and columns for each location – this can be symmetrical or, less commonly, may have more locations on the rows;
iii. a list format, where distances to each destination are listed under the starting point, a format used mainly on North American maps; and
iv. a table of distances along selected routes from a starting point or between localities (e.g. Italian *autostrade* on BP, c1966, [105]).

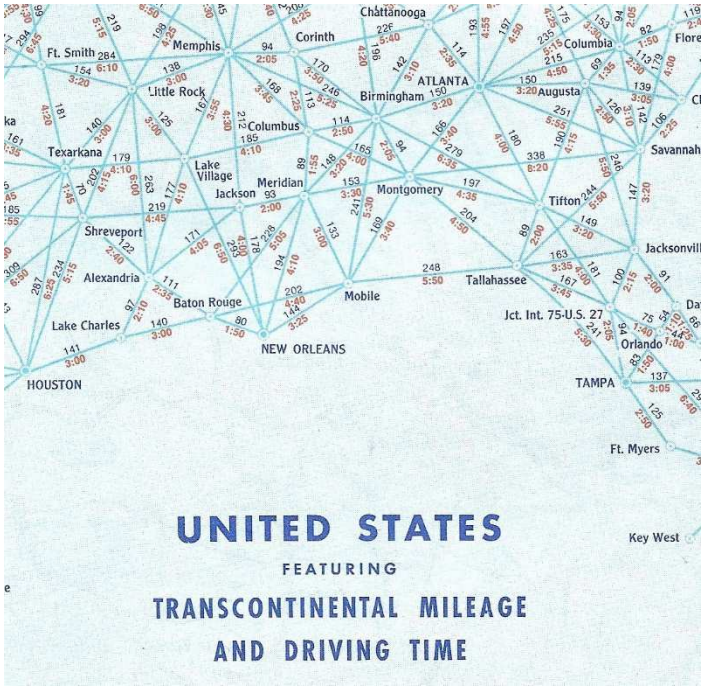


Figure 203: Combined mileage and travel time cartogram [84]

Just four maps in the sample showed any indication of travel times. The 1982 Texaco Ireland [44] had a simple table with typical journey times for 9 common trips – an approach of limited value as, for example, Killarney was only linked to Rosslare Harbour. The 1977 Gulf regional US maps [84] combined travel times with mileages in a cartogram (Figure 203); this

656230	Akron, Ohio	Atlanta, Ga.	Baltimore, Md.	Birmingham, Ala.	Boston, Mass.	Buffalo, N.Y.	Chicago, Ill.	Cincinnati, Ohio	Cleveland, Ohio	Columbus, Ohio	Detroit, Mich.	Indianapolis, Ind.	Jacksonville, Fla.	Louisville, Ky.	Memphis, Tenn.	Milwaukee, Wis.	Montreal, Que.	New Orleans, La.	New York, N.Y.	Philadelphia, Pa.	Pittsburgh, Pa.	Tampa, Fla.	Toledo, Ohio	Washington, D.C.
Akron, Ohio		668	321	698	651	207	346	226	32	119	172	288	919	336	705	435	588	1045	472	393	105	1097	120	326
Albany, N.Y.	491	986	317	1080	167	286	811	707	470	605	538	761	1110	817	1188	893	231	1435	155	233	445	1298	580	356
Atlanta, Ga.	668		671	154	1072	877	692	461	691	549	718	508	314	394	366	781	1212	501	866	768	697	467	661	630
Baltimore, Md.	321	671		787	399	345	667	494	351	392	498	564	795	604	949	756	547	1144	197	97	219	983	441	41
Birmingham, Ala.	698	154	787		1190	907	652	474	715	579	731	480	421	366	247	740	1288	347	984	884	742	541	674	748
Boston, Mass.	651	1072	399	1190		447	967	852	629	750	699	922	1191	962	1326	1056	316	1540	216	304	577	1379	738	437
Buffalo, N.Y	207	877	345	907	447		527	430	191	328	269	484	1067	545	909	618	385	1250	453	354	221	1248	296	359
Chicago, Ill.	346	692	667	652	967	527		292	341	306	271	186	1006	298	538	89	850	927	816	739	448	1159	239	672
Cincinnati, Ohio	226	461	494	474	852	430	292		241	109	256	107	775	113	479	381	810	820	648	566	284	928	208	492
Cleveland, Ohio	32	691	351	715	629	191	341	241		139	167	295	944	351	720	427	567	1061	482	415	138	1122	110	351
Columbia, S. Car.	626	215	510	367	911	770	785	517	655	544	733	601	297	499	581	874	1054	709	705	605	568	478	676	469
Columbus, Ohio	119	549	392	579	750	328	306	109	139		189	172	807	217	586	355	709	926	546	464	191	986	141	402
Detroit, Mich.	172	718	498	731	699	269	271	256	167	189		277	996	366	713	354	585	1076	647	570	378	1174	61	503
Evansville, Ind.	450	415	718	364	1076	651	292	294	462	331	444	121	799	127	278	380	1029	642	872	750	598	873	388	716
Harrisburg, Pa.	294	719	79	812	385	294	640	469	316	365	471	537	855	577	941	729	498	1167	178	105	200	1036	414	116
Indianapolis, Ind.	288	508	564	480	922	484	186	107	295	172	277		822	112	436	273	862	805	718	636	354	975	221	564
Jacksonville, Fla.	919	314	795	421	1191	1067	1006	775	944	807	996	822		708	668	1095	1340	570	990	890	865	229	939	754
Louisville, Ky.	336	394	604	366	962	545	298	113	351	217	366	112	708		369	387	920	710	758	676	394	861	310	596
Memphis, Tenn.	705	366	949	247	1326	909	538	479	720	586	713	436	668	369		619	1287	394	1122	1044	758	779	657	908
Miami, Fla.	1270	665	1146	765	1542	1418	1357	1126	1295	1158	1347	1173	351	1059	1011	1446	1691	875	1341	1241	1216	254	1290	1105
Milwaukee, Wis.	435	781	756	740	1056	618	89	381	427	395	351	273	1095	387	619		939	1008	905	828	537	1248	318	761
Montgomery, Ala.	775	173	843	94	1239	984	748	563	795	656	819	576	348	462	334	836	1360	328	1038	938	819	445	763	802
Montreal, Que.	588	1212	547	1288	316	385	850	810	567	709	585	862	1340	920	1287	939		1628	388	458	587	1528	642	586
Nashville, Tenn.	515	256	727	187	1123	720	447	290	531	396	546	294	570	180	200	535	1098	534	922	822	550	714	490	686
New Orleans, La.	1045	501	1144	347	1540	1250	927	820	1051	926	1076	805	570	710	394	1008	1628		1339	1239	1089	643	1020	1103
New York, N.Y.	472	866	197	984	216	453	816	648	482	546	647	718	990	758	1122	905	388	1339		93	373	1178	590	229
Philadelphia, Pa.	393	768	97	884	304	354	739	566	415	464	570	636	890	676	1044	828	458	1239	93		291	1078	513	136
Pittsburgh, Pa.	105	697	219	742	577	221	448	284	138	191	279	354	865	394	758	537	587	1089	373	291		1046	222	245
Quebec, Que.	740	1364	703	1436	390	537	1002	962	721	866	737	1014	1492	1072	1439	1091	153	1780	540	610	739	1680	794	738
Raleigh, N. Car.	540	396	305	548	701	602	790	526	562	498	687	634	492	551	748	879	880	908	800	400	448	680	630	264
Richmond, Va.	409	533	150	685	546	461	754	508	431	453	586	609	645	580	846	843	695	1040	345	245	307	833	529	109
Rochester, N.Y.	282	948	329	971	384	75	598	497	257	399	327	551	1098	607	977	683	313	1318	316	308	278	1279	367	368
Tampa, Fla.	1097	467	983	541	1379	1248	1159	926	1122	985	1174	975	229	861	779	1248	1528	643	1178	1078	1046		1117	942
Toledo, Ohio	120	661	441	674	738	296	239	208	110	141	61	221	939	310	657	318	642	1020	590	513	222	1117		446
Toronto, Ont.	313	949	451	963	548	102	498	489	292	422	238	510	1173	569	946	587	332	1309	479	460	317	1354	290	465
Washington, D.C.	326	630	41	748	437	359	672	492	351	402	503	564	764	596	908	761	586	1103	229	136	245	942	446	

EASTERN UNITED STATES MILEAGE CHART

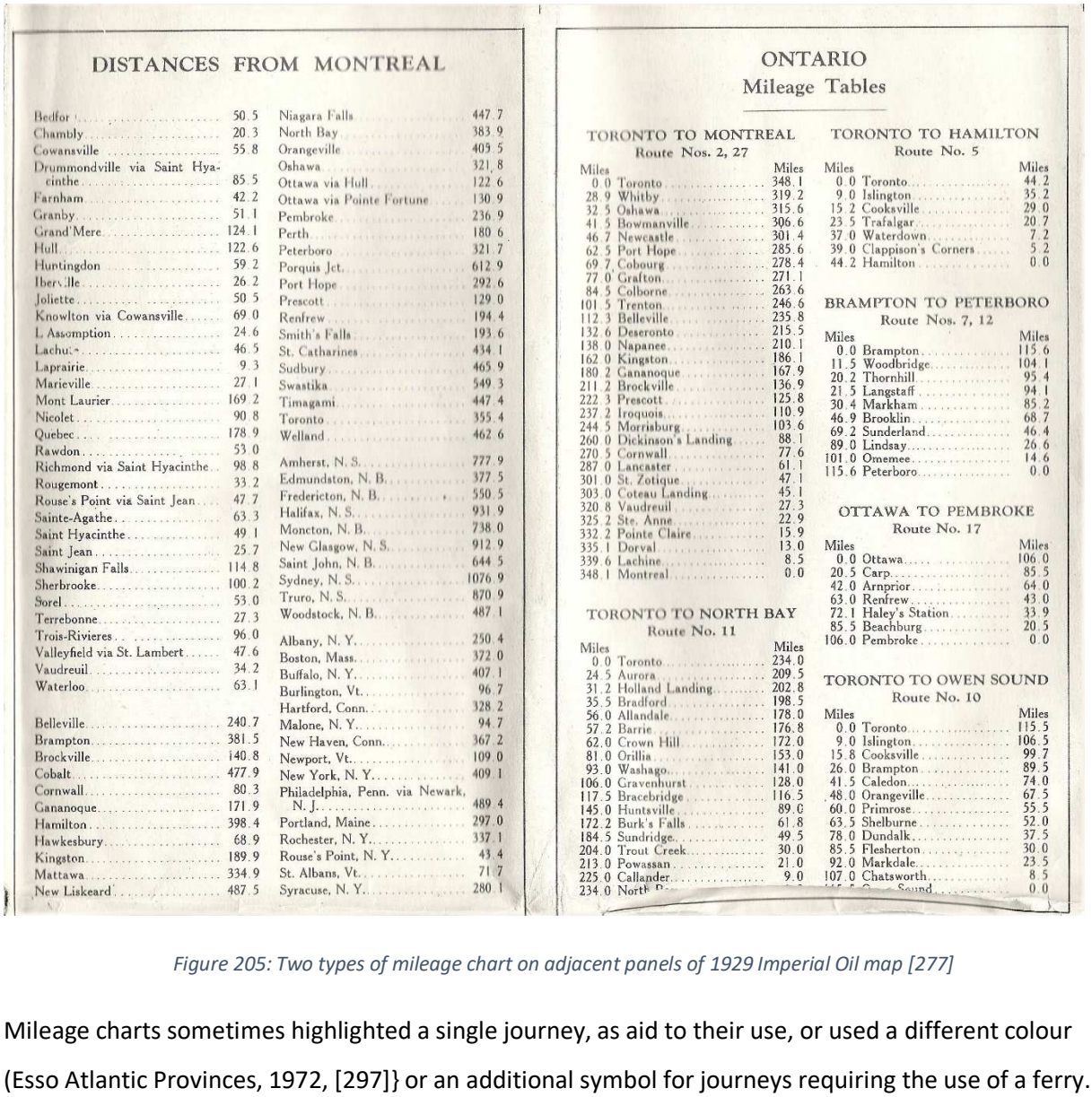
LIMITED ACCESS HIGHWAYS HAVE BEEN UTILIZED IN COMPUTATIONS WHERE MOST PRACTICAL EVEN THOUGH NOT THE SHORTEST ROUTE

Figure 204: Conventional mileage chart from the 1977 Gulf map [84]

took an accurate geospatial arrangement. However as longer journeys would have required summation of several distances, the map also included a conventional mileage chart (Figure 204), without showing times – not all cities appeared on both the *x* and *y* axes.

The 1905 Pratt's atlas [1] included a different table, showing speeds related to the time to travel one mile.

All maps in the sample from Canada and Thailand had one form or other of mileage table. In contrast, only around a sixth of maps from the UK or France did so. The 1929 Imperial Oil Eastern Canada and NE United States [277] (Figure 205) devoted almost half its reverse side (10/24 panels) to several tables arranged along key routes, split by province or region, in addition to a separate table of distances from Montreal. This map showed distances to the nearest 0.1 mile.



DISTANCES FROM MONTREAL

Bedford	50.5	Niagara Falls	447.7
Chambly	20.3	North Bay	383.9
Cowansville	55.8	Orangeville	409.5
Drummondville via Saint Hyacinthe	85.5	Oshawa	321.8
Farnham	42.2	Ottawa via Hull	122.6
Granby	51.1	Ottawa via Pointe Fortune	130.9
Grand'Mere	124.1	Pembroke	236.9
Hull	122.6	Perth	180.6
Huntingdon	59.2	Peterboro	321.7
Iberville	26.2	Porquis Jct.	612.9
Joliette	50.5	Port Hope	292.6
Knowlton via Cowansville	69.0	Prescott	129.0
L'Assomption	24.6	Renfrew	194.4
Lachute	46.5	Smith's Falls	193.6
Laprairie	9.3	St. Catharines	434.1
Marieville	27.1	Sudbury	465.9
Mont Laurier	169.2	Swastika	549.3
Nicolet	90.8	Timagami	447.4
Quebec	178.9	Toronto	355.4
Rawdon	53.0	Welland	462.6
Richmond via Saint Hyacinthe	98.8		
Rougemont	33.2	Amherst, N.S.	777.9
Rouse's Point via Saint Jean	47.7	Edmundston, N.B.	377.5
Sainte-Agathe	63.3	Fredericton, N.B.	550.5
Saint Hyacinthe	49.1	Halifax, N.S.	931.9
Saint Jean	25.7	Moncton, N.B.	738.0
Shawinigan Falls	114.8	New Glasgow, N.S.	912.9
Sherbrooke	100.2	Saint John, N.B.	644.5
Sorel	53.0	Sydney, N.S.	1076.9
Terrebonne	27.3	Truro, N.S.	870.9
Trois-Rivieres	96.0	Woodstock, N.B.	487.1
Valleyfield via St. Lambert	47.6		
Vaudreuil	34.2	Albany, N.Y.	250.4
Waterloo	63.1	Boston, Mass.	372.0
		Buffalo, N.Y.	407.1
Belleville	240.7	Burlington, Vt.	96.7
Brampton	381.5	Hartford, Conn.	328.2
Brockville	140.8	Malone, N.Y.	94.7
Cobalt	477.9	New Haven, Conn.	367.2
Cornwall	80.3	Newport, Vt.	109.0
Gananoque	171.9	New York, N.Y.	409.1
Hamilton	398.4	Philadelphia, Penn. via Newark, N.J.	489.4
Hawkesbury	68.9	Portland, Maine	297.0
Kingston	189.9	Rochester, N.Y.	337.1
Mattawa	334.9	Rouse's Point, N.Y.	43.4
New Liskeard	487.5	St. Albans, Vt.	71.7
		Syracuse, N.Y.	280.1

ONTARIO
Mileage Tables

TORONTO TO MONTREAL
Route Nos. 2, 27

Miles		Miles
0.0	Toronto	348.1
28.9	Whitby	319.2
32.5	Oshawa	315.6
41.5	Bowmanville	306.6
46.7	Newcastle	301.4
62.5	Port Hope	285.6
69.7	Cobourg	278.4
77.0	Grafton	271.1
84.5	Colborne	263.6
101.5	Trenton	246.6
112.3	Belleville	235.8
132.6	Deseronto	215.5
138.0	Napanee	210.1
162.0	Kingston	186.1
180.2	Gananoque	167.9
211.2	Brockville	136.9
222.3	Prescott	125.8
237.2	Iroquois	110.9
244.5	Morrisburg	103.6
260.0	Dickinson's Landing	88.1
270.5	Cornwall	77.6
287.0	Lancaster	61.1
301.0	St. Zotique	47.1
303.0	Coteau Landing	45.1
320.8	Vaudreuil	27.3
325.2	Ste. Anne	22.9
332.2	Pointe Claire	15.9
335.1	Dorval	13.0
339.6	Lachine	8.5
348.1	Montreal	0.0

TORONTO TO NORTH BAY
Route No. 11

Miles		Miles
0.0	Toronto	234.0
24.5	Aurora	209.5
31.2	Holland Landing	202.8
35.5	Bradford	198.5
56.0	Allandale	178.0
57.2	Barrie	176.8
62.0	Crown Hill	172.0
81.0	Orillia	153.0
93.0	Washago	141.0
106.0	Gravenhurst	128.0
117.5	Bracebridge	116.5
145.0	Huntsville	89.0
172.2	Burk's Falls	61.8
184.5	Sundridge	49.5
204.0	Trout Creek	30.0
213.0	Powassan	21.0
225.0	Callander	9.0
234.0	North B...	

TORONTO TO HAMILTON
Route No. 5

Miles		Miles
0.0	Toronto	44.2
9.0	Islington	35.2
15.2	Cooksville	29.0
23.5	Trafalgar	20.7
37.0	Waterdown	7.2
39.0	Clappison's Corners	5.2
44.2	Hamilton	0.0

BRAMPTON TO PETERBORO
Route Nos. 7, 12

Miles		Miles
0.0	Brampton	115.6
11.5	Woodbridge	104.1
20.2	Thornhill	95.4
21.5	Langstaff	94.1
30.4	Markham	85.2
46.9	Brooklin	68.7
69.2	Sunderland	46.4
89.0	Lindsay	26.6
101.0	Omemee	14.6
115.6	Peterboro	0.0

OTTAWA TO PEMBROKE
Route No. 17

Miles		Miles
0.0	Ottawa	106.0
20.5	Carp	85.5
42.0	Arnprior	64.0
63.0	Renfrew	43.0
72.1	Haley's Station	33.9
85.5	Beachburg	20.5
106.0	Pembroke	0.0

TORONTO TO OWEN SOUND
Route No. 10

Miles		Miles
0.0	Toronto	115.5
9.0	Islington	106.5
15.8	Cooksville	99.7
26.0	Brampton	89.5
41.5	Caledon	74.0
48.0	Orangeville	67.5
60.0	Primrose	55.5
63.5	Shelburne	52.0
78.0	Dundalk	37.5
85.5	Flesherton	30.0
92.0	Markdale	23.5
107.0	Chatsworth	8.5
	... Sound	0.0

Figure 205: Two types of mileage chart on adjacent panels of 1929 Imperial Oil map [277]

Mileage charts sometimes highlighted a single journey, as aid to their use, or used a different colour (Esso Atlantic Provinces, 1972, [297]} or an additional symbol for journeys requiring the use of a ferry.

2140 Sheet Index

A sheet index is most helpful where the sheets do not follow political or natural boundaries. As such they were most commonly seen on UK and German maps, which tended to divide the country into rectangular sections: three-quarters of each country's maps had an index map, often on the rear cover, but occasionally on the front or inside. 5% of maps had a text list of available sheets, sometimes adjacent to an index map. 18% indicated adjacent sheets, either in the margins around the map, or as a text box on the adjacent territory – in the US often using a formulation like "A*djoining Esso Road Map may be obtained from Esso Dealers in New England*" (Esso, New York, 1955 [63]). Text listings of all available sheets were rarely encountered.

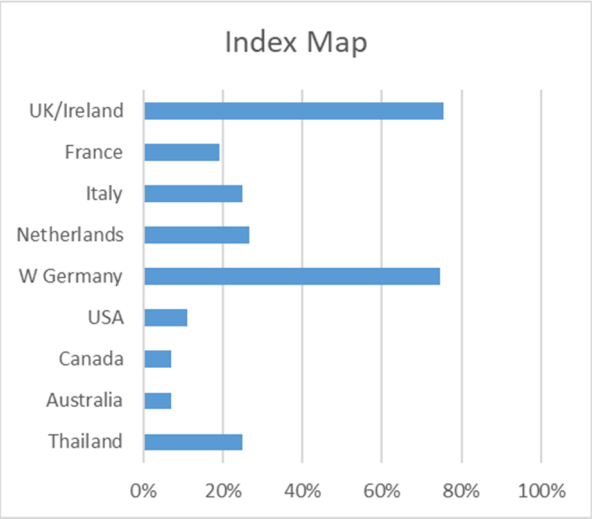


Figure 206: Index maps were found mainly in countries with numbered sections

2150 Road Signs

Commonly found in road atlases in Europe, to show specific national signs or variants, panels showing road signs are less common on sheet maps, with just over 10% of the sample including them.

Figure 207: Road Signs from 1939 BP-Olex map [169] - these are essentially the same as those in the 1949 UN Protocol

They were most common in Italy, but with several examples from Thailand and the UK, starting with the 1905 Pratt's atlas but also after the adoption of international signs in 1965 recommended by the Warboys Committee Report (Warboys 1963). These largely adopted those of the United Nations Conference on Motor Transport Protocol on Road Signs and Signals, of 19 September 1949 (UN 1949/1964). Although the BP-Olex sectional maps of Germany from the 1930s showed road signs, albeit in one colour only, those from BV-Aral did not. However the latter were available as a set of 12 maps in a card folder that also included a leaflet *Das Wichtigste aus dem neuen Verkehrsrecht* that included two panels showing road signs as well a summary of traffic regulations introduced in March 1934.

6.4.2. Pictorial Elements (2200)

Pictorial elements can be included either on map covers, around the borders of a map, on the plane of a map, or on separate panels adjacent to the map. These may be spatially arranged (for example by placing small sketches of points of interest close to the cities or regions with which they are associated. In undertaking the analysis they were broken down into three broad categories: those identifying a link with either the oil company of the map itself; those that related to places or points of interest in the area of the map, and those that were purely decorative. This categorisation is to some extent arbitrary, but explored a little further below. An essentially cartographic analysis of the maps (as in this thesis) will not go into detail over the image selection or iconography, or to delve too deeply into intended messages. These are covered briefly in the chapter reviewing the literature (e.g. Wood and Fels 1986).

2210 Identification

Almost all maps had some pictorial corporate identification, rather than relying on pure text:

Figure 208: Gulf, 1956 [65]

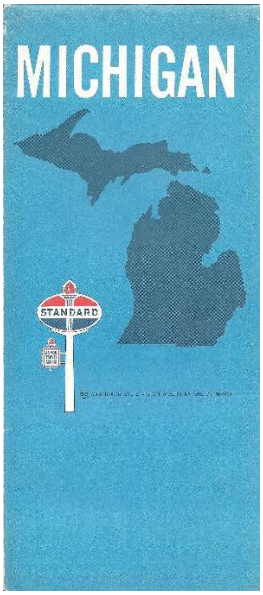


Figure 209: Standard 1967 [73]

Most (88%) included the brand's logo but a minority (13%) included some other signifier of the oil company, such as a service station, petrol pump or oil can, either in addition or instead of the logo – although these are more commonly found on maps from smaller US companies not in the sample, overprinted onto a generic map cover design. Gulf's 1956 cover design [65] (Figure 208) is a typical example of the "banjo" style used by several oil companies in the USA, but rarely elsewhere.

A second pictorial form of identification was sometimes used to show that it was a map (as opposed to some form of promotional leaflet) – generally by including an outline of the country or region covered

inside (Standard 1967 [73], Figure 209). Under 4% included an extract of the actual map inside – sometimes at a reduced scale or as a monochrome excerpt (Shell Nederland [236]). These can overlap, by showing a motorist at a service station (often in an open-top car) looking at a map (Esso 1968 New York [74], Texaco c1929 Netherlands [210]).

2220 Decorative elements

Although there is a fine dividing line from geographical illustrations, this category has been kept for purely decorative elements, not relating to the oil company or to any specific location covered by the map. It is used to describe drawings or photographs of a typical scene, wood or village, as well as more obviously folkloric images (Shell Ontario [301]), or birds, animals or vintage cars (BP Quebec [299]) – three quarters of the Canadian maps carried such images. Some firms, such as Texaco or Conoco in the USA in the 1960s used a small number of common photos across numerous different titles.

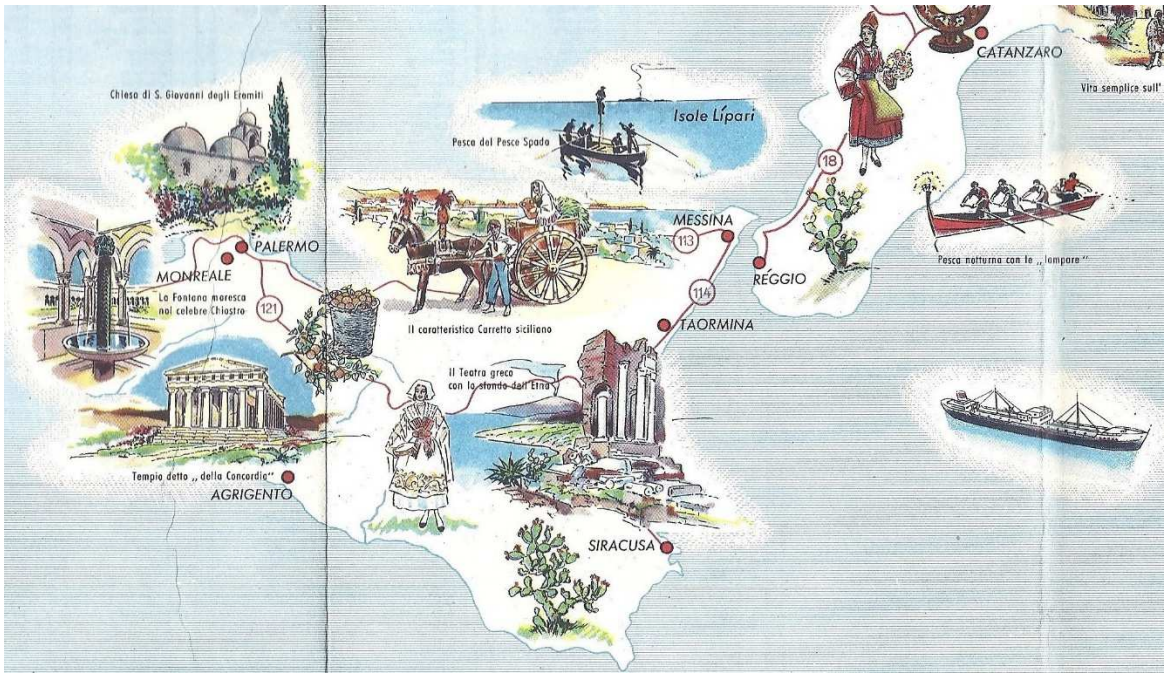


Figure 210: Extract from pictorial guide on 1955 Esso map of Italy [98].
Note the uncaptioned ladies in regional costume, prickly pear cacti and tanker.

In most markets (not the UK) Esso maps had a "pictorial guide" from the late 1940s to the mid-1950s (USA) or around 1960 (Europe) with a mix of identified local sights and generic drawings of boats, plants or people in national costume. US maps often indicated State Parks with lakes by ladies in swimsuits. However as map scales increased and more town plans were added, decorative elements were often removed. Companies using Michelin maps as their base retained the humorous cartoons of Mr Bibendum in the sea (Mobilgas [127], Avia [132]). Decorative elements were occasionally also used to fill in the blank spaces on maps.

Cover images could be provided by either by the cartographer or the oil company itself. A clear example of the former is the way Rand McNally reused certain generic images for different companies, including that of a smiling forecourt attendant (Spaid 2022); all the big US cartographers produced generic illustrations that could be used by mainly smaller oil companies (Wimer 2010). But evidence of an oil company providing images comes from Shell's photographic covers from the mid-1960s; the 1967 California map [72] by HM Gousha used the same cover photo of a road passing through a redwood forest as the following year's edition produced by Diversified Map Co [78]. Shell likewise reused photos on its Gousha and Donnelley version of its North Carolina maps. More commonly, oil companies would provide their cartographers with advertising images that could be used in several countries, such as those on the rear cover of European Chevron maps – the service station drawn on the Italy-Sud map [107] reappeared on maps from Austria and the UK, with only minor edits.

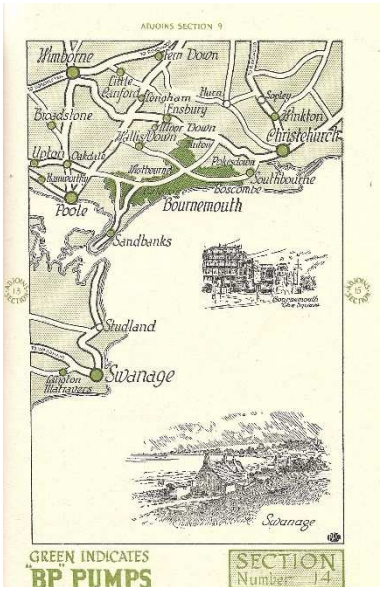


Figure 211: BP section 14 from Road Guide No. 3

2230 *Drawings and Photographs of points of interest (POIs)*

These could be positioned on the cover; on 1930s US maps monochrome photographs were popular but with the move to full colour maps these were replaced by scenic illustrations, notably on Esso and Chevron maps. As shown in Figure 210, smaller illustrations were also used on pictorial inset maps, or occasionally on the main map plane. Around 1930, a series of BP Road Guides included illustrations where sea provided blank space, but never for inland areas (Figure 211).

Chevron used illustrations with descriptive text from the late 1940s for 20 years; the format varied over the period but the example from a 1960 California map [69] is typical, though by 1969 [78] all illustrations were on the reverse of the map as fewer, larger half-tone photographs.

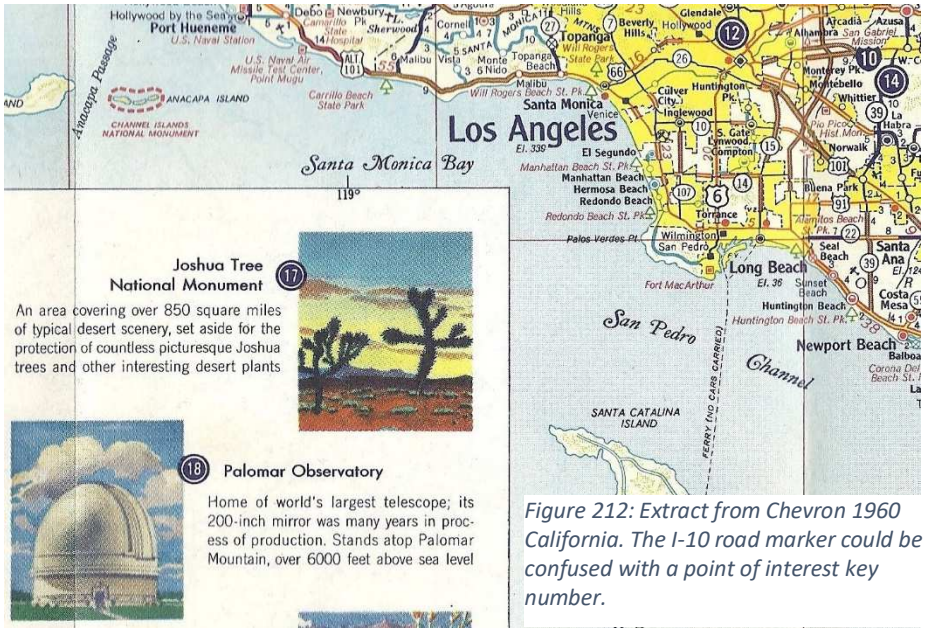


Figure 212: Extract from Chevron 1960 California. The I-10 road marker could be confused with a point of interest key number.

Format was influential; as the product moved away from a sheet map towards an atlas, the greater paper area available (and often higher cover price) permitted more tourist information, whether illustrations or text. The item with the largest number of illustrations in the sample was a folded atlas covering just the Autoroutes of France (BP, 1969 [145]).

2250 Speed/safety reminders

This category contains mainly simply graphics such as a ”Buckle Up!” cartoon, or advice to keep tires correctly inflated {Gulf, 1934 [55]). No maps in the sample used speed limit signs to indicate applicable limits; only text was used. Fewer than 10% of maps used any graphical means to impart safety advice.

2260 Advertising (corporate or third party)

Just over half the maps carried a panel that was clearly advertising, and not part of the map. This commonly promoted specific products, including non-fuel items such as tyres, batteries and – most often – motor oil; this was most frequent in North America with over three-quarters doing so. A smaller number had an advert that promoted the sponsoring oil company in more general terms. Third party advertising was quite uncommon (under 10%), and included both product related adverts – e.g. for Pennzoil motor oils on a 1939 B/A map [280] that might have been sold at their service stations – and for hotels, restaurants and tourist attractions. Occasionally these were keyed to the map (Standard 1967 [73], 1973 [81]).

Credit card exchange programmes, widespread in USA/Canada from the 1950s onwards, were shown on a small number of maps – this would have been more frequent had more smaller US companies' maps been selected, as the largest firms were marketed over larger areas with less need for exchange programmes. As a result, more Canadian maps showed this feature in the sample, advising motorists of signs to look for South of the border. None were identified outside North America.

6.4.3. Textual Elements (2300)

Compared to larger scale topographical maps, oil company road maps often carried significant amounts of text, in tables, panels, or occasionally floating on the surface of the map itself. Much of the text appears to have been selected by the oil company and is unique to their maps, seeking to add value for customers.

2310 Copyright and Compilation

All but three maps (including two Dutch 1950s issues – BP [215], Caltex [216]) carried some information about the copyright owner, cartographer or printer, although the latter can be dated by an advert on the rear cover claiming “Caltex 50 Jaar Service 1905-1955”, incorrectly as Caltex only replaced the earlier Texaco operation in 1948.

Almost 60% carried a copyright date, with national variations being greater than corporate ones. Few British maps were dated before 1958, following a change in the law (HMSO 1956). Irish maps remained

undated, although where they did carry a copyright, this could be misleading – so the Texaco map [43] using a logo introduced in 1968 still carries a 1958 copyright date from the originating Swiss cartographer, Orell Fussli; the map itself had been reprinted several times with different covers and, in this example, a different printer credit.

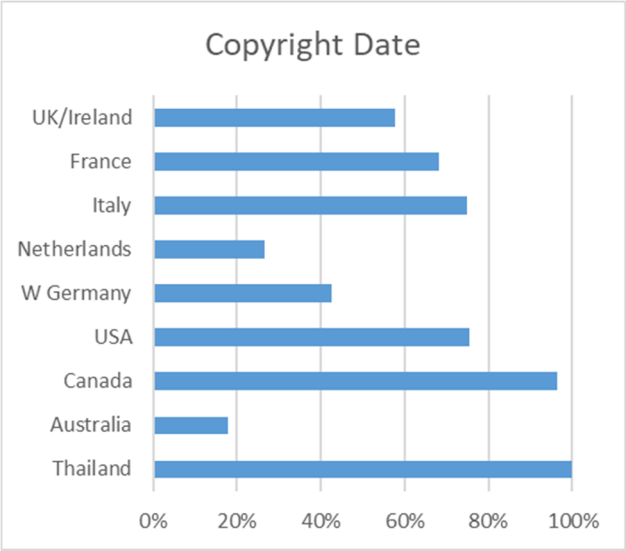


Figure 213: Copyright date frequency by country

Prior to World War II, US maps typically displayed the year prominently, but in the 1950s were often undated. Accurate dates can be determined through cartographers' print codes for the three largest firms. Later US maps were again generally dated in the Legend, although the coded compilation dates sometimes are for the previous year (eg. a 1965 edition Esso map may be coded W1164). For the analysis a hierarchy of dates has been used: copyright or if unavailable date code, and finally cover or edition date. Where there are several map codes, it has been assumed that the latest matches the production date. No sampled maps had separate dates for the map and covers, unlike the situation with some older Michelin maps (Everard 1999). German maps can also be confusingly dated, sometimes including a marginal note like "*laufzeit bis 1998*" on a 1996 copyrighted map (Shell [203]), but earlier maps occasionally just had the date for which they were still to be displayed, and the production date hidden in a code.

Sources and Projections

Few maps offered additional information about compilation, other than the near universal reference to being based on Ordnance Survey cartography on British maps. Some US and Australian maps give a projection, as noted above under "scale". Just one German map (Esso Nord, 1958 [178]) explains with remarkable detail (in translation) as "*Kaupert equidistant conic projection between 50° and 53°, with remaining area in [a] polyhedral projection*". The 53rd parallel runs roughly across the middle of the sheet, just South of Bremen.

2320 Place/Street Index

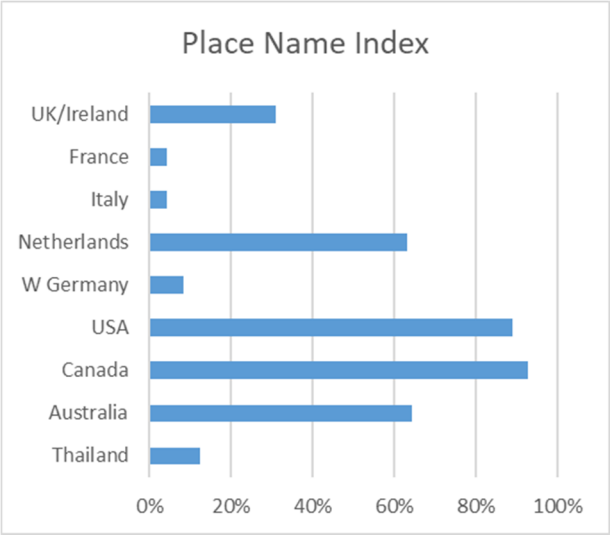


Figure 214: Frequency of Place Name Indexes by Country

At the scales selected, maps had a place name index (sometimes referred to on them as a gazetteer) rather than streets. This tended to follow national, not corporate, preferences and was almost always done on North American maps, but rarely on French, German or Italian examples. Within each country, it was independent of age. US maps often had an index divided between counties and cities/towns.

Populations were given against places on 40% of US maps, 15% of Canadian issues, but no others.

Some carried additional summary information, such as whether the location is legally a municipality (Shell Netherlands 1988 [233] or has a camping area (Shell [254] and Neptune [255] Queensland). By 1970 [265] Shell's Queensland maps carried symbols in the index for golfing, camping and bowling, colouring towns with Shell fuel in red, but by the 1980s [270] and [271] they had reverted to just caravan parks. Around 9% of maps had a separate index for selected points of interest, typically named as such on Canadian maps, for example Union 1969 [296] or Esso 1977 [202].

2330 Gazetteer Descriptions of POIs

Descriptions of points of interest were included on a quarter of maps sampled, with slightly more in Australia and fewer in continental Europe. These were structured in several possible ways: as a regional or national overview; listed by town or city; or as specific points of interest, with no approach especially common. Multiple approaches could be used on a single map, as with Regent 1953 [7]. Some were associated with illustrations or photographs (see 2230 above). A minority of maps provided information in the form of suggested tours. For space reasons a single language was generally used, except on the Italian maps (Shell 1961/71 [102/108]; Esso 1962/1972 [103/109]) where four languages were used, reflecting the importance of international tourism.

2340 Structured Address Lists

These spanned the twin roles of a map. Firstly they could be purely promotional, providing a list of service station locations, sometimes restricted to simply a list of towns or villages where the sponsoring brand may be found, but sometimes in a tabular format showing all facilities at each location, and adding telephone numbers. Lists could also comprise paid-for directories of hotels, restaurants, car dealers or tourist attractions, a genre popularised in the mid-1930s by Mid-Western Map Company and still produced for tourist advertising maps. Oil company issues only rarely included third party listings,

other than those from Amoco/Tempo Designs in the 1960s-70s (Standard Michigan, 1973 [81] and 1978 [86]).

In North America listings were more commonly provided of national or regional parks, and sometimes associated campsites. Outside the sample, a few oil company maps were produced specifically for camping, such as in Italy from BP (1964 [531]) or Agip (1964 [501], 1999 [508]), Shell France (1964 [612]) or Norway (1970 [618]), and Slovnaft Slovakia (2004 [634]). Few other lists were provided, but occasionally included ferries or mountain passes. Mobil's 1959 list of New York ferries [68] included details of opening hours and frequency.

2350 Motoring information

Around a quarter of maps in the sample used text to provide additional information for motorists, most often a summary of traffic laws or regulations, or a simple listing of speed limits (common in North America where they varied between states and provinces). Gulf's 1934 map [55] placed these in a table for each state, including speed limits, "non-resident privilege days" (after which a permit would need to be purchased by out-of-state motorists), minimum age, hand signal requirements, accident rules and gasoline taxes. Where only limited information was provided, speed limits were sometimes included in the legend. Although the structured analysis also considered inclusion of radio stations, road tolls, metric conversion tables and car registration plates (international or local), more maps had miscellaneous information, again notably from North America. Examples found include US and Canadian customs regulations, game laws, and advice on preventing forest fires (all on Imperial Oil, Eastern Canada, 1929 [277]). Not unexpectedly, Total's 1979 *Route de Nuit* [151] had hints on night driving.

6.5. Conclusion

At a high level, the outcomes of the analysis may be summarised as:

- Newer maps tend to be more complex than older ones, although at the very end of the period of issuance there were significant numbers of basic locator maps produced;
- Although oil company maps typically included a significant degree of generalisation, the extent to which this happened varied significantly between the main countries;
- European maps tended to show more traditional cultural sites than maps from elsewhere;
- North American maps typically marked fewer features (either natural or man-made);
- Attempts to impose common design parameters (either cartographically or cover design) between countries were never wholly successful and only lasted for a few years;
- Individual cartographers could have a major influence over company designs, but this was not universal (General Drafting-Esso Group; Foldex-Shell; Busche-Aral);

- Oil company maps were not always used to promote service stations, as under one-third marked service station locations, and most lacked any iconography or images directly associated with service stations;
- Other products – tyres, batteries accessories (TBAs) and lubricating oil – were only occasionally advertised on branded road maps;
- Most maps contained a degree of extraneous information on the map plane (usually by symbols) that would be of very limited use to motorists.

The first four bullets all relate to the level of complexity on these road maps – essentially how far they have been stripped down to just show essential or universal elements (roads, towns, international borders and coastlines), or how much additional information, often targeted at tourists has been added. One way that the overall complexity can be considered is by simply counting the number of different features (area, line or point symbols) and the number of categories into which they fall, accepting that the division into cartographic groups is to some extent arbitrary. Focusing just on the cartographic elements, Figure 161 in Chapter 5 has 21 possible cartographic groups. The detailed analysis shows that no maps display features from every one of these groups; the median number of groups on maps in the sampled population was just 10 groups, with the range running from 2 (the 1950s Mobil Roadfinder sectional map [11], which used white roads on a dark blue land mass, see Figure 67) to 19 (a 2001 Shell/Mairs General Karte sectional map of Germany [205]). Plotting the number of cartographic groups against age (Figure 215), shows a weak correlation with younger maps tending to show more; however when compared by countries there are clear national variations (Figure 216):

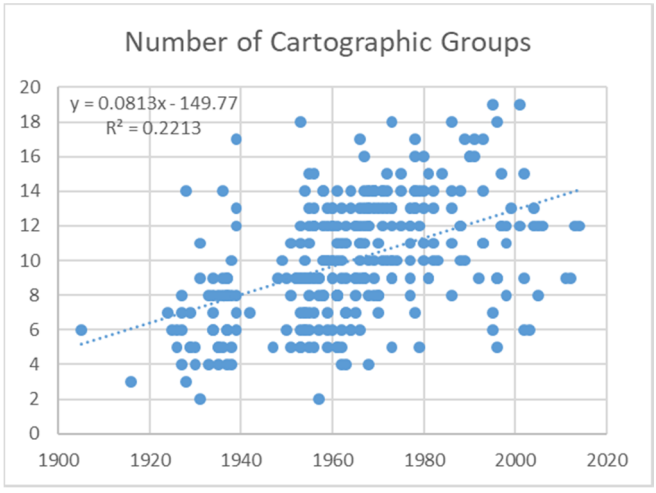


Figure 215: Number of Cartographic Groups by age

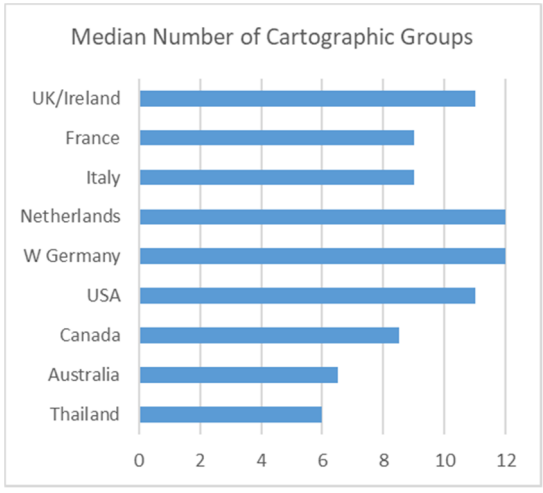


Figure 216: Number of Cartographic Groups by country

The following table summarises the level of occurrence of each category. Most categories are further broken down into as many as nine sub-groups, as explained in the methodology section.

6.5.1. Summary Table of Analysis

		Total	GB/IRL	F	I	NL	D	USA	CDN	AUS	TH
	Number of maps in sample (*n*=)	**302**	**45**	**47**	**24**	**30**	**47**	**45**	**28**	**28**	**8**
Code	*Category*										
1100	**Natural Land Forms and Cover**										
1110	**Hydrology (Rivers, Lakes, Beaches)**	**99%**	**96%**	**98%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
1111	Rivers, estuaries	97%	93%	96%	88%	100%	100%	96%	100%	100%	100%
1112	Features on rivers	5%	-	15%	-	-	11%	7%	-	-	13%
1113	Lakes and reservoirs	98%	91%	98%	100%	100%	98%	98%	100%	100%	100%
1114	Beaches and bathing places	8%	33%	9%	4%	-	6%	-	-	-	13%
1115	Bores, springs, wells	1%	-	-	-	-	-	-	-	4%	13%
1116	Bathymetric data	1%	4%	-	-	-	-	-	-	-	-
1130	**Terrain and Relief (Tints, Shading, Symbols)**	**71%**	**89%**	**77%**	**96%**	**13%**	**91%**	**78%**	**29%**	**79%**	**38%**
1131	Hypsometric tinting	2%	11%	-	-	-	-	-	-	-	13%
1132	Contours (without tinting)	-	-	-	-	-	-	-	-	-	-
1133	Hill shading	29%	11%	32%	83%	-	66%	24%	4%	21%	-
1134	Other land forms	7%	2%	-	54%	-	6%	2%	-	11%	-
1135	Named Peaks	54%	49%	51%	88%	-	64%	76%	29%	75%	25%
1136	Spot heights	64%	82%	70%	96%	13%	83%	67%	29%	57%	25%
1140	**Vegetation/Land Use Forest, Cultivated, Desert**	**40%**	**42%**	**66%**	**13%**	**80%**	**74%**	**18%**	**4%**	**-**	**-**
1141	Tree cover (forest, etc.)	33%	42%	62%	13%	73%	55%	-	4%	-	-
1142	Agricultural land use	-	-	-	-	-	-	-	-	-	-
1143	Desert, swamp, heath, dunes	19%	2%	13%	-	63%	51%	18%	-	-	-

		Total	GB/IRL	F	I	NL	D	USA	CDN	AUS	TH
	Number of maps in sample (*n*=)	**302**	**45**	**47**	**24**	**30**	**47**	**45**	**28**	**28**	**8**
1200	**Communications: Accessibility and Transport**										
1210	**Roads: Type, Surface, Road No., Features, Distances**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
1211	Type (often unofficial)	98%	89%	100%	100%	100%	100%	100%	100%	100%	100%
1212	Classn (formal/ road nos)	86%	87%	100%	63%	77%	98%	93%	100%	57%	50%
1213	Construction status	67%	67%	60%	67%	97%	74%	80%	64%	14%	88%
1214	Width	32%	22%	55%	8%	13%	17%	62%	64%	-	-
1215	Surface	33%	-	19%	4%	3%	13%	89%	93%	57%	25%
1216	Hills/ gradients/ passes	39%	42%	72%	67%	3%	72%	27%	7%	-	-
1217	Other dangers/limitations	23%	18%	28%	25%	50%	38%	18%	-	-	-
1218	Scenic routes	18%	9%	17%	21%	17%	55%	9%	-	7%	-
1219	Distances	92%	87%	89%	100%	90%	100%	96%	89%	100%	50%
1220	**Rail**	**51%**	**67%**	**40%**	**58%**	**70%**	**70%**	**2%**	**18%**	**79%**	**100%**
1221	Railway lines	44%	62%	17%	42%	70%	66%	2%	18%	79%	100%
1222	Stations	23%	44%	9%	17%	50%	40%	-	-	18%	13%
1223	Tunnels, embanks, cuttings	5%	9%	4%	8%	-	17%	-	-	-	-
1224	Motorail, Rail Ferries	8%	2%	23%	29%	-	13%	-	-	-	-
1230	**Paths Rights of Way**	**16%**	**16%**	**11%**	**-**	**7%**	**21%**	**9%**	**-**	**71%**	**-**
1231	Tracks/ paths not for motors	16%	16%	11%	-	7%	21%	9%	-	71%	-
1232	Private roads	0%	-	-	-	-	2%	-	-	-	-
1240	**Canals Navigable Rivers**	**75%**	**82%**	**77%**	**58%**	**93%**	**94%**	**84%**	**82%**	**18%**	**-**
1241	Canals; Navigable stretches/ limits	33%	69%	49%	13%	30%	70%	2%	-	-	-
1242	Locks Weirs Pumping stations	4%	-	4%	-	17%	9%	2%	-	4%	-
1243	Ports ferry termini, marinas	2%	2%	4%	4%	-	2%	-	-	-	-
1244	Ferries Shipping Routes Toll bridges	71%	78%	72%	58%	93%	85%	82%	82%	14%	-
1250	**Cycle Tracks, Bus Routes**	**1%**	**-**	**-**	**-**	**10%**	**2%**	**-**	**-**	**-**	**-**
1251	Cycle routes/ numbers	-	-	-	-	-	-	-	-	-	-
1252	Bus/tram routes	1%	-	-	-	10%	-	-	-	-	-
1253	Tram lines	0%	-	-	-	-	2%	-	-	-	-

		Total	GB/IRL	F	I	NL	D	USA	CDN	AUS	TH
	Number of maps in sample (*n*=)	**302**	**45**	**47**	**24**	**30**	**47**	**45**	**28**	**28**	**8**
1260	**Civil Aviation**	**66%**	**76%**	**70%**	**46%**	**83%**	**62%**	**73%**	**86%**	**18%**	**50%**
1261	Airports, airfields	65%	76%	68%	46%	77%	62%	73%	86%	18%	50%
1262	Helipads, Gliding fields	7%	16%	2%	-	10%	19%	-	-	-	-
1263	Commercial air routes	1%	-	-	-	-	-	-	11%	-	-
1264	Air ferries	6%	-	23%	-	20%	-	-	-	-	-
1300	**Settlement, Territory and Resources**										
1310	**General Built up**	**80%**	**78%**	**70%**	**83%**	**100%**	**98%**	**93%**	**93%**	**32%**	**25%**
1311	Population symbols/ figures	43%	36%	21%	21%	47%	47%	76%	82%	25%	-
1312	Extent of built up areas	76%	76%	57%	79%	100%	96%	87%	93%	29%	25%
1313	Land use	2%	-	-	-	17%	-	-	-	-	-
1314	Text-based population indicator	0%	-	-	-	-	-	2%	-	-	-
1315	Elevation	7%	-	-	-	-	9%	31%	7%	4%	-
1316	Interesting or tourist towns	12%	2%	36%	17%	3%	26%	-	-	-	-
1320	**Public Administration**	**98%**	**96%**	**100%**	**100%**	**100%**	**98%**	**100%**	**100%**	**100%**	**75%**
1321	Admin boundaries	98%	96%	100%	100%	100%	98%	100%	100%	96%	75%
1322	Administrative seats	30%	2%	60%	21%	-	13%	69%	39%	11%	63%
1323	Time zones	10%	-	-	-	-	-	44%	29%	7%	-
1324	ZIP/Post codes and boundary	0%	-	-	-	-	2%	-	-	-	-
1325	Public Buildings	2%	2%	-	-	7%	-	2%	-	4%	25%
1326	Education	4%	-	-	-	-	-	18%	-	4%	25%
1327	Indian (Native American)/Aboriginal Reservns	5%	-	-	-	-	-	18%	4%	18%	-
1330	**Religious Features**	**3%**	**7%**	**4%**	**4%**	**-**	**2%**	**-**	**-**	**4%**	**13%**
1331	Churches, chapels, cathedrals	2%	7%	2%	4%	-	2%	-	-	4%	-
1332	Mosques	-	-	-	-	-	-	-	-	-	-
1333	Synagogues	-	-	-	-	-	-	-	-	-	-
1334	Temples, Gurdwara, Wats	0%	-	-	-	-	-	-	-	-	13%
1335	Cemeteries and crematoria	0%	-	2%	-	-	-	-	-	-	-

		Total	GB/IRL	F	I	NL	D	USA	CDN	AUS	TH
	Number of maps in sample (*n*=)	**302**	**45**	**47**	**24**	**30**	**47**	**45**	**28**	**28**	**8**
1340	**Industry, Comms and Power**	**8%**	**4%**	**4%**	**4%**	**10%**	**26%**	**-**	**4%**	**7%**	**13%**
1341	Factory, works (general)	2%	-	4%	-	-	9%	-	-	-	-
1342	Mine, quarry, oil well	6%	-	-	4%	10%	26%	-	-	7%	-
1343	Oil refinery, depot	1%	4%	-	-	-	2%	-	-	-	13%
1344	Pipeline	-	-	-	-	-	-	-	-	-	-
1345	Wind/PV Power stations/lines	2%	-	-	-	-	9%	-	4%	4%	-
1350	**Military and Police**	**23%**	**4%**	**11%**	**8%**	**37%**	**28%**	**56%**	**18%**	**21%**	**13%**
1351	Military aerodrome	8%	-	4%	-	3%	-	40%	7%	-	-
1352	Army barracks, facility	1%	-	-	-	-	-	7%	-	-	-
1353	Naval port	0%	-	2%	-	-	-	-	-	-	-
1354	Police station/ jails	2%	-	-	-	-	-	9%	-	-	13%
1355	Other military/ defence/ cemetery	8%	-	4%	8%	30%	11%	11%	-	-	-
1356	Danger or prohibited zones	12%	4%	2%	-	7%	28%	22%	11%	21%	-
1360	**Motoring/other facilities**	**53%**	**56%**	**74%**	**25%**	**43%**	**91%**	**51%**	**14%**	**18%**	**63%**
1361	Filling stations	29%	4%	62%	25%	30%	45%	31%	11%	7%	38%
1362	Service areas	22%	40%	11%	-	20%	70%	11%	-	-	-
1363	Car repair/ breakdown	0%	-	-	4%	-	-	-	-	-	-
1364	Rest/ Parking areas, lay-bys	10%	9%	2%	4%	20%	13%	18%	4%	7%	-
1365	Emergency telephone boxes	5%	31%	2%	4%	-	-	-	-	-	-
1366	Public toilets (WC)	-	-	-	-	-	-	-	-	-	-
1367	Hospitals, First aid posts	4%	2%	6%	4%	7%	-	2%	-	4%	25%
1368	Other facilities	1%	4%	2%	-	-	-	2%	-	-	-
1400	**Tourism, Recreation and Conservation**										
1410	**National/State/Local Parks, AONB**	**49%**	**64%**	**23%**	**13%**	**13%**	**47%**	**89%**	**100%**	**36%**	**13%**
1411	National Parks or Forests	43%	51%	21%	8%	-	38%	82%	100%	36%	13%
1412	Regional Parks/ AONB	11%	13%	2%	-	-	2%	44%	4%	18%	-
1413	National Trust land or similar	6%	36%	-	-	7%	-	-	-	-	-
1414	Nature reserves	8%	7%	2%	4%	7%	21%	7%	14%	-	13%
1415	Parks Recreation areas	16%	16%	-	-	-	2%	62%	39%	-	-

		Total	GB/IRL	F	I	NL	D	USA	CDN	AUS	TH
	Number of maps in sample (*n*=)	**302**	**45**	**47**	**24**	**30**	**47**	**45**	**28**	**28**	**8**
1420	**Landmarks, Viewpoints, POIs**	**49%**	**42%**	**40%**	**42%**	**57%**	**64%**	**76%**	**39%**	**25%**	**25%**
1421	View-points	13%	33%	13%	8%	10%	28%	-	-	-	-
1422	Windmills Water-mills	6%	-	2%	-	3%	32%	-	-	-	-
1423	Monuments, follies, towers	13%	-	6%	17%	23%	36%	20%	-	-	-
1424	Lighthouse lightship	15%	11%	17%	13%	50%	28%	-	-	4%	-
1425	Landmark, other POI	37%	11%	38%	21%	37%	43%	76%	39%	25%	25%
1426	Tourist Inform Offices	5%	9%	-	8%	10%	9%	-	4%	4%	-
1430	**Historical Buildings (Castles, Churches, Ruins)**	**37%**	**67%**	**34%**	**50%**	**60%**	**62%**	**11%**	**4%**	**-**	**13%**
1431	Castles	28%	51%	30%	33%	43%	57%	-	-	-	-
1432	Churches, abbeys, priories	24%	44%	30%	42%	3%	55%	2%	-	-	-
1433	Historic houses	6%	33%	2%	-	-	4%	-	-	-	-
1434	Forts, old military sites	2%	-	6%	-	-	6%	-	-	-	-
1435	Ancient/prehistoric Monuments	13%	13%	9%	25%	47%	19%	-	-	-	-
1436	Ruins (general)	13%	9%	26%	21%	17%	26%	-	-	-	13%
1437	Battlefield sites	5%	31%	-	-	-	2%	-	-	-	-
1438	Other historic buildings	15%	33%	9%	-	20%	30%	9%	4%	-	-
1439	Identify owner/ access	2%	13%	-	-	3%	-	-	-	-	-
1440	**Cultural: Museums, Galleries, Theatres, Music**	**7%**	**16%**	**11%**	**-**	**-**	**11%**	**4%**	**-**	**-**	**13%**
1441	Museums and (Art) Galleries	2%	9%	2%	-	-	4%	-	-	-	-
1442	Theatres, cinemas	-	-	-	-	-	-	-	-	-	-
1443	Music/ concert halls	0%	-	-	-	-	-	-	-	-	13%
1444	Theme and amusement parks	1%	7%	-	-	-	-	-	-	-	-
1445	(State or County) Fairgrounds	-	-	-	-	-	-	-	-	-	-
1446	Gardens, arboreta, vineyards	2%	11%	-	-	-	4%	-	-	-	-
1447	Industrial heritage	2%	11%	2%	-	-	2%	-	-	-	-
1448	Zoos, aquaria, farms	2%	11%	-	-	-	4%	-	-	-	-
1449	Other cultural	2%	-	9%	-	-	-	4%	-	-	-

		Total	GB/IRL	F	I	NL	D	USA	CDN	AUS	TH
	Number of maps in sample (*n*=)	**302**	**45**	**47**	**24**	**30**	**47**	**45**	**28**	**28**	**8**
1450	**Sport Facilities/Stadiums**	**37%**	**56%**	**32%**	**54%**	**37%**	**45%**	**31%**	**18%**	**25%**	**13%**
1451	Golf courses	13%	40%	13%	-	13%	9%	2%	-	21%	-
1452	Swimming, lidos, Spas, thermal	9%	2%	26%	13%	13%	13%	-	-	4%	13%
1453	Sailing facilities, boat hire	5%	20%	6%	-	-	2%	2%	-	-	-
1454	Skiing, cable-cars and winter sports	20%	18%	23%	50%	-	32%	18%	18%	-	-
1455	Other sports stadia/ facilities	12%	22%	9%	17%	10%	9%	18%	-	4%	13%
1456	Tennis, badminton, etc.	-	-	-	-	-	-	-	-	-	-
1457	Motor racing circuits	6%	40%	-	-	-	-	-	-	-	-
1458	Horse Racing courses	6%	40%	2%	-	-	-	-	-	-	-
1459	Leisure and holiday centres	5%	4%	-	4%	30%	9%	-	-	-	-
1460	**Hotels, Pubs, Restaurants**	**39%**	**38%**	**19%**	**42%**	**37%**	**64%**	**44%**	**61%**	**4%**	**25%**
1461	Hotels, motels, chalets	11%	2%	11%	25%	3%	28%	4%	7%	4%	25%
1462	Camping and caravan sites	28%	4%	6%	38%	33%	53%	44%	61%	-	-
1463	Youth hostels	9%	22%	2%	-	20%	19%	-	-	-	-
1464	Pubs, Inns	2%	2%	2%	4%	-	6%	-	-	-	-
1465	Restaurants	4%	-	13%	17%	3%	-	-	-	-	-
1466	Picnic sites	3%	7%	-	-	-	-	-	18%	-	-
1467	Shopping centres, malls	0%	-	-	-	-	-	-	-	-	13%

		Total	GB/IRL	F	I	NL	D	USA	CDN	AUS	TH
	Number of maps in sample (*n*=)	**302**	**45**	**47**	**24**	**30**	**47**	**45**	**28**	**28**	**8**
2100	**Graphical Elements (often linked to map)**										
2110	**Legend and Scale Bar**	**99%**	**98%**	**100%**	**88%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
2111	Legend	97%	98%	96%	83%	100%	100%	98%	100%	96%	100%
2112	Scale Bar	86%	93%	66%	88%	87%	79%	96%	100%	96%	50%
2113	Scale	73%	91%	77%	67%	93%	98%	62%	57%	14%	50%
2114	Languages	35%	9%	38%	79%	77%	43%	-	50%	-	100%
2120	**Compass Rose**	**72%**	**73%**	**38%**	**25%**	**87%**	**62%**	**98%**	**96%**	**96%**	**88%**
2121	Compass Rose	53%	42%	9%	21%	77%	19%	93%	93%	93%	75%
2122	Grid lines	35%	38%	9%	17%	57%	55%	47%	54%	7%	13%
2123	Marginal references (for grid)	51%	51%	19%	13%	63%	34%	87%	93%	64%	25%
2124	Latitude/ longitude	8%	7%	-	13%	-	2%	7%	39%	11%	13%
2125	Grid square references	6%	2%	13%	-	-	21%	4%	-	-	-
2130	**Mileage/Driving Time Chart**	**50%**	**16%**	**17%**	**54%**	**53%**	**36%**	**71%**	**100%**	**82%**	**100%**
2131	Mileage chart, Cartogram	50%	16%	17%	54%	53%	36%	71%	100%	82%	100%
2132	Driving times	1%	2%	-	-	-	-	2%	7%	-	-
2140	**Sheet Index**	**45%**	**82%**	**32%**	**38%**	**30%**	**81%**	**27%**	**32%**	**21%**	**25%**
2141	Index map	34%	76%	19%	25%	27%	74%	11%	7%	7%	25%
2142	Text list of sheets	5%	11%	-	8%	-	9%	2%	11%	-	-
2143	Adjacent sheets	18%	11%	15%	4%	3%	43%	16%	25%	21%	-
2150	**Road Signs**	**11%**	**20%**	**4%**	**58%**	**10%**	**6%**	**-**	**-**	**-**	**38%**
2151	Road signs	11%	20%	4%	58%	10%	6%	-	-	-	38%

		Total	GB/IRL	F	I	NL	D	USA	CDN	AUS	TH
	Number of maps in sample (*n*=)	**302**	**45**	**47**	**24**	**30**	**47**	**45**	**28**	**28**	**8**
2200	**Pictorial Elements**										
2210	**Identification**	**92%**	**89%**	**94%**	**92%**	**97%**	**96%**	**91%**	**96%**	**89%**	**75%**
2211	Cover photo or drawing - oil co	13%	7%	17%	17%	3%	9%	27%	11%	14%	13%
2212	Area outline on cover(s)	27%	18%	32%	46%	50%	55%	7%	4%	7%	-
2213	Part of map shown on cover	4%	9%	2%	4%	3%	2%	-	-	7%	13%
2214	Logo	88%	84%	87%	79%	97%	89%	91%	96%	86%	75%
2215	Marketing territory map	1%	-	-	-	-	-	4%	4%	-	-
2220	**Decorative elements**	**45%**	**29%**	**49%**	**50%**	**47%**	**30%**	**33%**	**75%**	**64%**	**63%**
2221	Cover photo or drawing	30%	24%	23%	21%	33%	13%	27%	64%	50%	38%
2222	Locale-related/ folklore	5%	2%	2%	-	-	6%	2%	7%	11%	38%
2223	Cartographer produced	5%	-	15%	4%	-	2%	2%	-	11%	25%
2224	Oil company related	14%	4%	11%	25%	23%	17%	4%	18%	29%	-
2230	**Drawings and Photographs of points of interest (POIs)**	**25%**	**29%**	**28%**	**13%**	**3%**	**28%**	**38%**	**18%**	**29%**	**25%**
2231	Cover photo or drawing	15%	20%	13%	4%	3%	19%	22%	7%	25%	13%
2232	Internal image(s) – drawings	8%	9%	13%	13%	-	6%	13%	4%	4%	13%
2233	Internal image(s) – photos	4%	-	2%	-	-	2%	7%	11%	11%	-
2234	Outline maps eg. POIs, borders	3%	-	13%	-	-	2%	2%	-	-	-
2250	**Speed/safety reminders (visual eg. "Buckle Up")**	**8%**	**-**	**2%**	**-**	**-**	**-**	**31%**	**4%**	**32%**	**-**
2251	Speed limits	-	-	-	-	-	-	-	-	-	-
2252	Safety advice	3%	-	2%	-	-	-	11%	4%	11%	-
2253	Other advice	5%	-	-	-	-	-	22%	-	21%	-
2260	**Advertising (corporate or third party)**	**52%**	**33%**	**51%**	**29%**	**43%**	**47%**	**73%**	**82%**	**64%**	**13%**
2261	General corporate advert	13%	4%	9%	4%	3%	30%	16%	32%	7%	-
2262	Oil company product adverts	36%	20%	49%	17%	40%	23%	58%	29%	54%	13%
2263	Lubrication Chart	1%	-	-	4%	-	-	2%	-	4%	-
2264	3rd party adverts (general)	6%	11%	-	17%	3%	4%	4%	4%	4%	13%
2265	3rd party adverts (located)	2%	-	-	-	-	-	11%	-	-	-
2266	Credit card exchanges shown	3%	-	-	-	-	-	2%	29%	-	-

		Total	GB/IRL	F	I	NL	D	USA	CDN	AUS	TH
	Number of maps in sample (*n*=)	**302**	**45**	**47**	**24**	**30**	**47**	**45**	**28**	**28**	**8**
2300	**Textual Elements**										
2310	**Copyright and Compilation**	**99%**	**100%**	**100%**	**100%**	**93%**	**100%**	**100%**	**100%**	**96%**	**100%**
2311	Copyright/production details	97%	100%	100%	100%	90%	96%	100%	100%	89%	100%
2312	Copyright date	59%	58%	68%	75%	27%	43%	76%	96%	18%	100%
2313	Map codes	39%	22%	9%	4%	50%	57%	78%	25%	57%	25%
2314	Projection	3%	-	-	-	-	2%	16%	-	7%	-
2320	**Place/Street Index**	**43%**	**31%**	**4%**	**4%**	**63%**	**15%**	**93%**	**93%**	**64%**	**13%**
2321	Place/street index	41%	31%	4%	4%	63%	9%	89%	93%	64%	13%
2322	Population	7%	-	-	-	-	-	40%	14%	-	-
2323	Additional info	5%	-	-	-	13%	4%	4%	-	21%	-
2324	Index to other POIs	9%	-	-	-	-	6%	22%	39%	7%	-
2330	**Gazetteer Descriptions of POIs**	**26%**	**20%**	**17%**	**17%**	**30%**	**17%**	**40%**	**21%**	**50%**	**25%**
2331	National/regional overview	7%	7%	4%	-	-	6%	4%	14%	25%	-
2332	City/Town/Village info	13%	7%	13%	8%	10%	13%	18%	4%	32%	13%
2333	National/state parks and forests	1%	-	-	-	-	-	4%	-	-	-
2334	Details on specific POIs	9%	7%	6%	-	17%	2%	20%	7%	11%	13%
2335	Suggested Tours/Itineraries	3%	7%	-	8%	3%	-	4%	-	4%	-
2336	Hunting Shooting Fishing Skiing	0%	-	-	-	-	-	-	4%	-	-
2340	**Structured Address Lists**	**31%**	**16%**	**40%**	**29%**	**30%**	**17%**	**62%**	**50%**	**4%**	**13%**
2341	Corporate office addresses	5%	4%	17%	-	7%	4%	-	-	-	-
2342	Service station addresses	11%	4%	28%	8%	17%	13%	7%	4%	-	-
2343	3rd party advertiser addresses	2%	-	2%	-	-	-	9%	-	-	-
2344	First aid posts, roadside assist	-	-	-	-	-	-	-	-	-	-
2345	National, State or Regional Parks	9%	-	-	-	-	-	44%	25%	-	-
2346	Other incl. ferries	11%	7%	2%	29%	7%	-	20%	36%	4%	13%

			Total	GB/IRL	F	I	NL	D	USA	CDN	AUS	TH
Number of maps in sample (*n*=)			**302**	**45**	**47**	**24**	**30**	**47**	**45**	**28**	**28**	**8**
2350	**Motoring information**		**24%**	**16%**	**21%**	**13%**	**7%**	**11%**	**51%**	**50%**	**32%**	**-**
2351		Traffic laws/speed limits	8%	4%	2%	13%	3%	-	22%	14%	11%	-
2352		Weather info	-	-	-	-	-	-	-	-	-	-
2353		Radio stations	3%	2%	-	-	-	2%	9%	4%	4%	-
2354		First Aid	-	-	-	-	-	-	-	-	-	-
2355		Road tolls	3%	-	2%	-	-	-	18%	-	-	-
2356		Metric converter table	2%	4%	-	4%	-	-	-	-	11%	-
2357		Car registration plates	2%	-	4%	8%	-	4%	-	-	-	-
2358		Other text information	13%	9%	15%	-	3%	4%	31%	36%	7%	-

Table 5: Summary of frequency of specified cartographic and non-cartographic elements, as a proportion of maps in the selected sample (in total and by each country)

Chapter 7:

Case Studies

7. Case Studies

Despite their low cost, maps still had to be marketed at several levels – from cartographer to the oil company, from the oil company to the service stations stocking them, and from the oil company or service station to the end consumer, the motorist. This chapter is largely drawn from primary sources, including the Rand McNally archive in the Newberry Library in Chicago, and original marketing materials.

The chapter provides four short case studies looking at:

1. How Esso USA explained its maps to dealers;
2. How Esso and Mobil UK marketed their maps to dealers, as way of ensuring distribution;
3. The cartographer-oil company relation (with a focus on Esso in Europe);
4. How the Canadian cartographer, Rolph McNally, tried to maintain sales of maps to oil companies.

7.1. Case Study 1: Marketing Maps to Dealers

This section analyses a map produced by Esso for its retailers, that highlighted the changes to, and content of, its 1954 map of Pennsylvania. Esso (and its Texas affiliate, Humble) produced an equivalent map for all the main US states in which they sold fuel in the mid-1950s.

7.1.1. Explaining the map to dealers

Surviving materials aimed at dealers (service stations) suggest they needed to be persuaded of the value of maps as a marketing tool. In the 1950s, Standard Oil of New Jersey (Esso) revised its US state maps; it produced an overprinted version explaining its merits to dealers. Compared to the 1953 edition the covers appeared similar, each showing customers looking at a map beside a uniformed pump attendant, but the title had subtly changed, dropping the "Road Map with Pictorial Guide" in favour of "with special maps of Philadelphia and Pittsburgh".

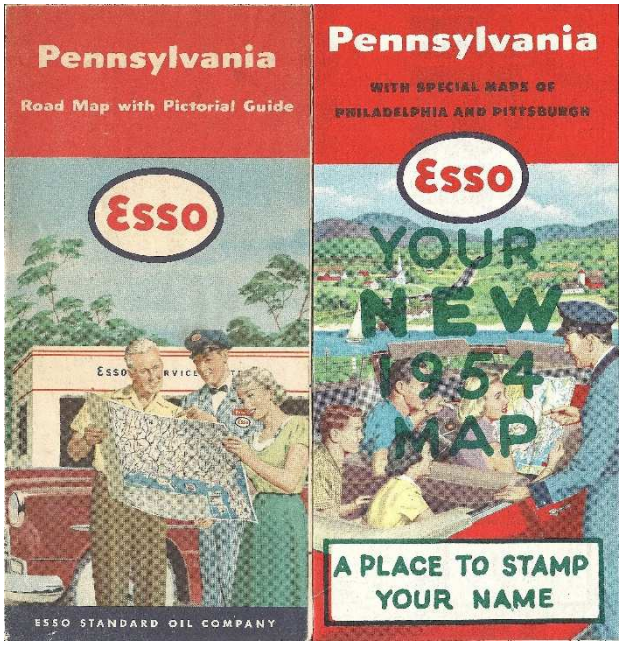


Figure 217: 1953 and 1954 Esso Maps of Pennsylvania [662, 663]

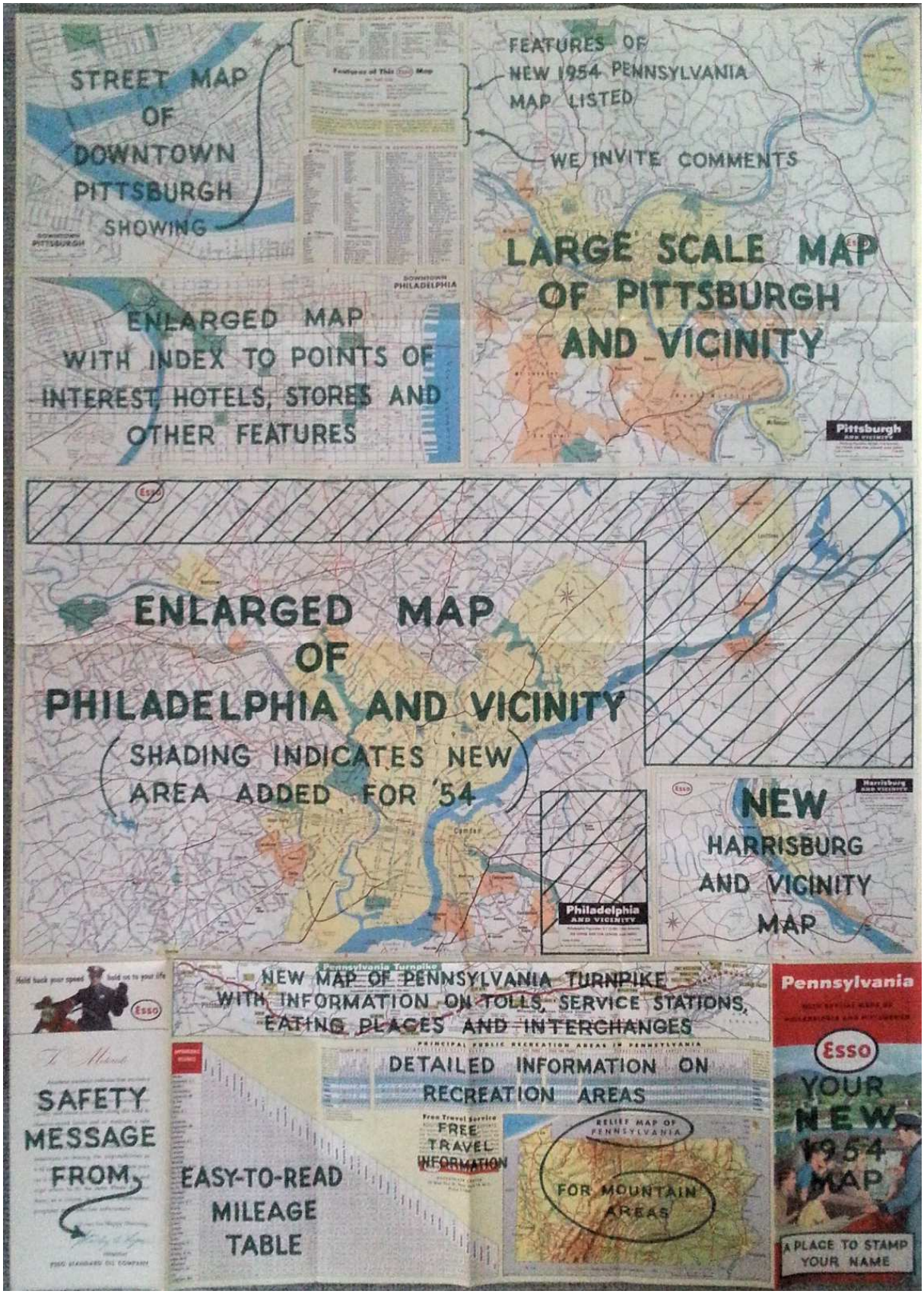


Figure 218: Reverse side of 1954 Esso dealers' map [663]

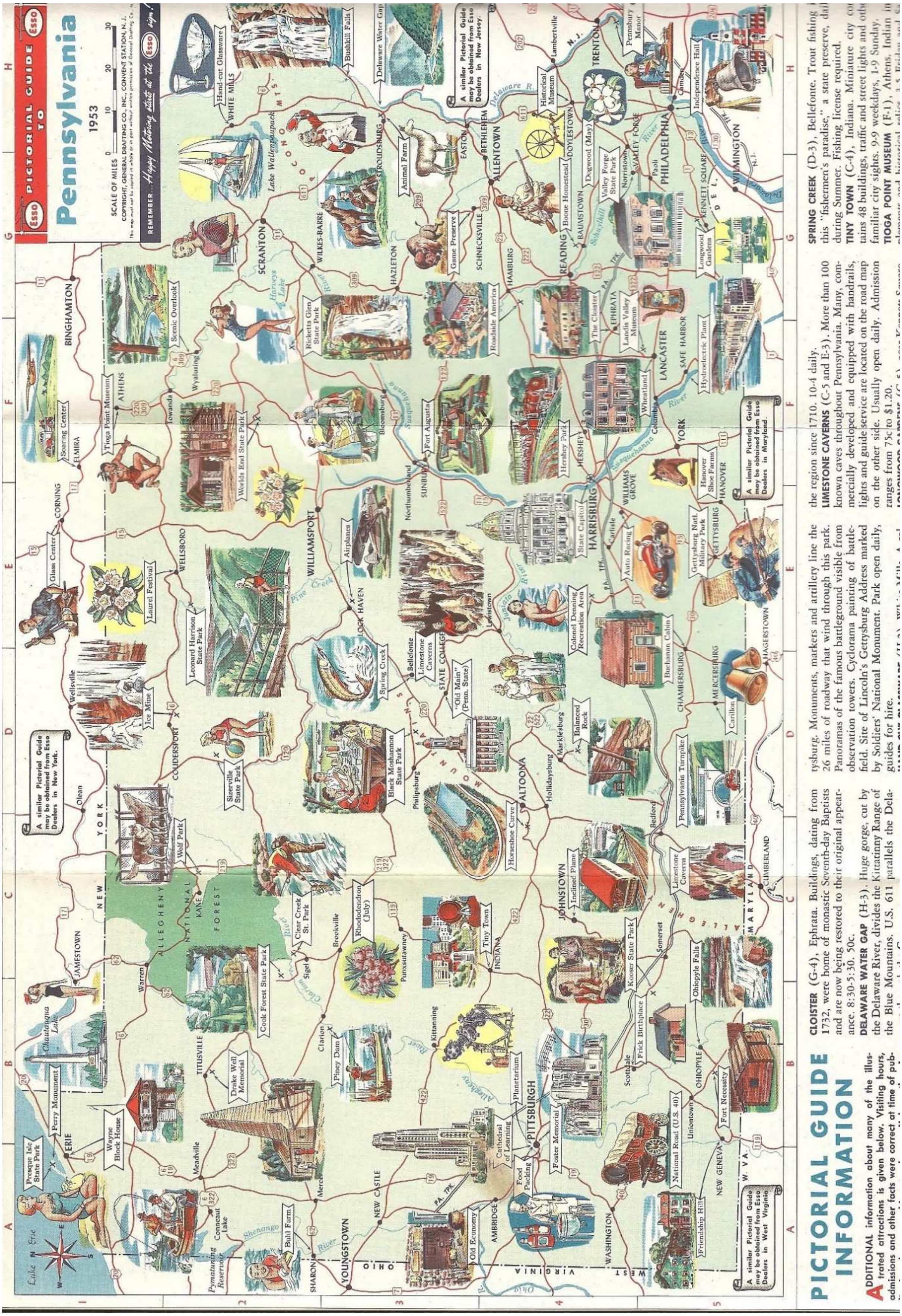


Figure 219: 1953 Esso Pictorial Guide of Pennsylvania, omitted from 1954 and later editions

This reveals a major but unannounced change: Esso's pictorial guide, which in 1953 had included summary information on 44 attractions ranging from Gettysburg to tours of the Heinz factory in Pittsburgh, had been omitted from the reverse of the map. This permitted an enlarged map of Philadelphia, which enabled the route of the extension of the Pennsylvania Turnpike, due to open in Fall 1954, to be shown. The reverse side added a map of Harrisburg, the state capital. Although these "vicinity" maps were useful, Esso dealers may have been aware that some competitors, including Amoco, Atlantic and Gulf, were able to provide dedicated maps of Philadelphia and Pittsburgh, a practice not begun by Esso until 1965/1958 (RMCA, 2023). The new map of the Pennsylvania Turnpike was a redrawn map rather than wholly new, but did now mark service areas selling Esso products. Though not marked as new, the relief map drawn by Vahe Kirishjian was a new element, utilising the style recently popularised on airline maps (Ehrenburg 2018). Although helpful for tourists, this may have been added as hill shading was no longer shown on the main map. Indeed this was explained as "completely redrawn for '54…easier to read". None of the other features highlighted on the reverse were new.

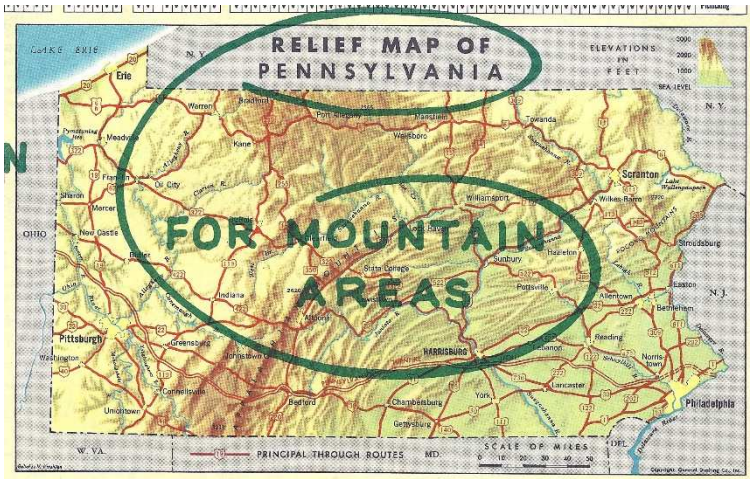


Figure 220: Relief map of Pennsylvania from 1954 Esso map

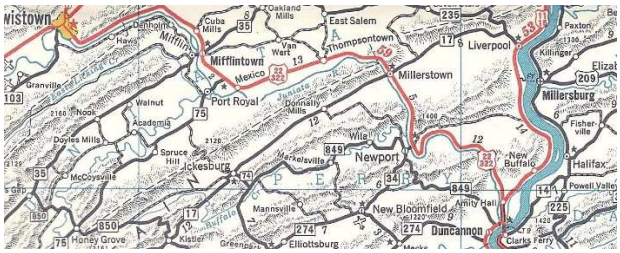


Figure 221: 1953 map extract with hill shading

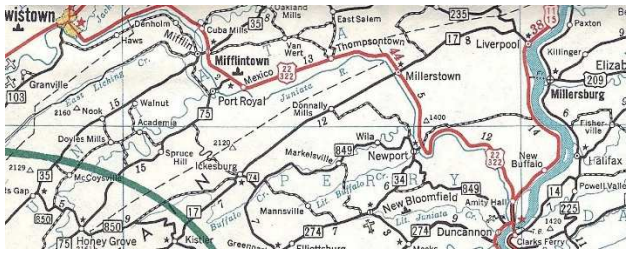


Figure 222: 1954 map extract with no hill shading

Similar changes were made to other Esso maps based on General Drafting Co. cartography over the following few years (in 1957 for Italian maps, for example).

The main map plane highlights several features (although not all were new on the updated map, and most would have been familiar to users of other, non-oil company road maps):

- Special symbol for county seats (the only completely new feature)
- Cumulative and point to point mileages
- Turnpike interchanges named (previously had just been labelled "interchange")
- National Forest area

- Mountain elevations and Mountains named
- Airports classified as to civilian, military and other
- Points of interest, and
- Grid lines for easy index reference.

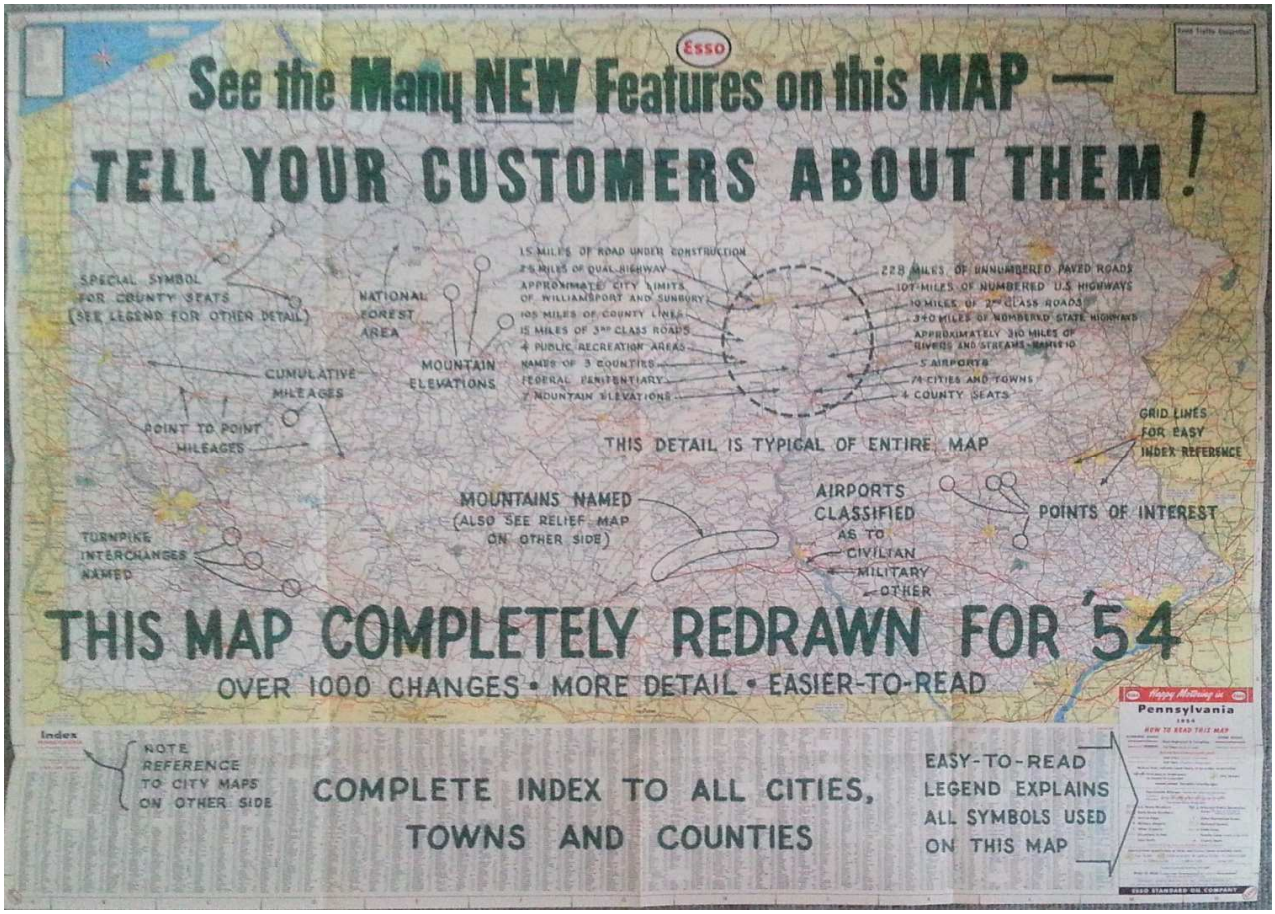


Figure 223: Main map from overprinted 1954 Esso dealers' map

Figure 224: Penitentiary, airports and county seat

A broken circle indicated the density of features (Figure 225), listing not just what was shown, but also how many were in the circle – so it included almost 700 miles of roads of varying class, broken down into 7 categories as well as "approximately 310 miles of rivers and streams – names 10". Almost everything in the "easy-to-read legend" was highlighted here, except for populations, and one feature not in the legend was – a Federal penitentiary. The enlarged extract (Figure 224) also shows the non-intuitive county seat symbol (below Lewisburg) and the way the outline "other airport" symbol could be both rotated and shrunk to fit the space available. The black stars are mileage

indicators; the one mile distance for the road crossing the river is hard to see on the original map, despite a gap in the river beneath it.

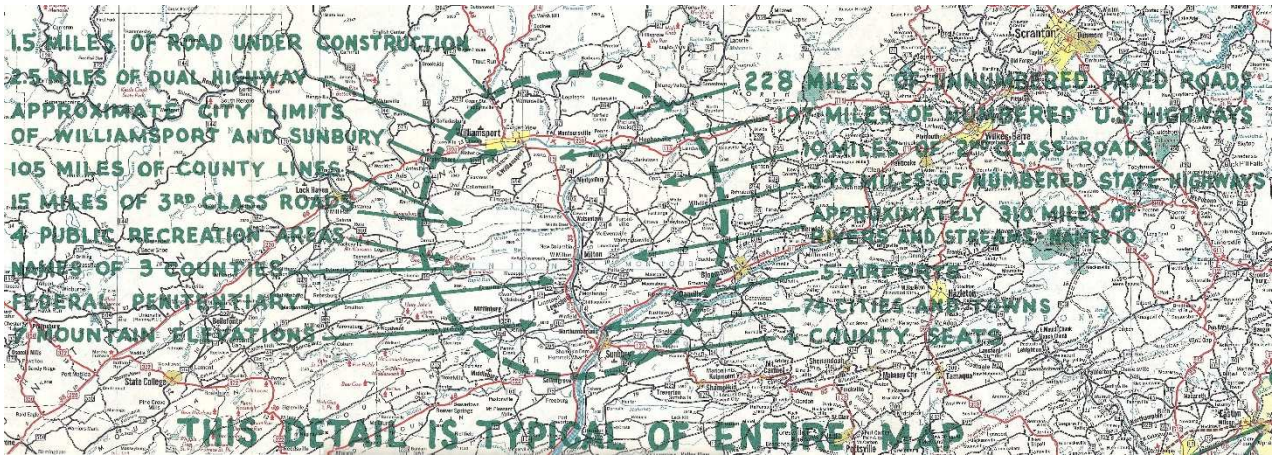


Figure 225: Highlighted detail from 1954 Esso Pennsylvania map

From the analytical work summarised in Chapter 6, the General Drafting style used by Esso often used fewer distinct symbols than maps from European cartographers, making it easier to explain them in this manner. It is not known if Esso/General Drafting produced similar explanatory maps in other countries, nor if their commercial rivals did in the US. There is no indication of the print run for this overprinted version of the map, but 17 years later there were 1,857 Esso dealers in Pennsylvania (NPN 1971) suggesting it is unlikely that more than 2,000 copies would have been produced; the map examined here came from duplicate stock when the General Drafting Co. archive was transferred to the Newberry Library.

7.2. Case Study 2: Selling the maps to dealers

The second case study investigates some materials produced by Esso or Mobil for dealers to encourage their sale to customers in the UK, as well as point of sale materials aimed directly at those customers.

In the UK, where maps were sold, not given away freely, they were seen both as a service and a profit centre. A 1957 Esso dealer guide to the tools for selling, noted that Esso Travel Aids provided a "profitable and exclusive" line; displayed where they can be seen, "they readily sell themselves". The Esso Touring service – still run out of Paris – was targeted as much at the "many thousands of foreign motorists [who] will be touring this country", but in the other direction it noted that "Before a motorist goes abroad he spends an average of £7 10s. 0d on products and service", recognising that many dealers ran full service garages for which fuel sales were incidental. And the motorist was unthinkingly a "he". A good dealer could sell 50 maps a week, or occasionally up to 100 maps a day, although most would have been the cheaper UK sections (Wigmore 1956). Overall, the Spring 1957 *Esso Dealer* magazine noted that cumulative sales of Esso road maps had reached almost 10 million.

The 1967 Esso Dealer Sales Aids, Goodwill Novelties, Road Maps and Guides, Stationery brochure actively encouraged dealers to sign up for an Esso Touring Service franchise. It explained:

> "*Although the Esso Touring Service has only been in operation since June 1963, dealers who have accepted the franchise have been well satisfied with sales of the new European Maps and Guides. Sales of the very popular maps of Great Britain and Ireland continue to increase and now stand at an all-time record.*
>
> *"By accepting the Esso Touring Service franchise, you undertake to maintain and actively promote the sales of the complete range of Esso Maps and Guides. In return you will receive free, on loan, an attractive display rack together with a distinctive window identification sign which will direct motorists to your forecourt. Active promotion of the Esso Touring Service will earn* you *an average profit of more than 40% over the range of items offered…"*

The initial package contained 34 packets of 6 road maps, cruising guides or phrase books and was offered on a take it or leave it basis. While it is easy to imagine a demand for some of the more popular items, the 13 Continental Road Map titles included Finland for example, and it seems unlikely that the South Coast sectional cruising guides would have sold well in Scotland. The margins were not high; each Continental Road Map cost 1/6d, with a retail price printed on the map of 2/-, so it seems likely that many would have lost money. Additional maps could be bought in packets of 10, except for the UK sections which were sold in 25s. As these had a 100% markup, costing dealers 3d but selling for 6d, they appear to be the better bet.

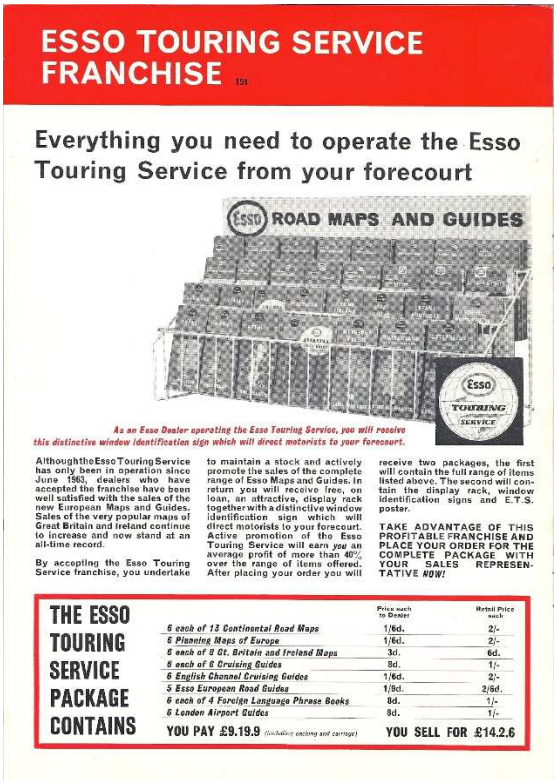


Figure 226: Promoting maps to Esso dealers

By 1982 costs to dealers had risen, but were still low. Mobil's British maps were available in packets of 10 at 30p/map, with 5 titles covering the country; dealers could also buy a dispenser at £5.95 plus VAT.

Marketing was supplemented by consumer-facing advertisements, mainly in the motoring press, although sometimes targeted as specific users such a Shell-BP advert in *Motor Cycling* (1955) or an Esso advert in *The Motor Cycle* (1952), and additional point of sale material. Both Esso and Shellmex-BP produced brochures in the 1950s in the UK promoting their respective maps and, for Esso, its international Touring

Service. Esso noted that the latter was "not intended to replace the services which the large motoring organisations…supply to their members". A mid-1950s Esso Travel Aids brochure listed countries for which maps were available, on request from Paris, ranging from Algeria to U.S.A. but treating Latin America as a single country, despite separating out Luxembourg. Some brochures could be overprinted with dealers' names for a fee. Press adverts promoting road maps were used in several countries, including the UK, USA, Italy (Figure 82) and France.

7.3. Case Study 3: The Company-Cartographer Relationship – Esso in Europe

7.3.1. Esso in the UK: Edward Stanford Ltd

The previous section shows that Esso was active in promoting its maps and protective of the unique style it had developed in partnership with the General Drafting Company (Figure 143 to Figure 148). This is borne out by the way it retained copyright on almost all its maps, leading to something of an arm's length relationship with local cartographers.

In the UK, Edward Stanford Ltd was a long established retailer of maps which, by the time it was acquired by George Philip and Son in July 1947, produced only a limited range of its own maps, but retained a strength in nautical charts and owned a map printing plant in Willesden. In a July 1948 Board meeting, its directors expressed concern that there might be "*priority given to Philip's work to the delay of Stanford's*" at Willesden, but the September 1948 minutes state:

"*Mr Philip advised the Board that the negotiations for the Esso order for Sectional maps of the British Isles had been successfully concluded. The order should be completed in just over 2 years and would amount to £27,000. Mr Godfrey said that the copyright would be the property of Esso."* (Stanford 1948)

Later minutes reveal that this would increase the company's sales by around 15%. Although it did lead to a "bottle-neck" in printing at Willesden, by 1951/2 the Directors' report to the AGM was able to state there were record profits *"In the main it is due to the completion of part of the order placed by the Esso Petroleum Company for the preparation and printing of several millions of 'Esso' road maps of the British Isles, further quantities of which have since been ordered."* (Stanford 1952)

The relationship appears to have developed smoothly, even though Stanford's parent company had the map contract for Esso's arch-rival in the UK, Shellmex-BP. Despite its importance to the company, the board minutes focus on minor issues (such as new jackets or a franking machine) and it is not until July 1959 that a substantive issue came before the Board – the cost of revisions to the maps. Item 3 read:

"*Esso Map Revision*

Sanction was given to the thorough revision of the Esso maps as proposed by Mr Fullard at an estimated cost of £1,000 per sheet, subject to further detailed consideration of the work proposed since this might

well be reduced. It was agreed that only two sheets per edition should be revised.
Great concern was again expressed at the failure of the works to keep these sheets fully revised and to make allowance for proper revision in their estimates." (Stanford 1959)

This reveals that although there were approximately annual reprints, with minor design changes to the front or rear covers, the actual maps inside were not being revised at the same frequency.

The relationship between Stanford's and George Philip is not always clear cut. Although all Shell maps were copyrighted to George Philip & Son (not to Shell), Stanford's appear to have undertaken the cartography for Shell's Central London map as the Board decided to base the map on "*the key prepared for 'Shell' London*", rather than to produce a completely new one (Stanford 1959). This appeared as "Stanford's Map of Inner London", which was authorised to be printed in 20,000 copies for resale at a price of 2/6d in the December 1960 board meeting – a bad deal for customers as the same map could have been bought in its Shell version backed with an outer London map for just one shilling. The day books for Philip's reveal that throughout the 1960s and 1970s selected titles prepared for Shellmex-BP were recycled "to publishing", where they could be sold under different covers at a significantly higher price.

7.3.2. Esso in Europe – copyrights

Esso's retention of copyright on the Edward Stanford maps was far from uncommon. The Stanford issues generally say "*Printed in Great Britain by Edward Stanford Ltd., London Copyright, Esso Petroleum Company Ltd.*" in the margins. In contrast, the Shell, BP and National Benzole maps all say "*Copyright, George Philip and Son, Ltd., London*" and elsewhere carry the phrase "*Specially prepared for Shell-Mex and B.P. Ltd. by George Philip & Son, Ltd.*"

Equivalent statements appear on almost all European Esso maps from the 1950s to 1970s. Esso's Swiss operation was once of the first to issue maps using General Drafting Co. designs after the War. In 1950 it just stated "*Copyright, tous droits réservés, Esso Standard (Switzerland), Zürich*", but once again the cartographic support is apparent from the printer "*Impression Kümmerley & Frey, Berne*". By the mid-1960s, their involvement is more explicitly recognised (and switched from French to German) as "*© Esso Standard (Switzerland) Kartografie + Druck Kümmerley & Frey Bern*".

French Esso maps follow a similar pattern. The notice in the Legend reads "*Copyright, 1954, ESSO STANDARD S.A.F., tous droits réservés / Dessins préparés par General Drafting Co., Inc., Convent Station N.J., États-Unis / Cartographie et Impression par Blondel la Rougery S.A., Édit. Imp., 7, rue St-Lazare, Paris (France)*" [134]. Uniquely, in France Esso had a second map of the country in the 1950s, which folded to a smaller format, but had a slightly larger scale (1:1,500,000 against 1:1,600,000 for the regular issues) as it

was split across both sides of the paper and lacked the pictorial guide. This second map did not use General Drafting Co designs, and did not give the copyright to Esso; it did however credit Blondel la Rougery [552a]. In line with other Esso European road maps, the regular design was updated for 1962; the maps helpfully explain in four languages that "*The new ESSO road map has been produced after a close study of motorists requirements*". At the same time the scale was increased to 1:1,000,000 by eliminating the pictorial map on the reverse. As elsewhere, the copyright was retained by Esso, but Blondel la Rougery were still credited with the cartography, and General Drafting Co was no longer mentioned.

The 1950s Danish maps are equally explicit in the relationship. While the Legend has (in Danish) *Udarbejdet af Geodætisk Institut, Köbenhavn*, and in English "Copyright Dansk Esso A/S Copenhagen", floating in the sea below is the explanation (also in English) "*This map is produced from designs prepared by General Drafting Co., Inc., Convent Station, New Jersey, U.S.A.*". Its 1960s maps drop the General Drafting Co reference, as well as the explicit recognition for the cartographer. Instead there is a small message (in the sea near the Swedish coast, but at the top of the rear cover when folded) "*Printed in Denmark Møller & Landschultz 661, Copyright Dansk Esso A/S, Copenhagen*" [550a]. The cartographer only appears in a box in the sea above Jutland: "*Dette nye Esso kort er fremstillet på basis af en markedsundersøgelse blandt tusinder as europæiske motorkørende, hvis ønsker nøje er blevet fulgt. Det kartografiske arbejde er udført af Geodætisk Institut, og det turistmæssige stof er udarbejdet i samråd med Turistforeningen for Danmark*" (*This new Esso map is made on the basis of a market survey among thousands of European motorists whose wishes have been carefully followed. The cartographic work has been done by the* Geodætisk Institut*, and the touristic content has been prepared in consultation with the Tourist Association for Denmark*).

Analogous statement giving copyright to the local Esso company, but only acknowledging General Drafting company designs until the 1962 revision, can be found on Esso maps from Germany, Austria, Belgium, the Netherlands, Norway and Italy.

It appears, therefore, that Esso closely controlled the map designs and retained copyrights until the 1970s, when a wider range of locally produced designs appeared. However we cannot always assume that common features imply central coordination. The mid-1970s Esso UK maps (Figure 110) and late 1960s Canadian city maps all have artwork by a Texan artist, Suzanne Dolesch. However this was not centrally planned; the Esso UK marketing manager had worked in Canada in the 1960s and liked the design so independently commissioned the artist.

7.4. Case Study 4: The Cartographer-Company relationship – Rolph McNally

7.4.1. Rolph McNally – A Canadian Joint Venture

Rolph McNally was a Canadian printer and publisher of road maps, active from the late 1960s. It was established as a joint venture between Rolph-Clark-Stone, a printer with over 125 years' experience based in Toronto, Canada, and Rand McNally, the largest US commercial map publisher at the time. The Rand McNally archive held in the Newberry Library contains more information about the work Rolph McNally undertook with oil companies than it does for the parent company. It includes supporting papers for some, but not all, Board Meetings in the 1969-78 era when the business's main focus was on providing these maps. The archive only contains documents sent to Rand McNally, one of the joint venture owners, in Chicago, but these include a number of internal briefing documents or memos from the joint venture, as well as limited examples of printed material from the company. This case study is largely drawn from that archive, augmented by maps in the author's collection, using Cape Breton Island to illustrate cartographic points.

7.4.2. Background to Rolph Clark Stone's oil company cartography work

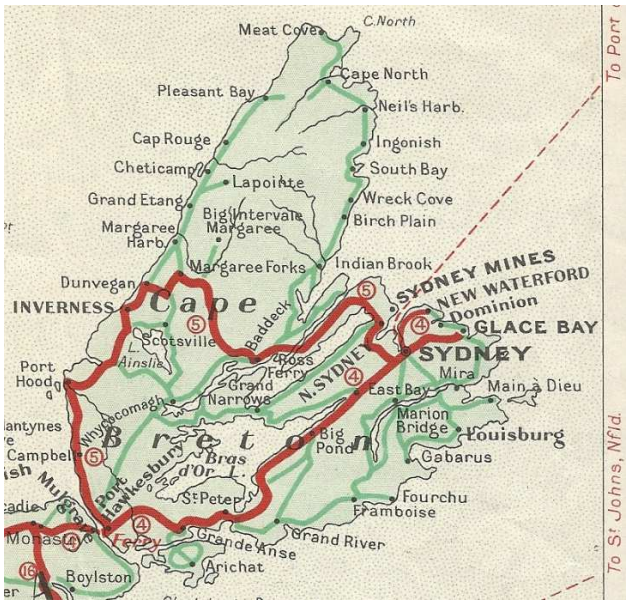


Figure 227: 1929 Imperial Oil/Rolph Clark Stone three colour cartography of Cape Breton Island [277]

Figure 228: 1936 Rolph Clark Stone map of Cape Breton Island for Sunoco. Names in red represent hunting and fishing opportunities [642]

It is not certain when Rolph Clark Stone first became involved with maps or established their cartography department. As a large general printer, it is possible that they may have started by printing third party maps and then decided to move up the value chain to create the maps themselves. The Toronto Public Library has a map showing proposed improvements to a public park, drawn by Alexander and Cable, dated 1903, and with lithography by Rolph and Clark Ltd (Doucette 2016). By 1929 the company was lithographing maps for Imperial Oil, Ltd., the Canadian affiliate of Standard Oil Company of New Jersey

and one of the largest suppliers of petroleum products in the Dominion (RMCA, 2014). Copyright in the maps belonged to Imperial, and this business was lost in 1933 when Imperial switched to the US cartographer General Drafting Company in line with its parent – as explained below, it only returned to what had become Rolph McNally in the mid-1970s.

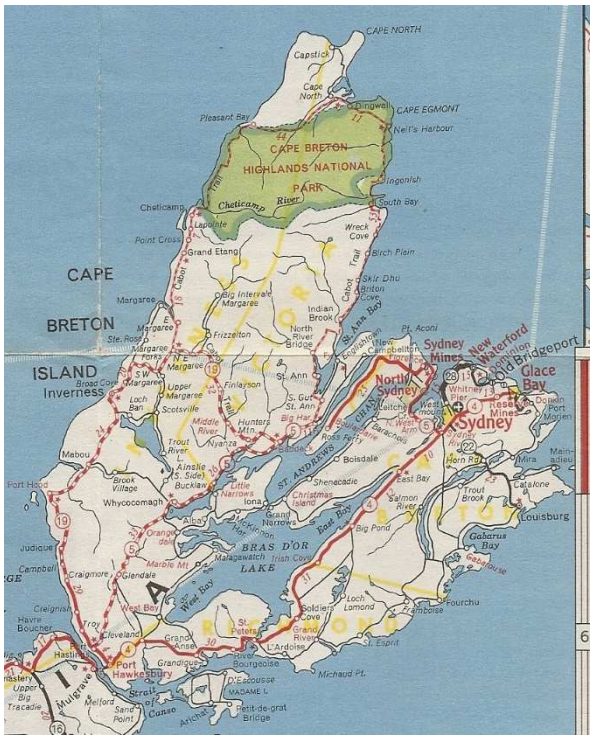


Figure 229: 1957 Rolph Clark Stone map of Cape Breton for Superline. Towns with Superline stations are named in red; the style is more like General Drafting than Rand McNally [644]

In the mid-1930s, Rolph Clark Stone picked up more oil company work from Sunoco, McCall-Frontenac (which used the Red Indian brand and later became Texaco) and Irving Oil. Competing mainly against HM Gousha's Canadian subsidiary, the early 1950s appear to have been the most successful for Rolph Clark Stone's cartography department, when it was simultaneously working for a range of oil companies including B/A, Champlain, Irving, Sunoco, Superline, Supertest and Texaco. Many of these clients were lost in the 1960s, partly as a result of mergers in the Canadian petroleum industry, but also due to competition from Gousha.

By the mid-1960s, it was not just the cartography division of Rolph Clark Stone that was suffering, but the entire company needed to be restructured. In early 1967, Rand McNally started looking at the cartography operation to see if they could acquire or merge with it.

7.4.3. Initial approach by Rand McNally, 1967-8

The first mention of Rolph Clark Stone (RCS) in the Rand McNally archives explains that it originated in 1849 when Rolph-Clark Ltd was formed; in 1917 it merged with Stone Ltd. By 1967, when Rand requested a Dun and Bradstreet Report dated March 8, 1967, it had six divisions, mainly concerned with general printing, greetings cards, folding cartons or cheque printing. The Board still included two Rolphs and two Clarks; trading was declining and despite acquisitions, it was to some degree dependent on bank finance. In December 1967 it announced a restructuring; the cartographic operation was not mentioned, but it is clear that they requested Rand McNally to take a look at the operation, as a senior manager, Russell Voisin, had visited the company making a set of notes dated January 28, 1968,.

The cartographic section was very small with just 4 staff; its head – Les Thompson – had been with RCS for 40 years, and his father had been chief cartographer at RCS before him. The business was shrinking; all

staff were expected to be able to undertake any operation. In 1964 they had, "*in a crash programme*", updated the province maps, but much of the production of the master maps was outsourced to George Philip in London. They refer to a single provincial map customer; in 1968 it would have been Shell, though Sunoco had used them for its 1967 maps; in addition RCS produced city maps for other oil companies in this period including Esso, and a Western Canada map for Richfield, a US oil company. Nine or 10 city maps were produced, but "*only one… was scribed, Halifax, and it was produced in only a single edition for Texaco and is not currently printed for anyone*." The others were either held as original artwork or had been photographically converted. The report criticised the techniques used, observing that they led to excessive costs.

At one point Voisin's notes state "*Serious consideration ought to be given to utilizing the present RCS Provincial maps in any continuing sale of the product in Canada and perhaps these maps should be used by Rand McNally for its American customers under copyright and royalty arrangement which would allow us to discard our present maps. In fact, we could take over the elements, maintaining them instead of our own. I would believe that improvement could be made by doing some color separation of type and symbols, which would not be expensive, and this would free up the general appearance and lighten the character of the map considerably. As Harold Fink has observed, the scale of the Gousha, Rand McNally and RCS maps does not vary considerably and the early belief that the scale was the prohibiting factor in the present sale of the RCS maps does not really seem to hold water.*" (Voisin 1968)

The archive is silent over the exact financial arrangements, including whether the possibility of an outright purchase, instead of a joint venture, was considered. It also omits the exact date of the transaction, which appears to have taken place in summer 1968.

7.4.4. Rolph McNally: the recovery of the cartography business

Around the time of the merger, Rand McNally investigated why profitability at the RCS cartography operation had been so poor. This included discussions (memos) about the cost of producing maps for British American Petroleum. Rand did an analysis of costs, to attempt to determine why they were higher at RCS; total estimated costs for producing the series of maps were $54,939 at RCS compared to just $39,390 at Rand McNally.

There is no correspondence saved for the next few months, but it is clear that closer working – including allowing Marquette Paper Corp to supply RCS with Ranally Map Paper, and obtaining permission for using RCS maps as a data source for the 1968 updates to Rand maps – was discussed. By September 1968 there are references to a new Canadian company with a completely new name. However it appears that B/A and Texaco had moved to Gousha, leaving only Shell with RCS for 1968.

Cartographic production costs for 5 new titles for Shell were quoted at $10,800, with an additional $1,800 if relief shading was needed. (Undated memo "Monday"; probably September 1968). By November administrative arrangements were being considered; the stock maps on hand included ones for Irving Oil (3 maps), Sun Oil, Imperial Oil and Shell Oil, in addition to the New Brunswick Government, Firestone, real estate and tire companies. In November 1968 the deal went public as part of a "slimming and strengthening" process at RCS. Art Alder was appointed as a new General Manager (by the mid-1970s there were concerns about his performance recorded on file). A handwritten note says RCS sold 1,800,000 maps in 1968.

The new blood had an immediate benefit. As early as December 6, 1968 Union Oil Company of Canada wrote confirming they would get their 1969 requirements from the new Canadian affiliate of Rand McNally; a pencilled note says "*Looks like we have a start!*" On December 23, Texaco were sent a quote for 1,106,000 maps (98,000 Atlantic, 226,000 Quebec, 452,000 Ontario, 134,000 Man.-Sask., and 196,000 Alta.-B.C.). The price was $46.50 per thousand, with no variation by section.

A summary dated January 8th, 1969 lists prospective customers:

- British American – Rolph McNally to get city plans and Gaucha (*sic*) provinces; the Rolph McNally provincial bases were "too conjested (*sic*)"
- Texaco – quotation outstanding
- BP – ordered re-run from Gaucha (*sic*); request proposal in May for November order
- Fina – unable to contact
- Shell – lost all for this year
- Sunoco – currently quoting
- Champlain – have sufficient stock – ordered from RCS two years before; they use RCS cities and General Drafting provinces
- Union Oil – order received for BC and Alberta
- Federated Co-operative – order for 20M maps of four western provinces
- Esso and Irving added to list in pencil without comments – a later memo said both should print in 1969, but had no information for the Rolph McNally rep
- Non-oil clients included Brewers Warehouse with an order for 300,000

Later documents mention Supertest, Eagle[5] (Newfoundland) and Husky as still needing to be contacted.

[5] Golden Eagle (not "Eagle") constructed a refinery in Newfoundland in 1960 (Atterbury & McKenzie 1985:139)

A question was raised in a later memo whether Ralph-McNally (*sic*) will be "stocking maps in the flat, ready-for-imprinting like Rand McNally does". These are presumably the generic covers that were marketed to smaller oil companies (and occasionally other businesses).

Road atlases were also an important line. Although some were quoted to oil companies, the main customers appeared to be national companies in other sectors for use as a premium; so in January 1970, for example, there is reference to currently producing 470,000 32 page Canadian Atlas and Travel Guide for Procter and Gamble, and 66,000 64 page atlases for International Harvester, Sun Life and others.

Business with oil companies began to pick up; contracts were obtained for city maps from Imperial Oil (Esso), and – for 1970 – for all the road map work for Gulf Oil and Texaco. However in 1970-1 the focus was more on non-oil clients such as Readers Digest and Procter and Gamble. An auditor's note refers to a sale to Irving Oil of $30,933 for maps without a purchase order that had been refused delivery.

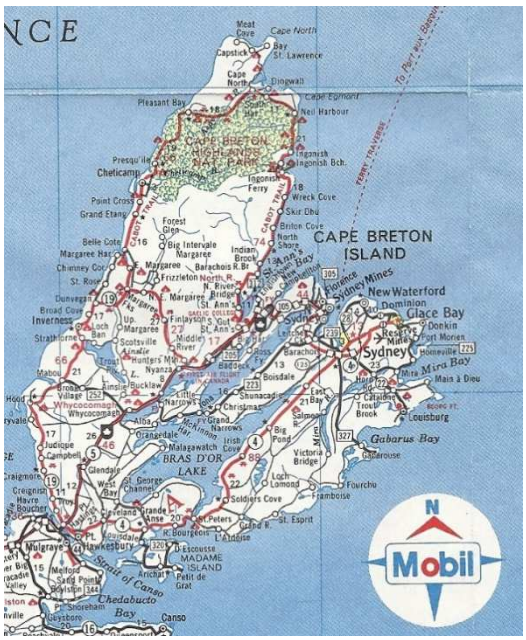


Figure 230: Cape Breton Island from a 1972 Mobil map of Quebec-Atlantic Provinces [587] (Rand McNally credited as cartographer)

Royalty Payments to RCS		
January 1, 1971 to October 1, 1971		Price
Alberta BC Man Sask		per M
Arco	100000	$42.20
Husky	75000	$59.90
Mobil	30000	$43.00
Phillips	20000	$38.85
	225000	
Ontario (Northern and Southern)		
Husky	33000	$59.90
Mobil	125000	$43.00
	158000	
Maine-Atlantic Provinces		
Gulf - US	225000	$45.40
Quebec-Atlantic Provinces		
Mobil	80000	$43.00
Ontario (Southern)-Quebec		
Arco	150000	$42.20
BP	10000	$45.00
Husky	10000	$59.90
National Enterprises, Inc	400	$68.40
	170400	
British Columbia-Alb-Alaska		
Husky	29000	$59.90
Sohio	350	$57.00
Other Auto Club (US)	3100	varies

Table 6: Royalty payments for Q1-3, 1973

Table 6) from Rand to Rolph Clark Stone (not Rolph McNally) shows how a limited number of US oil companies took cartography from Rolph McNally in the early 1970s. As this only covered a nine month period it is unlikely to be a complete list. Royalties were calculated at 10% of sales value, less 50% for one side only (the Maine/AP and BC-Alb-Alaska titles). In the Table, "M" = thousand.

7.4.5. Declining demand in the early 1970s

1972 orders included 1,055,000 maps for Gulf Oil at a reduced size (but still worth $91,285), and 1,000,000 maps for Texaco at $73,860. The only other oil companies were Imperial Oil (cities expected, trying to get provincial from General Drafting) and Federated Cooperative. Discussions continued with Texaco about a road atlas. It also held onto a small BP order (cities?). A June board paper noted that BP Oil/Supertest (now one company) and Sunoco were with Grant-Mann, and that Ashton Potter had picked up Shell and Texaco (Toronto city map only). Rolph McNally were concerned that although they could compete with Ashton Potter on price, they were unable to do so on design. The RMCA catalog has no Ashton Potter maps from any company; although the wording suggests that all Shell maps were with them, it may be that only the Toronto one was, as provincial maps are known to have been produced by Creative Sales Corp. Ashton Potter was another long-standing Canadian printer, with a specialism in postage stamps.

The 1973 file is almost completely devoid of textual information, being mainly monthly financial reports, and a few memos about cash flow and specific projects, such as a Canada Campground and Trailer Park guide. Board minutes are just short formal documents, with no narrative reports, unlike those provided previously. 1974 is similarly uninformative, until one memo dated September 4 from Art Alder, reviewing the year to date. This included the paragraph:

> "*The major change in our business will be in the map business in the coming 12 months. This is due to changing in the use of maps by the oil companies. For example, Gulf bought a million maps in 1974 and is selling them at 25c each. This means they will have enough stock for two or three years. Texaco is apparently committed to Creative Sales' subsidized program for 1974 and 1975; so we cannot plan on Texaco in 1975 unless we convert them to our new stock program. Shell is due for a new contract in the fall of this year. We have been actively working on this and we are creating an all-new approach using stock maps, like Rand McNally Is producing. We feel that Shell will opt for something new, just as they did with our new routing service. We visualize producing a complete line of city and provincial stock maps, which Shell can retail at 25c each, just as Gulf*

does. We think Shell will convert to a new program where their dealers can order from us and the dealers can retail the maps just as any other product….By creating a stock line of Canadian maps to match up with Rand McNally's stock maps, we hope to convert major oil companies to the use of stock maps. This should be easier to accomplish now that Gulf is selling maps."

The subsidized program refers to the inclusion of third-party advertisers on two panels of the map; these are then spotted on the map with a number on a blue disk. Texaco's own outlets are only shown when near junctions on limited access highways. Sunoco similarly took subsidised maps with third party advertisers in 1974-5; their maps however highlight all towns or villages with Sunoco service by highlighting the place name in yellow, adding to the congestion on the map. Subjectively, placing Sunoco's Rolph McNally 1973-4 and Creative Sales 1974-5 maps side by side, I find the Rolph McNally maps slightly crisper in design, although the scale and level of detail are almost identical.

The next board meeting (October 2, 1974) showed an annual potential of 300,000 maps from Shell and Gulf (currently using 1,000,000 maps each per annum) and 100,000 for Sunoco (currently on 300,000). Stock maps could be sold in any quantity from 25 up on a sliding scale – essentially costing from 50c for 25, 40c for 100, 30c for 500, 25c for 1,000, 16c for 100,000 to 14c for 300,000. City maps were 4c more in each price band. The Shell approach was seen as being in line with US expectations. It was around this time that the Shell travel service was started in Canada.

7.4.6. Board papers from 1975 and 1976 – the end of free maps

Board papers from 1975 included much discussion about new maps for the 1976 Montreal Olympic Games, and how to retain or gain oil company business, largely through offering a wider range of maps under stock covers. Most oil companies wanted "to get right out of the map business" so were interested in using Rolph McNally's "Can/Map" program. The main competition was seen as Creative Sales Corp from Chicago (not Grant-Mann Gousha). One note says that they cannot imagine anyone creating new Western City maps as they (Rolph McNally) have difficulty justifying updating the map. Esso's total order of city maps was estimated at 200,000 copies.

Estimates in the March 18, 1975 board papers were that unit volumes would be for an oil company (presumably any one of the big four):

Give away maps as 2 years ago	1,000,000 maps
Sell maps at 25c-35c	400,000 maps
Sell maps on our program at 50c	200,000 maps

1,000,000 maps would cost 10c each to manufacture and could be sold to an oil company for 20c each; with merchandising handling and shipping costs factored in at 5c a map, the profit might amount to

$50,000. This led to a consideration of the use of vending machines (as Shell had been doing in the US), or possibly selling the maps in bulk to a distributor: there were two named (DCI and Gorrie) who ran vending machines.

March 15, 1976 shows the division of map accounts. Only BP used Gousha and they still had stocks of 600,000 maps to get rid of. Creative Sales, through a distributor called Comda, supplied Gulf and Sunoco. Shell, Texaco, Howden Petroleum[6], Chalet, Messageries Dynamiques[7], Husky, Co-Op and Turbo were with Rolph McNally. Fina's intentions were uncertain although they had used Rand McNally for their routeing service (distributing around 1,000 maps a week). Esso had 500,000 provincial and 11,000 city maps in stock and were hoping someone would take the stock off their hands (see also below).

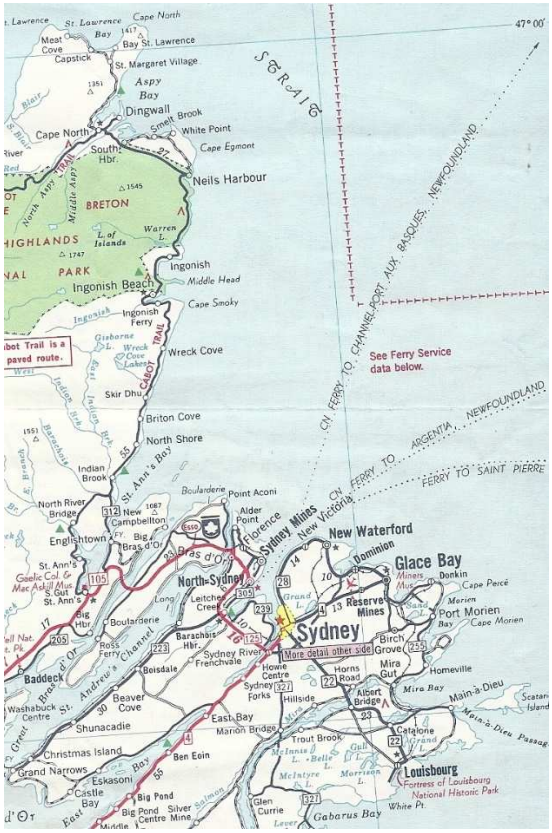


Figure 231: Extract from 1972 Esso map of Cape Breton Island [297], cartography by General Drafting Co (NY, USA). Note grid orientation uses longitudinal lines

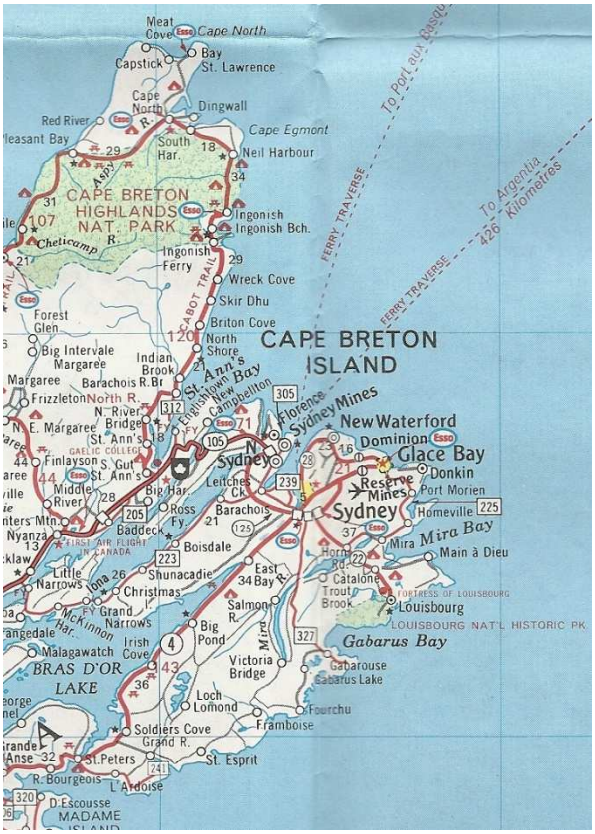


Figure 232: Extract from 1977-8 Esso map of Cape Breton Island [302], cartography by Rolph McNally. This map has the Esso "spottings" added

A December 1976 board summary says they were pleased to get Imperial Oil onto their stock map program, as General Drafting had been supplying their provincial maps for over 30 years. It continues "We are adding the Esso logo and some spottings [*sic*] on our Provincial maps and just the logo on some

[6] Almost certainly acquired by Ultramar Canada. No branded maps are known in major collections from this company, so it may just have been supplied with generic maps by Rolph McNally.

[7] Messageries Dynamiques is (2019) the largest distributor of newspapers and magazines in the province of Quebec. It was established in 1964 (website http://messageriesdynamiques.com/en/, accessed 20 November 2019).

of our city maps. Any title that will turn over a minimum of 25,000 a year will be branded for Esso." This was a four year agreement with leftover maps able to be used by Rolph McNally in the following season, and the right to substitute stock maps. Esso were obligated to buy back any stocks if they cancelled before 4 years. Rolph McNally also purchased the remaining Esso GD maps for $6,000, with an estimated value of $80,000 – these were later sold for 19c to dealers.

Distribution was a continuing problem. Esso, Gulf and Sunoco had been using Comda for fulfilment, but they ran into financial difficulties, allowing Rolph McNally to pick up the business. (In general, it was a hard time for the industry – Rolph McNally itself considered requesting a capital injection from its parent companies.) Map vending machines were considered but dismissed; a machine cost $500 so the prospect of a financial return was very low. A brochure kept on the Rolph McNally file from Selecta Inc. shows a machine located adjacent to the petrol pump at a (US) Marathon station. Another supplier is quoted elsewhere as selling them for around $250. A wholly different approach to distribution was taken by KFC, the fast food chain. They provided a free map with a chicken bucket that led to incremental sales of 1,500,000 copies – although not stated in the Rolph McNally archive, these maps marked KFC outlets and were also produced by province.

Another recurring theme was the need to update maps and limited funds available to do the work. City map updates cost $8-10,000; Hamilton, Calgary and Edmonton needed revising as they were "not saleable as is".

In early 1977 an offer was made to buy Creative Sales for $50,000 but it was turned down; this was despite Rolph McNally having been quite dismissive of the business in previous board meetings.

7.4.7. 1977: the end of oil company maps in Canada

A folder of brochures and letters sent out to gas station operators explains why oil company maps ended in Canada – essentially it was metrication. In September 1977 all Canadian speed and distance signs were converted to metric units; to mark the introduction of Rolph McNally metric maps, 20,000 map program catalogs were mailed to service stations ("dealers") across Canada. Although the mailings referred to there being over 100 maps available for sale, most were standard USA Rand McNally issues. The Canadian ones comprised an all-Canada map, 5 provincial maps (still pairing BC-Alberta and Sask-Man), with 16 Canadian cities, including Mississauga, Brampton, Thunder Bay, Windsor and Regina, which had never been published in oil company editions. Notes prepared for the June 1, 1976 Board Meeting, indicate that the data for the Mississauga map came from the city itself at no charge and the one of Windsor was "borrowed from the owner in Windsor"; it was primarily being produced for the Royal Bank but an overrun would be used for their own stock. The Canada map was an updated Government map, on which a 10% royalty had to be paid.

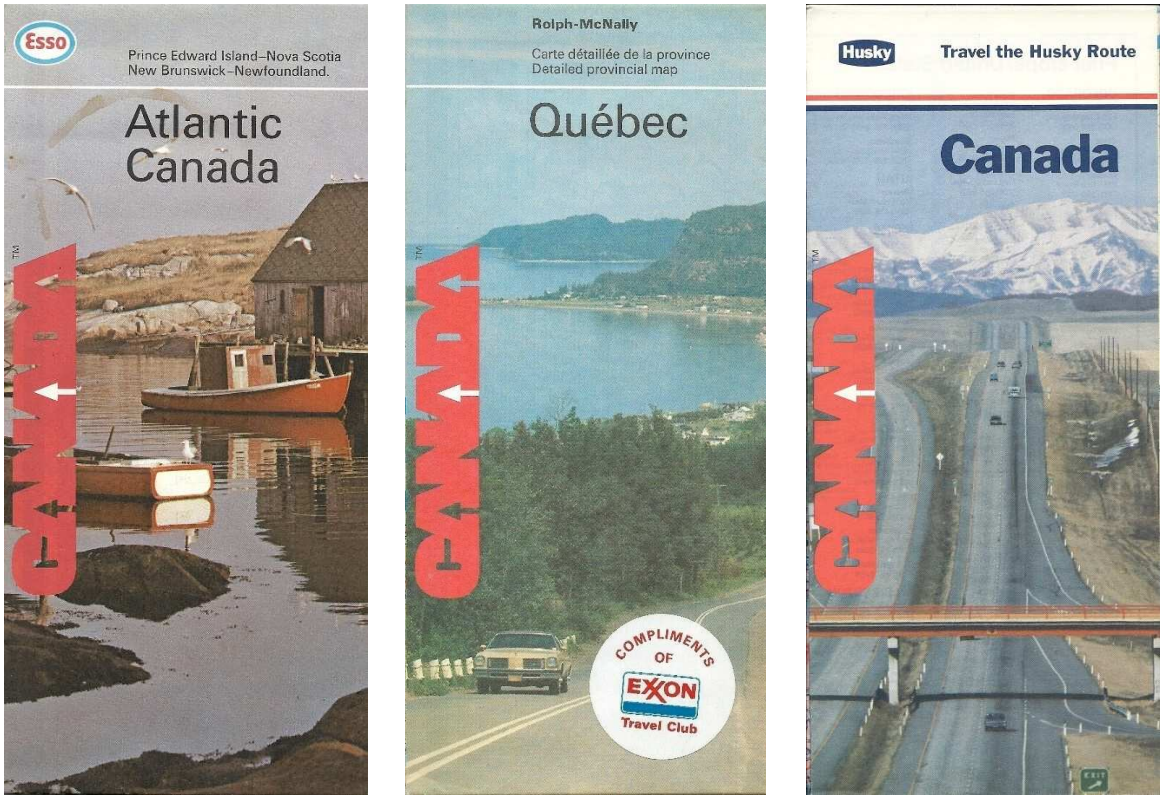


Figure 233: Three examples of the new Rolph McNally maps with the copyrighted "Canada" logo

The three maps in Figure 2336 show from left, a 1977-8 Atlantic Canada (the title was changed from Atlantic Provinces for the metric editions) in its bespoke Esso version – this is the cover from the map in Figure 232. Centre: A 1980 Québec issue with plain cover, used by Exxon in the US with a sticker; ironically this map would have been sold for 50c by its Esso subsidiary in Canada, but was free to Travel Club members. Right: With its far-flung network of truck stops, Husky still felt it necessary to commission a customised map of Canada [572]. Inside this 1980 map the Government copyright (from 1971) is acknowledged; all Husky truck and fuel stops are marked on the map.

Rolph McNally produced a common catalogue, in English and French versions, plus additional versions of the catalogue with customised covers for Shell, Esso, Fina and Texaco. Husky was also named as a company using Rolph McNally as their preferred supplier. In a letter to RCS in the archive, Esso (Imperial Oil) identified potential improvements, such as constant updates, Esso or Voyageur (restaurant) locations indicated on major highway routes on all provincial maps, and a competitive wholesale price of 30c a map. Esso, alone, continued to sell off its stocks of its old branded maps, for which 5 titles were still available: Ontario, Quebec, Atlantic Provinces, and Eastern and Western USA. The notes for the June 1976 Board Meeting, before the Imperial Oil contract was won, indicate that Esso still had 700,000 maps on hand, but had asked General Drafting to take over distribution (in the way that Rolph McNally did); another attraction of Rolph McNally was its range of city maps.

A letter from Shell Canada highlighted Rolph McNally's comprehensive line of map titles, which improved its dealers' profits, as they had previously only sold Toronto and Montreal maps (the other sheets had been given away). Shell's letter also correctly identified that the Calgary-Edmonton titles was a single sheet, as the new separate sheets were not yet available. With the appointment of Rolph McNally as its recommended supplier of road maps, the Shell Travel Service was discontinued from October 30, 1975 – Gulf and Esso had already closed in March 1975 (Board papers March 18, 1975 and October 24, 1975); Texaco was still running at the time. Demand for the service had steadily declined.

A letter from Fina suggested that there was a trend to provide travellers with a wider selection of city and highway maps. It notes that across North America company-identified maps had been discontinued and that Dealers "*no longer distribute maps free of charge (which were sometimes discarded without being used)*".

Figure 234: Fina only switched to Rolph McNally with the stock maps; it had only used HM Gousha (or its Grant-Mann subsidiary) from 1954-74, as shown on this 1971 Maritimes map showing Cape Breton Island

An order form for bulk supplies suggested that customised editions of maps were still available for quantities of 25,000 maps or more with prices on request; otherwise, the 30c maps sold to dealers could be bought directly on a sliding scale of discounts from 25% for bundles of 25, to 70% for bulk purchases of more than 25,000 maps. Even purchasing 500 assorted titles (presumably all Canada) enabled a 50% discount. In contrast although the maps had no set retail price, most companies suggested that 50c was the level at which most dealers were selling them. The only example of a customised item in the archive is a road atlas of Canada for Burns' Pride of Canada (manufacturers of sausages and processed meats), available free with six name flags (proof of purchase) or for $2.99 without. An initial run of 10,000 atlases in 1976 soon sold out, so was followed by an order for 20,000 in 1977. (Canadian Premiums and Incentives, c1977).

7.4.8. Discussion

Rolph McNally is possibly exceptional as it brought together two long established cartography companies: Rolph Clark Stone and Rand McNally. With slightly different house styles, but both based on the post-war North American design principles of white land masses and roads that lacked black edging, users might have been hard placed to identify the cartographer if they had picked up a map at random from a service station counter. All maps were drawn to a broadly similar scale, dictated by the relative size of the provinces and the supply of paper. But there were differences; the memo from 1969 that indicates B/A (British American Oil) would not take maps from Rolph McNally because they were too congested is borne out by comparing Figure 232 with Figure 231. Other than choosing between the limited range of available cartographers – and by the 1970s there were only really three in Canada: Rolph McNally, Grant-Mann (formerly HM Gousha) and Creative Sales Corp, as General Drafting rarely worked outside the Esso group – the oil company clients had relatively little say over the map design. Most of the detailed work was still carried out in-house, often by aging teams of draughtsmen, although it is notable that Rolph Clark Stone (pre-merger) had sub-contracted some work to George Philip in the UK. One can speculate that they might have been introduced by Shell who switched their Canadian map programme to RCS about the same time, and who had been the mainstay client of George Philip for many years.

There is little discussion about what should or should not go onto a map, apart from occasional references to "spottings" (service station locations). Maps were increasingly utilitarian, and the overriding cartographical imperative was to keep them reasonably up to date at a cost that would enable them to be sold profitably. Keates (1996) identified profit as the main motive, and dismissed Harley's concept of such maps having a hidden agenda. Where cost effective, Rolph McNally was happy enough to buy in a third party map (the Government of Canada and city maps named above being examples) and simply redraw them for their own edition; however as the 1980 Husky edition shows, additional information might be added at a client's request.

The correspondence in the archive provides some answers to the questions from Petchenik (1985) about why we map and who pays for it. In Rolph McNally's case it was being driven, by the mid-1970s, by the cartographer, seeking to maintain a business. There is a clear sense that oil companies were increasingly reluctant to deal with the business of distributing and, by 1977, selling maps.

Note on sources

Unless otherwise indicated documents mentioned in this case study are in the Newberry Library Rand McNally Archive (Series 7, Boxes 1 and 2) or taken from the original maps.

7.5. Summary

This chapter has looked in more detail at the relationships around the oil companies – both upstream, with the producers of maps (cartographers and publishers), but also downstream, with service station operators.

The example of Rolph McNally in Canada shows that for some cartographer-publishers, the need to sell maps to oil companies was existential, with few other significant customers. In the USA, General Drafting Company were similarly highly reliant on oil company business, but geared to a single company (Esso/Exxon); this permitted Esso to claim its own copyright over maps produced for it (even when created by a third party cartographer such as George Philip/Edward Stanford or Karl Thiemig). Although General Drafting did produce some maps for supermarket or financial sector customers, such as Auto-Owners Insurance, Marine Midland Bank, or the retail chains including Pathmark, Shurfine and Stop & Shop[8] (Figure 236), using the same basic designs as Exxon, and later sold maps under the TravelVision name[9], numerically these were negligible compared to their work for Exxon.

Figure 235: New Haven from 1978 Exxon New England map [561a]

Figure 236: New Haven from 1980 Stop & Shop map [641a]

The extracts here show how cartographic designs originally created for Esso (Exxon) were later used by General Drafting Co. for other clients. Both have 'spottings', but the Exxon adjacent to the interstate is hardly visible (just above Short Beach). In contrast Stop & Shop keyed their stores by number; an index to stores replaced the mileage chart on the Exxon map, identifying store name and street address.

In Germany, Busche of Dortmund were in a similar situation, being reliant almost exclusively on Aral for their business. It is probably no coincidence that the very last oil company map programmes in the USA and Germany came from Exxon and Aral respectively.

The Canadian case study also shows how the move to discontinue free maps was largely driven by cost. In the 1960s and 1970s the major companies, with extensive map programmes in North America, frequently became embroiled in gasoline price wars, led by low cost operators. In Canada, where substantially all gasoline came from the same refineries, the cost differential could be up to 10c a gallon.

[8] There is little data on non-oil company customers, although most appear to have been based in the Northeast or mid-Atlantic states, in the core Exxon marketing area (Sveum, 2023).

[9] In the 1980s General Drafting sold a complete set of 25 state or regional maps in a folder as a "Map Library" – the series including a World Map and some state combinations not used for Exxon. No city plans were included. The front covers had a blank area where a service station (or other) stamp could be placed, but none have been reported by members of the RMCA as being used in this way.

In evidence given to the Canadian Government in 1972, the 'regional major' Sunoco observed that of this 10c, independent operators could gain "*an advantage of 2.6 cents per gallon in terms of lower marketing costs (credit cards, full service operations, maps, advertising, training, sales support)*" (Bertrand 1981:353). To narrow the differential costs, and increase dealer margins, dropping free map programmes was an obvious choice. However a calculation based on a typical sales volume of 250,000 gallons/annum (derived from Bertrand 1981), and based on the quotation for Texaco in section 7.3.4 above, and the Texaco chain having 5,000 outlets (Table 3) suggests that one map would have been given away for every 1,100 gallons, at an equivalent cost of just 0.0042 cents per gallon (or 0.16% of marketing costs).

Conversely, in markets where maps were sold, the oil companies promoted them to dealers as an additional profit centre – although how well this worked in practice, when dealers were required to buy equal numbers of road maps of (say) Finland and France, is open to doubt. Shellmex-BP, whose British sectional maps were sold in the 1950s at double the price of Esso maps, still advised their dealers that "*the maps, which are on high quality tough paper to retail at 1/- will be sold to you at 8d. each, which is below the cost price*" and then added as emphasis in italic text "*Remember that every map you sell brings you an additional profit of 4d.*" (Shell and BP Service, c1954).

Promoting maps to dealers, however, required that those dealers – many of whom would have had only a basic education – to be able to understand the worth of the map and, where necessary explain them to customers. There are several examples of covers showing a service station attendant performing this role, but the 1950s Esso map demonstrates that these attendants may have needed some coaching themselves.

7.5.1. Conclusion

In conclusion, we have seen that the relationship between cartographer, oil company and customers (whether service station owners or end users of maps) could be quite complex, and varied over time. Until the 1960s, the large oil companies (such as Esso, Shell, BP or Gulf) were able to dictate to the cartographers what they wanted. However, as the costs of free or subsidised map programmes rose, the situation reversed, and cartographers had to fight to retain oil company business. Although initially provided as a marketing benefit without charge or at a purely nominal cost, where maps were sold to end users, oil companies encouraged their dealers to see them as a profit centre, especially as cover prices rose and they were no longer subsidised by oil company marketing departments.

In the next chapter we look at some of the wider aspects of the production and distribution of oil company road maps.

Chapter 8:

Discussion

8. Discussion

The aim of this thesis has been to is to apply a rigorous cartographic analysis to the oil company road map, and to place these maps into a wider context, including – as far as can be determined many years are their production – whether they influenced other maps and user perceptions. The preceding two chapters have looked in some detail at the content of these maps, and at how this was developed and the maps then marketed to service stations. However this in-depth work has inevitably missed some of the wider context, around the influence of oil company road maps. As a high level historical cartographic review of these maps, with a detailed focus on just nine countries, this thesis cannot hope to bring out all the nuances and influences on these maps, nor to identify a single common feature that distinguishes them from any other sort of map. However it is worth partially inverting the research question to ask "What if these maps had not been produced – would other maps have been different?" Arguably, where an oil company has simply rebadged a third party stock map, its imprimatur added little value; a very similar map would have been available to the motorist – most likely in the same service station – in any event. Where maps have been produced by companies as a premium (free issue), or part of a touring service, or to encourage loyalty to a particular brand of fuel, the answer may be more complex.

This chapter seeks to identify various aspects of influence, including placing oil company road maps into their societal context by briefly considering some of the ethical and environmental issues.

8.1. Cartographic influence

8.1.1. Uniformity of design

We have seen how at times oil companies imposed a common design on their maps across borders, most notably Esso with its use of designs derived from the General Drafting Company in the 1950s. Working with these designs may well have influenced subsequent independent work by cartographers such as George Philip & Son in the UK, Karl Thiemig in Germany, or Blondel la Rougery in France.

For some oil companies this was sometimes this was restricted to specifying covers or colour schemes – Mobil was exceptionally careful to maintain its own pantones that had to be used by third party printers of maps). At other times oil companies set requirements on the look of maps – for example, Gulf provided the Scottish cartographer John Bartholomew with a sample Gulf Oil map from the USA when asking it to quote on the production of a series of European maps (Gulf European Company 1959).

Oil companies were also willing to employ non-native cartographers. The analysis includes examples from Texaco using the Swiss firm Orell Füssli in Ireland [42, 43]; Shell using Foldex (France) in several countries in the 1930s and 1950s [5, 121, 124, 213] but subsequently using Mairs Geographischer Verlag (Germany)

in several markets [218][10]; Aral commissioning maps from Busche (Germany) across its entire operation [152]; and Esso and Mobilgas using Rand McNally in Thailand [241, 244]. There are numerous other examples with cartographers such as Agostini (Italy), Hallwag (Switzerland) and Kümmerley & Frey (Switzerland) working with oil companies outside their home market.

Despite this, the final say on what content to show on a map appears to have been made at the national level. Esso's European maps showed more varied points of interest than its North American ones, and Chapter 6 has shown that European maps generally included more features, possibly as they were typically at a larger scale. In this aspect, the cartographer appears to have been leading the oil company except in the specific category of motoring facilities, notably service stations selling the oil company's products. Although many firms were content to issue plain maps without spottings, others specified multiple variations to show factors such as fuel types and ancillary facilities available.

Similarly, the depiction of different types of road – width, surface and classification – also tended to depend on the country, although there were some variations from different oil companies, notably around the marking of dual carriageways (other than motorways).

However, it is not possible to generalise about the extent to which cartographic conventions used on oil company road maps were subsequently applied to other maps. Large companies were able to impose more requirements on their cartographers to provide a more uniform product to their customers. But there were exceptions, and the highly uniform approach across borders was quite short – the 1950s and 1960s. If oil company maps often look uniform, it is precisely because the period of greatest uniformity was also the period of greatest production. By 2000, when there were very few oil company maps still being produced, except for the German company Aral, there was very little uniformity between markets.

A second area of influence could be in coproduction between oil companies and third parties, such as car rental firms, especially if the third party continued to produce and distribute maps after the oil company stopped. However this appears to have been uncommon; only one map in the sample (MonteShell/Hertz, Italy [113]) was a coproduction, and this follows a design led by Hertz, although only MonteShell locations are shown (not Hertz – Figure 238). The base map was by Michelin and similarly styled maps from the car rental firm with no oil company link have been seen, for example from the UK (Figure 237). Even in the wider population few were found:

[10] In making the selection of maps for the detailed sample, I specifically avoided Shell's issues produced by Mairs, as being less representative of domestic maps. My wider collection includes almost 300 Shell-branded maps produced by Mairs from around 20 countries, including ones where they are unlikely to have been distributed locally, such as Japan or Yugoslavia. Most would have been available in Shell filling stations in Germany, but some titles were distributed through the book trade internationally (some of mine came from WH Smith in the UK).

	Avis	Budget	Godfrey Davis	Hertz	Kemwel
Aral	Austria; Germany				
BP	Europe			UK; Australia	Europe
Caltex		*South Africa*		Australia	
Mobil	New Zealand			USA (one city); New Zealand	
MonteShell				*Italy*	
OPET		*Turkey*			
Shell			UK	Norway	
Statoil	Denmark				
Texaco				Greece	

Table 7: Known examples of jointly branded maps from oil and car hire companies

Table 7 needs treating with considerable caution. There are likely to be many other examples, as all the above titles have only been seen or reported occasionally, and some car hire-led maps may not obviously disclose the partner oil company on the map cover. Countries in italics are issues that appear to have been led by the car hire company; the balance are generally lightly modified or overprinted versions of a recognisable oil company issue. The exception is the sole US example, where Mobil and Hertz appear to have jointly sponsored a 1965 Ashburn map of San Antonio, Texas, with each company taking one of the covers, using a design not linked to either firm. However the relative infrequency of co-productions would limit their influence. Oil companies and car hire firms both had a reason to publish road maps showing locations, so are likely to have commissioned similarly styled maps from cartographers. The same considerations could apply to restaurant maps, where companies such as McDonalds, in several countries, and Little Chef, in the UK, occasionally distributed branded road maps.

Figure 237: 1986 Hertz maps, showing coproduction with MonteShell in Italy [113]

Figure 238: Extract from 1986 Hertz/ MonteShell map [113].

8.1.2. Simplification

We have seen that oil company maps often used simplified cartography, making it easier for motorists to assess quickly where they are and the most straightforward way to get to their destination. Sheppard and Adams (1971) are among the few to have observed and tested this; they undertook a usability test comparing 128 experienced male drivers' perceptions of two maps of NE England – the Ordnance Survey 1:250,000 and the Shell map produced by George Philip and Son at 1:253,440. Their conclusions were

that a majority were able to make better inferences about the best route from Stanhope to Hexham (either in fine weather or when snow is forecast) using the clearer simpler style of the Shell map, with no statistically significant variation by age or professional status. A decade earlier, the Consumers' Association (1963) had come to a similar finding on the success of commercial, as opposed to OS, maps, awarding Esso's sixpenny sheet maps the Which? Best Buy status.

TABLE II Touring

PUBLISHER and Title	Price per map	Scales (miles/inch)	Date on maps tested	Town plans: Inform-ativeness	Town plans: Number	Town plans: Inform-ativeness	Legend and symbols	Clarity of lettering: day	Clarity of lettering: night	Suitability of colour combinations: day	Suitability of colour combinations: night	London to Edin-burgh	Dover to Ply-mouth
MAPS (*with number of sheets in each series*)	£ s. d.											Sheets	
BARTHOLOMEW'S Sixth-inch Motoring Maps of Great Britain (8)	3 0	6	1960–2††	good	—	—	good	good	good	fair	fair	4	2
BP Road Maps (6)	1 0	5	1961–2††	good	1	v. good	good	v. good	good	good	fair	3	2
DAILY MAIL Motor Road Maps (6)	5 0*	4, 6	—	good	—	—	fair	good	fair	v. good	v. good	4	2
DUNLOP Width of Road Maps (6)	5 0	5, 6	—	good	83	poor	v. good	good	good	good	fair	3	2
ESSO Road Maps (8)	6	4, 5, 6, 8	1960-2††	v. good	1	v. good	good	v. good	good	v. good	v. good	4	2
FOLDEX Maps of Great Britain (12)	5 0*	4	—††	v. good	—	—	fair	good	fair	good	fair	6	3
GEOGRAPHERS' Road Maps of Great Britain (8) **C**	4 6	4	—††	fair	—	—	good	good	v. good	fair	fair	4	2
MOBIL Road Maps (5)	1 0	5, 10	1960-2††	v. good	38	fair	v. good	good	fair	fair	poor	3	2
NATIONAL BENZOLE Road Maps (6)	1 0	5	1959	good	1	v. good	good	v. good	good	good	good	3	2
NUFFIELD (or AUSTIN) Numbered Road Touring Maps of Great Britain (6) **C**	5 0	5	—††	good	—	—	fair	fair	fair	good	fair	3	2
ORDNANCE SURVEY Quarter-inch Maps of Great Britain, Fifth Series (17) **C**	5 6	4	1960–3	v. good	—	—	v. good	v. good	good	v. good	good	5	3
REGENT British Isles Section Road Maps (5)	1 0‡	5, 6	—	v. good	—	—	good	good	good	good	fair	3	1
SHELL Touring Maps (6)	1 0	5	1961–2††	good	1	v. good	good	v. good	good	good	fair	3	2

Figure 239: Extract from 1963 Which? assessment of "motoring maps"

These examples come from the UK, a late adopter of the oil company map compared to the US, where there had long been inexpensive (necessarily so, for free distribution) maps from Rand McNally, HM Gousha and General Drafting Co. Their pared down designs helped define the style for road maps globally, as opposed to reductions from topographic maps or the more detailed styles suitable for cyclists and walkers (Nicholson 2004). As we have seen, above all, General Drafting Co.'s designs for Esso (and in some territories, Mobil) were used in many countries of the world, enabling them to influence local cartography. Of course this was not universal; Switzerland (and to some extent Germany) with their strong cartographic traditions resisted simplification, and in France it was Michelin's own style that set the standard for others to follow. In contrast, the Anglo-French Foldex approach with a plethora of detail, championed by Shell in the 1950s, appears to have been a blind alley. Later maps have also been criticised for showing too much detail, occasionally leading to inaccuracies (Byrne 2007). Linked to this is the question as to whether simplification can improve (or at least not damage) good aesthetics while retaining usability (Kent 2005). As noted by Wright (1942/1966) "*An ugly map, with crude colours, careless line work, and disagreeable, poorly arranged lettering may be intrinsically as accurate as a beautiful map, but it is less likely to inspire confidence.*"

8.1.3. Falsification

The primarily quantitative approach to the analysis in Chapter 6 considered what was displayed, and how it was displayed, but not how accurately. Studies of earlier maps (e.g. Edney 2019) necessarily consider

how they relate to the actual landforms, but by the twentieth century it is implicitly assumed that at one level – subject to a degree of generalisation – the maps are free from unintentional error (Monmonier 1996, Keates 1996:106). There were some minor deliberate errors as copyright traps (Akerman 2006:326), but their incidence may have been exaggerated by cartographers to dissuade copying.

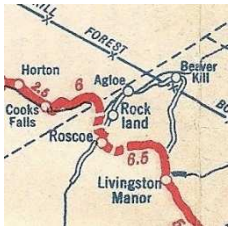


Figure 241: Agloe on 1926 Socony map of New York [48]

Figure 240: Agloe on 1977 Exxon map of New York [83]

An example of this is the addition of the fictional village of Agloe to General Drafting Company maps of New York state as a copyright trap; the name was created by scrambling the initials of the two principals in the company: Otto G. Lindberg and Ernest Alpers. Subsequently The Agloe General Store was built at the road junction where Agloe was marked, as the owner assumed that this was a real place and named his business accordingly.

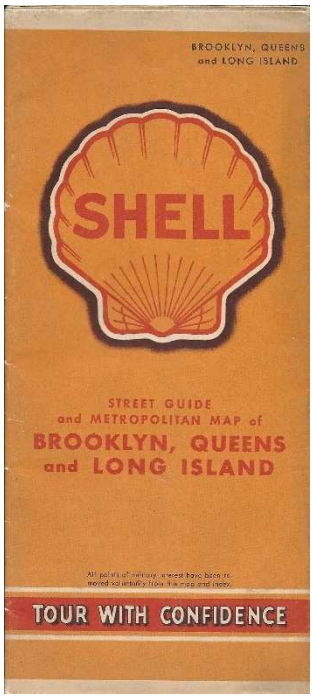


Figure 242: 1942 Shell map with masking message[623b]

Otherwise, examples of deliberate falsification are typically of sensitive military facilities that were masked following an official request (see 4.5 for more examples from World War II). This falsification was, however, publicly acknowledged on the covers of some road maps. Figure 242 shows the cover of a 1942 Shell map produced by HM Gousha. The very small type above "TOUR WITH CONFIDENCE" reads "*All points of military interest have been removed voluntarily from this map and index*". The same message appeared on maps for other oil companies prepared by Gousha. The effect of this can be seen from extracts from two Shell maps of the area below; the Seaplane Base label (top right of Figure 243) has also been removed.

Figure 243: North Beach Airport from 1939 Shell map for New York World's Fair [623a]

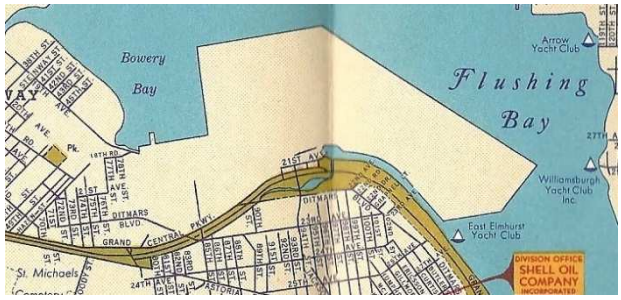


Figure 244: Masked airport from 1942 Shell map of Brooklyn, Queen's and Long Island [623b]

8.1.4. Accuracy

Accuracy is difficult to determine. In most cases cartography will have been derived wholly or partially from national mapping agencies such as GB's Ordnance Survey, which is routinely credited on British maps, so is likely to – at best – be as accurate as the base map, subject to editorial decisions by the cartographer and, on occasions the oil company, about generalisation. Although maps can be compared with topographical maps from national mapping agencies they may be as likely to repeat errors as to create new ones. Reputationally, companies would not want to be associated with inaccurate or overtly misleading maps.

Disclaimers such as "The representation of a Road, Track or Footpath is no evidence of a right of way" were commonly found on British maps (e.g. Esso GB 1958 [12]. 1966 [21], 1986 [35]; Shell GB 1956 [10], BP 1984 [34] – although Shell/BP maps omitted the "Track or Footpath" which were not shown on maps of this scale). This disclaimer was often associated with the statement that they were based on the Ordnance Survey maps; it was not used on maps sourced from the Automobile Association (Esso [39], Shell [30]) which did not credit the Ordnance Survey. In the 1930s Shell/Foldex had explicitly excluded responsibility for any errors (Shell [5]). No maps in the sample carried any bounds of accuracy, such as those used on recent large scale (1:25,000) topographic maps of Australia, which note that 90% of vertical elevations are within 5 metres of the true elevation (Land and Property Information NSW 2002).

8.2. Ethics of Oil Company Road maps

8.2.1. Places and politics

It is perhaps a prosopopoeia to ascribe the ethics to the map as opposed to the cartographer or company that created or commissioned the map, but this ties in with the general tendency to regard the map as a propositional object (Wood 2010) and not as a neutral carrier of information. The ethical dimension was explicitly considered by Harley (1991), posing three questions around social justice, how to formulate principles around moral judgments and whether it is even possible to have an ethically informed cartography. Unethical cartography does not mean that the cartographers are trying to mislead their audience. All maps require some degree of judgment about inclusion/exclusion, and about the conventions applied, and aesthetic choices may also have a moral dimension. So while some cartographic decisions are conscious choices (e.g. the Peters projection to challenge Western notions of how the world looks), others may be less so.

Stickler (1990) has claimed that the black dormitory townships around the edge of every major White South African town had been made invisible by the style of symbolization.

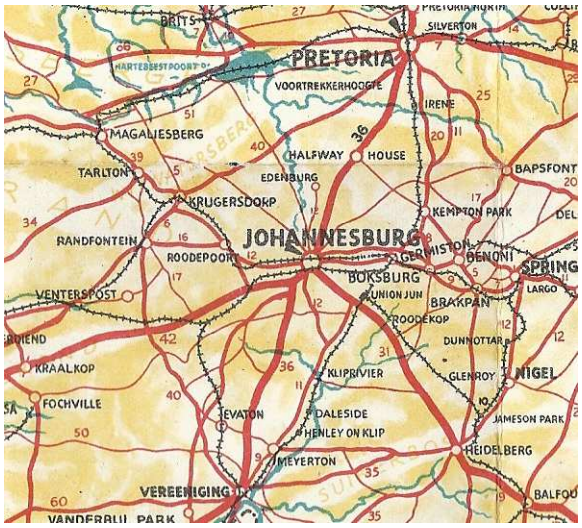


Figure 245: Gauteng area from 1959 Mobilgas map [589] (cartography Galvin and Co) 1:1,700,000. This map lacks the clutter of more recent editions naming suburbs.

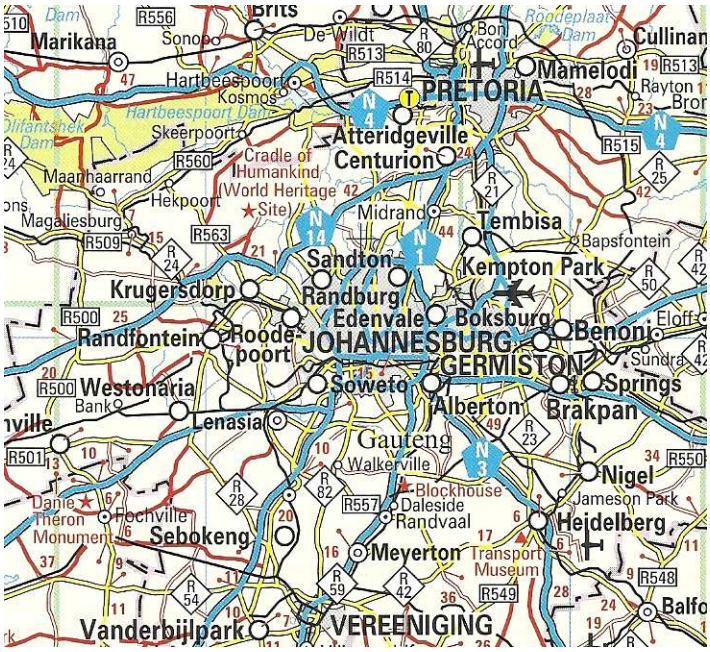


Figure 246: Gauteng area from 2001 Engen atlas [545] (cartography Map Studio) 1:1,500,000. Johannesburg is no longer dominant.

Looking at oil company road maps of South Africa, most were produced by a single firm – Map Studio – so tend to reflect a common house style: it appears that the initial judgments are being made at the cartographer level. Map Studio's maps also always credit the Government source of data (just as UK maps acknowledge the Ordnance Survey), so decisions on what is worthy of inclusion may have rested at an even higher level. However earlier maps have a wider range of cartographers, and up to the mid-1960s the area to the Southwest of Johannesburg variously appears almost devoid of settlements or with minor ones such as Florida. By 1969 Soweto appears on a Mobil map of the country with a symbol for towns of more than 50,000 inhabitants and all later maps also show it relatively prominently; its name was only adopted in 1963. The 2001 Engen road atlas (from the successor company to Mobil) shows how the Gauteng area had become congested with place names to the extent of limiting its use for navigation by road; in general most maps aimed at motorists do not support Stickler's claim when considering relative population numbers at the time they were printed.

Wood (1993) identified how maps can be used to justify the taking of territory from native Americans. The four examples below show how the Umatilla Indian Reservation in Oregon, established by a treaty of 1855, has been consistently shown on oil company road maps.

Figure 247: Texaco/General Drafting Co, c1927 [52]

Figure 248: Texaco/Rand McNally, 1930 [650]

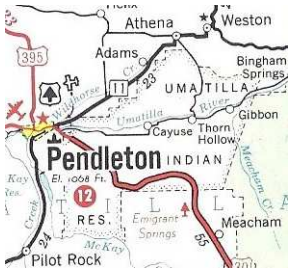


Figure 249: Enco/General Drafting Co, 1963 [70]

Figure 250: Racetrac/ Universal Map, 2010 [597]

8.2.2. Borders

No maps are entirely free from politics, whether legally sanctioned, purely commercial or samizdat productions. Oil company maps had to reflect national boundaries where there was disputed territory. On the Caltex and Texaco maps of Ireland [42, 43], the border with Northern Ireland was euphemistically described as "The Boundary of the Six Counties".

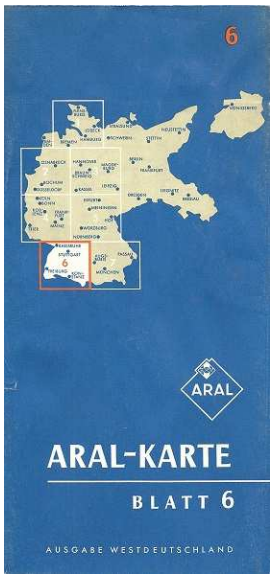


Figure 252: c 1961 Aral sectional map 6 [181]

Aral's 1950s and 1960s maps of West Germany certainly made a more discretionary use of territorial claim, continuing to show on their map covers the December 1937 German Reich boundaries. This was despite the Potsdam conference in effect overriding these by the granting of territory by the Allies to Poland and the Soviet Union east of the Oder-Neisser line. The design shown here was used from around 1956 to 1965 on maps produced for them by Busche; other companies did not use the pre-war Reich boundaries.

Figure 251: 1969 Anglo map of Ecuador with pre-1942 borders [512]

A second example is the January 1969 Anglo-Ecuadorian Oilfields map of Ecuador, that shows the outline of the country before ceding 200,000km^2 to Peru in the 1942 Rio Protocol, which had been refuted by the Ecuadorian president in 1960 (Zook 1962).

Some South African maps show another effect of apartheid – the creation of nominally independent homelands:

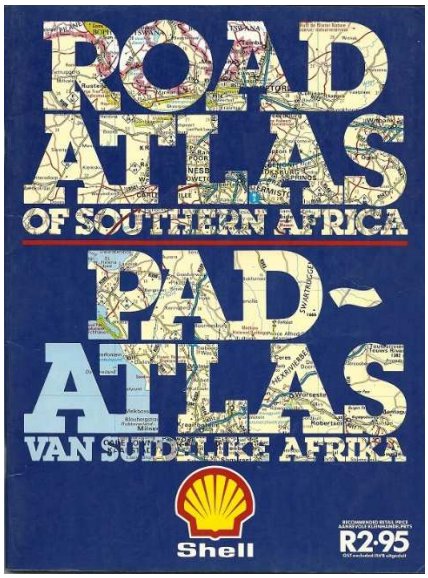


Figure 253: Shell 1987 Road Atlas of Southern Africa [627]

Figure 254: Key map (for cities) from the atlas from Shell 1987 Road Atlas of Southern Africa

Shell's 1987 road atlas, again produced by Map Studio, shows Transkei, Ciskei, Venda and Bophuthatswana as being independent countries, *pari passu* with Lesotho or Swaziland; a decade later there is no evidence of these at all, with the territory reabsorbed into the regular provinces such as Eastern Cape. These maps also reflect a linguistic shift; pre-liberation ones are in Afrikaans and English, and refer to "Southern" not "South" Africa, but later ones are wholly in English, despite this language only being the fourth most common first language of the eleven officially recognised, with fewer than 10% of the population (Statistics South Africa, 2012).

It could be argued that the companies involved – whether cartographer or oil company client – are simply toeing the official line and not taking a stance on the issue. Certainly the prevalence of the nine-dash line, showing Chinese sovereignty over much of what is known in English as the South China Sea, shows how nominally independent cartographers have, not only to respect the claim, but also to incorporate them into road atlases where there is no real need. The example shown here is an inset onto the page showing Hainan from a 2015 Sinomaps-BQTop road atlas of all China, for general sale (not from an oil company).

Figure 255: China's Nine Dash Line from 2015 road atlas

Figure 256: East German and international boundaries on c1958 BP map of Europe [529a]

Figure 257: East German and international boundaries on c1960 BP map of Europe [529b]

Cartographers also needed to be responsive to their oil company customers. Correspondence in the Bartholomew Archive shows that in 1959 BP's German subsidiary had objected to how the border between East and West Germany was shown on the BP Europe map (BP 1959). The initial versions of this map (Figure 256) showed it *pari passu* with other international borders, but when Bartholomew revised the map it was downgraded to a thinner yellow band that is only half the width of other borders, such as that with Czechoslovakia, and relatively hard to see against the light yellow land mass (Figure 257).

8.2.3. Place names

The selection of place names is closely allied to the selection of places. Ireland's place names have a disputed history, as many local names were codified by the British Ordnance Survey in the 1840s. Despite this, many interior surveyors were locally recruited, and the topographical branch was staffed largely by Irish speakers (Hewitt 2010).

Oil company road maps generally took their cue from their (local) cartographer, following local practice. This could however lead to inconsistent usage, especially where there were disputed or politically charged alternatives. The Texaco maps of Ireland show this clearly, although all were produced for the Irish subsidiary (not the UK one). The oldest map [41], prepared in the 1930s by George Philip & Son in London (UK) follows UK practice in naming Londonderry, but adds "(BAILE ÁTHA CLIATH)" after Dublin. From 1958 to the 1970s [42/43], cartography was by the Swiss firm Orell Füssli, and this rigorously kept to Derry, with no parenthetical name beside Dublin. In 1982, the Ordnance Survey of Ireland took over [44], and reinstated the Irish name beside Dublin. None of these maps had Irish names for other cities such as Cork or Wexford. By 2002, resurgent nationalism meant that Texaco's Bartholomew map [45], although produced in the UK, had parenthetic names for the smaller cities as well as Dublin, but North of the border reverted to Londonderry (Derry). This did not last – the next edition in 2005 came from the AA in Basingstoke, and was uniformly English, not even allowing Derry. The final option of "Derry (Londonderry)" cannot be found on any Texaco maps, but turns up on a 1990s Maxol map produced by France's Recta Foldex in association with the UK's RAC (and printed by Kümmerley & Frey in Switzerland).

Elsewhere, European names were widely used in colonies or former colonies. Although many English names were used, French ones also appeared occasionally. The 1930s Shell map of West Africa [625] was produced by its Francophone subsidiary so has Coomassie for the city in Ghana generally known today as Kumasi.

8.2.4. Race, gender and wider issues

Relatively few oil company road maps depict people, but when they do, images of motorists are uniformly white (and US maps often show a typical family with two small children); the Engen atlas (Figure 133) is an exception. Unusually, to find a black service station attendant we have to go back to the 1960 Esso independence year map of Nigeria (Figure 99 [559]) and, perhaps surprisingly, the 1953 Caltex map of Southern Africa (Figure 97 [538]), demonstrating an ideal that would almost certainly not have been possible later under apartheid.

Road Maps may also reflect contemporary views of gender (Dando 2018). The depiction of ladies on road maps is outside the scope of this thesis; there appears to have been a lack of research into the gender acceptability of differing styles of maps, or of the use of symbology, despite the widely-expressed myth that women find it more difficult to use a road map. Nevertheless, in the 1930s a few US companies, including Shell and Standard Oil (California) promoted an idealised freedom for women to travel created by the car on their maps; compare this with the hackneyed image of a female service station attendant on a 1980s Romanian map (Figure 88).

Figure 258: 1936 Standard Oil Idaho map [639]

In considering the ethics of maps, less consideration has been given to their use. Harley (1991) refers to protests outside the US Defense Mapping Agency about the 35 million maps that had reportedly been shipped to US troops in Iraq and the Persian Gulf. In other areas of conflict with limited commercially available mapping, oil company road maps may have been of use to a prospective aggressor – Davis (2018:185) notes, for example, that Soviet military city maps appear to have drawn in part upon widely available commercial street plans of Western cities, and there is no reason to assume that the same approach would not have applied to the creation of military road maps.

Harley (1991) criticises cartographers for "scientific essentialism" and not being open to alternative views, especially those with humanistic perspectives. By so doing, he is underlining the wedge that has grown up between academic and practising cartographers, whereby those creating maps may strive for accuracy and an acceptable aesthetic without too much consideration of how the map may be read. Harley's ethically informed cartography is seen as aspirational, although this was written before Open Street Map permitted a more democratic selection of content, and freed map makers from such a great reliance on Government data. Here he notes again that official maps do not show features like toxic waste dumps, and may perpetuate ethnically pejorative place names – the latter a point made also by Wood (1993).

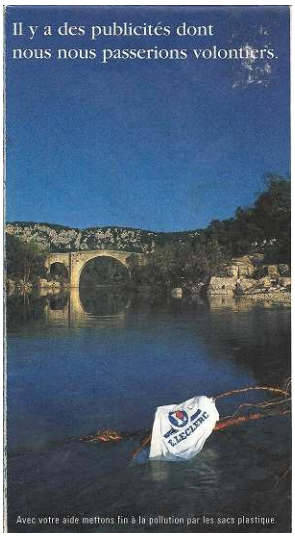


Figure 259: (Front) cover of 1996 Leclerc map of France [581]

Changing attitudes are reflected, though, in a 1996 map for the French hypermarket chain Leclerc with a cover (right) showing a branded plastic bag caught on a bush in a river in front of a scenic bridge. *"Il y a des publicités dont nous nous passerions volontiers"* the cover is headed, *"Avec votre aide mettons fin à la pollution par les sacs plastiques" (There are advertisements that we would be willing to do without. With your help to put an end to pollution by plastic bags).* However the greatest environmental impact comes from emissions associated with the burning of fossil fuels (see 8.2.5).

Finally, the question remains on how much inexpensive maps encouraged exploration by car, or how much they simply met a demand. Would Americans have been less inclined to make transcontinental trips if they had not known that they could pick up a free map from almost every gas station along the way, and that – in earlier years at least – they would show road conditions? And would British motorists have been less willing to risk putting their car on the ferry to France, without first having acquired an Esso or BP Touring Service kit? Or was the explosion of private motoring trips to the Continent an inevitable reaction to austerity at home and a desire to see Europe at peace, so soon after the Second World War? How much was the state-sponsored tourism of the Third Reich influenced by the maps it spawned, and how does this compare to later campaigns such as "Discover America Best by Car" (for which the logo appeared on many oil company road maps)? Where maps have had a combined role with a basic tourist guide, did they influence motorists in their choice of places to visit?

Figure 260: Rear cover of 1972 Rock Island Refining map with Discover America Best by Car logo [603]

8.2.5. Energy and environment

In the twenty-first century, an objection may be made to the encouragement by oil companies of inessential travel, leading to greater fuel consumption and exacerbating environmental issues, including particulates and global climate change. It is hard to separate maps as a publicity tool from other advertising, such as the escapist campaigns of the 1950s and 1960s, using slogans like "Getaway National" or Regent's "Get out of town – fast" (Duffy Archive 1966). Despite this, British and most other European maps were often restrained, lacking any exhortation to drive for pleasure; those from the USA slightly less so, but still no more than state-sponsored "official" maps. Many US oil companies also participated in the mid-1960s "Discover America best by Car" campaign (Figure 260), although this was often restricted to small logo on the map cover or in the sea of the actual map.

Figure 261: Tiger Tips to help save you gasoline (Exxon, 1976 [561])

Oil companies often defend themselves against charges of encouraging wasteful use of fuel by pointing to parallel campaigns encouraging greater fuel economy. Until the 1970s publicity around improved mileage per gallon was aimed more at encouraging motorists to switch brands, such as the message on a 1962 leaflet: "*a visit to your Mobil dealer will help you to improve your m.p.g. Start your own economy run today*" (Mobil 1962), or Shell's long-running campaign based on cars crossing Morecambe Bay. These slogans rarely, if ever, crossed over to maps. Fuel economy became more of a marketing tool after the 1972-3 oil price shock; Exxon, for example, included a list of "Tiger Tips to help you save gasoline" on the rear cover of its US road maps from 1974-1981. Figure 261 comes from the rear cover of a 1976 Exxon map of Pennsylvania; these tips remained on maps until 1984.

Until very recently some oil companies also claimed, incorrectly, that the science around global climate change was uncertain. Even today, ExxonMobil is running press adverts suggesting that the solution is to capture and store carbon (CCS), rather than to limit fossil fuel production. This is not the place to go into the claims and counter-claims, including those of funding by largely US companies of dissenting science to sow doubt about climate change, other than to note that as far back as 1965, the White House published a report into pollution that laid out strong evidence of a link between CO_2 emissions from fossil fuels and rising global temperatures with the risk of severe side effects (Revelle 1965). This pre-dates campaigns such as 'Discover America best by Car'. Internal memos in Exxon, such as those published on the

climatefiles.com website, show that they were aware of potential dangers from the "CO_2 effect" to the climate as early as 1977, and were funding scientific research into the sources and effects of increasing carbon dioxide concentrations.

Discussion

As a committed environmentalist (and member of Friends of the Earth for over 30 years) I have had to wrestle internally with the study – not glorification – of road maps from petrol and oil companies. But it was their very variety and the competition between companies selling what was, on the face of it, a commodity, that led me to become interested in the energy industry in the first place that then led, inexorably, to the conclusion that humankind cannot just go on squandering energy indefinitely.

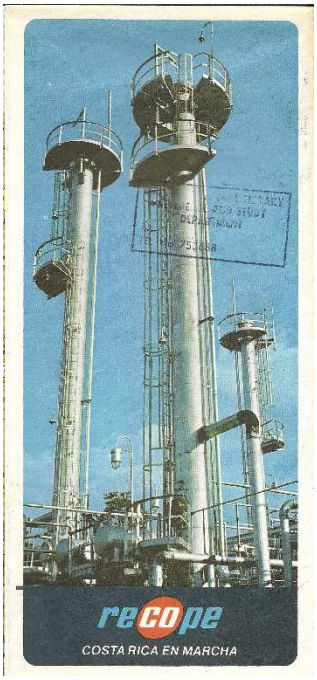


Figure 262: 1977 Recope map showing oil refinery [598]

Even before most oil companies grudgingly accepted the reality of climate change and their role in it, they were aware that their products were potentially polluting and have often tried to put a more socially or environmentally responsible gloss onto their activities (Hall 2015, Hüzeir 2020, Supran et al 2023). At the same time, companies have occasionally not shied away from the industrial nature of their activities, seeing it as a matter of pride – the example here of a refinery comes from Recope, the Costa Rican state oil company, owned by a Government that latterly has been much keener to demonstrate its green credentials.

8.2.6. Promotion of Tourism

Tourism is sometimes presented as a positive influence, with maps and guides encouraging motorists to sample local culture or enjoy visits to parks, beaches and other natural points of interest. Conversely it is also sometimes presented as degrading local environments, marginalising inhabitants and encouraging a homogenisation (or "Disneyfication/Disneyization") of cultures (Zhang et al 2021). Buildings, themes and heritages are designed for the tourist gaze (Urry 1990, Urry and Larsen 2011); images and text on oil company road maps at times underlined this artificial construction of place, including the promotion of sight/sites (Meltzer 2002).

This thesis is not the place to go into wider ethical issues around tourism or the positioning of oil companies within it, except insofar as it impacted the design of the oil company road maps; it may be an area worthy of future study.

8.2.7. Ethics: Discussion

It is all too easy for a researcher in the 2020s to look back at maps that may be 50 to 100 years old, and shake his head at some of the content or underlying assumptions. These maps are of their time. There is nothing here to suggest that that they were any worse than reflecting the prevailing attitudes at the time they were published, even if they did demonstrate (as Harley described images on eighteenth century English atlases) "*an attachment…to their own class and nation, a love of ownership and property, a bellicose chauvinism, and a tendency to despise the savages*" (Harley 1990/2001:147). Conversely, some of the 1930s US maps appear to be promoting a more progressive attitude towards gender than might be expected. On the downside, oil companies appear to have accepted their role in apartheid South Africa without questioning (see Figure 254), although under pressure from politicians, US firms including Exxon and Mobil did divest themselves of operations. Here, the maps are implicitly supporting the power and legitimising the regime, as could be said of the extension of German map series of the late 1930s to reflect the Anschluß and subsequent annexation of parts of Czechoslovakia. In the late 1930s, oil companies had to update their German maps regularly to reflect the expansion of Germany: the 1939 BP-Olex map in Figure 263 represents the final version before war ended publication of commercially available maps. The 1937 boundaries fitted neatly above the logo; as boundaries expanded, the city of Klagenfurt in Austria has ended up inside the BP shield.

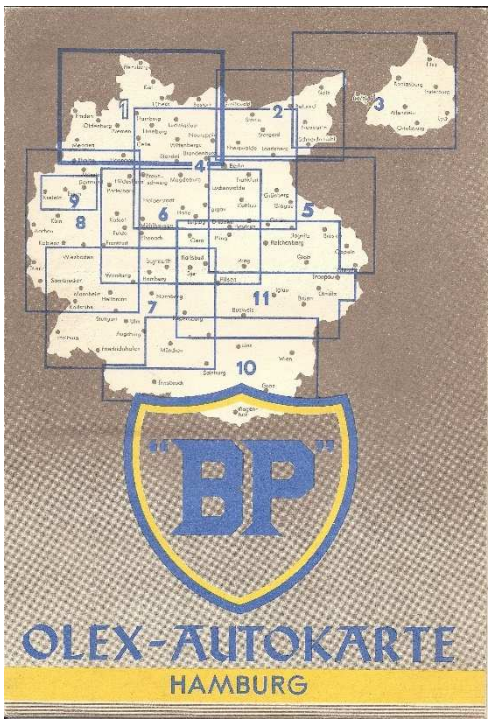


Figure 263: BP-Olex map showing 1939 expansion of Germany [169]

However, recognising the autoethnograhical element as a researcher *and* collector of these maps, I have to consider my own ethical position. Including historical maps of Germany that record territorial expansion is not the same as collecting Nazi memorabilia for its own sake. With the exception of a few elements on a small number of Esso/Standard Oil maps, Nazi iconography is notably absent from oil company road maps, unlike those of the main automobile club which are adorned with a swastika, centre stage. In 8.2.5 I have briefly mentioned my concerns about whether these maps encouraged unnecessary travel by car, and note the link between my environmental awareness and interest in the oil industry. I would also defend the position that if we ignore objects such as these, we are at risk of airbrushing history and not learning from past mistakes.

8.3. Conclusion: Influence and Ethics of Oil Company Road Maps

At the start of this thesis, I noted that oil company maps were widely distributed across the globe (Figure 2). However that does not necessarily make them influential, and there is a big difference between the impact of, say, an early Pratt's atlas [1] or some of the pioneering US maps and a later, derivative map that just happened to be sponsored or sold by an oil company (such as a post-1990 map of Russia or the Ukraine, or the 1996 Australian issues by Liberty [583]). The case studies in Chapter 7 show how in the 1950s Esso, in particular, was not just taking a product off the shelf, but actively promoting its content, but that 20 years later the onus was much more on the cartographer to maintain oil company interest, as the simple economics of maintaining a map program came to the fore. The Stanford and Philip's records show how some designs, when copyright was not retained by the oil company, could be reused as purely commercial products – this has also been observed for Foldex after it lost the Shell contracts. Even where there was no direct reuse, cartographers could pick up design points, especially round the generalisation and simplification of road maps, using the simplified, idiomatic network style (Akerman 2006).

However the influence is not restricted to cartographic design or content. The concept of a free or low cost map distributed in millions democratised mapping in a way that more detailed or expensive topographic maps seldom could. The table from the Which? 1963 comparative review of motorists maps (Figure 239) also reveals that a national set of maps from Esso would cost 4/- (20p), from Shell or BP 6/- (30p) but from the Ordnance Survey (at the slightly larger scale of 4 miles to the inch) would cost £4/13/6d (£4.67½) – 23 times as much[11]. Uniquely, Regent maps were also available free, but only by request from the Regent Touring Service (Consumers Association 1963). In several markets, including the USA, Canada, and – for some titles, France and Italy – all oil company road maps were free. As a result, the oil company road map was often the first map encountered by generations of, mainly Western, adults after a more formal encounter with school atlas maps. It is inevitable that these adults would have therefore gained at least some sense of place from these maps.

Despite the main map plane often being simple, with roads connecting towns across a largely featureless background (Akerman 2006), the perimap increasingly contained rhetorical flourishes, turning a utilitarian product into an overtly promotional product. This must also have influenced perception of place, although lacking a time machine, it is not possible to test this objectively.

[11] These are the quarter inch maps, broadly equivalent to oil company road maps. A complete set of the better known one inch maps would have cost £61/15/- on paper or £80/15/- on cloth; Bartholomew's half inch series were 3/- per sheet on cloth, costing £9/6/- for a complete set. The average male manual worker's weekly earnings in April 1963 amounted to £16/3/1d (Hansard 1964). The Ordnance Survey and Bartholomew sets are just of Great Britain; the cheaper Esso, Shell and BP sets include Ireland and a planning map of London.

This chapter has also considered the ethical issues around oil company road maps. While is it popular to demonise oil companies, notably for their impact on climate change, it should be borne in mind that these maps were produced in a different time, and that there are relatively few examples that appear to be particularly egregious. (A possible exception is the acceptance of borders imposed by force in 1930s Germany, or in apartheid South Africa.) Moreover, most oil company road maps were produced before climate change was recognised as an issue, although other impacts of air quality and noise have been understood for much longer.

It is less obvious if the influence of oil company road maps has lasted into the era of GIS and internet mapping. Paper maps are relatively static – although users can annotate or modify them, and bring their own process or performance to their interpretation. In contrast most internet mapping is dynamic, allowing users to zoom in or out from a location. But this very dynamism constrains the detail at any given scale and imposes as much selectivity as the publisher of a paper map. Some lessons may have been learned from the most basic oil company maps (the locator maps) and these may have influenced online mapping. However, transferring a paper map to a screen does not work – if only because the colour selection needs to change to avoid glare. It is outside the scope of this thesis to consider the relationship between paper maps and the internet, but in the following chapter it is flagged as an area potentially worthy of further study, especially in the context of locator maps, such as those showing service stations.

Chapter 9:

Conclusions

9. Conclusions

9.1. Research summary

At the start of this thesis the research aims were posed as being to apply a rigorous cartographic analysis to the oil company road map using a novel analysis, and to place these maps into wider context. Specifically, its objectives were:

- To determine if there are characteristics that are specific to oil company road maps which transcend national boundaries and/or differ from other contemporaneous maps;
- To investigate the process of preparation and marketing of oil company road maps, with a focus on the relationship between the oil company, its cartographer and its immediate customers (the operators of service stations).

A secondary aim was to seek to identify the influence that oil company road maps may have had on the development of cartography in the twentieth century.

9.1.1. Specific characteristics

The introduction started by determining what is meant by an "oil company road map". It noted that as many maps show roads among other features, natural or man-made, it was necessary first to ask if there is a distinctive type of "road map". Essentially, these are distinguished either by purpose – a self-declared road or highway map – or ones that have been generalised to display roads in a manner that make it easy for users – primarily motorists or cyclists – to identify roads and determine routes between two places. The latter may be categorised in Akerman's 2006 description as "network maps" where "*paved highways and side roads appear as solid lines, graded by thickness or color…[that]…traverse a largely featureless landscape populated chiefly by towns, crossroads, parks and designated places of interest*".

Adding the second descriptor, an oil company road map is quite simply a road map that has been by produced by or for a fuel or lubricant supplier to (or operator of) service stations. This excludes many commercially sold road maps, as well as those from automobile clubs, state or other tourist associations, hotels, restaurants, and a plethora of other businesses. The category includes some 'locator maps' – stripped down maps with relatively simple cartography produced primarily to enable customers to find the sponsor's business.

In Chapter 3 it was identified that oil company road maps were published for more than a century, covering most of the 193 countries of the world recognised by the United Nations, bearing the logos of several hundred companies, produced by almost as many different cartographers.

The more detailed analysis in Chapter 6 of a cross-section of maps from nine major markets showed that while there was some commonality in cartographic design, maps from a single country and time period were probably more alike than those from different continents or eras. However there was often similarity in the material surrounding the map or cartographic plane – text, images and tables that were collectively designated by Wood and Fels (2008) as the "perimap". In order to analyse oil company maps fully, it was necessary in Chapter 5 to extend classifications of map content to include this additional material. This extended methodology did, however, stop at the edge of the sheet; despite the temptation to take it further to include a wider "epimap," including elements as diverse as point of sale materials, the service stations, or the performative actions of the map users such as annotations. Although this was in line with a broadly positivist approach, identifying what is on the map, it still needed to be interpretivist – making value judgments about the quality of the maps, or suitability for their most likely users. In the past, comparative studies of maps were initially driven by the need to users to understand "foreign maps" (Olson 1944), but subsequently focused on usability. Such comparisons were aimed both at end-users (motorists – Consumers' Association 1963) and designers of maps or the symbology used on maps.

Even when at their greatest complexity, many oil company maps were still highly selective in the information they contained. Few exhibited much clutter; initially building on American designs they spearheaded a straightforward style of mapping, at its best enabling motorists to readily determine the optimal route between two points, while still enabling this to be placed in a wider geographical context. Publishers (whether the oil company or the cartographer) selected key landmarks or practical information but – in most cases – left much of the interpretation to the user, showing a degree of constraint considering their position of power.

In summary, to answer the first research question succinctly, there are common features of oil company road maps, but these varied over time and revealed distinct national differences. Oil company issues were not very different from other low cost or free maps, including those sold under cartographers' imprints, or distributed by other businesses such as car hire companies, hotels or restaurants. Nonetheless, there are sufficiently many distinctive features (cartographic and non-cartographic) on these maps to justify their study.

9.1.2. Preparation, Production and Marketing

The broad review in Chapter 3 showed an arc of production, from isolated examples before World War I, to a near universality of such maps in the 1950s and 1960s, and a long decline into the twenty-first century. In general terms this was mirrored cartographically, with often quite basic maps using a limited palette on early maps, adding a degree of complexity near their peak – especially in Europe, before reverting to more focused, simpler or smaller-scale maps in their decline. The decline of oil company

road maps was followed, at intervals varying from around 40 years in North America to 10 years in parts of Europe, by a similar decline in all paper maps. However the driver for the oil company maps' decline was primarily economic, as was identified in the Rolph McNally case study (see 7.4), whereas for later paper road maps (although outside the scope of this thesis) it was due to competition from online maps and GPS based navigation tools.

Chapter 7 also looked at some of the decisions that went into the design of oil company maps, and specifically the relationship between the cartographer and oil company. In the 1950s the larger oil companies were very much in charge of the process, specifying their needs and then promoting the resultant map to their dealers (see 7.1.1), but by the 1970s it was the cartographers driving the relationship, seeking to sell their products to increasingly reluctant oil companies, or through wholesalers to service stations omitting the oil company completely.

9.1.3. Influence of Oil Company Road Maps

The thesis also considered the influence of oil company road maps, cartographically and more widely. It suggested that the main influence was from multinational oil companies (such as Esso, Shell or BP) applying a common design across national borders, including commissioning cartographers to work outside their home market. This may have led to a greater adoption of the simplified "network map" style, most widely used in North America under the influence of the "Big 3" domestic cartographers, although it also appears to have been independently developed in Europe by Michelin.

The falsification of maps was considered briefly, although there is no evidence that oil company issues were any more or less likely than other maps to introduce copyright traps or other errors.

It was harder to determine if there was any influence on the end users' (motorists') perception of place. This would mostly have come from the perimap – the text and images surrounding the map. However, although there were exceptions such as the French Shell *cartoguides* [135, 147, 150] or the beautifully illustrated Chevron (Standard Oil Company of California) maps from the 1950s [60, 69], most of the perimap elements identified in Chapter 6 were more utilitarian, such as place name indexes, mileage charts or panels adverting the oil company's products. It appears unlikely that they would influence users in the way that Wood and Fels (1986/2011, 2008) surmised that the North Carolina official state highway map, or some National Geographic maps, were intended to do. The influence on users was more secondary, providing them with confidence to go to places that they might not have otherwise have visited, and this role was enhanced by the oil company touring services which distributed hundreds of thousands of maps each year in the 1950s and 1960s.

Chapter 8 also considered some more cross-cutting themes, including the depiction of national borders, gender and environmental issues. It concluded that oil company road maps were broadly reflective of their time and place, and there were few egregious examples, though companies active in 1930s Germany and apartheid South Africa did follow national policy. On gender it was a balanced score card; the 1930s images from the USA depicting women empowered by a map to travel freely were offset by some more sexist images from Europe, but neither type was found commonly: most maps kept to geometric, touristic, cartographic or company-related images. These are areas that could be investigated further.

It is debateable as to the extent to which these road maps were a very early form of "greenwashing" designed to give motorists a favourable view of the issuing company, or simply a necessary marketing tool. Specifically, concerns around climate change did not become widely known until the 1980s, after the majority of oil company maps had been published although the evidence was first available to oil companies in the mid-1960s.

In summary, these maps were not without influence, providing mainly middle-class motorists with a filtered sense of place, and a low cost access to maps that had once been the preserve of the elite.

9.1.4. Novelty and Originality

The research aims also set out the intention to develop a novel analytic approach. This has been done through:

- Development of the analytical structure for the content of maps established by Kent and Vujakovic (2009) for topographic maps at 1:50,000 and extended by Davis (2018) to account for Soviet city plans. This has required adding more categories for commercial activities, as well as extending to the information (text, graphical or pictorial) surrounding the map in the perimap;
- Further enhancement of the map-perimap-epimap division, building on the work of Wood (2010);
- Derivation of a definition for an "oil company road map" (see Appendix 1) including identifying what may constitute an oil company (see Appendix 2) and the development of the "Type of map".

The original research included a detailed study of unpublished source documents relating to Rolph McNally in the Rand McNally archive in the Newberry Library (Chicago), as well as additional documents in the Edward Stanford archive (held at the Royal Geographical Society in London) and the Bartholomew archive at the National Library of Scotland in Edinburgh. It also included a review of over 300 physical maps in the stratified sample (and numerous other maps outside the sample).

9.2. Suggestions for future research

9.2.1. Improvements to methodology

As I worked through the analysis, different symbol categories suggested themselves, but it was sometimes too late to go back and re-examine the previous maps to add the new category. Two key categories not included (but seen widely on the maps examined) were:

- Motorway junction numbers or names
    - Also symbols for junctions with limited access/egress
- Border posts, potentially with separate symbols for:
    - Open 24 hours/always
    - Restricted periods of opening (e.g. summer months)
    - Information at border posts (from the oil company, touring clubs, etc.)

There were several grey areas, which would have benefitted from establishing a clear set of rules, or where the categorisation could possibly be refined. For example, toll roads were an area with some variability in how they were depicted on the map. In some countries, notably the USA, they were described as turnpikes or thruways and shown as distinct from other limited access highways, even if both form part of a single numbered road network (interstate highways with an I-number in the USA). Where toll booths or barriers were shown they were classed as an "other obstruction".

Another recurrent example was around the distinction between motorways and dual carriageways. Generally dual carriageways were treated as an indicator under the width category and not treated as a separate class of road – and indeed, some cartographers allowed for the possibility of dualled roads across several classes (though conversely there are some single carriageway motorways in the Netherlands and Germany). Michelin maps, in particular, distinguished between dual carriageways, dual carriageways with motorway characteristics, and motorways – the middle category usually being limited access highways not designated by public authorities as motorways.

A similar problem applied to road surfaces: US maps often allowed each of several surface types to apply to most or all road designations, although some maps elsewhere restricted any unsurfaced road to a single category (and in Australia this blended into the vehicle track category). Of course, much online mapping, such as Google Maps, fails to advise on surface at all.

Several other elements (usually textual not symbolic) were combined into general categories and not always recorded as a separate feature, such as periods of closures of mountain passes. These could be expanded.

A purely quantitative approach to the bulk of the data collection also meant that some nuances were missed. By way of an example, most maps have – at most – a single mileage chart, but this can take at least three formats: a table (either rectangular or triangular), a series of lists, where mileages are listed under one city, and then under the next (usually with decreasing numbers until the penultimate city alphabetically only lists the distance to the final city); or a semi-cartographical approach, where mileages are marked in a lattice, broadly reflecting the shape of the country or area covered (see Figures 205 to 207). A number greater than one in the mileage chart field could indicate more than one type of chart, or separate charts of a single type (e.g. where there are different US states on a single road map). The value of 2 was also used for a rectangular chart with one half in miles and the other in kilometres.

9.2.2. Extensions to Scope of Study

This thesis has provided a high-level review of the development of the oil company road map, taking into account cartographic and non-cartographic elements. Many of the features revealed would be worth studying further in greater depth. The following list offers just a few possible topics:

- Extension to further countries – the ones selected were intended to be broadly representative, but with large numbers of maps available, countries such as Austria, Belgium, Denmark, South Africa, Sweden and Switzerland could be tackled next. Switzerland, in particular, has a long cartographic tradition and some of its cartographers worked on oil company maps outside the country, extending its influence.
- Focus on the depiction of roads – the variations of the generalised, simplified style have been difficult to encapsulate in a brief study.
- Focus on the depiction of service stations locations on the maps – potentially as part of a wider study of locator maps.
- An in-depth review of the influence of Esso and the global rolling out of the General Drafting Company designs after World War II, and the influence this had on local cartographers required to produce maps to their specification, and of the Esso Touring Services.
- Extension to consider town plans or street maps, which were widely produced alongside the regional or national maps considered here.
- Study of the cover designs and messages inherent in them. This has been done in the popular literature notably by Yorke et al (1996), and in most of the collectors' literature (RMCA website, *The Legend*). To date this has focused on US maps, but could be extended globally.
- Investigation of the influence, if any, of printed oil company maps on their online maps, especially locator maps showing service stations.

9.3. Final personal observation

At the start of this document, I made a brief reference to taking an autoethnographical approach. I have not approached the topic as a dispassionate observer, but as a collector of oil company road maps, with possibly the largest private collection outside North America. Prior to collecting, I have fond memories of travel across Europe with, most often, a Shell or BP map on my knee. Of course, this is countered to a degree by my concern over climate change (in my professional as well as private life). The motivation for undertaking the research was twofold – firstly to codify some of the knowledge I have gained over the past 30 years of active collecting and 60 years of using oil company road maps, but secondly to extend that knowledge and see where these maps fit into the broader cartographic landscape. Therefore, in spite of the autoethnographic elements, I have also sought to be as objective as possible in my analysis. Indeed, the slightly downbeat conclusions about the distinctiveness and influence represents an impartial assessment of their characteristics, rather than a rose-tinted view of them. Nevertheless, I stand by my original assertion that, as these maps were distributed and used so widely, any comprehensive history of cartography in the twentieth century cannot ignore them.

Inevitably I may have favourite maps within my collection, but they have hopefully been treated equally with the least favoured (almost certainly, the dullest or most common). Indeed, many of my favourites are out of scope, as they were produced by or for minor companies of relatively obscure locations using idiosyncratic cartography – so, for example, the 1972 Bell Oil Operations map of Lincolnshire, designed by Wally Day D/M Services, has not been mentioned until this point in the thesis.

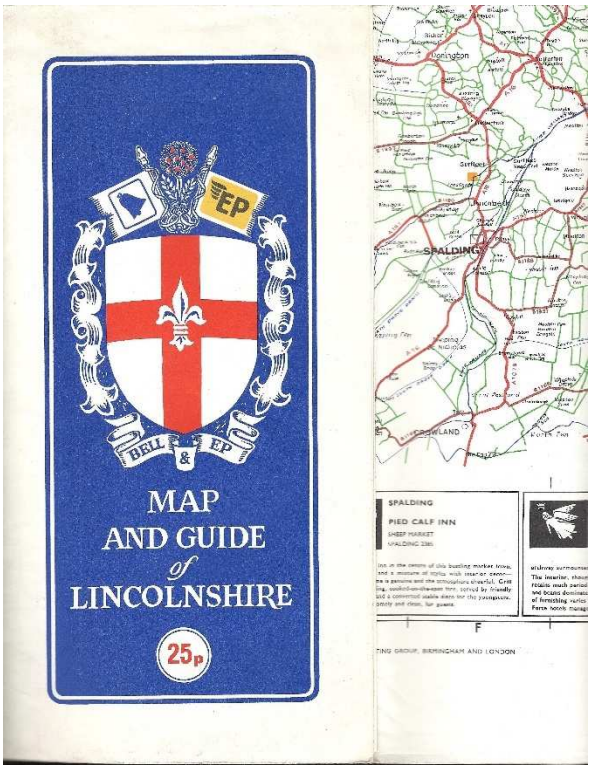


Figure 264: 1972 Bell/EP map of Lincolnshire

Finally, I hope that I have justified the confidence placed in me by Dr Alexander Kent and Professor Peter Vujakovic in allowing me to start on this journey of discovery into the oil company road map.

Appendices

Appendix 1: Definition of an Oil Company Road Map

This Appendix expands on the development of a definition contained in the introduction. The classification of 'oil company' as used in this thesis, is in Appendix 2.

A.1.1 What is a map?

There is no single accepted definition of a map. Andrews (1996) collected 321 definitions from 1649-1996 and found the most common terms to refer to representation (205 occurrences) in a plane (150 occurrences) of all or part of the earth's surface (144 occurrences). This aligns with a typical dictionary definition stating that a map is "*a representation, usually on a plane surface, of (part of) the earth's surface showing physical and political features, etc.*" (modified from Oxford 1976:665). The plane surface will most commonly be paper, but could be a screen or vellum. More recently the Oxford Living Dictionary (online: Oxford, 2017) defines a map as "*A diagrammatic representation of an area of land or sea showing physical features, cities, roads, etc.*".

The International Cartographic Association (ICA) itself struggled with a definition (Board 2015:800). ICA's definition is rather abstract – "A map is a symbolised image of geographical reality, representing selected features or characteristics, resulting from the creative effort of its author's execution of choices, and is designed for use when spatial relationships are of primary relevance" (ICA 2003) but designed to extend to map-like objects such as diagrammatic or caricature maps (Dorling and Fairbairn 1997:3). Maps need not be of real geographical locations, and can include fantasy locations as to some extent all maps rely on analogy (Wood 2010:36, Brotton and Millea 2019:141).

The International Organization for Standardization (ISO), in its document ISO 19117:2012 (ISO, 2012) provides some definitions including those for a symbol, feature, portrayal (presentation of information on a map) and dataset, but is primarily targeted at those creating maps through a geographic information system, rather than analysing extant maps. Notably, ISO does not define a map.

Robinson et al (1978) note that "*loosely*" (their qualifier) a map is a "*drawn representation of geographical space".* Any map requires a dimensionally systematic representation (the scale), be depicted on a flat surface (through a projection and flattening out of hill forms, although globes are also possible), and show only a selection of geographical phenomena that have been generalised.

The design of a map may vary greatly dependent upon its intended use (and the skills of the cartographer) but that users can generally recognise many different styles as being a 'map'. Earlier, Robinson (1952) was one of the first cartographic theorists to identify that cartographers are effectively encoding information for the user in map form, but that users are required to engage in the process through interpreting the map; the distinction between map maker and map user is unwarranted (Edney

2019:234). User participation has increased significantly in the ensuing 70 years with the rise of cheap computers capable of running GIS packages and collaborative initiatives such as OpenStreetMap.

This study will restrict itself to flat maps printed on paper (which on older maps may be backed by cloth), although implications of its findings for the delivery of maps electronically (online, including through smartphones) will be briefly considered in its conclusions. It will mainly consider folding maps printed on a single sheet of paper, but will occasionally cover road atlases, booklets, street plans and maps as part of a wider package of information, or strip maps which may show schematic arrangements of roads (as opposed to a spatially accurate depiction retaining scales or angles). School or world atlases are outside its scope as they are unlikely to be used or usable by motorists for wayfinding.

A1.2 What is a Road Map?

Essentially, a road map is one that can be used for navigation or wayfaring by a motorist, using roads marked on the map. Partly due to limitations of scale, not all roads in the area covered by a map need be shown; and they may be restricted to a single type, such as motorways. However, road maps normally show major settlements, a selection of natural features (including lakes and rivers) and landforms. They typically also mark administrative boundaries and may optionally show a wide range of additional features or information (datasets), such as railways, points of interest and commercial or tourist information, as discussed in Chapter 5.

In North America "road maps" following this definition are often known as "highway maps" (e.g. Bockenhauer 1994, and Standard Oil (Indiana) maps); more rarely they are called "travel maps" (Esso, Mobil), "touring maps" (Chevron) or "info-maps" (Gulf), primarily to provide a marketing distinction, but also to suggest that they contain rather more than just a map. In this thesis, the term "road map" will be used irrespective of what is written on the cover, and only in its literal sense, not figuratively.

Road maps need distinguishing from two closely related types of maps:

- A topographical map is a map that places a greater focus on natural physical features than on manmade ones. Typically it will be at a larger scale and aim to be more comprehensive than a commercially available road map, which will be more selective in its representation. Topographical maps typically show features such as contours, power transmission lines, at least some individual buildings and different levels of administrative boundary (NRCAN 2014).
- A tourism map (or tourist map) is less well defined. This term is widely used for a map prepared for actual or intended visitors to a locale or attraction for leisure purposes. As with a road map, a degree of selectivity is required; the publisher or sponsor of the map is often associated with the locale or attraction. Tourism maps typically highlight selected buildings or points of interest,

often using pictorial or photographic representations, and contain additional textual information in the *perimap* (the space around the cartographic image). To avoid confusion, this thesis will call such maps "tourism maps" (even where they have an oil company sponsor) as some more straightforward road maps are also called "tourist maps" by their publishers or sponsors.

However, there is a continuum – a topographical map can "shade" into a tourism map or road map (Keates 1998:83). Arguably, road maps are primarily about wayfinding which "*emphasizes the geosemiotic cues … to let travelers know what they need to do*", and tourism maps about wayfaring which "*suggests that traveling involves more than moving between A and B … to facilitate the richness of lives lived on the move*" (Lanng and Jensen 2016:247). However many of the maps within the scope of this thesis can – and do – service both purposes, providing a relatively uncomplicated road map, augmented by tourist information including drawings, photographs and text.

The term "road map" may also encompass larger scale maps of cities, towns or villages that mark – and name – all roads within their area, that are often called street maps or street plans. The justification for this is fourfold:

1. Both types of map are primarily used for wayfinding, and would be used by motorists in the relevant location;
2. The distinction between the two is fuzzy, as "pure" road maps get larger in scale they take on some characteristics of street maps/plans, for example by naming the more important roads and locating key buildings;
3. Many road maps contain larger-scale inset maps of important cities within the area covered;
4. Many series of road maps issued by oil companies included separate sheets for major cities. For example the regional road map series issued by brands such as Shell, BP, Esso and Texaco in the UK all included a section of "London", and major oil companies in the USA and Germany gave away city maps as well as state or sectional maps.

The term "motorists" has been used above. The main target group for road map users can be assumed to be drivers (or passenger-navigators) in powered vehicles – not just privately owned or rented motor cars, but vans, lorries, large trucks and motorbikes.

Prior to the development of powered vehicles, there was an existing market for cycling maps (Nicholson, 2004). Initially cars travelled at similar speeds to cycles, so common maps would suffice – in the UK, the "Red Flag Act", repealed in 1896, enforced walking speed. Nicholson shows how some map publishers added motorists into title, but as cars improved, their maps needed to be differentiated – with greater attention to factors such as road surfaces and facilities that might attract motorists. Before long, cars

were capable of much higher speeds than cyclists, requiring road maps at a smaller scale with greater coverage. Cyclists typically turned instead to use topographical maps, although in recent years many more specifically cycling maps have been produced and larger scale road maps may still be used by cyclists or pedestrians.

A1.3 What is an oil company road map?

The final question of definition then is what constitutes an "oil company road map" – or perhaps, what is an "oil company"? To answer the latter question first, an oil company is any entity, private or publicly-owned – including state monopolies, that is (or was at the time of the publication of the map) engaged in the refining, distribution and retailing of road fuels and/or motor oils (lubricants). Companies purely engaged in the upstream production of crude oil are outside the scope (and rarely produced road maps, although they did sometimes produce or sponsor geological or more general maps). Road fuels over the period covered (broadly the twentieth century through to 2010) are primarily petrol (gasoline), but include diesel and – more rarely – liquefied petroleum gas (auto-LPG); dedicated maps for diesel and LPG users can both be found. As the scope includes retailing, it will extend to encompass service station chains, whether of "traditional" service garages (such as Caffyns or Kenning in the UK) or associated with supermarkets (such as Tesco or Safeway in the UK, Leclerc or Intermarché in France, Metro in Germany) and chains of convenience stores selling fuel. However most of the examples will be drawn from the most widely available maps of the largest international oil companies – notably, Shell, Esso, BP, Mobil, Total, Texaco/Caltex and (in Europe) Aral, although several hundred other brands are known. Appendix 2 considers the various types of oil company in greater detail to provide a contextual space into which the oil company road map fits.

An "oil company map" synthesises this by demanding that the road map must have been published by, or for, or be carrying a significant advertising component from, the oil company. The signifier "road" will not always be used in the body of this thesis unless the findings relate primarily to smaller scale maps, but maps that have been primarily produced as promotional gifts for customers, such as maps showing folklore or the moon, are outside the scope of this research. The "significant advertising component" would normally be regarded as the sole advertiser, sponsor or, at the very least, the headline advertiser on the front cover of the map. In practice many maps were produced by commercial cartographers and then sold to oil companies for distribution to those companies' customers (see Chapter 7).

A1.3.1 Locator Maps

This thesis refers several times to "locator maps" which needs to be defined as it is not widely used in the academic literature. Common usage (as indicated by the Wikipedia page "Locator map") reveals two conflicting meanings. One is for an inset map showing the location of the main map in its geographical context, commonly used in newspapers (Vujakovic 2018), also known as a key map.

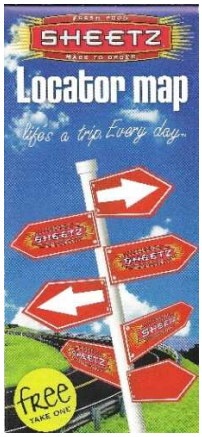


Figure 265: Sheetz Locator map [605]

Figure 266: Extract from 2008 Sheetz locator map

The other, which will be used in this thesis, is a relatively simple map with the primary purpose of showing business or other thematic locations; businesses promoted are not just petrol stations but include banks, hotels, restaurants and car rental offices (Byrne 2022a). The term appears to be most prevalent in the USA, as in the example shown in Figure 265; it is typical for less detail to be shown in areas where there are no corporate locations (Figure 266; Figure 123). Up to 1997, the US fuel and convenience store chain Sheetz called this a "Location Map" [604], since 2004 it has been a "Locator Map" [605].

Appendix 2: Classification of Oil Companies

This thesis regularly refers to oil companies or petroleum companies; it also refers to service stations – to understand the context it is necessary to categorise the companies.

For convenience, the term "oil company" is used to mean all the groups classified below. Although the phrase "petrol company" is occasionally used, this would most often be for independent wholesalers and distributors, and includes all forms of motor fuel, including diesel and, occasionally, auto-LPG. The term "downstream" is used to encompass all or any of the stages of the oil industry that "follow extraction, especially those of refining, distribution, and marketing" (Oxford 2023a).

A2.1 Primary Classification

A simple hierarchy can be:

1. International Oil Companies (IOCs)
2. National Oil Companies (NOCs)
3. Independent Refiners
4. Independent wholesalers and distributors
5. Jobbers
6. Cooperatives
7. Retailers (Service station operators)

A2.2 International Oil Companies (IOCs)

Often also known as "oil majors", although that can be in the context of oil production capacity. Traditionally this is used for integrated companies involved in all the main functions: exploration, production, refining and distribution. Most IOCs are publicly quoted, although in recent years privately held oil traders (notably Vitol and Trafigura) have moved into refining and marketing in numerous countries.

Traditionally the main international oil companies were seen as being dominated by the Anglo-American "Seven Sisters" (using a term attributed to Enrico Mattei, who sought to develop the Italian company AGIP into a competitor). These comprised:

- Exxon Corp., formerly Standard Oil Co. of New Jersey (Esso);
- Royal Dutch-Shell Transport and Trading (with most operating companies owned 60:40 by the Dutch and British arms);
- British Petroleum (BP);
- Gulf Oil Corporation;

- Mobil Oil Corporation (formerly Standard Oil Co. of New York);
- Texaco; and
- Standard Oil Co. of California (Chevron)

Downstream, Chevron and Texaco operated in a joint venture in Asia, Australasia and East and South Africa after 1939 (and in Europe from 1947-67) called Caltex.

Although these seven companies were the largest integrated IOCs, there were always other "independents" and state-influenced European companies that rivalled them. Among the key additional companies were Compagnie Française des Pètroles (Total), Petrofina (Fina) and Ente Nazionale Idrocarburi E.N.I. (AGIP) from France, Belgium and Italy respectively, and Standard Oil Co. of Indiana (Amoco), Atlantic Richfield (Arco), Continental Oil Company (Conoco, using the Jet name in Europe) and Phillips Petroleum Company (Phillips 66) from the USA. At a downstream level only, the German firm Aral had a reach equivalent to the main IOCs in Europe.

Most, but not all, IOCs are also directly involved in retailing fuel through service stations, often owning and/or operating a proportion of the stations that carry their colours. The proportion of service stations directly owned by oil companies has varied with time and location. In the UK, for example, it was negligible before 1939, but with the development of solus[12] stations it had risen to 13% by 1964 (Monopolies Commission 1965), 31% by 1979 and 44% by 1999. Although this had fallen back to 31% by 2016 (Petroleum Review 1980, 2000, 2017), more than half the current numbers are at supermarkets, with the proportion owned by IOCs being under 20%. There has been a similar reduction in company-owned stations in the USA and most other developed countries, as the IOCs and larger independents seek to reduce capital tied up in retailing assets.

Over the last 25 years there has been consolidation among the IOCs, driven partly by activist investors looking to increase returns on capital, but also by a looser attitude towards large mergers by regulatory (anti-trust) bodies. This has led to Exxon and Mobil merging into ExxonMobil; Chevron acquiring first Gulf and then Texaco; BP acquiring Amoco, Arco and Aral; Conoco and Phillips merging; and Total acquiring Fina and Elf. Downstream assets have changed hands even more regularly, with some companies withdrawing largely from refining, and several selling many of their retail assets, although sometimes licensing their brand to the new owners.

[12] A solus station is "an outlet for the sale of oil and petrol that sells the products of one company only" (Oxford 2023b)

The IOCs were the most common issuers of branded road maps. However, due to the size of their retail chains, they were less likely to mark or list service station locations than smaller companies.

A2.3 National Oil Companies (NOCs)

These were largely established by, or with the active support, of national Governments, generally established since 1960 – Viña and Ferrara (2019) give 29 examples. Commonly used for exploration and production companies in oil producing countries, NOCs can also be partly or wholly state-owned integrated companies with a focus on their home market, such as Elf (France), Repsol (Spain), Equinor (ex-Statoil, Norway), Petro-Canada, Petrobras (Brazil) or YPF (Argentina), but which may also market fuels in other countries. In contrast, with the notable exception of the Kuwait Petroleum Company (Q8, which acquired Gulf's marketing operations in most of Europe), middle eastern NOCs have tended to focus more on upstream assets, although some – such as Saudi Arabia's Aramco – have invested in downstream companies. Most NOCs in Western countries have been wholly or partly privatised, leaving them vulnerable to takeover. Of the six examples named above, three have been taken over: Elf by Total, Petro-Canada by Suncorp (also of Canada), and YPF by Spain's Repsol, although it was subsequently renationalised. Statoil's downstream activities were also sold, largely to Couche-Tard from Canada (which uses the Circle K trade name).

A2.4 Independent Refiners

This term is again slightly ambiguous. Although it includes pure refiners, in the context of this thesis it mainly refers to firms also supplying service stations at the retail level. It is most commonly applied to US companies not considered large enough to be IOCs, or which lack an international reach. Since 2000, several mid-sized integrated US companies have been split between upstream and downstream activities, including Hess, Sunoco, Marathon and Murphy. This tier seems particularly vulnerable to attack from corporate raiders, but one newer name appears to have reached critical mass: Valero (which subsumed much of Ultramar and Diamond Shamrock) and acquired the Texaco assets in the UK and Ireland. Independent refiners in Europe were most commonly found in Italy (ERG with service stations; Saras without); Germany (where most supplied Aral or the many distributors to free stations); and Rotterdam/Antwerp; none had a major presence in retail service stations.

A2.5 Independent wholesalers and distributors

Generally smaller than refiners, they supply retail networks, usually only in a single country or region. A wholesaler will have its own storage facilities; a distributor will normally buy product from a refinery or wholesaler, either under contract or on the spot market. Companies in this sector tend to supply

anything from a couple to several hundred retail outlets. Most tend to be at the smaller end and, except in the USA and Germany, have never issued roadmaps. In recent years, with the support of venture capital, some independent wholesalers have started to operate in several countries, most notably DCC of Ireland, which operates under a mix of its own brands (Emo, QStar) and licensed brands (Gulf).

A2.6 Jobbers

Jobbers are a particularly type of wholesaler or distributor that sell fuel from one or more major brands (usually IOCs or independent refiners). Although historically most jobbers sold a single brand, sometimes with a few stations under its own "private" brand, more recently jobbers frequently offer a range of brands. Although a largely US phenomenon, jobbers were also found in Germany and Austria.

With the withdrawal from direct operations by IOCs in several countries of Europe, entire chains have sometimes been sold to a jobber – such as Greenergy in the UK (supplying most of the Esso dealers), Intervias (which uses the BP name in France and Texaco in Benelux), Valero (operating Texaco in the UK and Ireland), VIVA Energy (operating Shell in Australia), Cool Petroleum (Shell in Jamaica) and DISA (operating Shell in Spain). This is slightly different from where a company licenses its brand to independent wholesalers, as has been done with the Gulf brand in several countries since rights to the name were acquired by Indian interests. Bespoke maps from jobbers are relatively rare; there are a few dozen examples known from the US, such as Aero Oil (Phillips 66 in York PA), Smith Oil (Gulf then Sunoco in Rockford, IL) and Lyden Oil (Amoco, in Youngstown, PA) – most are characterised by being maps of the jobber's home town.

Sherwood Bros, a rather larger East Coast jobber, had several editions of maps showing its joint branding of Betholine-Richfield or Betholine-Sinclair in the 1940s and 50s. Elsewhere few jobber issues have been reported, although Cool Petroleum has sold a Shell map of Jamaica (2007), and Doppler, which uses BP and private brands, issued an atlas of Austria, also in 2007.

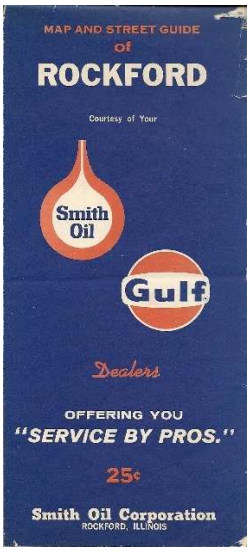


Figure 267: 1965 Smith Oil map of Rockford [635] (note 25c price)

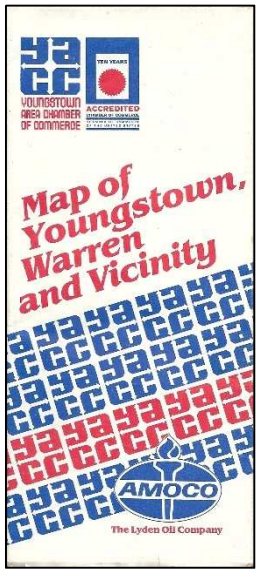


Figure 268: 1981 Lyden Oil map of Youngstown [510]

Figure 269: 1952 Betholine-Sinclair (Sherwood Bros.) map of Delmarva [527]

A2.7 Cooperatives

There are two main types of co-op: consumer co-ops and producer co-ops. The former are uncommon in the retail petroleum industry, owing to the need for a large amount of capital. The one main exception is the OK cooperative, which operates in Scandinavia and absorbed an earlier co-op using the IC name. Maps were produced for both OK and IC. General retail co-ops have also sometimes operated service stations (the Lincolnshire co-op in England was active for many years), but generally have not produced road maps in their own name.

Producer co-ops were established to enable smaller independent companies to compete more effectively with larger firms, notably the IOCs. Typically they involved cooperative purchasing of fuel as well as using common branding and marketing materials. The most successful of these is the Swiss-based AVIA co-op, which brands service stations in several countries of Europe and has regularly coordinated maps for use by its members. In some cases maps have been overprinted with the member's name, and one case is known of an AVIA map existing in two versions – one for use by all members and one for a specific member with additional details relating to that member (Knittel in Germany).

A2.8 Retailers

Retailers can also be split into sub-categories. Independent retailers operate one or more service stations which may carry a third-party supplier brand or their own brand. In the former case it is relatively uncommon for them to issue road maps. There are occasional issues from single service stations (typically from MWM maps in the USA in the 1930s); in one sense it is only a small step from adding a rubber stamp for the dealer to the front of a map to having it overprinted with that dealer's name. Operators of large chains of service stations seem to have relied on their supplier(s) for maps, with one main exception: Kenning in the UK – which mainly sold fuel from Shell or BP – issued a number of maps of the country from the 1960s to 1980s, possibly more for its car rental customers than to support petrol sales.

Retailers selling their own brand of fuel from their own service stations have long been a feature in certain markets. Most common in the USA, many started life as discounters with service stations next to rail sidings – some even reflected this in their names (both Tankar and Spur allude to this). While Spur expanded to be become the retail arm of Murphy Oil Corp., taking on third party dealers, some other chains remained with service stations widely spread across the country. These occasionally issued maps, despite keeping to a low cost base, as with a very low density of stations it was hard for motorists to know where to find them. Examples are known from, among others, Fisca, Hudson and Quality/Woerner. A

few such chains remain, including Thorntons (now owned by BP) and Racetrac, with the latter having published an atlas showing locations on the rear cover as recently as 2012. In the USA the distinction between such service stations and convenience stores (selling snacks and limited range of food items) has disappeared, in part due to looser planning requirements making it easier to build stores with gasoline sales. In recent years large chains of C-stores with fuel sales have been built up, led by 7-Eleven (owned by 7&i Holdings of Japan) and Circle K (part of Canada's Alimentation Couche-Tard). Both sell a mix of major and own brand fuels; 7-Eleven was at one stage owned by a common (Venezuelan) parent as Citgo so exclusively sold their gasoline. Smaller in range, but with perhaps a greater focus on fuel sales, Casey's General Stores operates across a swathe of rural America. Other key names include QT (QuikTrip), Kwik Trip, Sheetz and Wawa. Beneath them are hundreds of smaller chains, more often than not operated by jobbers and selling major brands of fuel. Apart from a very few basic locator maps (e.g. Sheetz [605], Figure 265), almost all developed too late to offer branded road maps. Deals in the sector are frequent, with blocks of stores changing hands (and brands) frequently.

Historically there were few similar retail filling station chains in Europe (Heron in Britain and Kirol in Germany were exceptions) and virtually none elsewhere. (Although Japanese service chains were common enough, all also carried a major fuel brand.) However this changed in 1963 when France's Carrefour opened its hypermarket with an attached service station (Burt 1985; Ritson et al 2018). Since then, supermarket own brand stations have become a major player in the retail markets of France and Britain, and to a lesser extent in Germany, Spain, Canada and the USA. Not wholly dependent on fuel sales to drive map sales, some operators have produced large format atlases (Morrisons and Tesco in the UK; Meijer in the USA) while others have gone for low cost locator maps (Intermarché in France; Tesco, Safeway and Sainsbury's in the UK) with relatively few for more conventional maps (Metro in Germany, Système U in France). Oddly, perhaps, it is the German discount supermarkets (such as Aldi or Lidl) that most frequently sell branded maps, even though they never have attached petrol stations.

Although conventional filling stations have replaced auto service facilities with convenience retailing in Europe, as in North America, independent chains have been slow to develop: the retail offering tends to carry a franchise name from the fuel supplier or a symbol group such as Spar, REWE or Londis. Again these changes have mainly happened since 2000, so have had no direct impact on oil company roadmaps. In Australia, a similar realignment has led to Shell selling its sites to Coles Express, Mobil to 7-Eleven, and EG buying the Woolworth fuel assets, but using the Ampol (formerly Caltex) brand; in all cases the fuel has retained a brand well-known to local consumers.

A2.9 Summary

Although it is sometimes useful to categorise oil companies, the detailed analysis of maps focused mainly on maps from IOCs or NOCs, with other types of fuel retailer only becoming significant as total map production volumes fell off towards the end of the primary study period (essentially post-2005).

#	IWB dbase	Brand	Land	Section title (English)	Year	Cartographer	Main Map Scale	Folded H mm	Folded W mm	Sheet H mm	Sheet W mm	Sheet Area/m²

Appendix 3: Table of Maps in detailed sample

(a) Cartographer, Scale and Sheet sizes

#	IWB dbase	Brand	Land	Section title (English)	Year	Cartographer	Main Map Scale	Folded H mm	Folded W mm	Sheet H mm	Sheet W mm	Sheet Area/m²
1	9198	PRATT'S	GB	Road Atlas of England and Wales	1905	George Philip and Son	380160	217	127	217	127	
2	9149	BP	GB	North of England	ca1924	G W Bacon	506880	181	115	555	560	0.311
3	9150	BP	GB	Central Southern Counties	ca1931	British Publishing Co Ltd	253440	190	126	185	120	
4	12251	REGENT	GB	Road maps of England and Wales	ca1937	Edward Stanford Ltd	633600	220	152	216	136	
5	7402	SHELL	GB	Great Britain Southern Section Nos. 1 and 2	ca1939	Foldex Ltd	253440	242	142	448	990	0.444
6	4298	ESSO	GB	South and East England	ca1949	Edward Stanford Ltd	316800	228	96	580	682	0.396
7	9207	REGENT	GB	South East England	ca1953	Geographia Ltd	380160	254	97	506	776	0.393
8	6542	NATIONAL	GB	3 Miles to 1 Inch Road Atlas	ca1954	W and AK Johnston and GW Bacon Ltd	190180	213	147	210	139	
9	9213	SHELL	GB	South and West England	ca1956	George Philip and Son	380160	266	127	532	758	0.403
10	6612	SHELL BP	GB	London and South-East England	ca1956	George Philip and Son	380160	266	127	532	758	0.403
11	8837	MOBIL	GB	South and S.E. England	ca1957	Roadfinder Maps	500000	232	120	479	690	0.331
12	10960	NATIONAL	GB	South West England South East England	ca1958	George Philip and Son	316800	230	117	582	914	0.532
13	577	ESSO	GB	South and East England	1959	Edward Stanford Ltd	316800	228	96	580	682	0.396
14	10349	MOBIL	GB	South East and South West England	1960	A.W. Gatrell and Co. Ltd	316800	292	113	582	905	0.527
15	437	NATIONAL	GB	Kent and East Sussex	1960	George Philip and Son	158400	228	116	580	904	0.524
16	3963	SHELL	GB	South West England and South East England	1960	George Philip and Son	316800	230	115	580	902	0.523
17	1245	BP	GB	Southern England	1961	George Philip and Son	316800	230	115	580	902	0.523
18	1696	REGENT	GB	Great Britain South Sheet	ca1961	Geographia Ltd	570240	232	100	855	600	0.513
19	8870	AMOCO	GB	Great Britain	ca1964	Geographia Ltd	1100000	220	94	437	565	0.247
20	11286	BP	GB	South and East England	1966	George Philip and Son	253440	222	120	443	943	0.418
21	12278	ESSO	GB	South and East England	1966	Edward Stanford Ltd	316800	214	104	908	423	0.384
22	3096	SHELL	GB	South and East England	1966	George Philip and Son	253440	222	120	443	943	0.418

#	IWB dbase	Brand	Land	Section title (English)	Year	Cartographer	Main Map Scale	Folded H mm	Folded W mm	Sheet H mm	Sheet W mm	Sheet Area/m²
23	11521	CLEVELAND	GB	South and East England	1967	George Philip Printers	316800	214	102	918	424	0.389
24	1457	BP	GB	South and East England	1968	George Philip and Son	253440	222	118	442	940	0.415
25	7266	REGENT TEXACO	GB	Southern England	ca1968	Geographia Ltd	316800	228	100	680	905	0.615
26	8719	AMOCO	GB	Great Britain South.	ca1969	Geographia Ltd	570240	232	109	850	598	0.508
27	1477	BP	GB	South and East England	1971	George Philip and Son	253440	222	120	443	943	0.418
28	260	MOBIL	GB	South East and South West England	1973	Wm. Collins Sons and Co Ltd	316800	290	115	582	905	0.527
29	1733	AMOCO	GB	West country South coast	1975	John Bartholomew and Son Ltd	253440	252	115	1100	768	0.845
30	226	SHELL	GB	South East and East Midlands	ca1977	Automobile Association	316800	215	120	1145	410	0.469
31	11675	TEXACO	GB	Greater London	1977	Geographia Ltd	84480	228	99	482	672	0.324
32	8029	MOBIL	GB	South East and South West England	1980	Wm. Collins Sons and Co Ltd	316800	292	113	582	905	0.527
33	382	BP	GB	South and East England	1981	George Philip Printers	200000	220	108	600	975	0.585
34	6999	BP NATIONAL	GB	South-East England	1984	George Philip Printers	200000	220	108	600	975	0.585
35	7039	ESSO	GB	South East and Central England	1986	Geographers' A-Z Map Co., Ltd	316800	237	154	876	1135	0.994
36	621	TEXACO	GB	Road Atlas of Great Britain	1988	George Philip and Son Ltd	316800	287	215	287	215	
37	341	BP	GB	South East England and East Anglia	1990	Automobile Association	200000	264	146	780	1170	0.913
38	591	SHELL	GB	South East England and East Anglia	1990	Automobile Association	200000	264	130	780	1170	0.913
39	293	ESSO	GB	South West England	1991	Automobile Association	200000	268	136	780	1230	0.959
40	8743	TEXACO	GB	Fastfuel site directory 2006/7	2005	Collins	1000000	210	170	210	148	
41	12328	TEXACO	IRL	Ireland	ca1938	George Philip and Son	506880	209	140	209	266	
42	12337	CALTEX	IRL	Ireland	1958	Orell Fussli	670000	227	115	911	672	0.612
43	9968	TEXACO	IRL	Ireland	ca1968	Orell Fussli	670000	227	115	911	672	0.612
44	3970	TEXACO	IRL	Ireland	1982	Ordnance Survey	575000	233	118	830	622	0.516
45	7037	TEXACO	IRL	Ireland	2002	Collins Bartholomew	620000	224	155	896	618	0.554
46	9475	GULF	USA	New York	1916	Automobile Blue Book Pub. Co.	ca2550000	217	94	217	281	0.061
47	9596	SHELL	USA	Northern California	1925	Shell Company of California	ca2175000	229	103	456	305	0.139
48	9651	SOCONY	USA	New York	1926	General Drafting Co.	ca810000	180	96	554	709	0.393
49	9699	STANDARD	USA	MD, VA, WV, NC, SC, DC	1926	General Drafting Co.	ca1575000	180	100	712	554	0.394
50	9685	STANDARD	USA	California	ca1927	WC Eubank Co	ca2370000	228	102	605	228	0.138

#	IWB dbase	Brand	Land	Section title (English)	Year	Cartographer	Main Map Scale	Folded H mm	Folded W mm	Sheet H mm	Sheet W mm	Sheet Area/m²
51	9670	STANDARD	USA	Iowa	1927	Langwith	ca1150000	228	104	457	602	0.275
52	9733	TEXACO	USA	Washington, Oregon, etc.	ca1927	General Drafting Co.	ca2500000	194	104	603	770	0.464
53	9687	STANDARD	USA	California	1931	Rand McNally	ca1900000	228	102	679	402	0.273
54	2011	STANDARD	USA	Michigan	1933	HM Gousha	ca1140000	229	102	602	456	0.275
55	9487	GULF	USA	New York	1934	Rand McNally	ca1050000	203	101	404	1113	0.450
56	9739	TEXACO	USA	Idaho Montana Wyoming	1934	Rand McNally	ca1750000	188	90	702	747	0.524
57	10022	ESSO	USA	New York	1937	General Drafting Co.	800000	179	96	554	710	0.393
58	11297	SOCONY	USA	New York	1937	General Drafting Co.	760000	198	111	654	787	0.515
59	2192	SHELL	USA	California	1938	HM Gousha	1775000	228	102	504	380	0.192
60	7790	CHEVRON	USA	California	1951	HM Gousha	ca1250000	228	101	228	200	
61	422	STANDARD	USA	Michigan	1953	Rand McNally	918720	229	106	733	455	0.334
62	5944	SHELL	USA	Pacific Southwest	1954	HM Gousha	1964160	230	98	678	459	0.311
63	2496	ESSO	USA	New York	1955	General Drafting Co.	687000	213	102	606	848	0.514
64	6109	TEXACO	USA	E Texas-Oklahoma with New Mexico-W Texas	1955	Rand McNally	1647360	293	98	810	582	0.471
65	938	GULF	USA	New York	1956	Rand McNally	760000	228	101	906	454	0.411
66	10995	MOBILGAS	USA	New York	1956	Rand McNally	700000	228	113	454	836	0.380
67	12215	GULF	USA	New York and New Jersey	1958	Rand McNally	780000	218	102	650	806	0.524
68	98	MOBIL	USA	New York	1959	Rand McNally	685000	216	126	646	909	0.587
69	9397	CHEVRON	USA	California	1960	HM Gousha	1330560	228	98	454	676	0.307
70	12275	ENCO	USA	Oregon Washington	1963	General Drafting Co.	309000	214	102	638	611	0.390
71	11116	TEXACO	USA	Texas	1966	HM Gousha	1615680	230	98	675	457	0.308
72	1829	SHELL	USA	California	1967	HM Gousha	1267200	230	98	1068	455	0.486
73	4173	STANDARD	USA	Michigan	1967	Rand McNally	ca1250000	225	100	676	454	0.307
74	1425	ESSO	USA	New York	1968	General Drafting Co.	687000	212	102	594	843	0.501
75	937	GULF	USA	NH, VT and MA, CT, RI	1968	Rand McNally	500000	229	102	646	808	0.522
76	274	MOBIL	USA	New York	1968	Rand McNally	685000	228	105	646	894	0.578
77	11006	SHELL	USA	California	1968	RR Donnelley	1318000	230	98	915	596	0.545
78	9402	CHEVRON	USA	California	1969	HM Gousha	1330560	229	98	454	868	0.394

#	IWB dbase	Brand	Land	Section title (English)	Year	Cartographer	Main Map Scale	Folded H mm	Folded W mm	Sheet H mm	Sheet W mm	Sheet Area/m²
79	6850	TEXACO	USA	Texas	1970	HM Gousha	1615680	230	98	556	774	0.430
80	6837	SHELL	USA	California	1973	HM Gousha	1267200	230	98	1062	458	0.486
81	6278	STANDARD	USA	Michigan	1973	Diversified Map Co	3160000	227	100	642	455	0.292
82	11632	MOBIL	USA	New York	1975	Rand McNally	ca1250000	153	91	304	533	0.162
83	11430	EXXON	USA	New York	1977	General Drafting Co.	712000	212	102	594	843	0.501
84	952	GULF	USA	Eastern United States	1977	Rand McNally	2200000	228	102	646	906	0.585
85	4263	SHELL	USA	Central And Western United States	1977	HM Gousha	ca3800000	230	98	673	456	0.307
86	2104	STANDARD	USA	Michigan	1978	Amoco Oil Co/National Survey	1250000	227	99	676	450	0.304
87	1577	CHEVRON	USA	Washington	1979	HM Gousha	1075000	228	98	677	458	0.310
88	11570	MOBIL	USA	Connecticut Rhode Island	1989	Rand McNally	ca350000	229	106	456	678	0.309
89	11210	AMOCO	USA	Illinois	1993	Dalan Publishing	750000	234	98	964	572	0.551
90	6025	EXXON	USA	New York	1998	GeoSystems Global Corp	ca1450000	140	102	278	604	0.168
92	9229	SHELL	I	Through Italy by Motor	1927	Compagnia Italiana Turismo	n.a	169	122	169	232	
93	9230	SHELL	I	Through Italy by Motor	1930	Compagnia Italiana Turismo	n.a	170	122	170	232	
94	11827	AGIP	I	Italy	1933	Art Graf Navara SA Milano	ca1550000	210	166	321	419	0.134
95	11233	PETROL CALTEX	I	Italy	ca1952	Soc. Cartografica G De Agostini - Milano	650000	282	152	282	430	0.121
96	6956	SHELL	I	Italy (set of cards)	ca1953	Officine Litografiche, Milano	1300000	264	199	260	191	
97	11265	AGIP	I	Italy	ca1955	Clementi	1000000	274	146	546	806	0.440
98	10047	ESSO	I	Italy	1955	Karl Thiemig KG	1000000	217	103	854	608	0.519
99	190	BP	I	Italy	1957	IGDA Novara	1000000	215	134	647	645	0.417
100	6365	AGIP	I	Italy	1961	IGDA, Novara	1200000	246	127	488	766	0.374
101	10347	PETROL CALTEX	I	Italy	ca1961	Istituto per Ricerche Geografiche e Studi Cartografici SpA - Milano	1000000	243	116	482	695	0.335
102	1472	SHELL	I	Northwest (Italy)	1961	IGDA, Novara	500000	248	138	687	487	0.335
103	8013	ESSO	I	Italy North	1962	Karl Thiemig KG	500000	205	104	812	712	0.578
104	3973	BP	I	Italy	1963	IGDA Novara	1000000	200	120	393	964	0.379
105	238	BP	I	Italy	ca1966	Vallardi	1250000	240	133	480	660	0.317
106	4449	AGIP	I	Italy	1967	Vallardi	1000000	221	116	221	116	
107	5555	CHEVRON	I	Italy South	1971	IGDA, Novara	600000	205	114	406	678	0.275

#	IWB dbase	Brand	Land	Section title (English)	Year	Cartographer	Main Map Scale	Folded H mm	Folded W mm	Sheet H mm	Sheet W mm	Sheet Area/m²
108	12071	SHELL	I	Northwest (Italy)	1971	IGDA, Novara	500000	248	138	687	487	0.335
109	12082	ESSO	I	Italy North	1972	Thiemig KG	500000	205	104	812	712	0.578
110	1537	AGIP	I	Italy Ski Map	1977	Ufficio Tecnico Cartografico A.C.I.	ca1050000	253	133	1008	895	0.902
111	8054	CHEVRON	I	Italy	1981	IGDA, Novara	750000	235	135	788	1000	0.788
112	11218	ESSO	I	Italy Autostrade	1986	Prof N. Esposito	750000	210	104	839	700	0.587
113	1995	MONTESHELL	I	Italy	1986	Michelin	1000000	304	111	987	608	0.600
114	12347	AGIP	I	Italy	ca1993	Ufficio Tecnico Cartografico A.C.I.	800000	214	140	780	836	0.652
115	5200	SHELL	I	Italy	1999	IGDA, Novara	ca750000	200	104	791	1114	0.881
116	4479	CIP	F	France Region Nord-Ouest	1934	Michelin	1000000	249	120	498	596	0.297
117	12282	CIP	F	France Nord-Est	1934	Blondel la Rougery	1000000	262	86	262	770	0.202
118	7414	SERCO	F	France	1935	SCIP - Paris	ca2100000	245	116	474	626	0.297
119	12281	STANDARD	F	Vosges Alsace	1935	Brun-Fauré	500000	198	89	393	348	0.137
120	7585	ENERGIC	F	Provence	1936	Blondel la Rougery	900000	240	100	240	396	0.095
121	9094	SHELL	F	Bretagne	1936	Foldex	400000	227	132	362	864	0.313
122	10043	OZO	F	France	ca1938	Editions Oper/SGA	2000000	69	147	540	290	0.157
123	9082	ESSO	F	France	1951	Blondel la Rougery	1500000	171	85	340	742	0.252
124	4339	SHELL	F	Bretagne	ca1953	Foldex	250000	214	135	407	910	0.370
125	9068	AZUR	F	France	1954	R Graindorge	1300000	240	130	420	820	0.344
126	2363	BP	F	les Routes de France	1954	Blondel la Rougery	1300000	255	122	255	444	
127	9085	MOBILGAS	F	France Grandes Route Partie Nord	1954	Michelin	1000000	253	111	497	1097	0.545
128	3278	BP	F	France	ca1956	Dechaux	1000000	275	127	275	494	
129	189	BP	F	Road Map of France	ca1957	George Philip and Son	1750000	246	104	730	618	0.451
130	8369	BP	F	France	1957	"La Photolith" - L. Delaporte	1000000	275	127	275	494	
131	11548	CALTEX	F	France	1957	Michelin	1000000	250	115	990	1100	1.089
132	9066	AVIA	F	France Nord	1958	Michelin	1000000	250	111	498	1312	0.653
133	8045	BP	F	France	ca1958	"La Photolith" - L. Delaporte	ca1385000	280	179	558	713	0.398
134	10631	ESSO	F	France	1959	Blondel la Rougery	1600000	211	103	840	612	0.514
135	2295	SHELL	F	Normandie	1959	Shell Berre (FF)	500000	231	147	458	584	0.267
136	477	BP	F	France	ca1960	M.Dechaux	ca1200000	210	110	417	982	0.409

#	IWB dbase	Brand	Land	Section title (English)	Year	Cartographer	Main Map Scale	Folded H mm	Folded W mm	Sheet H mm	Sheet W mm	Sheet Area/m²
137	5093	ANTAR	F	France	1961	Blondel la Rougery/Vox	1000000	247	112	497	1342	0.667
138	4543	AZUR	F	Atlas Azur	1963	R Graindorge	ca1800000	220	118	220	208	
139	11766	CALTEX	F	France Nord	1963	Michelin	1000000	250	111	498	1312	0.653
140	2182	MOBIL	F	France Sud Grandes Routes	1963	Michelin	1000000	250	111	500	1315	0.658
141	5897	BP	F	France	1965	IGN/Dechaux	1000000	275	127	275	500	
142	10057	TOTAL	F	La Route Total	1966	Michelin	1000000	250	111	500	1315	0.658
143	2178	ELF	F	France Nord-Ouest	1967	Foldex France	ca600000	238	116	470	1140	0.536
144	4972	MOBIL	F	Cote d'Azur	1967	SFIPE/IGN	250000	242	110	477	656	0.313
145	3276	BP	F	Autoroutes de France	1969	SFREC / IGN	200000	288	120	288	221	
146	525	ESSO	F	France	1969	Blondel la Rougery	1000000	208	104	1104	614	0.678
147	5106	SHELL	F	Normandie	1969	Shell Berre	500000	231	137	458	676	0.310
148	1645	AVIA	F	France Nord	1970	Michelin	1000000	250	111	498	1312	0.653
149	5096	BP	F	France	ca1978	Recta Foldex	1000000	243	134	972	1320	1.283
150	11317	SHELL	F	Normandie	1978	Shell Berre	500000	231	108	458	642	0.294
151	10009	TOTAL	F	France - route de nuit	1979	Recta Foldex	ca2300000	245	106	450	635	0.286
152	12297	ARAL	F	Frankreich France	1981	Busche	1000000	210	111	630	980	0.617
153	2803	ESSO	F	France	1983	Institut géographique national	1000000	254	132	509	1320	0.672
154	5861	BP	F	France	ca1988	Blay Foldex	1000000	244	134	968	1330	1.287
155	7005	MOBIL	F	Région Nord-Ouest	ca1991	Recta Foldex	600000	305	141	305	1342	0.409
156	12283	AGIP	F	France	1995	Nouveautés Editions Touristiques	1500000	208	111	620	654	0.405
157	4770	SHELL	F	France	1995	CDP/Géo Signal	1000000	251	110	500	1420	0.710
158	7797	ESSO	F	France	1997	Michelin	1000000	250	110	498	1202	0.599
159	3294	TOTAL	F	France 98 (football)	1998	Leader Communication	ca725000	210	103	610	802	0.489
160	12301	AGIP	F	France	2003	Gabelli s.a.r.l.	1650000	200	114	596	796	0.474
161	8065	SHELL	F	France	2004	Blay Foldex	1000000	244	110	486	1310	0.637
162	12298	AVIA	F	France	2011	APRIM Graphic	1100000	198	114	778	1092	0.850
163	7733	BV	D	Mittel-Europa sheet 70	1928	Ravenstein	300000	159	97	317	390	0.124
164	10587	STANDARD	D	Luftbildkarte Plan 21	ca1934	F Bruckmann	500000	241	113	480	446	0.214
165	6637	B.V.-ARAL	D	Germany - sheet 1	ca1935	n/a	750000	224	107	445	633	0.282

#	IWB dbase	Brand	Land	Section title (English)	Year	Cartographer	Main Map Scale	Folded H mm	Folded W mm	Sheet H mm	Sheet W mm	Sheet Area/m²
166	1319	SHELL	D	Hannover	ca1936	ZRK ?	470000	220	113	437	450	0.197
167	8496	B.V.-ARAL	D	Germany - sheet 6	1937	n/a	500000	223	107	445	629	0.280
168	5048	BOIE	D	Germany (atlas)	ca1937	Dr. Güntzsche Stiftung,	1000000	268	155	283	268	
169	11379	BP-OLEX	D	Hamburg	1939	Georg Westermann	750000	220	149	435	595	0.259
170	6012	ESSO	D	Wegweiser 6	ca1939	F Bruckmann	500000	240	113	480	674	0.324
171	5352	ARAL	D	W Germany sheet 12	ca1951	Busche	400000	209	100	522	392	0.205
172	8965	ESSO	D	Mitteldeutschland	1952	ESSO A.G.	500000	230	118	686	469	0.322
173	7091	BP	D	Deutschland - Blatt 1	ca1953	JRO-Landkartendruck	500000	216	153	431	610	0.263
174	6139	ESSO	D	Deutschland Blatt Nord	1953	Thiemig-Wenschow	500000	205	103	611	614	0.375
175	6459	DEA	D	Hannover	ca1955	Falk-Verlag	250000	114	124	664	485	0.322
176	12288	AVIA	D	Autokarte 1	ca1956	JRO-Landkartendruck	300000	153	110	610	870	0.531
177	3285	SHELL	D	Niedersachsen	1956	?	500000	225	120	440	476	0.209
178	1857	ESSO	D	Deutschland Blatt Nord	1958	Esso AG/Karl Thiemig KG	500000	205	103	611	614	0.375
179	7315	BOIE	D	Norddeutschland	ca1960	Falk-Verlag	500000	170	119	672	473	0.318
180	7412	CALTEX	D	Deutschland West	ca1960	Hans König	800000	210	98	419	676	0.283
181	93	ARAL	D	W Germany sheet 6	ca1961	Busche	400000	209	100	591	591	0.349
182	6499	TOTAL	D	West Germany	ca1962	Georg Westermann	1000000	240	115	950	680	0.646
183	7783	SHELL	D	West-Deutschland	1964	Mairs Geographischer Verlag Stuttgart	550000	244	138	484	686	0.332
184	2043	BP	D	Deutschland - Blatt 1	ca1965	JRO-Landkartendruck	500000	217	102	430	611	0.263
185	777	BP	D	Deutschland - Teil 2	ca1966	H. König	400000	204	117	608	810	0.492
186	6048	ESSO	D	Deutschland Nord	1967	Esso AG/Karl Thiemig KG	500000	213	104	817	609	0.498
187	6767	DEA/TEXACO	D	West Germany	1968	Falk-Verlag	750000	245	114	783	488	0.382
188	7364	ADLER	D	Südwestdeutschland	1969	Ravenstein	400000	249	120	497	835	0.415
189	6769	ELF	D	SW Germany	1969	Ravenstein	400000	249	119	499	834	0.416
190	6378	ARAL	D	W Germany sheet 6	1971	Busche	400000	209	100	629	591	0.372
191	1505	SHELL	D	Deutsche Generalkarte Blatt 7	1973	Mairs Geographischer Verlag Stuttgart	200000	256	105	448	1044	0.468
192	65	TEXACO	D	Gebietskarte 1	1975	Falk-Verlag	250000	246	114	490	787	0.386
193	1535	BP	D	Deutschland - Teil 1	1978	H. König	400000	202	117	606	692	0.419

#	IWB dbase	Brand	Land	Section title (English)	Year	Cartographer	Main Map Scale	Folded H mm	Folded W mm	Sheet H mm	Sheet W mm	Sheet Area/m²
194	8060	FANAL	D	W Germany sheet 3	1978	Ravenstein	400000	249	120	497	835	0.415
195	12310	TOTAL	D	Deutschland Atlas	1979	Falk-Verlag	650000	244	141	1347	581	0.783
196	8006	ESSO	D	Deutschland Nord	1980	Esso AG/Karl Thiemig/JRO/Hallwag	450000	214	144	678	952	0.645
197	8123	ARAL	D	W Germany sheet 6	1982	Busche	400000	209	100	629	591	0.372
198	2546	BP	D	Schleswig-Holstein	1986	JRO Verlagsgesellschaft	300000	248	136	1288	930	1.198
199	11369	SHELL	D	Die General Karte 24	1986	Mairs Geographischer Verlag Stuttgart	200000	250	106	448	1044	0.468
200	11459	AVIA	D	Niedersachsen NW	ca1989	Fink-Kümmerley+Frey	250000	247	149	477	1325	0.632
201	11451	DEA	D	Nordrhein-Westfalen	1993	RV Reise	300000	246	130	974	1194	1.163
202	6559	ESSO	D	Schleswig-Holstein Hamburg	1995	RV Reise- und Verkehrsverlag	200000	247	130	972	1300	1.264
203	11370	SHELL	D	Die General Karte 3 - Niedersachsen Süd Hessen Nord	1996	Mairs Geographischer Verlag Stuttgart	200000	250	127	976	1415	1.381
204	3305	ARAL	D	Germany sheet 7	1998	Busche	400000	239	130	656	836	0.548
205	5736	SHELL	D	Pocket Die General Karte 5 - Hamburg Bremen Hannover	2001	Mairs Geographischer Verlag Stuttgart/Falk Verlag	200000	190	105	760	1044	0.793
206	6191	ESSO	D	Tiger on Tour (Straßenatlas Deutschland)	ca2002	Carto Travel	550000	265	177	265	177	
207	6910	TOTAL ELF	D	Germany	2002	CartoTravel	ca2000000	180	89	717	610	0.437
208	7725	AVIA	D	Germany (booklet)	2004	GeoGraphic Publishers	800000	210	146	210	292	
209	10709	ARAL	D	Germany sheet 7	2013	Busche	400000	229	120	678	956	0.648
210	11604	TEXACO	NL	Nederland	ca1929	W.R.Casparie and Zn	ca400000	216	120	856	700	0.599
211	7357	SHELL	NL	Nederland (atlas)	1931	Zenith	200000	221	139	221	266	
212	3744	TEXACO	NL	Nederland	ca1937	J.R.Smulders	400000	211	118	842	690	0.581
213	5075	SHELL	NL	Nederland	ca1950	Foldex Ltd	400000	252	116	460	672	0.309
214	5748	ESSO	NL	Nederland	ca1953	Topografische Dienst	387000	214	102	848	706	0.599
215	8377	BP	NL	Nederland Deel 2	ca1955	n/a	400000	224	156	456	623	0.284
216	3731	CALTEX	NL	Nederland	1955	Anonymous	400000	205	101	814	692	0.563
217	7002	SHELL	NL	Nederland	1955	Foldex Ltd	400000	240	150	440	967	0.425
218	4670	SHELL	NL	Benelux	1958	Mairs Geographischer Verlag Stuttgart	410000	206	118	682	806	0.550
219	6394	ESSO	NL	Nederland	1961	Topografische Dienst	387000	213	103	848	706	0.599

#	IWB dbase	Brand	Land	Section title (English)	Year	Cartographer	Main Map Scale	Folded H mm	Folded W mm	Sheet H mm	Sheet W mm	Sheet Area/m²
220	5567	SHELL	NL	Benelux	1961	Mairs Geographischer Verlag Stuttgart	410000	206	118	682	806	0.550
221	3732	CALTEX	NL	Nederland	1962	Anonymous	400000	205	101	814	692	0.563
222	1391	BP	NL	Nederland	1964	NV Cartografisch Instituut Bootsma	250000	277	108	1100	966	1.063
223	3740	PAM	NL	Nederland	1965	Cartografisch Instituut Bootsma	300000	270	116	539	810	0.437
224	2376	SHELL	NL	Nederland	1965	Mairs Geographischer Verlag Stuttgart	600000	224	119	448	477	0.214
225	10874	CALTEX	NL	Nederland	1967	E.C.I. - Den Haag	400000	238	100	945	696	0.658
226	4551	BP	NL	Nederland	1970	NV Falkplan/CIB	300000	266	106	1040	805	0.837
227	10688	ESSO	NL	Nederland	1971	Topografische Dienst	400000	205	102	816	606	0.494
228	8020	SHELL	NL	Nederland	1972	NV Falkplan/CIB	250000	283	111	1128	972	1.096
229	10095	CHEVRON	NL	Nederland	1973	Falkplan/CIB	300000	234	136	1065	850	0.905
230	1688	CHEVRON	NL	Nederland	1978	Falkplan/CIB	300000	234	136	1040	808	0.840
231	2551	ESSO	NL	Nederland	1982	Topografische Dienst	400000	205	102	816	606	0.494
232	3745	TEXACO	NL	Nederland	1982	Falkplan/CIB	300000	264	106	1040	808	0.840
233	1400	SHELL	NL	Nederland	1988	Falkplan-Suurland	250000	283	111	1130	968	1.094
234	11718	TEXACO	NL	Nederland	1993	Falkplan-Suurland BV	300000	264	106	1040	808	0.840
235	3719	ESSO	NL	Nederland	1996	Geocart bvba	ca1667000	160	100	678	470	0.319
236	3725	SHELL	NL	Nederland	1997	Falkplan-Suurland	250000	283	114	1130	968	1.094
237	6421	BP	NL	Nederland (atlas)	2001	Suurland Falkplan BV	250000	235	210	235	210	
238	11294	TEXACO	NL	Benelux	2012	Falkplan BV	370000	217	203	217	184	
239	11714	SHELL	NL	Nederland	2014	Falkplan B.V.	300000	364	104	1046	810	0.847
240	11866	SHELL	TH	Road Atlas of Thailand	1954	George Philip and Son	1000000	237	174	237	174	
241	36	MOBILGAS	TH	Thailand	1959	Rand McNally	ca2500000	218	102	808	455	0.368
242	8621	CALTEX	TH	Thailand and Bangkok	1962	(Local cartography)	ca2180000	268	100	780	534	0.417
243	10647	SHELL	TH	Thailand	1962	Thai Watana Panich R.O.P.	2000000	272	114	917	543	0.498
244	11492	ESSO	TH	Thailand	1965	Rand McNally	ca2500000	218	102	808	455	0.368
245	12184	CALTEX	TH	Thailand and Bangkok	1968	(Local cartography)	ca2200000	263	97	762	524	0.399
246	12276	SHELL	TH	Thailand and Bangkok	1980	(Local cartography)	2000000	309	174	856	607	0.520
247	7741	CALTEX	TH	Thailand Route Atlas	2005	Asian Innovative Marketing	700000	292	210	292	210	

#	IWB dbase	Brand	Land	Section title (English)	Year	Cartographer	Main Map Scale	Folded H mm	Folded W mm	Sheet H mm	Sheet W mm	Sheet Area/m²
248	10414	UNION	AUS	Victoria	ca1928	HEC Robinson	ca1450000	214	114	329	672	0.221
249	9856	VACUUM	AUS	New South Wales	ca1935	Clive Barrass	ca2100000	188	85	504	755	0.381
250	5781	ATLANTIC	AUS	Victoria	ca1936	HEC Robinson	ca1600000	240	96	480	755	0.362
251	9823	SHELL	AUS	Queensland	ca1938	n/a	ca3000000	250	100	494	578	0.286
252	5779	ATLANTIC	AUS	Victoria	ca1947	HEC Robinson	ca1600000	240	96	480	755	0.362
253	9864	VACUUM	AUS	New South Wales	ca1950	Australian Contract Drafting Co	ca2100000	192	86	502	757	0.380
254	5797	NEPTUNE	AUS	Queensland	1953	PC Grosser Litho	ca2750000	274	114	543	675	0.367
255	9831	SHELL	AUS	Queensland	1955	PC Grosser Litho	ca2750000	271	113	543	675	0.367
256	5783	C.O.R	AUS	Victoria	ca1956	Premier Printing	varies	246	178	246	178	
257	12289	ATLANTIC	AUS	Blue Mountains, NSW	ca1959	HEC Robinson/local?	ca63360	247	90	492	368	0.181
258	11758	ATLANTIC	AUS	Victoria	ca1959	HEC Robinson	ca1600000	240	96	480	755	0.362
259	9842	SHELL	AUS	Queensland	1960	PC Grosser Litho	ca2750000	272	114	546	686	0.375
260	1268	MOBIL	AUS	New South Wales	1962	The Ruskin Press	ca2450000	216	96	430	552	0.237
261	1854	BP	AUS	Victoria	1963	n/a	varies	246	180	246	178	
262	5812	TOTAL	AUS	New South Wales	ca1964	Mercury Press, Hobart	ca2150000	273	108	456	644	0.294
263	8539	ESSO	AUS	Victoria	1966	HEC Robinson	1090000	212	98	661	845	0.559
264	3527	MOBIL	AUS	Western Australia	ca1970	The Ruskin Press	ca1450000	240	123	480	726	0.348
265	10554	SHELL	AUS	Queensland	1970	Leigh-Mardon	ca1775000	272	114	676	546	0.369
266	2695	BP	AUS	Victoria	1973	n/a (PP)	ca900000	252	125	742	501	0.372
267	5811	TOTAL	AUS	(South Eastern Australia)	ca1973	Mercury-Walch Pty Ltd, Hobart	ca4450000	253	135	504	668	0.337
268	5648	TOTAL	AUS	Victoria	ca1978	Gregory's	1165000	227	145	569	902	0.513
269	4509	ESSO	AUS	Victoria	ca1980	RPLA	1090000	212	98	661	845	0.559
270	8099	SHELL	AUS	Queensland	1980	Alexander Bros Pty Ltd	ca3200000	274	106	835	544	0.454
271	3359	SHELL	AUS	Queensland	1988	Frank Daniels Pty Ltd	ca3200000	274	106	835	544	0.454
272	4431	MOBIL	AUS	South Australia	1992	Broadbent/Universal Press	2000000	253	127	882	626	0.552
273	3443	BP	AUS	Victoria	1996	Penguin Books Australia	ca1250000	270	110	402	828	0.333
274	3520	LIBERTY	AUS	New South Wales	1996	Penguin Books Australia	ca1950000	270	110	402	828	0.333
275	12325	BP	AUS	Victoria	2006	Universal Publishers Pty Ltd	975000	252	118	678	990	0.671
276	9312	B-A	CDN	Ontario	1929	D Barclay and A Hay	ca1050000	241	104	598	960	0.574

#	IWB dbase	Brand	Land	Section title (English)	Year	Cartographer	Main Map Scale	Folded H mm	Folded W mm	Sheet H mm	Sheet W mm	Sheet Area/m²
277	9319	IMPERIAL	CDN	Eastern Canada	1929	Rolph Clark Stone	ca1900000	200	117	582	890	0.518
278	1255	SHELL	CDN	Ontario	1930	The Mortimer Co Ltd	ca1500000	235	102	466	605	0.282
279	9315	CITIES SERVICE	CDN	Ontario	1937	HM Gousha	ca1200000	226	102	506	676	0.342
280	6675	B-A	CDN	Ontario	1939	Copp Clark	ca1140000	239	80	477	970	0.463
281	4024	IMPERIAL OIL	CDN	Eastern Canada	1939	General Drafting Co	950000	185	98	486	740	0.360
282	1018	PURITY 99	CDN	Alberta	1939	Alberta Motor Association/G Laing	ca1900000	210	117	624	463	0.289
283	9328	RED INDIAN	CDN	Ontario Quebec Maritimes	1942	Rand McNally	1000000	222	94	540	885	0.478
284	9967	IMPERIAL OIL	CDN	Maritime Provinces	1948	General Drafting Co	1360000	178	124	532	735	0.391
285	6844	SUPERTEST	CDN	Ontario/Quebec	1953	Rolph Clark Stone	ca1150000	248	92	494	732	0.362
286	3270	BA	CDN	Ontario	1954	Rolph Clark Stone	ca1200000	247	92	492	732	0.360
287	9332	WHITE ROSE	CDN	Ontario	1954	Rolph Clark Stone	1150000	247	92	493	932	0.459
288	429	TEXACO	CDN	Quebec and Maritime Provs	1955	Rolph Clark Stone	1140000	227	97	454	673	0.306
289	11208	ROYALITE	CDN	BC-Alberta-Sask-Manitoba	1956	Rolph Clark Stone	2100000	247	91	492	734	0.361
290	1999	BP	CDN	Quebec	1960	HM Gousha	1170000	227	96	454	866	0.393
291	12274	HOME	CDN	British Columbia and Canada	1960	HM Gousha	2500000	228	98	456	678	0.309
292	1030	BA	CDN	Ontario	1961	Rolph Clark Stone	ca1300000	97	229	456	776	0.354
293	8207	ESSO	CDN	Atlantic Provinces	1961	General Drafting Co	936000	212	103	607	847	0.514
294	2959	SHELL	CDN	Ontario	1962	HM Gousha	1084000	227	98	456	774	0.353
295	10806	TEXACO	CDN	Quebec	1965	Rolph Clark Stone	1140000	227	97	454	675	0.306
296	1933	UNION 76	CDN	British Columbia and Alberta	1969	Rolph Clark Stone	2470000	228	98	454	574	0.261
297	3658	ESSO	CDN	Atlantic Provinces	1972	General Drafting Co	936000	227	105	542	690	0.374
298	5376	SHELL	CDN	Ontario	1972	Creative Sales Corp	1140000	230	102	458	912	0.418
299	3434	BP/SUPERTEST	CDN	Quebec	1973	Smith Grant Mann	1075000	229	97	454	873	0.396
300	10597	TEXACO	CDN	Atlantic Provinces	1973	Rolph Clark Stone	1584000	246	92	492	730	0.359
301	5377	SHELL	CDN	Ontario	1974	Creative Sales Corp	1140000	230	102	458	910	0.417
302	10260	ESSO	CDN	Atlantic Canada	1977	Rolph McNally	ca1350000	213	103	607	847	0.514
303	2018	HUSKY	CDN	Alberta	1997	Alberta Environmental Protecti	1500000	265	113	1000	692	0.692

IWB dbase is an internal reference that is broadly chronological by date of acquisition – it is retained here to enable physical maps to be traced if necessary.

In columns headed ‘year’ and ‘Main map scale’ ca refers to author estimates. For many North American and British maps, the scale has been converted from a “miles to the inch” statement, and has sometimes been rounded to a logical metric equivalent.

Total sheet areas are generally not calculated for booklet or atlas formats.

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*

(b) Table of Map characteristics

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
1	PRATT'S	GB	Road Atlas of England and Wales	1905	3 - Bespoke production	A - atlas	5 - Small atlas	Double sided	2/6	4	77	21	30	*6*	*6*
2	BP	GB	North of England	ca1924	5 - Stock map - bespoke covers	R - regional map	2 - Folding map	One-side map, verso text/ads	No (paid for)	2	1			*7*	*5*
3	BP	GB	Central Southern Counties	ca1931	2 - Bespoke cartography	A - atlas	5 - Small atlas	Double sided	6d	2	16			*2*	*7*
4	REGENT	GB	Road maps of England and Wales	ca1937	2 - Bespoke cartography	A - atlas	5 - Small atlas	Double sided	7/6	4	14	50		*9*	*7*
5	SHELL	GB	Great Britain Southern Section Nos. 1 and 2	ca1939	6 - Stock map in covers	S - sectional map	3 - Folding map with covers	Single sided	Yes (obliterated)	4	2			*17*	*4*
6	ESSO	GB	South and East England	ca1949	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	Sixpence	4	2			*10*	*7*
7	REGENT	GB	South East England	ca1953	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	2/-	4	1	16		*9*	*6*
8	NATIONAL	GB	3 Miles to 1 Inch Road Atlas	ca1954	6 - Stock map in covers	A - atlas	5 - Small atlas	Double sided	Paid for	4	324	27		*14*	*7*
9	SHELL	GB	South and West England	ca1956	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	One shilling	4	2	18		*12*	*5*
10	SHELL BP	GB	London and South-East England	ca1956	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	One shilling	4	2	6		*12*	*5*
11	MOBIL	GB	South and S.E. England	ca1957	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	Sixpence	2	1	9		*2*	*10*
12	NATIONAL	GB	South West England South East England	ca1958	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	1/-	4	2			*10*	*6*
13	ESSO	GB	South and East England	1959	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	Sixpence	4	2			*10*	*7*
14	MOBIL	GB	South East and South West England	1960	3 - Bespoke production	S - sectional map	2 - Folding map	One-side map, verso text/ads	One shilling	4	1	15		*12*	*5*
15	NATIONAL	GB	Kent and East Sussex	1960	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	2/-	4	1			*12*	*8*
16	SHELL	GB	South West England and South East England	1960	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	One shilling	4	2			*10*	*6*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
17	BP	GB	Southern England	1961	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	One shilling	4	2			*10*	*5*
18	REGENT	GB	Great Britain South Sheet	ca1961	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	9d	4	2	1		*8*	*7*
19	AMOCO	GB	Great Britain	ca1964	3 - Bespoke production	N - national map	2 - Folding map	Double sided	Sixpence	3	2			*6*	*3*
20	BP	GB	South and East England	1966	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	One shilling	4	3			*12*	*5*
21	ESSO	GB	South and East England	1966	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	Sixpence	4	2			*10*	*8*
22	SHELL	GB	South and East England	1966	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	One shilling	4	3			*13*	*6*
23	CLEVELAND	GB	South and East England	1967	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	One shilling	4	2			*9*	*9*
24	BP	GB	South and East England	1968	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	1s 6d	4	2			*14*	*6*
25	REGENT TEXACO	GB	Southern England	ca1968	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (paid for)	4	2			*14*	*5*
26	AMOCO	GB	Great Britain South.	ca1969	3 - Bespoke production	S - sectional map	3 - Folding map with covers	Double sided	No (paid for)	4	2	1		*8*	*7*
27	BP	GB	South and East England	1971	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	12p	4	3			*14*	*8*
28	MOBIL	GB	South East and South West England	1973	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	10p	4	1	15		*13*	*5*
29	AMOCO	GB	West country South coast	1975	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (paid for)	4	3			*15*	*5*
30	SHELL	GB	South East and East Midlands	ca1977	6 - Stock map in covers	S - sectional map	3 - Folding map with covers	Double sided	No (paid for)	4	2			*10*	*5*
31	TEXACO	GB	Greater London	1977	3 - Bespoke production	U - urban area map	2 - Folding map	Double sided	No (paid for)	4	2			*11*	*5*
32	MOBIL	GB	South East and South West England	1980	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (paid for)	4	1	15		*14*	*5*
33	BP	GB	South and East England	1981	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (paid for)	4	2			*15*	*6*
34	BP NATIONAL	GB	South-East England	1984	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (paid for)	4	2			*15*	*7*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
35	ESSO	GB	South East and Central England	1986	5 - Stock map - bespoke covers	S - sectional map	3 - Folding map with covers	Single sided	£2.50	4	1			*13*	*6*
36	TEXACO	GB	Road Atlas of Great Britain	1988	6 - Stock map in covers	A - atlas	6 - Large atlas	Double sided	No (paid for)	4	77			*14*	*8*
37	BP	GB	South East England and East Anglia	1990	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (paid for)	4	2			*16*	*6*
38	SHELL	GB	South East England and East Anglia	1990	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (paid for)	4	2			*16*	*8*
39	ESSO	GB	South West England	1991	6 - Stock map in covers	S - sectional map	2 - Folding map	Double sided	£2.50	4	2			*16*	*5*
40	TEXACO	GB	Fastfuel site directory 2006/7	2005	2 - Bespoke cartography	A - atlas	5 - Small atlas	Double sided	Free to card holders	4	15	7		*8*	*8*
41	TEXACO	IRL	Ireland	ca1938	2 - Bespoke cartography	A - atlas	5 - Small atlas	Double sided	No	4	11	19		*8*	*8*
42	CALTEX	IRL	Ireland	1958	3 - Bespoke production	N - national map	2 - Folding map	One-side map, verso text/ads	No (poss free)	4	1	6		*8*	*9*
43	TEXACO	IRL	Ireland	ca1968	3 - Bespoke production	N - national map	2 - Folding map	One-side map, verso text/ads	No (poss free)	4	1	6		*8*	*9*
44	TEXACO	IRL	Ireland	1982	3 - Bespoke production	N - national map	2 - Folding map	One-side map, verso text/ads	No (poss free)	4	1	6		*11*	*10*
45	TEXACO	IRL	Ireland	2002	3 - Bespoke production	N - national map	2 - Folding map	One-side map, verso text/ads	No (€5-99 sticker)	4	1	2		*9*	*8*
46	GULF	USA	New York	1916	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	No (free)	3	1	1		*3*	*5*
47	SHELL	USA	Northern California	1925	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	No (prob free)	2	1	1		*6*	*8*
48	SOCONY	USA	New York	1926	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	No (free)	2	2	7		*6*	*9*
49	STANDARD	USA	MD, VA, WV, NC, SC, DC	1926	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	No (free)	2	1	2		*5*	*8*
50	STANDARD	USA	California	ca1927	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	2	1	2		*6*	*4*
51	STANDARD	USA	Iowa	1927	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	No (free)	2	1	7		*7*	*7*
52	TEXACO	USA	Washington, Oregon, etc.	ca1927	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	2	1	2		*8*	*7*
53	STANDARD	USA	California	1931	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	2	1	10		*11*	*7*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
54	STANDARD	USA	Michigan	1933	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	No (free)	2	2	1		*8*	*8*
55	GULF	USA	New York	1934	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	1		*8*	*9*
56	TEXACO	USA	Idaho Montana Wyoming	1934	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	3	1	21		*9*	*9*
57	ESSO	USA	New York	1937	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	No (free)	4	2	5		*8*	*9*
58	SOCONY	USA	New York	1937	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	3		*8*	*12*
59	SHELL	USA	California	1938	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	9		*10*	*8*
60	CHEVRON	USA	California	1951	3 - Bespoke production	A - atlas	4 - Booklet map	Double sided	No (prob free)	4	7	2		*11*	*9*
61	STANDARD	USA	Michigan	1953	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	2	2	9		*9*	*10*
62	SHELL	USA	Pacific Southwest	1954	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (free)	4	1	6		*10*	*10*
63	ESSO	USA	New York	1955	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	3	8		*13*	*11*
64	TEXACO	USA	E Texas-Oklahoma with New Mexico-W Texas	1955	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	2	2	6		*11*	*6*
65	GULF	USA	New York	1956	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	1		*13*	*10*
66	MOBILGAS	USA	New York	1956	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	2	2	7		*9*	*9*
67	GULF	USA	New York and New Jersey	1958	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	3		*10*	*9*
68	MOBIL	USA	New York	1959	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	10		*13*	*11*
69	CHEVRON	USA	California	1960	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	2		*13*	*10*
70	ENCO	USA	Oregon Washington	1963	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	9		*12*	*10*
71	TEXACO	USA	Texas	1966	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	5		*11*	*10*
72	SHELL	USA	California	1967	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	2		*12*	*10*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
73	STANDARD	USA	Michigan	1967	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	7		*11*	*10*
74	ESSO	USA	New York	1968	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	3	9		*12*	*9*
75	GULF	USA	NH, VT and MA, CT, RI	1968	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2			*12*	*10*
76	MOBIL	USA	New York	1968	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	10		*13*	*12*
77	SHELL	USA	California	1968	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	6		*13*	*10*
78	CHEVRON	USA	California	1969	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	No (free)	2	2	2		*14*	*11*
79	TEXACO	USA	Texas	1970	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	13		*11*	*10*
80	SHELL	USA	California	1973	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	7		*12*	*11*
81	STANDARD	USA	Michigan	1973	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	9		*13*	*12*
82	MOBIL	USA	New York	1975	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	2		*12*	*9*
83	EXXON	USA	New York	1977	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	3	9		*13*	*8*
84	GULF	USA	Eastern United States	1977	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	18		*8*	*9*
85	SHELL	USA	Central And Western United States	1977	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (prob free)	4	2			*9*	*8*
86	STANDARD	USA	Michigan	1978	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	6		*13*	*10*
87	CHEVRON	USA	Washington	1979	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	10		*14*	*9*
88	MOBIL	USA	Connecticut Rhode Island	1989	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	$2.25	4	1	10		*10*	*9*
89	AMOCO	USA	Illinois	1993	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	17		*11*	*9*
90	EXXON	USA	New York	1998	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No, paid for (~$1.49)	4	2	5		*8*	*8*
92	SHELL	I	Through Italy by Motor	1927	2 - Bespoke cartography	A - atlas	4 - Booklet map	Double sided	No (poss free)	2	23	1		*4*	*7*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
93	SHELL	I	Through Italy by Motor	1930	2 - Bespoke cartography	A - atlas	4 - Booklet map	Double sided	No (poss free)	2	23	1		*4*	*8*
94	AGIP	I	Italy	1933	5 - Stock map - bespoke covers	N - national map	3 - Folding map with covers	Double sided	No (free)	3	2			*4*	*4*
95	PETROL CALTEX	I	Italy	ca1952	3 - Bespoke production	N - national map	5 - Small atlas	Double sided	No (free)	4	13	1		*9*	*8*
96	SHELL	I	Italy (set of cards)	ca1953	2 - Bespoke cartography	N - national map	8 - Complex	Double sided	L. 150	4	9			*5*	*6*
97	AGIP	I	Italy	ca1955	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	2	2		*9*	*5*
98	ESSO	I	Italy	1955	2 - Bespoke cartography	N - national map	2 - Folding map	Double sided	No (free)	4	2			*9*	*9*
99	BP	I	Italy	1957	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	2	1		*6*	*6*
100	AGIP	I	Italy	1961	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (free)	4	2	1		*8*	*7*
101	PETROL CALTEX	I	Italy	ca1961	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (free)	4	2	2		*5*	*5*
102	SHELL	I	Northwest (Italy)	1961	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	No (free)	4	1			*12*	*6*
103	ESSO	I	Italy North	1962	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	DM1.35	4	2	12		*13*	*6*
104	BP	I	Italy	1963	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	2	9		*7*	*6*
105	BP	I	Italy	ca1966	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	2	2		*6*	*5*
106	AGIP	I	Italy	1967	3 - Bespoke production	A - atlas	4 - Booklet map	Double sided	No (free)	4	23		19	*9*	*7*
107	CHEVRON	I	Italy South	1971	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (poss free)	4	2			*12*	*6*
108	SHELL	I	Northwest (Italy)	1971	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	No (free)	4	1	4		*14*	*6*
109	ESSO	I	Italy North	1972	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	Lire 170	4	2	12		*15*	*6*
110	AGIP	I	Italy Ski Map	1977	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (free)	4	1	49		*12*	*4*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
111	CHEVRON	I	Italy	1981	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	2	2		*9*	*5*
112	ESSO	I	Italy Autostrade	1986	3 - Bespoke production	M - motorway	2 - Folding map	Double sided	No (poss free)	4	1	10	27	*8*	*4*
113	MONTESHELL	I	Italy	1986	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	2			*11*	*11*
114	AGIP	I	Italy	ca1993	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	2	5		*11*	*4*
115	SHELL	I	Italy	1999	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	2	3		*13*	*5*
116	CIP	F	France Region Nord-Ouest	1934	3 - Bespoke production	S - sectional map	2 - Folding map	Single sided	No (prob free)	4	1			*6*	*4*
117	CIP	F	France Nord-Est	1934	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (prob free)	3	2	1		*6*	*6*
118	SERCO	F	France	1935	3 - Bespoke production	L - locator map	2 - Folding map	One-side map, verso text/ads	No (poss free)	3	1	8		*4*	*6*
119	STANDARD	F	Vosges Alsace	1935	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (prob free)	4	1	2		*8*	*6*
120	ENERGIC	F	Provence	1936	3 - Bespoke production	S - sectional map	2 - Folding map	One-side map, verso text/ads	No (poss free)	4	2			*9*	*7*
121	SHELL	F	Bretagne	1936	3 - Bespoke production	S - sectional map	3 - Folding map with covers	Single sided	8 frs	4	2	4		*14*	*6*
122	OZO	F	France	ca1938	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	3	2			*5*	*4*
123	ESSO	F	France	1951	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	2			*5*	*8*
124	SHELL	F	Bretagne	ca1953	5 - Stock map - bespoke covers	S - sectional map	3 - Folding map with covers	One-side map, verso text/ads	7/6 (UK)	4	2			*18*	*4*
125	AZUR	F	France	1954	2 - Bespoke cartography	N - national map	3 - Folding map with covers	Single sided	No (200Fr)	3	1			*6*	*4*
126	BP	F	les Routes de France	1954	3 - Bespoke production	A - atlas	5 - Small atlas	Double sided	No	4	7			*9*	*7*
127	MOBILGAS	F	France Grandes Route Partie Nord	1954	4 - Stock map with added features	S - sectional map	3 - Folding map with covers	Single sided	95fr	4	1	3		*9*	*5*
128	BP	F	France	ca1956	3 - Bespoke production	A - atlas	5 - Small atlas	Double sided	No	4	9	1		*9*	*6*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
129	BP	F	Road Map of France	ca1957	3 - Bespoke production	N - national map	2 - Folding map	Single sided	No (Touring Service)	4	1			*8*	*6*
130	BP	F	France	1957	3 - Bespoke production	A - atlas	5 - Small atlas	Double sided	No	4	9	2		*9*	*6*
131	CALTEX	F	France	1957	4 - Stock map with added features	N - national map	2 - Folding map	Single sided	No (poss free)	4	1			*9*	*5*
132	AVIA	F	France Nord	1958	3 - Bespoke production	R - regional map	2 - Folding map	Single sided	95Fr	4	1	1		*8*	*6*
133	BP	F	France	ca1958	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (Touring Service)	4	2			*12*	*5*
134	ESSO	F	France	1959	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	1			*7*	*9*
135	SHELL	F	Normandie	1959	3 - Bespoke production	S - sectional map	2 - Folding map	One-side map, verso text/ads	No (free sheet/sold as set)	4	1			*10*	*8*
136	BP	F	France	ca1960	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (Touring Service)	4	2	1		*13*	*4*
137	ANTAR	F	France	1961	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	3	11		*8*	*4*
138	AZUR	F	Atlas Azur	1963	2 - Bespoke cartography	A - atlas	5 - Small atlas	Double sided	No (poss free)	4	12	59		*4*	*6*
139	CALTEX	F	France Nord	1963	3 - Bespoke production	R - regional map	2 - Folding map	Single sided	Fr 1,30	4	1	1		*9*	*7*
140	MOBIL	F	France Sud Grandes Routes	1963	3 - Bespoke production	S - sectional map	3 - Folding map with covers	Single sided	No (paid for)	4	4			*11*	*8*
141	BP	F	France	1965	3 - Bespoke production	A - atlas	5 - Small atlas	Double sided	No	4	11	5		*9*	*6*
142	TOTAL	F	La Route Total	1966	3 - Bespoke production	N - national map	3 - Folding map with covers	Double sided	No (paid for)	4	8			*9*	*7*
143	ELF	F	France Nord-Ouest	1967	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (poss free)	4	3			*14*	*4*
144	MOBIL	F	Cote d'Azur	1967	3 - Bespoke production	R - regional map	3 - Folding map with covers	double sided	No (poss free)	4	3			*16*	*6*
145	BP	F	Autoroutes de France	1969	3 - Bespoke production	A - atlas	5 - Small atlas	Double sided	Fr 2,50	4	24	7		*10*	*10*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
146	ESSO	F	France	1969	3 - Bespoke production	N - national map	2 - Folding map	Double sided	2/6d	4	2	13		*14*	*8*
147	SHELL	F	Normandie	1969	3 - Bespoke production	S - sectional map	2 - Folding map	One-side map, verso text/ads	No (free sheet/sold as set)	4	1			*13*	*7*
148	AVIA	F	France Nord	1970	3 - Bespoke production	R - regional map	2 - Folding map	Single sided	No (paid for)	4	1	1		*8*	*6*
149	BP	F	France	ca1978	3 - Bespoke production	N - national map	2 - Folding map	Single sided	No	4	5	19		*13*	*5*
150	SHELL	F	Normandie	1978	3 - Bespoke production	S - sectional map	2 - Folding map	One-side map, verso text/ads	No (free sheet/sold as set)	4	1			*14*	*7*
151	TOTAL	F	France - route de nuit	1979	3 - Bespoke production	L - locator map	2 - Folding map	One-side map, verso text/ads	No (prob free)	4	1	6		*5*	*6*
152	ARAL	F	Frankreich France	1981	2 - Bespoke cartography	N - national map	2 - Folding map	Double sided	DM 4,50	4	3	8		*9*	*7*
153	ESSO	F	France	1983	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (paid for)	4	2	7		*10*	*8*
154	BP	F	France	ca1988	3 - Bespoke production	N - national map	2 - Folding map	Single sided	No (paid for)	4	1	19		*12*	*5*
155	MOBIL	F	Région Nord-Ouest	ca1991	3 - Bespoke production	R - regional map	3 - Folding map with covers	double sided	No (poss free)	4	11			*17*	*4*
156	AGIP	F	France	1995	4 - Stock map with added features	N - national map	2 - Folding map	Double sided	No (prob free)	4	1			*6*	*6*
157	SHELL	F	France	1995	1 - Limited cartography	N - national map	2 - Folding map	Double sided	No (poss free)	4	2	10		*7*	*6*
158	ESSO	F	France	1997	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	2			*12*	*4*
159	TOTAL	F	France 98 (football)	1998	3 - Bespoke production	N - national map	2 - Folding map	One-side map, verso text/ads	No (free)	4	1	10		*11*	*6*
160	AGIP	F	France	2003	3 - Bespoke production	L - locator map	2 - Folding map	One-side map, verso text/ads	No (poss free)	4	1	8		*6*	*6*
161	SHELL	F	France	2004	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (€4,50)	4	3	10		*12*	*5*
162	AVIA	F	France	2011	3 - Bespoke production	L - locator map	2 - Folding map	One-side map, verso text/ads	No (poss free)	4	2	16		*9*	*5*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
163	BV	D	Mittel-Europa sheet 70	1928	4 - Stock map with added features	S - sectional map	2 - Folding map	One-side map, verso text/ads	No (poss free)	4	1			*14*	*7*
164	STANDARD	D	Luftbildkarte Plan 21	ca1934	3 - Bespoke production	S - sectional map	2 - Folding map	One-side map, verso text/ads	No (prob free)	4	1	5		*7*	*7*
165	B.V.-ARAL	D	Germany - sheet 1	ca1935	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (prob free)	4	3	18		*5*	*4*
166	SHELL	D	Hannover	ca1936	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	No (prob free)	4	1			*8*	*8*
167	B.V.-ARAL	D	Germany - sheet 6	1937	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (prob free)	4	1	14		*4*	*5*
168	BOIE	D	Germany (atlas)	ca1937	4 - Stock map with added features	A - atlas	5 - Small atlas	One-side map, verso text/ads	No (poss free)	4	13	26		*6*	*6*
169	BP-OLEX	D	Hamburg	1939	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (prob free)	4	1	9		*12*	*7*
170	ESSO	D	Wegweiser 6	ca1939	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (prob free)	4	6			*13*	*5*
171	ARAL	D	W Germany sheet 12	ca1951	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (poss free)	4	1	9		*8*	*6*
172	ESSO	D	Mitteldeutschland	1952	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	DM 0,25	4	1	6		*9*	*10*
173	BP	D	Deutschland - Blatt 1	ca1953	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (prob free)	4	1			*12*	*5*
174	ESSO	D	Deutschland Blatt Nord	1953	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	DM 0,35	4	3	3		*11*	*11*
175	DEA	D	Hannover	ca1955	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (poss free)	4	1			*12*	*7*
176	AVIA	D	Autokarte 1	ca1956	5 - Stock map - bespoke covers	S - sectional map	3 - Folding map with covers	Single sided	No (prob free)	4	1			*15*	*4*
177	SHELL	D	Niedersachsen	1956	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	DM -,25	4	1			*12*	*7*
178	ESSO	D	Deutschland Blatt Nord	1958	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	DM 0,35	4	4	3		*14*	*11*
179	BOIE	D	Norddeutschland	ca1960	3 - Bespoke production	R - regional map	2 - Folding map	Single sided	No (poss free)	4	1	2		*12*	*5*
180	CALTEX	D	Deutschland West	ca1960	3 - Bespoke production	R - regional map	2 - Folding map	Single sided	No (poss free)	4	1			*9*	*4*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
181	ARAL	D	W Germany sheet 6	ca1961	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (poss free)	4	1	10		*8*	*6*
182	TOTAL	D	West Germany	ca1962	3 - Bespoke production	N - national map	2 - Folding map	Single sided	No (poss free)	4	1			*9*	*5*
183	SHELL	D	West-Deutschland	1964	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	DM 0,75	4	1	4		*14*	*6*
184	BP	D	Deutschland - Blatt 1	ca1965	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	DM 0.25	4	1			*12*	*6*
185	BP	D	Deutschland - Teil 2	ca1966	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	DM 0,75	4	2	4		*17*	*6*
186	ESSO	D	Deutschland Nord	1967	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	DM 0,95	4	6	9		*13*	*9*
187	DEA/TEXACO	D	West Germany	1968	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	2			*10*	*6*
188	ADLER	D	Südwestdeutschland	1969	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	DM -,95	4	2			*14*	*4*
189	ELF	D	SW Germany	1969	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (poss free)	4	2			*14*	*3*
190	ARAL	D	W Germany sheet 6	1971	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	65pf	4	1	10		*10*	*7*
191	SHELL	D	Deutsche Generalkarte Blatt 7	1973	3 - Bespoke production	R - regional map	2 - Folding map	Single sided	No (paid for)	4	1			*18*	*5*
192	TEXACO	D	Gebietskarte 1	1975	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	DM 1,95	4	2	3		*14*	*5*
193	BP	D	Deutschland - Teil 1	1978	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	DM 2,25	4	2	3		*17*	*6*
194	FANAL	D	W Germany sheet 3	1978	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	DM 2,50	4	2			*16*	*5*
195	TOTAL	D	Deutschland Atlas	1979	5 - Stock map - bespoke covers	N - national map	8 - Complex	One-side map, verso text/ads	No (prob free)	4	4	16		*12*	*9*
196	ESSO	D	Deutschland Nord	1980	3 - Bespoke production	S - sectional map	3 - Folding map with covers	Double sided	No (paid for)	4	4	9		*16*	*10*
197	ARAL	D	W Germany sheet 6	1982	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	DM2,80	4	1	10		*10*	*6*
198	BP	D	Schleswig-Holstein	1986	6 - Stock map in covers	R - regional map	2 - Folding map	Double sided	(DM 9,95)	4	2			*14*	*6*
199	SHELL	D	Die General Karte 24	1986	3 - Bespoke production	S - sectional map	2 - Folding map	One-side map, verso text/ads	No (paid for)	4	1	5		*18*	*8*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
200	AVIA	D	Niedersachsen NW	ca1989	5 - Stock map - bespoke covers	S - sectional map	2 - Folding map	Double sided	No (paid for)	4	2			*17*	*5*
201	DEA	D	Nordrhein-Westfalen	1993	5 - Stock map - bespoke covers	R - regional map	2 - Folding map	One-side map, verso text/ads	No (DM12.90)	4	1			*17*	*7*
202	ESSO	D	Schleswig-Holstein Hamburg	1995	6 - Stock map in covers	S - sectional map	3 - Folding map with covers	Single sided	No (paid for)	4	1			*19*	*7*
203	SHELL	D	Die General Karte 3 - Niedersachsen Süd Hessen Nord	1996	3 - Bespoke production	S - sectional map	2 - Folding map	Single sided	No (paid for)	4	1			*18*	*4*
204	ARAL	D	Germany sheet 7	1998	3 - Bespoke production	S - sectional map	3 - Folding map with covers	Double sided	DM9,80	4	1	15		*12*	*6*
205	SHELL	D	Pocket Die General Karte 5 - Hamburg Bremen Hannover	2001	3 - Bespoke production	S - sectional map	2 - Folding map	Double sided	No (paid for)	4	2			*19*	*4*
206	ESSO	D	Tiger on Tour (Straßenatlas Deutschland)	ca2002	3 - Bespoke production	A - atlas	5 - Small atlas	Double sided	€1,95	4	41	8		*15*	*10*
207	TOTAL ELF	D	Germany	2002	3 - Bespoke production	L - locator map	2 - Folding map	One-side map, verso text/ads	No (prob free)	4	2			*6*	*7*
208	AVIA	D	Germany (booklet)	2004	3 - Bespoke production	A - atlas	4 - Booklet map	Double sided	No (prob free)	4	22			*13*	*9*
209	ARAL	D	Germany sheet 7	2013	3 - Bespoke production	S - sectional map	3 - Folding map with covers	Double sided	No (in boxed set costing €29,95)	4	1	3		*12*	*7*
210	TEXACO	NL	Nederland	ca1929	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	3	1	15		*5*	*7*
211	SHELL	NL	Nederland (atlas)	1931	3 - Bespoke production	A - atlas	5 - Small atlas	Double sided	F 2.-	3	31	19		*9*	*9*
212	TEXACO	NL	Nederland	ca1937	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	3	1	16		*6*	*7*
213	SHELL	NL	Nederland	ca1950	5 - Stock map - bespoke covers	N - national map	3 - Folding map with covers	Single sided	fl. 1.50	4	2			*9*	*5*
214	ESSO	NL	Nederland	ca1953	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	1	6		*5*	*10*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
215	BP	NL	Nederland Deel 2	ca1955	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (prob free)	4	1	6		*5*	*5*
216	CALTEX	NL	Nederland	1955	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	1	1		*8*	*6*
217	SHELL	NL	Nederland	1955	5 - Stock map - bespoke covers	N - national map	3 - Folding map with covers	Double sided	f. 1.25	4	3	6		*15*	*5*
218	SHELL	NL	Benelux	1958	5 - Stock map - bespoke covers	N - national map	3 - Folding map with covers	One-side map, verso text/ads	No (prob free)	4	2			*14*	*5*
219	ESSO	NL	Nederland	1961	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	1	6		*5*	*10*
220	SHELL	NL	Benelux	1961	5 - Stock map - bespoke covers	N - national map	3 - Folding map with covers	One-side map, verso text/ads	fl 2,25	4	2			*14*	*5*
221	CALTEX	NL	Nederland	1962	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	1	9		*10*	*6*
222	BP	NL	Nederland	1964	5 - Stock map - bespoke covers	N - national map	2 - Folding map	Double sided	No (prob paid for)	4	3			*13*	*7*
223	PAM	NL	Nederland	1965	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	2			*12*	*4*
224	SHELL	NL	Nederland	1965	3 - Bespoke production	N - national map	2 - Folding map	One-side map, verso text/ads	No (prob free)	4	1	3		*9*	*7*
225	CALTEX	NL	Nederland	1967	3 - Bespoke production	N - national map	2 - Folding map	Double sided	Fl. 0,50	4	1	22		*9*	*7*
226	BP	NL	Nederland	1970	6 - Stock map in covers	N - national map	2 - Folding map	Double sided	No (fl5.50 price sticker)	4	2			*13*	*8*
227	ESSO	NL	Nederland	1971	3 - Bespoke production	N - national map	2 - Folding map	Double sided	f 1,00	4	1	8		*13*	*8*
228	SHELL	NL	Nederland	1972	5 - Stock map - bespoke covers	N - national map	2 - Folding map	One-side map, verso text/ads	fl 1.25	4	7	4		*14*	*6*
229	CHEVRON	NL	Nederland	1973	5 - Stock map - bespoke covers	N - national map	3 - Folding map with covers	Single sided	No (paid for)	4	1			*10*	*6*
230	CHEVRON	NL	Nederland	1978	5 - Stock map - bespoke covers	N - national map	3 - Folding map with covers	One-side map, verso text/ads	No (paid for)	4	1	1		*14*	*8*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
231	ESSO	NL	Nederland	1982	3 - Bespoke production	N - national map	2 - Folding map	One-side map, verso text/ads	f 1,50	4	1	3		*13*	*7*
232	TEXACO	NL	Nederland	1982	5 - Stock map - bespoke covers	N - national map	3 - Folding map with covers	One-side map, verso text/ads	No (paid for)	4	1	1		*14*	*8*
233	SHELL	NL	Nederland	1988	5 - Stock map - bespoke covers	N - national map	2 - Folding map	One-side map, verso text/ads	fl 2,95	4	3	4		*12*	*7*
234	TEXACO	NL	Nederland	1993	5 - Stock map - bespoke covers	N - national map	3 - Folding map with covers	One-side map, verso text/ads	No (paid for)	4	1	1		*14*	*8*
235	ESSO	NL	Nederland	1996	3 - Bespoke production	N - national map	2 - Folding map	One-side map, verso text/ads	No (free)	4	1	4		*5*	*6*
236	SHELL	NL	Nederland	1997	4 - Stock map with added features	N - national map	2 - Folding map	One-side map, verso text/ads	No (paid for)	4	4	4		*12*	*8*
237	BP	NL	Nederland (atlas)	2001	3 - Bespoke production	A - atlas	5 - Small atlas	Double sided	No (fl9.95 price sticker)	4	23	6		*12*	*8*
238	TEXACO	NL	Benelux	2012	3 - Bespoke production	A - atlas	5 - Small atlas	One-side map, verso text/ads	No (paid for)	4	26			*9*	*9*
239	SHELL	NL	Nederland	2014	4 - Stock map with added features	N - national map	2 - Folding map	One-side map, verso text/ads	No (paid for)	4	1			*12*	*6*
240	SHELL	TH	Road Atlas of Thailand	1954	3 - Bespoke production	A - atlas	5 - Small atlas	Double sided	No (poss free)	4	32	14		*6*	*9*
241	MOBILGAS	TH	Thailand	1959	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	1	1		*6*	*5*
242	CALTEX	TH	Thailand and Bangkok	1962	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	1	1		*4*	*7*
243	SHELL	TH	Thailand	1962	3 - Bespoke production	N - national map	2 - Folding map	One-side map, verso text/ads	No (poss free)	4	1			*5*	*7*
244	ESSO	TH	Thailand	1965	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	1	1		*7*	*5*
245	CALTEX	TH	Thailand and Bangkok	1968	3 - Bespoke production	N - national map	2 - Folding map	Double sided	No (poss free)	4	1	1		*4*	*7*
246	SHELL	TH	Thailand and Bangkok	1980	3 - Bespoke production	N - national map	2 - Folding map	Double sided	25 Baht	4	4			*11*	*6*
247	CALTEX	TH	Thailand Route Atlas	2005	3 - Bespoke production	A - atlas	5 - Small atlas	Double sided	No (paid for)	4	34	76		*12*	*8*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
248	UNION	AUS	Victoria	ca1928	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No (free)	1	1	3		*3*	*6*
249	VACUUM	AUS	New South Wales	ca1935	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No (free)	4	1	5		*5*	*9*
250	ATLANTIC	AUS	Victoria	ca1936	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No (free)	4	1	5		*5*	*8*
251	SHELL	AUS	Queensland	ca1938	2 - Bespoke cartography	R - regional map	3 - Folding map with covers	Double sided	No (free)	4	1	7		*4*	*8*
252	ATLANTIC	AUS	Victoria	ca1947	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No (poss free)	4	1	4		*5*	*6*
253	VACUUM	AUS	New South Wales	ca1950	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No (poss free)	4	1	6		*6*	*9*
254	NEPTUNE	AUS	Queensland	1953	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (poss free)	3	1	6		*6*	*8*
255	SHELL	AUS	Queensland	1955	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (poss free)	4	1	6		*6*	*8*
256	C.O.R	AUS	Victoria	ca1956	2 - Bespoke cartography	A - atlas	4 - Booklet map	Double sided	No (poss free)	4	12	6	22	*5*	*9*
257	ATLANTIC	AUS	Blue Mountains, NSW	ca1959	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No (prob free)	2	9			*12*	*7*
258	ATLANTIC	AUS	Victoria	ca1959	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No (poss free)	4	1	4		*5*	*6*
259	SHELL	AUS	Queensland	1960	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (poss free)	4	1	5		*6*	*10*
260	MOBIL	AUS	New South Wales	1962	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No (poss free)	4	1	3		*6*	*9*
261	BP	AUS	Victoria	1963	2 - Bespoke cartography	A - atlas	4 - Booklet map	Double sided	No (poss free)	4	12	6	19	*7*	*9*
262	TOTAL	AUS	New South Wales	ca1964	3 - Bespoke production	S - sectional map	3 - Folding map with covers	Double sided	No (poss free)	4	1	8		*6*	*6*
263	ESSO	AUS	Victoria	1966	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	15c	4	1	8		*11*	*10*
264	MOBIL	AUS	Western Australia	ca1970	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No (poss free)	4	1	6		*8*	*8*
265	SHELL	AUS	Queensland	1970	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	15c	4	2	4		*7*	*11*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
266	BP	AUS	Victoria	1973	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (poss free)	4	2			*9*	*10*
267	TOTAL	AUS	(South Eastern Australia)	ca1973	3 - Bespoke production	S - sectional map	3 - Folding map with covers	Double sided	No (poss free)	4	1	13		*5*	*6*
268	TOTAL	AUS	Victoria	ca1978	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No (poss free)	4	1	7		*7*	*8*
269	ESSO	AUS	Victoria	ca1980	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	15c	4	1	8		*13*	*10*
270	SHELL	AUS	Queensland	1980	2 - Bespoke cartography	R - regional map	3 - Folding map with covers	Double sided	No (paid for)	4	1	16		*10*	*9*
271	SHELL	AUS	Queensland	1988	2 - Bespoke cartography	R - regional map	3 - Folding map with covers	Double sided	No (paid for)	4	1	16		*10*	*9*
272	MOBIL	AUS	South Australia	1992	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No ($3.50 sticker)	4	1	8		*9*	*8*
273	BP	AUS	Victoria	1996	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No ($3.50 sticker)	4	1	5		*9*	*9*
274	LIBERTY	AUS	New South Wales	1996	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No ($3.50 sticker)	4	1	6	2	*9*	*8*
275	BP	AUS	Victoria	2006	6 - Stock map in covers	R - regional map	3 - Folding map with covers	Double sided	No (paid for)	4	1	8	2	*12*	*7*
276	B-A	CDN	Ontario	1929	2 - Bespoke cartography	R - regional map	2 - Folding map	One-side map, verso text/ads	No (free)	3	1	18		*7*	*8*
277	IMPERIAL	CDN	Eastern Canada	1929	2 - Bespoke cartography	R - regional map	2 - Folding map	One-side map, verso text/ads	No (free)	3	1	37		*5*	*8*
278	SHELL	CDN	Ontario	1930	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	3	1	2		*5*	*11*
279	CITIES SERVICE	CDN	Ontario	1937	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	6		*9*	*8*
280	B-A	CDN	Ontario	1939	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	2		*8*	*9*
281	IMPERIAL OIL	CDN	Eastern Canada	1939	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No (free)	4	2	1		*7*	*11*
282	PURITY 99	CDN	Alberta	1939	3 - Bespoke production	R - regional map	2 - Folding map	One-side map, verso text/ads	No (free)	3	1			*6*	*8*
283	RED INDIAN	CDN	Ontario Quebec Maritimes	1942	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	3	3		*7*	*10*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*
284	IMPERIAL OIL	CDN	Maritime Provinces	1948	2 - Bespoke cartography	R - regional map	2 - Folding map	Double sided	No (free)	4	1	5		*9*	*11*
285	SUPERTEST	CDN	Ontario/Quebec	1953	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	1		*7*	*8*
286	BA	CDN	Ontario	1954	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	8		*7*	*9*
287	WHITE ROSE	CDN	Ontario	1954	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	6		*7*	*7*
288	TEXACO	CDN	Quebec and Maritime Provs	1955	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	8		*7*	*7*
289	ROYALITE	CDN	BC-Alberta-Sask-Manitoba	1956	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	8		*7*	*7*
290	BP	CDN	Quebec	1960	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	9		*9*	*9*
291	HOME	CDN	British Columbia and Canada	1960	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	5			*10*	*8*
292	BA	CDN	Ontario	1961	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	8		*8*	*8*
293	ESSO	CDN	Atlantic Provinces	1961	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (paid for)	4	2	10		*11*	*10*
294	SHELL	CDN	Ontario	1962	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	9		*11*	*9*
295	TEXACO	CDN	Quebec	1965	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	3		*8*	*11*
296	UNION 76	CDN	British Columbia and Alberta	1969	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	6		*9*	*12*
297	ESSO	CDN	Atlantic Provinces	1972	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	10		*13*	*10*
298	SHELL	CDN	Ontario	1972	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	7		*10*	*10*
299	BP/SUPERTEST	CDN	Quebec	1973	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	11		*10*	*10*
300	TEXACO	CDN	Atlantic Provinces	1973	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	6		*9*	*11*
301	SHELL	CDN	Ontario	1974	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	7		*10*	*9*
302	ESSO	CDN	Atlantic Canada	1977	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	2	7		*12*	*8*
303	HUSKY	CDN	Alberta	1997	3 - Bespoke production	R - regional map	2 - Folding map	Double sided	No (free)	4	1	17		*15*	*10*

#	Brand	Land	Section title (English)	Year	Production	Type	Format	Sides used	Cover price	Cols	No of maps	Inset maps/ plans	Strip maps	*Carto groups*	*Other groups*

The production is based on the author's assessment as to the extent to which the map was designed, commissioned or simply purchased by the oil company.

Type of map

The "Type" is to a lesser degree also subjective, with map types assigned from the categories in the following list:

Type (Style and Coverage)	
A - atlas	Atlas or booklet (divides territory covered into equal area or administrative [state] sections)
C - cruising guide	Cruising (nautical) guides, etc. Not primarily a road map, though will mark adjacent roads.
L - locator map	Locator map (primary purpose to show service stations)
M - motorway	Motorway, freeway, turnpike, toll road, strip map, route plan
N - national map	National map, used also for maps of all of part of Europe (supranational maps)
O - overseas	Overseas (out of area or cross-border) map
P - pictorial map (but still usable as a road map)	Pictorial map (but still usable as a road map; includes some "panorama" maps)
R - regional map	(Sub-)Regional Map (usually based on political or administrative boundaries. or North/South division)
S - sectional map	Sectional map (usually numbered from a series, often with a common scale)
T - town plan; street map	Town plan; Street Map (marks substantially all streets)
U - urban area map	Urban area map (does not mark all streets, but at a larger scale than most regional maps)
The following categories are also used in the underlying database but not used in selecting the sample	
X - excluded (exhibitions)	Excluded (exhibitions, national parks, no maps, guidebooks with maps inside, tour maps, air routes, etc.)
Y - excluded (adverts, not an oil company issue)	Excluded due to not being an oil company issue (e.g. a map carrying limited oil company advertising)
Z - excluded (duplicate)	Excluded due to being duplicate or near duplicate; may have a different print code

Some maps may be validly considered as being of more than one type. For example, a map of Northern Ireland may be seen as a sectional map, when forming part of a series of UK sectional maps, but as regional map if sold on a standalone basis. Many urban area maps are backed by a town plan or street map.

Cols = colours: 4 indicates at least a four colour process (so map is in full colour)

Carto groups represents the number of cartographical groups for which that map has symbols or other characteristics in the associated analysis. "Other groups" represents the count of textual or illustrative groups in the analysis.

Appendix 4: Summary of Age of Maps in Sample

This table contains the same data as the bubble chart Figure 158.

	pre1930	1930-45	1946-57	1958-65	1966-73	1974-86	1987-99	2000+	Maps	1971 stns	Source
Great Britain - SE England - Kent									**40**	**35883**	
Shell		1939	1956	1960	1966	1977	1990		6	7100	IP
Esso/Pratt's	1905		1949	1959	1966	1986	1991		6	6200	IP
BP	1924	1931	1956	1961	1966, 1968, 1971	1981	1990		9	4350	IP
Mobil			1957	1960	1973	1980			4	1500	IP
Texaco/Regent/ZIP		1937	1953	1961	1968	1977	1988	2005	7	3300	IP
Amoco				1964	1969	1975			3	360	IP
National			1954	1958, 1960		1984			4	3900	IP
Cleveland					1967				1	2150	IP
Ireland									**5**	**4000**	**est**
Texaco/Caltex		1938		1958	1968	1982		2002	5	700	est
France - Nord-Ouest - Cotentin Peninsula									**47**	**45900**	**web**
Shell		1936	1953	1959	1969	1978	1995	2004	7	6093	NPN
Esso/Standard		1935	1951	1959	1969	1983	1997		6	7080	NPN
BP/Energic		1936	1954, 1956, 1957, 1957	1958, 1960, 1965	1969	1978	1988		11	3521	NPN
Mobil/CIP		1934, 1934	1954	1963	1967		1991		6	2124	NPN
Total/Azur/OZO		1938	1952	1963	1966	1979	1998		6	12913	NPN
Caltex/Elf			1957	1963	1967				3	4153	NPN
Avia				1958	1970			2011	3	1000	est
Others: Serco/Antar/Aral/Agip		1935		1961		1982	1995	2003	5	8000	Est(An)
Italy									**24**	**33100**	**est**
Agip		1933	1955	1961	1967	1977	1993		6	6500	NPN
Petrol Caltex/Chevron			1952	1961	1971	1981			4	1850	est
Esso			1955	1962	1972	1986			4	4610	NPN
Shell	1927	1930	1953	1961	1971	1986	1999		7	4311	NPN
BP			1957	1963	1966				3	3186	NPN

	pre1930	1930-45	1946-57	1958-65	1966-73	1974-86	1987-99	2000+	Maps	1971 stns	Source
Netherlands - Benelux - South									**30**	**11500**	**est**
Shell		1931	1950, 1955	1958, 1961, 1965	1972		1988, 1997	2014	10	2962	NPN
Esso			1953	1961	1971	1982	1996		5	1985	NPN
BP			1955	1964	1970			2001	4	926	NPN
Chevron (Calpam, Pam)				1965	1973	1978			3	1450	est
Texaco/Caltex	1929	1937	1955	1962	1967	1982	1993	2012	8	250	est
West Germany - Nord - Hamburg/Hannover									**47**	**43358**	**EID 70**
Shell		1936	1956	1965	1973	1986	1996	2002	7	6406	NPN
Esso/Standard		1934, 1939	1952, 1953	1958	1967	1980	1995	2002	9	6100	NPN
BP/Olex		1939	1953	1965	1966	1978	1986		6	4640	NPN
Total/Elf				1962	1969	1979		2002	4	755	NPN
Texaco/Caltex/DEA/Rheinpreussen			1955	1960	1968	1975	1993		5	2700	NPN
Aral/BV	1928	1935, 1937	1951	1961	1971	1982	1998	2013	9	9500	NPN
Avia/Independents/Others		1937	1956	1960	1969	1978	1989	2004	7	13257	EID 70
USA - New York - Ohio - Texas - Oregon									**45**	**350000**	**est**
Shell	1925	1938	1954	1967 (62)	1968, 1973	1977			7	21217	NPN
Esso/Exxon/Enco	1926	1937	1955	1963	1968	1977	1998		7	29105	NPN
SOCONY/Mobilgas/Mobil	1926	1937	1956	1959	1968	1975	1989		7	24600	NPN
Texaco	1927	1934	1955	1966 (65)	1970				5	40230	NPN
Gulf	1916	1934	1956	1958	1968	1977			6	30450	NPN
Chevron	1928	1931	1951	1960	1969	1979			6	12325	NPN
Amoco (Standard)	1927	1933	1953	1967	1973	1978	1993		7	29041	NPN
Canada									**28**	**35000**	**est**
Imperial/Esso	1929	1939	1948	1961	1972	1977			6	6752	NPN
B-A/BA	1929	1939	1954	1961					4	5723	NPNG
BP/Supertest/Cities Service		1937	1953	1960	1973				4	3289	NPNB
Shell/White Rose		1930	1954	1962	1972	1974			5	5856	NPN
Texaco/Red Indian		1942	1955	1965	1973				4	4640	NPN73
Others: Home/Purity 99/ Royalite/Union/Husky		1939	1956	1960	1969		1997		5	352	NPNH

	pre1930	1930-45	1946-57	1958-65	1966-73	1974-86	1987-99	2000+	Maps	1971 stns	Source
Australia									**28**	**19000**	**est**
Shell		1938	1955	1960	1970	1980	1988		6	4372	NPN
Esso/Atlantic Union	1928	1936	1947	1959 (2)	1966	1980			7	1470	NPN
BP/C.O.R			1956	1963	1973		1996	2006	5	3682	NPN
Mobil/Vacuum		1935	1950	1962	1970		1992		5	3100	NPN
Others: Neptune, Total, Liberty			1953	1964	1973	1976	1996		5	417	NPNT
ASEAN - Thailand									**8**	**2000**	**est**
Shell			1954	1962		1980			3	480	NPNL
Esso				1965					1	600	NPN
Mobil				1959					1	150	est
Caltex				1962	1967			2005	3	313	NPN

Table 8: Maps selected in sample grouped by age band

Maps = total number of maps from the brand/country in the sample.

1971 stns = number of service station in 1971; Sources are described in Section 5.4.4. 1971 was used as being the closest date to the median for which sufficient reliable data was available, and is indicative of the relative size of the companies selected in each country.

est -= own estimate; Est(An) is an estimate that includes Antar and all minor brands.

NPN = National Petroleum News Factbook (NPN 1971); NPNB = BP and Supertest; NPNG = Gulf (successor brand to BA, Purity 99 and Royalite); NPNH = Home and Union (but not Husky); NPNL = Includes Shell Laos; NPNT = Total (C.F.P.); NPN73 = 1973 data

In the 1958-65 column, 1967 (62) indicates that a Shell map from 1967 was examined, but it is known to be identical in design and content to a 1962 issue; likewise for Texaco, where 1966 (65) indicates that a 1966 map known to be the same as a 1965 one was used. The (2) for Esso/Atlantic Union indicates that two different Atlantic maps were selected, both were undated but estimated to be from around 1959.

Appendix 5: Map references (not in sample)

This appendix lists other maps referred to in the body text or illustrated in the figures. For convenience these are listed alphabetically and carry reference numbers shown is square brackets in the text starting at 501 upwards. As in Appendix 2, the column headed dBase refers to the author's own detailed database.

Ref	Dbase	Brand	Land	Title	Scale	Cartographer	Year
501	12411	AGIP (advert)	I	Italy - camping (Fed It del C&C)	2700000	Aert Fraf Alinari Baglioni	1964
502	7563	LEUNA (advert)	D	Deutsche Heimatkarte 1	100000	Georg D.W. Callwey	1938
503	10408	AFOR	H	Hungary	833000	Kartografiai Valallat	1974
504	8662	AGIP	A	Kärnten ski-map	n/a	Kartographie Moser/Wielkind	2007
505	10146	AGIP	ETH	Ethiopia - new roads by Il Duce	2960000	n/a	ca1938
506	12298	AGIP	F	France	1650000	IGDA Novara	2007
507	1537	AGIP	I	Italy Ski Map	1200000	Ufficio Tecnico Cartograf ACI	1977
508	4349	AGIP	I	Camping Map of Italy	900000	Renzo Matino	1999
509	2613	AMOCO	USA	Arkansas/Louisiana/Mississippi	1900000	National Survey/Diversified	1977
510	8835	AMOCO	USA	Youngstown, Warren & Vicinity	50000	Champion Map Corporation	1981
511	11210	AMOCO	USA	Illinois	750000	Dalan Publishing	1993
512	10528	ANGLO	EC	Ecuador	1500000	Instituto Geografico Militar	1969
513	6728	APCO	USA	Arkansas/Louisiana/Mississippi	1330000	Rand McNally	1971
514	5682	ARAL	A	Austria	600000	Ed. Holzel	2000
515	7140	ARAL	CZ	Czech Republic	300000	Mairs	2003
517	4515	ARAL	D	W Germany - Sheet 3	400000	Busche, Dortmund	ca1961
518	10831	ARAL	D	W Germany	1275000	Busche	1968
519	12310	ARAL	D	Freiburg im Breisgau	18000	Stadte-Verlag	ca1993
520	7195	ARAL	D	Dresden (Czech edn. - Drážďany)	22500	Falk City Map	2002
521	7662	ARAL	D	Petit Bistro atlas	800000	Kobel Kummerly + Frey	2004
522	4416	ARAL	PL	Poland	750000	Daunpol	1999
523	6204	ARAL-BV	D	Germany - Sheet 6	500000	n/a	1937
524	7806	ARAL-BV	D	L+R Autobahn: Herford-Frankfurt-Aachen	175000	Busche/Witzel	ca1952
525	10186	ASHLAND	USA	Ohio	700000	HM Gousha	1965

526	776	ASSOCIATED	USA	United States	1775000	HM Gousha	1949
526a	733	BELL/EP	GB	Lincolnshire	190000	Wally Day D/M Services	1972
527	805	BETHOLINE/SINCLAIR	USA	Delaware/Maryland/Virginia/WVa	1090000	Rand McNally	1952
528	5048	BOIE	D	Germany (atlas)	1000000	Dr Guntzsche Stiftung	ca1937
529	10014	BP	CDN	Quebec	1170000	HM Gousha	1957
529a	3729	BP	EUR	Europe	4000000	John Bartholomew & Son	ca1958
529b	5895	BP	EUR	Europe	4000000	John Bartholomew & Son	ca1960
530	5011	BP	F	Guide "BP": Tome 1 Paris et ses environs	n/a	H Trope	1926
531	12410	BP	I	Campeggi e Villaggi Turistici	1250000	Vallardi	1964
532	7252	BP	I	Reggio Calabria	300000	IGDA Novara	1964
533	7958	BP	PL	Rzeszow	15000	Daunpol	2000
534	8595	BP-OLEX	D	Rheinland/Westfalen	750000	Georg Westermann	ca1939
535	7733	BV (GEBR. HOPPE)	D	Germany - sheet 70	300000	Ravenstein	1927
536	10455	BZ	CS	Moravsky Kras	n/a	UNIE Praha	ca1937
537	8389	CALTEX	DK	Denmark	505000	Recato Offset	ca1961
538	7013	CALTEX	ZA	South Africa (Padkaart)	n/a	E. O'Brien	1953
539	4312	CHEVRON	D	South East Germany	500000	H König	ca1968
540	10642	CITGO	USA	Southeastern United States	3168000	A.O.C.	1976
541	9425	CONOCO	USA	Touraide: Golden Gate Intl Expo	n/a	HM Gousha	1939
542	3646	CONOCO	USA	Arkansas/Louisiana/Mississippi	1390000	HM Gousha	1969
543	11326	COPEC	RCH	XII: Tierra del Fuego y Antarctica	550000	IGM /Juan Pablo Gardeweg Ried	2013
544	11260	DELTA	USA	North & South Carolina	1850000	MWM Map Co	1937
661	5518	DK	DK	Denmark (booklet)	1000000	Folia/Legindkort	1999
545	6715	ENGEN	ZA	South Africa Road Atlas	500000	Map Studio	2001
546	10782	ENGEN	ZA	South Africa Road Atlas	1250000	Map Studio	2012
547	9283	ESSO	-	War Map II (Invasion edition)	0	General Drafting Co	1944
548	6878	ESSO	B	Belgium (Genk Football Club)	295000	de Rouck	2002
549	12174	ESSO	D	Berlin	30000	Esso AG	1957
550	3733	ESSO	D	Hannover	12000	Esso AG	1959
550a	12305	ESSO	DK	Danmark	510000	Geodætisk Institut	1958
550b	648	ESSO	DK	Danmark	510000	Geodætisk Institut	1966

551	12005	ESSO	EA	Kenya Tanganyika Uganda	2500000	General Drafting/Map Studio	1963
552	10365	ESSO	F	Paris	18000	Blondel la Rougery	1958
552a	79	ESSO	F	France (US armed forces edition)	1500000	Blondel la Rougery	1957
553	349	ESSO	GB	South-East England	316800	George Philip Printers	1979
554	9225	ESSO	I	Sardegna	935000	ITAM/General Drafting	1959
555	8070	ESSO	MAL	Malaya	1000000	General Drafting Co	1963
556	2141	ESSO	PE	Peru	2530000	General Drafting Co	1950
662	10678	ESSO	USA	Pennsylvania	615000	General Drafting Co	1953
663	12433	ESSO	USA	Pennsylvania	615000	General Drafting Co	1954
557	5995	ESSO	USA	United States	2500000	General Drafting Co	1965
558	9279	ESSO	VZ	Estados Unidos de Venezuela	1625000	General Drafting Co	1941
559	4486	ESSO	WAN	Nigeria	2500000	General Drafting Co	1960
560	992	EXXON	USA	Arkansas/Louisiana/Mississippi	1120000	General Drafting Co	1975
561	10951	EXXON	USA	Pennsylvania	648000	General Drafting Co	1976
561a	6248	EXXON	USA	New England	460000	General Drafting Co	1978
562	4905	FINA	B	Belgium	350000	Carto	1991
563	11180	FINA	CDN	Maritimes	1500000	Grant Mann Lithographers	1971
564	8412	FINA	F	France Nord Grandes Routes	1000000	Michelin	1960
565	11818	FINA	S	Scandinavia	1500000	Falkplan/Bootsma	ca1964
566	6989	GASOLIN	D	Panorama:Nordl. Niedersachsen/Luneburger Heide	350000	Bruckmann	1956
567	8581	GULF	GB	M6 Motorway Nature Trail	n/a	n/a	1982
568	9475	GULF	USA	New York	2550000	The Automobile Blue Book Pub.Co.	1916
569	9485	GULF	USA	Through Roads to World's Fair	5000000	Rand McNally	1933
570	11772	GULF	USA	Florida	1500000	Rand McNally	1934
571	2310	HICKSATOMIC	USA	Illinois	875000	Rand McNally	1958
572	2019	HUSKY	CDN	Canada	2850000	Rolph McNally	1980
573	7671	HYDRO	D	W Germany/DDR (Danish edition)	800000	Cartographia	ca1988
574	5521	HYDROTEXACO/UNO-X	DK	Denmark (booklet)	500000	Folia/LegindKort	2000
575	10850	INTERMARCHE	F	France (Bison Futé)	1200000	IGN/DSCR-CNIR	1997
576	7521	INTERMARCHE	F	France	1700000	Bottin Cartographes	2005

577	7858	JET	CZ	Brno & suburbs	20000	Shocart	2002
578	6902	JET	S	Scandinavia	2100000	Kartcentrum	2002
579	11867	JUGOPETROL	YU	Yugoslavia	1000000	Avto Moto Sveza Slovenije	1980
580	10337	LAGOVEN	VZ	Venezuela	1500000	Aeromapas Serevenca	1980
581	12123	LECLERC	F	France	1500000	Blay Foldex	1996
582	2552	LEUNA	D	Berlin (Olympics)	n/a	n/a	1936
583	3522	LIBERTY	AUS	Sydney	106000	Penguin Books Australia Ltd	1996
584	5852	MINOL	DDR	East Germany	500000	VEB Hermann Haack	1966
585	5384	MINOL	DDR	East Germany	600000	VEB Hermann Haack	1987
586	3769	MOBIL	AUS	Northern Territory	2750000	Penguin Books Australia Ltd	1994
587	5374	MOBIL	CDN	Quebec Maritime Provinces	1140000	Rolph Clark Stone	1972
588	549	MOBIL	WAN	Nigeria	1750000	Federal Survey Department	1955
589	5324	MOBILGAS	ZA	South Africa	1750000	Galvin & Sales (Pty)	1959
590	3282	MOTUL	F	France	1300000	Blondel la Rougery	1956
591	5211	NITAG	D	Germany atlas	1000000	Ravenstein	1938
592	11946	PECO	RO	Romania	n/a	Editat de Mich-IPAC	1973
593	4026	PHILLIPS 66	-	War Map of the World	n/a	HM Gousha	1942
594	1434	PIONEER	USA	Mississippi	844800	Rand McNally	1921
595	4911	POLLET	E/P	Spain & Portugal	800000	RV Reise (Spectrum)	1984
596	8607	PRATT'S	GB	The Road Atlas of South-Western England for Motorists, Cyclists, & Pedestrians	506880	George Philip & Son	1904
597	10148	RACETRAC	USA	USA Large Print Atlas	n/a	Universal Map	2010
598	11780	RECOPE	CR	Costa Rica	n/a	Instituto Geografico Nacional	1977
599	6161	REGENT	GB	Southern England	316800	Geographia	ca1965
600	8790	REPSOL	E	Guia Repsol (3 vols.)	300000	Tele Atlas/Nexus/GradualMap	2009
601	9294	RICHFIELD (NY)	-	World-Wide News Map	9000000	Rand McNally	1940
602	3255	RICHFIELD/WEBACO	USA	New York	950000	Rand McNally	1933
603	4632	ROCK ISLAND	USA	Indiana	730000	Rand McNally	1972
604	3091	SHEETZ	USA	Pennsylvania (& adjacent)	1100000	not quoted	1997
605	10123	SHEETZ	USA	Locator Map	1560000	Smartmaps Inc	2008
606	7885	SHELL	A	Videň (Vienna - Czech edn)	16000	Shocart	2006

607	7378	SHELL	AUS	Bowen-Mossman	n/a	FC Grosser	1965
608	7377	SHELL	AUS	Across the Nullarbor	825000	FC Grosser	1967
609	3793	SHELL	D	Oberhausen	n/a	ZRK	ca1935
610	4810	SHELL	D	Tours: Hannover - Harzfahrt	n/a	ZRK	ca1937
611	5960	SHELL	D	Hannover	470000	ZRK	1938
612	3218	SHELL	F	Cartoguide camping	1650000	Foldex France	1964
613	512	SHELL	GB	Motorway strip maps	n/a	George Philip Printers	1974
614	20	SHELL	GB	Southern & Eastern England	200000	George Philip	1975
615	2912	SHELL	GB	South-East England	200000	George Philip Printers	1985
616	4459	SHELL	GHA	Ghana - Southern Section	500000	Survey of Ghana	1962
617	8896	SHELL	MAL	Malaya (in 3 sections)	760000	F.M.S. Surveys	1931
618	12248	SHELL	N	Norway (Camping map)	1450000	Emil Moestue A.s	1970
619	7180	SHELL	PL	Zakopane	13000	Daunpol	2003
620	11164	SHELL	RI	Java (in 3 sections)	n/a	De Bataafische Petroleum Mij	ca1930
621	3288	SHELL	TR	Turkey	2000000	IGA Novara	1960
622	9599	SHELL	USA	New Hampshire Vermont	760000	HM Gousha	1931
623	11585	SHELL	USA	Utica 'In and' Out map	89000	HM Gousha	1931
623a	9612	SHELL	USA	New York World's Fair	45000	HM Gousha	1939
623b	9614	SHELL	USA	Brooklyn, Queen's and Long Island		HM Gousha	1942
624	11457	SHELL	VZ	Venezuela	2000000	Caribbean Petroleum Co	1943
625	5124	SHELL	WA	Carte Routière de l'A.O.F.	3000000	Gaillac-Monrocq et Cie, Paris	ca1938
626	2797	SHELL	ZA	Southern Africa - Road Atlas	1500000	Map Studio	ca1976
627	4378	SHELL	ZA	South Africa Road Atlas	1500000	Map Studio	1987
628	4071	SHELL BP	WAN	Nigeria (5 sheets) Independence Edition	1000000	Shell-BP Petroleum Devt Co	1960
629	11865	SHELL BP	WAN	Niger Delta	350000	Shell-BP Petm Devt/GC Okoro	1971
630	1616	SINCLAIR	-	Europe & Near East News Map	8900000	Rand McNally	1940
631	9629	SINCLAIR	USA	Texas Mexico	2000000	Rand McNally	1936
632	9630	SINCLAIR	USA	Arkansas/Louisiana/Mississippi	1500000	Rand McNally	1937
633	9645	SKELLY	USA	Victory War Map	n/a	HM Gousha	1943
634	7898	SLOVNAFT	SK	Slovakia Camping	500000	BBKart	ca2004
635	4636	SMITH OIL/GULF	USA	Rockford,IL	n/a	J Foster Ashburn	1965

636	12021	SOCONY	USA	Citigraph: Rochester	160000	General Drafting Co	1934
637	4039	SOVEREIGN/DERBY	USA	Wisconsin	1200000	Rand McNally	1936
638	9687	STANDARD (CHEVRON)	USA	California	1900000	Rand McNally	1931
639	9690	STANDARD (CHEVRON)	USA	Idaho	1600000	HM Gousha	1936
640	10587	STANDARD (ESSO)	D	Luftbildkarte 21	500000	Bruckmann	ca1934
641	9285	Standard Oil (New Jersey)	-	Pictorial Map of the Americas	23000000	General Drafting Co	1948
641a	10237	Stop & Shop Supermarkets	USA	New England	460000	General Drafting Co	1980
642	1342	SUNOCO	CDN	Ontario-Quebec & Maritime Prs	1637000	Rolph-Clark-Stone Ltd	1936
643	2038	SUNRAY (GAFILL)	USA	Ohio Indiana Michigan IL WI	2725000	Rand McNally	ca1927
644	2413	SUPERLINE	CDN	Eastern Canada	1390000	Rolph Clark Stone	1951
645	7246	TALLEY BROS	USA	Ohio	1500000	Rand McNally	1928
646	289	TESCO	GB	Great Britain	1100000	Cook, Hammond & Kell	1995
647	8927	TEXACO	B/L	Belgium Luxembourg	350000	The Texas Company SAB	ca1930
648	7305	TEXACO	N	Norway	1450000	n/a	1973
649	9733	TEXACO	USA	Washington, Oregon, Idaho, Montana, Wyoming, Utah and Colorado	2500000	General Drafting Co	ca1927
650	9737	TEXACO	USA	Washington Oregon	1275000	Rand McNally	1930
651	8279	TEXACO	USA	New Jersey with Pennsylvania	412000	Rand McNally	1945
652	2378	TEXACO	USA	New York (Touring Center)	38000	Rand McNally	1955
653	11746	TEXACO	ZA	Cape Town-Jo'burg Garden Route	100000	Texas Company (South Africa)	ca1938
654	5812	TOTAL	AUS	New South Wales	2100000	Mercury Press	ca1964
655	3294	TOTAL	F	France 98 World Cup (DE/EN)	735000	Leader Communication	1998
657	7358	Touring Club Italiano	I	Grande Carta Automobilistica Foglio 1	300000	Artiche Grafiche Bertarelli	1930
658	6987	TS (SENGEISEN)	D	W Germany	1100000	JRO	ca1962
659	12054	VIRSI	LV	Latvia: Ar degvielas karti izdevīgāk!	1200000	Jāņa sēta	2019
660	9221	ZIP	GB	Motorists' Road Map of Scotland	1000000	Geographia	1938

Table 9: Maps referred to, but not in sample

Table of Figures

References

AACR2r (1998) *Anglo-American Cataloguing Rules revision 2*, Chapter 3: Cartographic Materials, Washington DC: American Library Association

Akerman, J.R. (1993) 'Selling Maps, Selling Highways: Rand McNally's 'Blazed Trails' Program', *Imago Mundi*, 45, pp. 77-89

Akerman, J.R. (2002) 'American Promotional Road Mapping in the Twentieth Century', *Cartography and Geographic Information Science*, 29(3), pp. 175-192

Akerman, J.R. (2006) 'Twentieth-Century American Road Maps and the Making of a National Motorized Space', in Akerman J.R. (ed.) *Cartographies of Travel and Navigation*. Chicago, IL: University of Chicago Press pp.151-206

Akerman, J.R. (2020) *Maps in Promotional Brochures: Unpacking Questions of Format and Content*, [Lecture] The International Society for the History of the Map Symposium (ISHMap 2020) Zoom, 12 June

Alder, A. (1974) 'Memorandum', unpublished, in Newberry Library, Rand McNally Archive Wing MMS Series 7, Box 1, File 2

Allen, P. (1992) *The Atlas of Atlases*. pp. 98-103, London: Marshall Editions/Ebury Press

Andrews, J.H. (1996) 'What Was a Map? The Lexicographers Reply', *Cartographica,* 33(4) pp. 1-12

Atterbury, P. and McKenzie, J. (1985) *A Golden Adventure: The First 50 Years of Ultramar*, Westerham, Kent: Hurstwood Press

Azócar Fernández, P.I. and Buchroithner, M.F. (2014) *Paradigms in Cartography: An Epistemological Review of the 20th and 21st Centuries*. Heidelberg: Springer

Bamberg, J. (2000) *British Petroleum and Global Oil 1950-1975*, Cambridge: Cambridge University Press

Barrett, R. and Worden, D. (2012) 'Oil Culture: Guest Editors' Introduction', *Journal of American Studies*, 46(2), pp. 269–272. doi:10.1017/S0021875812000163.

Bartlett, J. (2015) 'Did some maps set traps?', *Los Angeles Times* https://www.latimes.com/travel/california/la-trb-maps-set-traps-20150209-story.html accessed 3 July 2020

Bauer, J.T. (2009) 'The Official Automobile Blue Book, 1901–1929: Precursor to the American Road Map', *Cartographic Perspectives*, 62, North American Cartographic Information Society

Bertin, J. (1983/2011) *Semiology of Graphics*. Redlands, CA: ESRI Press

Bertrand, R.J. (1981) *The State of Competition in The Canadian Petroleum Industry: Volume 6 – The Marketing of Gasoline*, Hull, Quebec: Minister of Supply and Services Canada

Bianchetti, R.A., Wallgrün, J.O., Yang, J., Blanford, j., Robinson, A.C., and Klippel, A. (2012) 'Free Classification of Canadian and American Emergency Management Map Symbol Standards', *The Cartographic Journal*, 49(4), pp. 350-360, DOI: 10.1179/1743277412Y.0000000022

Blocker, H.G. (1979) *Philosophy and Art*. New York, NY: Charles Scribner's Sons

Board, C. (1982/2011) 'Cartographic Communication', in Dodge, M., Kitchin, R. and Perkins, C. (eds.) *The Map Reader.* Chichester: John Wiley and Sons, pp. 37-47

Board, C. (2015) 'Definitions of Map', in Monmonier, M. (ed.) *The History of Cartography Volume 6*, Chicago, IL: University of Chicago Press pp. 798-800

Board, C. and Taylor, R.M. (1977): 'Perception and Maps: Human Factors in Map Design and Interpretation', *Transactions of the Institute of British Geographers.* 2(1) pp. 19–36 https://doi.org/10.2307/622191

Bockenhauer, M. H. (1994) 'Culture of the Wisconsin Official State Highway Map', *Cartographic Perspectives,* 18, pp. 3–16

BP (1959) Letter to John Bartholomew & Co, *Bartholomew Archive Acc10222/BR/1173*, National Library of Scotland, Edinburgh

BP (2021) *Statistical Review of World Energy – all data 1965-2020* (Excel file) London: BP plc

Brannon, G. (2009) 'Is Map Design a Lost Art?', *Bulletin of the Society of Cartographers*, 25-2, pp. 7-8

Brotton, J. and Millea, N. (2019) *Talking Maps*. Oxford: Bodleian Library

Burt, S. (1985) 'The Carrefour Group - the First 25 Years', *International Journal of Retailing* 1,3 pp. 54-78

Byrne, I.W. (1998) 'Foldex Maps: The Ones with the Miracle Folds', *The Legend*, 9, pp. 1-2

Byrne, I.W. (2007) 'Books and Atlas reviews: AA Close-Up Britain Road Atlas', *The Cartographic Journal*, 44:1, pp94-95

Byrne, I.W. (2022a) 'Locator Maps: helping customers find businesses', *Abstracts of the International Cartographic Association*, 5, 2022. European Cartographic Conference – EuroCarto 2022, 19–21 September 2022, TU Wien, Vienna, Austria. https://doi.org/10.5194/ica-abs-5-88-2022

Byrne, I.W. (2022b) 'Soviet Tourist Maps: A Short Overview', *The Cartographic Journal*, DOI: 10.1080/00087041.2021.1982458

Byrne, I.W. (2022c) 'Population indicators on (road) maps', *Maplines*, Spring 2022, pp. 24-25

Canadian Premiums and Incentives (c1977) News item in undated edition (with no page numbers) of *Canadian Premiums and Incentives*, Toronto: Maclean-Hunter Publishing Ltd

Carroll, C. (2010a) 'John Foster Ashburn', *The Legend*, 46(1), pp. 6-8

Carroll, C. (2010b) 'H. M. Gousha's move from Chicago to San Jose', *The Legend*, 47, p.3

Carroll, C. (2012) 'Western Map Company', *The Legend*, 47, pp. 1-4

Carroll, C. (2015) 'My afternoon with Matt Helmbold, the Renaissance Man of Road Maps', *The Legend* 65, pp. 1-8

Carroll, C. (2021) 'Diversified Map Corporation – History Repeated?', *The Legend*, 89, pp. 1, 4-7

Cartwright, W. (2017) 'Serendipitous reflections on European antipodean cartography: imports to copying to self-sufficiency – an essay', *Bulletin of the Society of Cartographers* 51(1) pp. 21-33

Close, C.F. (1905) *Textbook of topographical and geographical surveying*, London: His Majesty's Stationery Office

Coleman, S. and Crang, M. (2002) 'Grounded Tourists, Travelling Theory', in Coleman, S. and Crang, M., *Tourism: Between Place and Performance.* New York, NY: Berghahn Books, pp. 1-17

Company i Mateo, R. (2014) 'Cartografia, ideologia i poder : els mapes etnogràfics del touring club italiano, 1927-1952', *Publicacions de La Universitat de Valencia*

Cole, D. (1997) 'Who gave a way the first free road maps?' *The Legend* Spring 1997 p. 1

Conrad, J. (1899), *Heart of Darkness*. Blackwood's Magazine, Edinburgh

Cooke, A. (2006) *American Journey*. London: Allen Lane

Conoco (1939) *Golden Gate International Exposition Touraide.* Denver, CO: Continental Oil Company

Consumers' Association (1963) 'Motoring Maps', *Which? July 1963*, pp. 196-203

Cosgrove, D. (2005/2010) 'Maps, Mapping, Modernity: Art and Cartography in the Twentieth Century', in Dodge, M., Kitchin, R. and Perkins, C. (eds.) *The Map Reader.* Chichester: John Wiley and Sons, pp. 269-277

Crampton, J.W. (2001) 'Maps as social constructions: power, communication and visualization', *Progress in Human Geography* 25(2) pp. 235–252

Crone, G.R. (1953/1978) *Maps and their Makers: An Introduction to the History of Cartography*, (5th edn.) Folkestone, Kent: Wm Dawson & Son Ltd

Cruse, D.A. (2000) *Meaning in Language: An Introduction to Semantics and Pragmatics*, Oxford University Press, Oxford

Dando, C.E. (2018) *Women and Cartography in the Progressive Era*. Abingdon, Oxon: Routledge

Darmon, O. (1997) *Le grand siècle de Bibendum*. Paris: Editions Hoëbeke

Davies, J. and Kent, A.J. (2017) *The Red Atlas: How the Soviet Union Secretly Mapped the World*. Chicago, IL: University of Chicago Press

Davis, M. (2018) 'A cartographic analysis of Soviet Military city plans', Ph.D. thesis, Canterbury Christ Church University – available online through Springer Scientific

De Raat, F. (1996) 'Suurland bloeit in kaartengek Nederland', *NRC Handelsblad*, 3 December 1996

Del Casino, V.J. and Hanna, S.P. (2006/2010) 'Beyond the 'Binaries': A Methodological Intervention for Interrogating Maps as Representational Practices', in Dodge, M., Kitchin, R. and Perkins, C. (eds.) *The Map Reader.* Chichester: John Wiley and Sons, pp. 102-107

Delano-Smith, C. (2006) 'Milieus of Mobility' in Akerman J.T (ed.) *Cartographies of Travel and Navigation*, Chicago, IL: University of Chicago Press, pp. 16-68

Dillon, D. (2007) 'Consuming Maps' in Akerman J.R. and Karrow, R.W. (eds.) *Maps: Finding our Place in the World*, Chicago, IL: University of Chicago Press pp. 289-344

Dorling, D. and Fairbairn, D. (1997) *Mapping*, Harlow, Essex: Longman

Doucette, J. (2016) 'Rolph-Clark-Stone Ltd, 201 Carlaw', *Leslieville Historical Society* website, https://leslievillehistory.com/2016/10/22/rolph-clark-stone-ltd-201-carlaw, accessed 20 November 2019

Downs, R.M. and Stea, D. (1973/2011) 'Cognitive Maps and Spatial Behavior: Process and Products' in Dodge, M., Kitchin, R. and Perkins, C. (eds.) *The Map Reader.* Chichester: John Wiley and Sons, pp. 312-317

Dumont, M., Touya, G. and Duchêne, C. (2016) 'Assessing the Variation of Visual Complexity in Multi-Scale Maps with Clutter Measures', Paper given at *19th ICA Workshop on "Generalisation and Multiple Representation"*, Helsinki

Eastman J.R. (1985) 'Cognitive models and cartographic design research', *Cartographic Journal* 22, pp. 95–101

Edney, M.H. (2007) 'Mapping Parts of the World', p139 in Akerman, J.R. and Karrow, R.W. *Maps: Finding our place in the world*. Chicago: University of Chicago Press

Edney, M.H. (2019) *Cartography: The Ideal and its History*. Chicago, IL: University of Chicago Press

Ehrenburg, R.E. (2018) 'Airline Map', in Monmonier, M. (ed.) *The History of Cartography Volume 6*, Chicago, IL: University of Chicago Press p. 37

Ellis, C., Adams, T.E. and Bochner, A.P. (2011) 'Autoethnography: An Overview'. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 12(1), Art. 10, http://nbn-resolving.de/urn:nbn:de:0114-fqs1101108

Esso Dealer, The (1957) 'Nearly ten million', 6(1), p. 16

Everard, C. (1999) 'Michelin Maps of the British Isles 1914-c.1934', *Special Research Paper*, Queen Mary and Westfield College, University of London

Fairbairn, D. (2006) 'Measuring Map Complexity', *The Cartographic Journal*, 43(3), pp. 224-238

Ferrier, R.W. (1986) 'Petrol Advertising in the Twenties and Thirties: The Case of the British Petroleum Company', *European Journal of Marketing*, 20(5), pp. 29-51

Field, K. and Demaj, D. (2012a) 'Reasserting Design relevance in cartography: Some Concepts', *The Cartographic Journal*, 49(1) pp. 70-76

Field, K. and Demaj, D. (2012b) 'Reasserting Design relevance in cartography: Some Examples', *The Cartographic Journal*, 49(1) pp. 77-93

Forrest, D. and Castner, H.W. (1985) 'The Design and Perception of Point Symbols for Tourist Maps', *The Cartographic Journal*, 22(1), pp. 11-19

Frankel, P.H. (1966) *Mattei Oil and Power Politics*. London: Faber and Faber

General Drafting Co. (1983) *Historic Facts and Figures: Maps, Road News, Travel Publications, Touring Service: Exxon Travel Club, Exxon Company U.S.A., Miscellaneous* (unpublished typescript) General Drafting Co., Convent Station, N.J. USA

Gill, G. (1993) 'Road map design and route selection', *The Cartographic Journal* 30(2), pp. 163-166 http://dx.doi.org/10.1179/000870493787860058

Giordano, A. (2015) 'Istituto Geografico De Agostini (Cartographic Institute De Agostini; Italy)' in Monmonier, M. (ed.) *The History of Cartography.* Chicago, IL: University of Chicago Press pp. 697-699

Grinlinton, D.P. (1995) 'The History and Development of Petroleum Law and Policy in New Zealand', *Otago Law Review* 8(3), pp. 375-411

Gulf (1934) *'Look…they gave me a map!'*, Gulf Refining Company, Pittsburgh PA (advertisement used in various US domestic publications)

Gulf European Company (1959) Letter to John Bartholomew & Co dated 10 December 1959, *Bartholomew Archive Acc10222/BR/1200*, National Library of Scotland, Edinburgh

Hall, S. (2015) 'Exxon Knew about Climate Change almost 40 years ago' *Scientific American* October 26, 2015 (also available online at https://www.scientificamerican.com/article/exxon-knew-about-climate-change-almost-40-years-ago/ accessed 23 August 2023)

Hansard (1964) 'Working Hours and Earnings', Hansard HC Deb 27 January 1964 vol 688 cc9-10

Harley, J.B. (1988/2001) 'Silences and Secrecy', *The New Nature of Maps*, Johns Hopkins University Press, Baltimore (reprinted from *Imago Mundi 40* (1988)) pp. 57-76

Harley, J.B. (1989/2001), 'Deconstructing the Map', *The New Nature of Maps*, Johns Hopkins University Press, Baltimore (reprinted from *Cartographica 26-2* (1989))

Harley, J.B. (1991) 'Can there be a Cartographic Ethics?', *Cartographic Perspectives,* 10, pp. 9-16

Harley, J.B. (1997/2001), 'Power and Legitimation in the English Geographical Atlases of the Eighteenth Century, *The New Nature of Maps*, Johns Hopkins University Press, Baltimore (reprinted from Wolter, J.A. and Grim, R.E (eds) *Images of the World: The Atlas through History*. New York, NY: McGraw Hill)

Hein, C. (2018) 'Oil Spaces: The Global Petroleumscape in the Rotterdam/The Hague Area', *Journal of Urban History*, 44(5), pp. 887-929

Hellema, D., Wiebes, C. and Witte, T. (2004) *The Netherlands and the Oil Crisis: Business as Usual*. Amsterdam: Amsterdam University Press

Henderson, N-M. (2011) 'Offensive place names once dotted the U.S. landscape', *Washington Post*, https://www.washingtonpost.com/politics/offensive-place-names-once-dotted-the-us-landscape/2011/10/04/gIQAeGaKLL_story.html, Accessed 26 September 2019

Henderson, W. and Benjamin, S. (1997) *Guide to Gasoline Logos*. LaGrange, OH: PCM Publishing

Hewitt, R. (2010) *Map of a Nation: A Biography of the Ordnance Survey*, London: Granta Books

HMSO (1956) *Copyright Act 1956 c.74*, London: Her Majesty's Stationery Office, on National Archives website https://www.legislation.gov.uk/ukpga/1956/74/contents/enacted accessed 20 March 2023

Hoffmann, J. (2007) 'Mairdumont übernimmt CartoTravel' *DNV Magazin* https://www.dnv-online.net/medien/detail.php?nr=12964, accessed 24 May 2020

Hornsey, R (2016) 'The Cultural Uses of the A-Z London street atlas: Navigational Performance and the Imagining of Urban Form' *Cultural Geographies* 23(2) pp.265-280 DOI:10.1177/1474474015572600

Horwitz, R. (2017) *Map Catalog*, unpublished CD-ROM listing details of maps donated to Osher Map Library at University of Southern Maine

Hogg, G. (1975) *The Shell guide to Viewpoints of England.* Reading, Berkshire: Osprey Publishing/George Philip and Son Ltd

Holt, R. and Mason, T. (2000) *Sport in Britain, 1945-2000*. Oxford: Blackwell

Hüzeir, V. (2020) 'BP knew the truth about climate change 30 years ago', *Follow the Money* (website) https://www.ftm.eu/articles/bp-video-climate-change-1990-engels accessed 23 August 2023

ICA (1981) 'Carl Mannerfelt is awarded the Carl Mannerfelt medal', *International Cartographic Association*, https://icaci.org/carl-mannerfelt-is-awarded-the-carl-mannerfelt-gold-medal/, accessed 19 September 2019

ICA (2003) 'Definitions', *International Cartographic Association*, https://icaci.org/mission/, accessed 28 April 2024

IOF (2019) *Mapping: International Specifications* https://orienteering.sport/iof/mapping/, accessed 24 July 2023

ISO (2012) *ISO 19117:2012 Geographic information — Portrayal*. Geneva: International Organization for Standardization

Jakle, J.A. and Sculle, K.A. (1994) *The Gas Station in America*. Baltimore, MD: The Johns Hopkins University Press

Jerome, J.K. (1891) *The Diary of a Pilgrimage*. London: J.W. Arrowsmith

Keates, J.S. (1996) *Understanding Maps.* Harlow, Essex: Addison Wesley Longman

Kent, A.J. (2005) 'Aesthetics: A Lost Cause in Cartographic Theory', *The Cartographic Journal*, 42, pp. 182–188

Kent, A.J. (2008) 'A methodology to classify and visualize stylistic evolution', paper presented to *Symposium on "Shifting Boundaries: Cartography in the 19th and 20th centuries"* Portsmouth University, Portsmouth, United Kingdom, 10-12 September 2008

Kent, A.J. (2018) 'Cartographic Aesthetics' in Kent, A.J. and Vujakovic, P. (eds.) *The Routledge Handbook of Mapping and Cartography*, Abingdon, Oxon: Routledge, pp. 299-310

Kent, A.J. (2023) 'Subversive Maps? A Cartographic Perspective on Grayson Perry', *Maplines*, Summer 2023, pp. 26-28

Kent, A.J. and Vujakovic, P. (2009) 'Stylistic diversity in European state 1:50000 topographic maps', *The Cartographic Journal*, 46(3), pp. 179–213 DOI: 10.1179/000870409X12488753453453

Kent, A.J. and Vujakovic, P. (2011) 'Cartographic Language: Towards a New Paradigm for Understanding Stylistic Diversity in Topographic Maps', *The Cartographic Journal,* 48(1), pp. 21-40, DOI: 10.1179/1743277411Y.0000000004

Kitchin, R.M, (1994) 'Cognitive Maps: What are they and why study them?', *Journal of Environmental Psychology*, 19(1) pp. 1-19

Kitchin, R. (2008) 'The Practices of Mapping', *Cartographica*, 43(3) pp. 211-215

Kitchin, R. (2010) 'Post-representational cartography', *lo Squaderno*, 15. pp. 7-12

Kitchin, R. and Dodge, M. (2007) 'Rethinking maps', *Progress in Human Geography*, 31(3) pp. 331–344. https://doi.org/10.1177/0309132507077082

Kitchin, R., Dodge, M. and Perkins, C. (2011) 'Introductory Essay: Conceptualising Mapping' in Dodge, M., Kitchin, R. and Perkins, C. (eds.) *The Map Reader.* Chichester: John Wiley and Sons, pp. 2-7

Koláčný, A. (1968) 'Cartographic Information-a Fundamental Term in Modem Cartography', *The Cartographic Journal*, 6, pp. 47-49.

Koch, T. (2008) Review of *The Natures of Maps: Cartographic Constructions of the Natural World* by D. Wood and J. Fels in *Cartographic Perspectives*, 59, pp. 48-50

Kopper, C. M. (2009) 'The breakthrough of the package tour in Germany after 1945', *Journal of Tourism History*, 1(1), pp. 67-92, DOI: 10.1080/17551820902742798

Korpi J. and Ahonen-Rainio P. (2010) 'Cultural Constraints in the Design of Pictographic Symbols', *The Cartographic Journal*, 47(4), pp. 351-359

Korpi, J. and Ahonen-Rainio, P. (2013) 'Clutter reduction methods for point symbols in map mashups', *The Cartographic Journal*, 50(3), pp. 257–265

Lanng, D.B. and Jensen, O.B. (2016) 'Linking Wayfinding and Wayfaring', in Hunter R., Anderson L., Belza B. (eds,) *Community Wayfinding: Pathways to Understanding*. Cham, Switzerland: Springer

Lepage, J-F., Langlois, S. and Turcotte, M., 2019, 'Evolution of the language situation in Nunavut, 2001 to 2016', *Statistics Canada Ethnicity, Language and Immigration Thematic Series*, https://www150.statcan.gc.ca/n1/pub/89-657-x/89-657-x2019010-eng.htm Accessed 20 March 2023

Library of Congress (2020) MARC 21 Format for Bibliographic Data (1999 revised to Update 30, May 2020) https://www.loc.gov/marc/bibliographic/, accessed 7 July 2020

Lierz, W., 1990, 'Von der Velokarte zur Autokarte', *Cartographica Helvetica*, 1990(I) pp. 32-36, http://doi.org/10.5169/seals-1130

Lloyd, R. (2000) 'Understanding and Learning Maps', in Kitchin, R. and Freundschuh, S. (eds.) *Cognitive Mapping, Past, Present and Future*. London: Routledge pp. 84-107

MacEachren, A.M. (1995) *How Maps Work: Representation, Visualization and Design.* New York. NY: The Guilford Press

MacGillavry, E. (2003) 'Collaborative mapping: By the people, For the people', *Bulletin of the Society of Cartographers,* 37(1)

MacLaggan, H.S. (1953/2002) *Shell Marketer* (reproduced in *The Legend* 19, p. 7)

Medynska-Gulij, B. (2003) 'The Effect of Cartographic Content on Tourist Map Users', *Cartography*, 32(2), pp. 49-54, DOI: 10.1080/00690805.2003.9714252

Meltzer, E. (2002) 'Performing Place: A Hyperbolic Drugstore in Wall, South Dakota', in Coleman, S. and Crang, M., *Tourism: Between Place and Performance.* New York, NY: Berghahn Books, pp. 160-175

Mocnik F.B. and Fairbairn D. (2018) 'Maps telling stories?', *The Cartographic Journal* 55(1) pp. 36–57

Monopolies Commission, The (1965) *PETROL: A Report on the Supply to Retailers in the United Kingdom.* London: Her Majesty's Stationery Office

Mobil (1962) *Proof of Economy 1962 International Mobil Economy Run*, [Leaflet]

Monmonier, M. (1996) *How to Lie with Maps*, 2nd edn. Chicago, IL: University of Chicago Press

Monmonier, M. (2000) 'Map-reading' In Johnston, R.J., Gregory, D., Pratt, G. and Watts, M., *The Dictionary of Human Geography*, 4th edn. Oxford: Blackwell Publishers pp. 475-6

Monmonier, M. (2016) 'A Critique of "Critical Cartography"', rejected essay for *Cartographic Grounds*, uploaded by the author to ResearchGate (also available on academic.edu)

Morrison, J.L. (1976) 'The Science of Cartography and its Essential Processes', *International Yearbook of Cartography*, XVI

Motor Cycle, The (1952) '*Have you seen the new Esso Road Maps*' advert in *The Motor Cycle,* 14 February 1952, p. 12

Motor Cycling (1955) '*Going Anywhere? These new maps will show you the way*' advert in *Motor Cycling,* July 28 1955, p. 12

Moule, T. (1836/1990) *England's Topographer or Moule's English Counties*, Geo Virtue, London (facsimile edition with text taken from Barclay's Complete and Universal English Dictionary, 1842) In *The County Maps of Old England*. London: Studio Editions

Muehlenhaus, I. (2012) 'If Looks Could Kill: The Impact of Different Rhetorical Styles on Persuasive Geocommunication', *The Cartographic Journal*, 49:4, 361-375, DOI: 10.1179/1743277412Y.0000000032

Mulazimoglu, E. & Basaraner, M. (2019) 'User-centered design and evaluation of multimodal tourist maps', I*nternational Journal of Engineering and Geosciences* DOI:10.26833/ijeg.535630.

Mummidi, L.N. and Krumm, J. GeoJournal (2008) 72: 215. https://doi.org/10.1007/s10708-008-9181-5

Murray, J.S. (2006) *Terra Nostra: The Stories Behind Canada's Maps*. Georgetown ON: McGill University Press, p. 182

Newberry (2020) *Core collections: Maps, Travel, and Exploration*, Chicago: The Newberry Library, https://www.newberry.org/maps-travel-and-exploration accessed 6 July 2020

Nicholson, N. (1988) *The Counties of Britain: A Tudor Atlas by John Speed.* London: Pavilion Michael Joseph

Nicholson, T. (2004) 'Cycling and Motoring Maps in Western Europe 1885–1960', *The Cartographic Journal*, 41(3), pp. 181-215

Nicholson, T. (2008) 'Road Maps and Advertising in Britain 1860–1940', *The Cartographic Journal*, 45(1), pp. 43-61

Norris, C. (1987) *Derrida*. Cambridge, Mass.: Harvard University Press

NPN (1971) 'Branded Retail Outlets in the United States', *National Petroleum News Factbook*, pp. 62-65 'Large Company Branded Outlets' pp. 86-87

Odell, P. (1975) *Oil and World Power.* 4th edn. London: Penguin Books

Oliver, R. (2022) 'Milestones and other distance markers and the Ordnance Survey', *Sheetlines*, 124 pp. 17-28

Olson, E.C. and Whitmarsh, A. (1944) *Foreign Maps.* New York, NY: Harper & Brothers

Ordnance Survey (1947) *A description of Ordnance Survey Small Scale Maps*, Chessington, Surrey: Director General at the Ordnance Survey Office

Ordnance Survey (2020) '*Ordnance Survey Ontologies*', http://data.ordnancesurvey.co.uk/ontology accessed 6 July 2020

Ory, J., Christophe, S., Fabrikant, S.I. and Bucher, B. (2015) 'How Do Map Readers Recognize a Topographic Mapping Style?', *The Cartographic Journal*, 52(2), pp. 193-203

Oxford (1976) *The Concise Oxford Dictionary.* 6th edn. London: Oxford University Press

Oxford (1989) *Oxford English Dictionary*, second edn. online edition https://www.oed.com/oed2/00207555 accessed 21 September 2021

Oxford (2023a) "Downstream, *Adv.*, Sense 2.a." *Oxford English Dictionary*, Oxford UP, July 2023, https://doi.org/10.1093/OED/6384819038

Oxford (2023b) "Solus, Adj., Sense 3.b." Oxford English Dictionary, Oxford UP, July 2023, https://doi.org/10.1093/OED/3970496981

Parker, M. (2013) *Mapping the Roads*, Basingstoke, Hants: AA Publishing

Parry, R.B. (2002) 'Cartography for the "new" cyclist', *Mercator's World*, 7(4) pp. 18-20

Perkins, C. (2004) 'Cartography - cultures of mapping: power in practice', *Progress in Human Geography* 28(3), pp. 381 -391

Perkins, C., Kitchin, R. and Dodge, M. (2011) 'Introductory Essay: Cognition and the Cultures of Mapping', *The Map Reader.* Chichester: John Wiley and Sons, pp. 298-301

Petchenik, B.B. (1983) 'A map-maker's perspective on map design research 1950-80' In Taylor D.R.F. (Ed) *Progress in Contemporary cartography Vol. 2*. New York: Wiley

Petchenik, B.B. (1985) 'Maps, Markets and Money', *Cartographica*, 22(3)

Peterson, M.P. (1987) 'The mental image in cartographic communication', *Cartographic Journal*, 24(1) pp. 35-41

Peterson, M.P., Gartner, G. and Fairbairn, D. (2023) 'Affordances and Models of Cartographic Communication', *Abstracts of the International Cartographic Association*, 6, 198,

Phaidon (2015) *Map: Exploring the World*. London: Phaidon Press

Phasuk, S. and Stott, P. (2004) *Royal Siamese Maps: War and trade in Nineteenth Century Thailand*. Bangkok: River Books

Pickles, J. (2004) *A history of spaces: cartographic reason, mapping and the geo-coded world*. London: Routledge

Plaiss, A. (2012) 'Who gets to draw the map? The contentious creation of the American road/map system', 1917–1926, *History and Technology*, 28(1), pp. 3-24, DOI: 10.1080/07341512.2012.662330

Postnikov, A.V. (2002) 'Maps for Ordinary Consumers versus Maps for the Military: Double Standards of Map Accuracy in Soviet Cartography, 1917-1991', *Cartography and Geographic Information Science* 29(3), pp. 243-260

Potié, Q., Mackaness, W. and Touya, G. (2022). 'When is a Ring Road a "Ring Road"? A Brief Perceptual Study' *AGILE: GIScience Series*. 3. 1-7. DOI: 10.5194/agile-giss-3-54-2022

Revell, P. (2005). 'Seeing the wood from the trees: generalising OS Mastermap® tree coverage polygons to woodland at 1 : 50 000 scale', in *8th ICA Workshop on Generalization and Multiple Representation, A Coruña, July 7–8, 2005*, https://generalisation.icaci.org/prevevents/75-workshop-2005-paper.html (accessed 7 June 2024)

Revelle, R. (1965) 'Appendix Y4: Atmospheric Carbon Dioxide', *Restoring the Quality of our Environment*, pp. 112-132, President's Science Advisory Committee, Washington

Ristow, W. W., and Bahn, C. I. (1964) 'Maps', *The Quarterly Journal of the Library of Congress*, 21(4), pp. 270–284. http://www.jstor.org/stable/29781140

Ritson, N., Byrne, I.W. and Cohen, D. (2018) 'UK petrol retailing: competitive rivalry and the decline of the oil majors in the twentieth century', in Craig, J., Gerali, F., Macaulay, F. & Sorkhabi, R. (eds) *History of the European Oil and Gas Industry*, Geological Society, London, Special Publications, 465

Robinson, A.C., Roth, R.E, and MacEachren, A.M. (2011) 'Understanding User Needs for Map Symbol Standards in Emergency Management', *Journal of Homeland Security and Emergency Management*, DOI: 10.2202/1547-7355.1811

Robinson, A.H. (1952) *The Look of Maps: An Examination of Cartographic Design*, Madison WI: University of Wisconsin Press

Robinson, A. H., Sale, R. D. and Morrison, J. L. (1953/1978) *Elements of Cartography.* 4th edn. New York: Wiley

Robinson, A.H. and Petchenik, B.B. (1975) 'The Map as a Communication System', *The Cartographic Journal*, 12(1), pp. 7-15

Robinson, A.H. and Petchenik, B.B. (1976) *The Nature of Maps: Essays Toward Understanding Maps and Mapping*. Chicago: University of Chicago Press

Rossetto, T. (2012) 'Embodying the Map: Tourism Practices in Berlin', *Tourist Studies*, 12(1) pp. 28-51 DOI: 10.1177/1468797612444192

Roth R.E., Finch, B.G., Blanford, J.I., Klippel, A., Robinson, A.C. and MacEachren, A.M. (2011) 'Card Sorting For Cartographic Research and Practice', *Cartography and Geographic Information Science*, 38(2), pp. 89-99, DOI: 10.1559/1523040638289

Sampson, A. (1975) *The Seven Sisters: the Great Oil Companies and the world they made*. London: Hodder and Stoughton

Sedighi, M. and Bader A. (2019) 'Framing a new discourse on petromodernity: the global petroleumscape and petroleum modernism', *Planning Perspectives*, 34(2), pp. 345-353, DOI: 10.1080/02665433.2018.1561323

Semmens, Kristin (2005) *Seeing Hitler's Germany: Tourism in the Third Reich*. London: Palgrave Macmillan/Springer

Shell and BP Service (c1954) *All about…Shell and BP Road Maps*

Sheppard D. and Adams J. M. (1971) 'A Survey of Drivers' Opinions on Maps for Route Finding', *The Cartographic Journal*, 8(2), pp. 105-114

Skiles, M.D. and Howarth, J.T. (2012) 'From Signs to Minds: Spatial information Design and Mental maps', *The Cartographic Journal*, 49(4), pp. 312-325

Smollar, D. (2014) 'World War II Map Censorship', *The Legend*, 63, pp. 1-6

Smollar, D. (2015) 'The Way WWII Map Censorship Took Place', *The Legend,* 67, pp. 1-8

Spaid, G. (2016a) 'Ohio Petroleum Marketers Association Maps, 1927-1930', *The Legend*, 69, pp6-7

Spaid, G. (2016b) 'SIGMA Maps of 1967 to 1971', *The Legend*, 71, pp. 1-4

Spaid, G. (2022) 'Generic Map Covers by Rand McNally', *The Legend*, 91 pp. 7-8

Stanford (1949) 'Board Meeting September 21st 1948', *Minute Book 1,* pp. 278-80, Edward Stanford Limited Archive (unpublished)

Stanford (1952) 'Directors' Report 1951/2', Edward Stanford Limited Archive (unpublished)

Stanford (1959) 'Board Meeting 7 July 1958', *Minute Book 2,* p. 207, Edward Stanford Limited Archive (unpublished)

Statistics South Africa (2012) *Census 2011: Census in brief*, Table 2.6, p. 25, Pretoria

Stickler, P.J. (1990) 'Invisible Towns: A Case Study in the Cartography of South Africa', *Geojournal*, 22(3), pp. 329-33

Swift, E. (2011) *The Big Roads: the untold story of the engineers, visionaries, and trailblazers who created the American superhighways.* New York, NY: Houghton Mifflin Harcourt

Supran, G., Rahmstorf, S. and Oreskes, N. (2023) 'Assessing ExxonMobil's global warming projections'. *Science* 379:6628 eabk0063 DOI:10.1126/science.abk0063

Taylor, D.R.F. (1997) 'Maps and Mapping in the Information Era' in Ottoson, l. (ed.) *Proceedings of the 18th International Cartographic Conference (ICC 97)*, Vol 1: 1-10, Gävle: Swedish Cartographic Society

Taylor, D.R.F. & Pyne, S. (2010) 'The history and development of the theory and practice of cybercartography', *International Journal of Digital Earth*, 3:1, 2-15, DOI: 10.1080/17538940903155119

Taylor, M., 2015, 'The People's Game and the People's War: Football, Class and Nation in Wartime Britain, 1939-1945', *Historical Social Research/Historische Sozialforschung* 40(4) pp. 270-297 https://doi.org/10.12759/hsr.40.2015.4.270-297

Tolman, E.C. (1948) 'Cognitive maps in rats and men', *Psychological Review* 55(4) pp. 189-208

Touya, G., Hoarau, C. and Christophe, S. (2016) 'Clutter and Map Legibility in Automated Cartography: A Research Agenda', *Cartographica* 51(4) pp. 198–207

Tugendhat, C. (1967) *OIL The Biggest Business*. London: Eyre and Spottiswoode

UN (1949/1964) *Protocol on Road Signs and Signals*, Geneva: United Nations Conference on Motor Transport,

Urry, J. (1990) The `Consumption' of Tourism. *Sociology*, *24*(1) pp. 23–35. https://doi.org/10.1177/0038038590024001004

Urry, J. and Larsen, J. (2011) *The Tourist Gaze 3.0* London: SAGE Publications Ltd

Viña, G.A. and Ferrara P. (2019) 'Yacimientos Petrolíferos Fiscales (YPF): History and legacy', *Journal of Public Affairs*, 19, p. 1906. https://doi.org/10.1002/pa.1906

Voisin, R.L. (1968) 'Notes concerning visit to Rolph-Clark-Stone, Toronto, January 25 and 26', unpublished, in Newberry Library, Rand McNally Archive Wing MMS Series 7, Box 1, File 1

Vujakovic, P. (2018) 'Cartography and the news' in Kent, A.J. and Vujakovic, P. (eds.) *The Routledge Handbook of Mapping and Cartography*, Abingdon, Oxon: Routledge, pp. 465-468

Wabiński, J., Mościcka, A. and Kuźma, M. (2021) 'The Information Value of Tactile Maps: A Comparison of Maps Printed with the Use of Different Techniques, *The Cartographic Journal*, 58(2), pp. 123-134

Warboys, W. et al (1963) *Report of the Traffic Signs Committee*, London: Her Majesty's Stationery Office

Wheeler, R.C. (2013) 'The depiction of RAF stations on the Provisional (National Grid) six-inch', *Sheetlines*, 97, pp. 46-47

Wigmore, A. (1956) 'Two leading Staffordshire Dealers', *Esso Dealer*, 5(2), p. 8

Wimer, W. (2010) 'Generic Maps', *The Legend*, 46 pp. 3-5

Wood, D. (1993) *The Power of Maps*. New York: The Guilford Press

Wood, D. (2010) *Rethinking the Power of Maps*. New York: The Guilford Press

Wood, D. (2019) 'Maps/Language' in S. D. Brunn, R. Kehrein (eds.) *Handbook of the Changing World Language Map*. Springer Nature Switzerland, https://doi.org/10.1007/978-3-319-73400-2_109-1

Wood, D. and Fels, J. (1986/2011) 'Designs on Signs/Myth and Meaning in Maps', in Dodge, M., Kitchin, R. and Perkins, C. (eds.) *The Map Reader.* Chichester: John Wiley and Sons, pp. 48-55

Wood, D. and Fels, J. (2008) *The Natures of Maps: Cartographic Constructions of the Natural World.* Chicago: University of Chicago Press

Woodward, D. (1987), (Introduction to) *Art and Cartography: Six Historical Essays (The Kenneth Nebenzahl Jr. Lectures in the History of Cartography).* Chicago: University of Chicago Press

Wright, J. K. (1942/1966) 'Map Makers are Human: Comments on the Subjective in Maps', reprinted in *Human Nature in Geography*. Cambridge, MA: Harvard University Press pp. 33-52

Wu, M. and Qiao, L (2022) 'Designing Metaphorical Multivariate Symbols to Optimize Dockless Bike Sharing', *Cartographic Journal* 59(3) pp. 220-238

Wyckoff, W. (2016) 'Cartography and capitalism: George Clason and the mapping of western American development, 1903-1931' *Journal of Historical Geography,* 52, pp. 48-60

Yan, L. and Lee, M.Y. (2015) 'Are tourists satisfied with the map at hand?', *Current Issues in Tourism*, 18(11) pp. 1048-1058, DOI: 10.1080/13683500.2014.959904

Yemitan, R.A. (2017) 'UN Mapped UN Civilised', Poster on UCL London website https://www.ucl.ac.uk/teaching-learning/sites/teaching_learning/files/rachel_yemitan_poster.pdf (accessed 27/12/2021)

Yorke, D.A., Margolies, J. and Baker, E. (1996) *Hitting the Road – the Art of the American Road Map*. San Francisco, CA: Chronicle Books

Yorke, D.A. and Margolies, J. (2000) 'Hitting the Road: Road Maps From the Map Collection of Yale University Library', https://www.library.yale.edu/MapColl/oldsite/map/road.html, Accessed 26 September 2019

Zhang, Z., Liang, Z. and Bao, J. (2021) 'From theme park to cultural tourism town: Disneyization turning of tourism space in China' *Regional Sustainability* 2:2 pp. 156-163 https://doi.org/10.1016/j.regsus.2021.05.003

Map references

These are listed in tabular form in Appendix 2 and Table 9 in Appendix 4.

List of websites

Byrne, I.W. (2020) *PetrolMaps: Mapping the history of oil company road maps in Europe*, http://www.petrolmaps.co.uk/ accessed 16 July 2023

Ethos (2020) *British Library e-theses online service*, https://ethos.bl.uk/ accessed 19 June 2020

Ritz, M. (2023) *Landkartenarchiv DE*, https://www.landkartenarchiv.de/, accessed 16 July 2023

RMCA (2023) *Road Map Collectors Association* https://roadmaps.org/, accessed 16 July 2023

RMCA (2014) *Petroleum Map Catalog – Exxon*, https://roadmaps.org/catalog/exxon/#imperial, accessed 20 November 2019

Sveum, T, (2023) *Locations on Non-oil maps*, https://roadmaps.org/locations-on-non-oil-maps/ accessed 26 June 2024