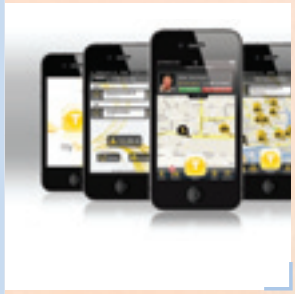

TAXI TECHNOLOGY Europe

The comprehensive guide to specialist solutions, equipment and technology in Europe's taxicab sector

VOLUME 1:
Products, technologies, legislation, national profiles and market forecasts

VOLUME 2:
Profiles of Europe's largest and most innovative manufacturers

Limatel

An Outline Of This Report

This report provides a comprehensive explanation of the European market for cab-equipment. It consists of two volumes. Volume 1 contains a study of the market in terms of products and technologies, legislation, market value and regional variations. Volume 2 provides profiles of over fifty producers of cab-equipment for the European market.

Volume 1 begins with an overview of the European market for taxicab equipment. This serves to set the in-depth analysis that follows in context. The research undertaken for this report suggests that the European market for the sale, licensing, and maintenance of equipment and related services was worth an estimated €620M in 2010. This value is based on the price paid by end-users (such as drivers or taxi organisations) and is exclusive of Value Added Tax. It is important to note that many manufacturers do not sell directly to end-users, and much of the market-value is won by installers, systems integrators and local agents.

The market has been analysed in six segments. The information in Chapters 2 to 7 explains and analyses each of these segments and forms the basis of the market forecasts that are provided.

Chapter 2 examines the market for **taximeters** – one of the most familiar items found in Europe's taxicabs. It explains the key technical and functional characteristics of meters and how these are used in different jurisdictions. It also explains the Measuring Instruments Directive (MID) which has been implemented across Europe, and the procedures that manufacturers must now follow to ensure acceptance of their meters on the market. It identifies the key drivers of taximeter sales and quantifies the market value for 2010, as well as providing 5 year forecasts until 2015.

Chapter 3 provides a full analysis of the use of **communication technologies** in the taxicab sector. The market for communication systems for cabs is currently undergoing a dramatic change. The position of well-established technologies is being partially usurped by the advent of public mobile networks and increasingly cheap smartphones that can function as MDTs. The Chapter begins with a comprehensive explanation of the wireless technologies used by vehicles to communicate with central dispatch offices: Professional Mobile Radio (PMR); Public Access Mobile Radio (PAMR) and Public Land Mobile Radio (the ubiquitous GSM-based mobile telephony system).

The key components of wireless systems are discussed as well as industry trends such as emerging new radio standards and the gradual migration from analogue to digital PMR.

Chapter 3 compares the merits of the competing technologies of PMR/PAMR with GSM, and shows why the latter is capturing a growing proportion of new vehicle installations. This is followed by an evaluation of the relative merits of using Mobile Data Terminals, versus Smartphones or Personal Digital Assistants (PDAs), as in-vehicle terminals for cabs.

Chapter 4 outlines the characteristics for **communications, dispatch and management systems** in Europe. Systems that cater for some or all of these activities now constitute one common segment of the market, as more and more systems are available that cater for all of these activities in one solution. Few vehicles now communicate solely with a dispatch operator by voice. Instead, they use data transmission and are integrated with sophisticated back office systems that facilitate a range of functionality. This chapter explains the key functionality of these systems including automatic vehicle location (AVL) using GPS; data dispatch; customer ordering by telephone operator, text, web and Interactive Voice Response (IVR); report generation and billing. The chapter concludes by quantifying the existing scale of the market for such systems, and providing five year forecasts.

Chapter 5 provides a full description of the use of **cashless payments in cabs**. In Europe, the cab sector is a laggard in the adoption of payment cards and other forms of electronic payment for taxi trips. However, there are exceptions, particularly in some large cities. Furthermore, the evidence from North America and the Far East is that cashless payments in taxis are destined to become more common.

Chapter 5 begins by explaining the general payment card market in Europe, in terms of the penetration rates of both payment cards and Point Of Sale (POS) Terminals in various countries as well as the adoption of mobile payments. This is followed by an analysis of credit card processing in taxis. It shows how the deployment of Chip & PIN verification is rising, but that offline processing remains most common. The chapter also provides an existing and forecast expenditure on card processing equipment that shows it to be modest; however, as discussed by citing real examples in the relevant section, this masks the very large returns that can be made from card surcharges and transaction fees by the players involved.

In addition to the core pieces of equipment found in cabs, there are a number of **peripheral devices** that constitute a valuable if highly fragmented market. These include roofsigns, security systems and digital screen applications. These are profiled in chapter 6. The chapter also provides individual estimates and five year forecasts for the various strands of peripheral devices in the European market.

Roofsigns are compulsory in almost all markets and are used by taxi regulators in increasingly sophisticated ways. In some cities such devices are often linked to the taximeter to signal not only the occupancy status of the vehicle but also the fare that is being applied by the meter, and the installation of such a device can cost up to €800.

Security systems in cabs are also a growing sector, in part due to the subsidies towards the purchase of such systems in some regions, and the fact that they are now compulsory in other countries.

The advertising revenues earned by cab firms through displays on vehicle panels is not a topic included in this report, since it does not generally involve expenditure on technology. However, it is relevant in so far as it overlaps with the still embryonic deployment of **digital screens** in taxis for the purposes of advertising, entertainment and even payment card processing in cabs. A discussion of the relevant deployments of such devices in Europe is included.

Public transport regulators, tax authorities and enforcement bodies are now aware of the ability of new technology to automatically monitor the activities of taxicab drivers. Chapter 7 provides detailed analysis of the use of **specialised equipment** for such purposes in Europe. This chapter shows how different equipment is used to limit the hours worked, to ensure compliance with licensed shifts, to monitor fiscal record keeping and to automatically record details including the origin and destination of each journey.

Chapters 2 through to 7 outline the key segments of the cab equipment market, and provide market valuations and forecasts for each. Chapter 8 of Volume 1 presents **separate profiles for Europe's fifteen most advanced or most valuable national markets:** Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Poland, Spain, Sweden, the United Kingdom and Norway. Each profile provides an explanation of the regulatory environment including the number and types of small public service vehicles, and the quotas on vehicle and driver numbers. The largest dispatch operators in each country are identified, and an estimate of the proportion of the national fleet that is affiliated to a dispatch centre is provided. The manufacturers of the most popular equipment found in the market are listed, and any obligatory equipment is outlined. A separate forecast of the annual expenditure by end users on taxicab solutions, from 2010 to 2015, is provided for each country. Chapter 9 summarises the findings of the report and draws a number of conclusions.

Volume 2 **provides detailed profiles of over fifty of Europe's largest and most innovative manufacturers** of equipment for small public service vehicles (SPSVs). Some are enterprises such as taximeter manufacturers dedicated solely to the SPSV sector, while others are producers of more general equipment such as radios or card payment systems that enjoy significant popularity in taxicabs. Many also provide dispatch and fleet management systems. Volume 2 consolidates the information given on manufacturers in Volume 1 and also adds additional information on the activities of each company, its key products, and the markets that it serves. Relevant contact details are listed, so that readers can further investigate any specific technical or pricing queries that they may have.

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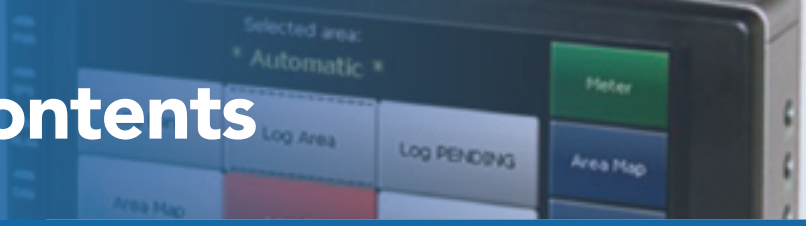
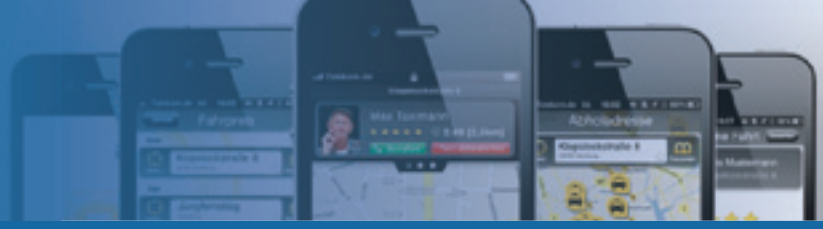


Vol. 2 - Contents



Volume 2 provides 110 pages of detailed profiles of over fifty of Europe's largest and most innovative manufacturers of equipment for taxicabs.

Some are leading pan-European specialists such ATA Gleike, DDS Wireless, Digitax, Heedfeld Elektronik, Kienzle Argo Taxi International and Taxitronic Intefacom. Others are general producers: these include radio equipment specialists such as Kenwood, Icom, and Motorola and cashless payment experts like Ingenico and Verifone. Many of those profiled are little known regional operators whose innovation has given them a leading position in a number of markets. They include manufacturers of on-board computerised solutions, fiscal meters, taxi queue detection systems, and cashless payment solutions as well as providers of dispatch and management systems that have been expertly tailored to local market-needs and languages.The profiles contain full contact details and product portfolios for all of those profiled, as well as additional information on key customers and markets.

Who should read this report?

- Regulators, licensing boards and supervisory authorities who wish to understand the governance of taxicabs in other jurisdictions, and how technology is used and mandated
- Equipment Manufacturers seeking competitive intelligence and emerging market opportunities
- Taxicab organisations undertaking large investment decisions
- Automotive manufacturers who serve the taxicab sector
- System integrators that are seeking to understand the myriad of technologies in use
- Distributors and installers that wish to identify opportunities to align with producers to address the taxicab market
- Mobile Network Operators and Professional Mobile Radio Specialists
- Telematics Providers
- Consultants and Industry Professionals that serve the Transportation Sector

What kind of questions can this report answer?

- In which European countries are the largest markets for cab equipment?
- Where can I find separate profiles of the regulatory and market conditions in individual countries?
- Which strands of equipment sales are most lucrative and which will show the greatest growth in the coming years?
- Who are the fifty most significant and innovative players in the manufacture of taxicab technology in Europe, and what are their principal markets and activities?
- What country will provide a once off boom in the sale of taximeters in the next three years?
- What opportunities in payment card processing exist within the cab industry?
- In which regions are all vehicles required to be affiliated to a central dispatch centre?
- How are the operators of Public Mobile Networks taking market share from Professional Mobile Radio?
- Can smart-phones really provide a satisfactory alternative to Mobile Radios and Data Terminals?
- What will be the implications of the European Union's Measuring Instruments Directive for the taximeter market?
- Where are third parties such as the police and taxi regulators using electronic equipment to automatically monitor driver activity?
- Which Finance Ministries are likely to be next to mandate fiscal functions in taximeters?
- Where are on-board computers currently required and where are large public subsidies being offered to install such equipment in vehicles?
- Who leads the way in the provision of automated parking and queue control systems for taxis at European airports?
- How are smartphone applications for passengers challenging the classic dispatch model?

About The Author

Raef Mac Giollarnáth is a Principal Consultant at Limatel He has provided research and consultancy services to clients in the public and private sectors since 2003. His work covers a broad range of transportation and telecoms activity. This includes working on major projects with public transport operators and regulatory authorities in the bus, rail and taxicab sectors.

Raef Mac Giollarnáth

Prior to working as a consultant, Raef held a number of senior roles in transport and technology companies. He was formerly the head of strategy for Eircom Enterprises, a division of Ireland's largest telco. Raef also previously worked as a Senior Engineer in the Planning and Projects Department of the CIÉ Group, Ireland's biggest transport operator. In that capacity he analysed the engineering and commercial feasibility of a varied range of proposals in the transportation sector; including bus, rail, and seaport projects.

Research & Acknowledgements

Research for this report was undertaken over the period March 2010 to June 2011. Information was obtained from a variety of published sources including websites; taxi and radio magazines; company annual reports and presentations; product brochures and technical manuals; studies undertaken by or on behalf of regulatory bodies; and the general business press.

In addition, interviews and correspondence were undertaken with over fifty key personnel working in the European taxicab sector.

These include taxi and private hire associations; technical experts and executives working for the manufacturers of taximeters, back office systems for dispatch centres, card payment terminals and radio systems; regulators in State and Municipal departments; executives in legal metrology authorities; and large equipment installers. The publisher wishes to acknowledge their assistance and enthusiasm for the project and to sincerely thank them for giving of their time and expertise. Much of the value of this report lies in the previously unavailable information that they provided.

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Limatel intends to regularly update and republish this report, in line with changes in the taxicab sector. It also offers consultancy services to the transportation sector. We welcome correspondence and queries from regulators, manufacturers, academics, taxicab organisations and other interested parties concerning any items of interest.

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