PTOLEMUS Consulting Group

Electronic Toll Collection Global Study 2015

Transforming road charging into a connected vehicle service

PTOLEMUS is the first strategy consulting firm focused on the connected vehicle and the Internet of Things

Our consulting services

Strategy definition
Vision creation, strategic positioning, business plan development, board coaching & support

Investment assistance
Strategic due diligence, market assessment, feasibility study, M&A, post-acquisition plan

Procurement strategy
Specification of requirements & tender documents, launch of tenders, supplier negotiation & selection

Innovation management
Value proposition definition, product & services development, architecture design, assistance to launch

Business development
Partnership strategies, detection of opportunities, ecosystem-building, response to tenders

Technology & project management
Deployment plans, complex / high risk project & programme management, risk analysis & mitigation strategy

Our fields of expertise

Car infotainment & navigation
Connected services (Traffic information, fuel prices, speed cameras, weather, parking, POIs, social networking), driver monitoring, maps, navigation, smartphone integration

Usage-based charging
Road charging / electronic tolling, PAYD / PHYD insurance, fleet leasing & rental, car sharing, Car As A Service, etc.

Telematics & Intelligent Transport Systems
ADAS, autonomous car, connected vehicle, fleet management, eCall, bCall, SVR, tracking, vehicle data analytics (OBD / CAN-bus), VRM, V2X, xFCD

Positioning / Location enablement

M2M & connectivity

We help all players in the mobility ecosystem

Telecom operators

vodafone, TIM, Telefónica, BASE freedom of speech, TELEKOM AUSTRIA GROUP, Sprint, telenet, Bouygues Telecom, verizon, kpn, SFR, SK telecom, orange

Mobile device & positioning suppliers

ANDREW, cnes, ERICSSON, deveryware, MOTOROLA, NORTEL NETWORKS, Navizon, rx networks, NOKIA Connecting People, SYSNAV Navigation Solutions, VIZIO, ThalesAlenia Space, TruePosition, TechnoCom

Automotive OEMs & suppliers

PSA PEUGEOT CITROËN, TOYOTA, Ford, MAGNETI MARELLI, HARMAN, SIERRA WIRELESS, DANLAW, Telit, QOROS, PHILIPS, intel, QUALCOMM, META SYSTEM, MICHELIN, Agero, Airbiquity

Telematics solution providers

HIMEX, cobra, ARKAN, drivefactor, Fleetmatics, OCTO, MOVELO, ORION, IMS, Lysanda, SafeFleet, LOJACK, DIRECTED, Quartix, wejo, s:mobil, Quindell, mobile devices, SISTEMA, Queclink

Insurers, aggregators & assistance providers

ADMIRAL, Aioi Nissay Dowa Insurance MS&AD INSURANCE GROUP, Allianz, AXA, Baloise Insurance, carrot, Co vea, Desjardins, europ assistance, GENERALI, The Hartford, HUK, INTER MUTUELLES ASSISTANCE, ИНГОССТРАХ Ingosstrakh, MENORA MIVTACHIM, MONDIAL ASSISTANCE, PROMUTUEL ASSURANCE, Liberty Mutual, MACIF, OUT SURANCE, RSA, SOMPO JAPAN, smile direct, telesure, TOKIO MARINE, youi, ZURICH

Content & application providers

ESRI, AAA, COYOTE, RoadPilot, LexisNexis, sas, ORACLE, CCC INFORMATION SERVICES INC., BMJ Group, commedi, TOMTOM, Google, tdf, here Maps for Life, Cognizant

ITS operators & regulators

AnsaldoSTS A Finmeccanica Company, ERTICO ITS Europe, egis, SOFICO, EUROPEAN COMMISSION, Nomad Digital

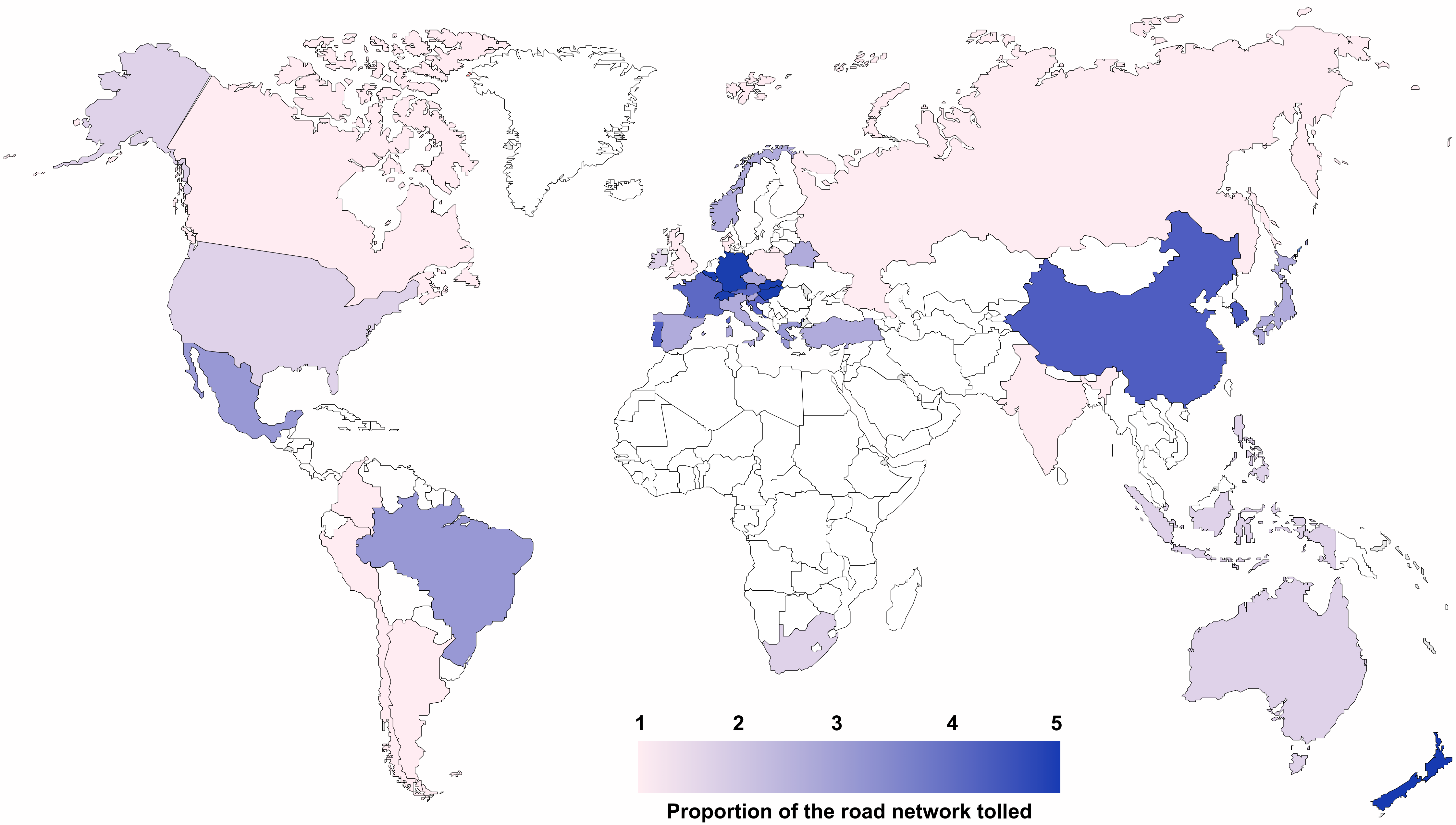
Fleets

ARVAL BNP PARIBAS GROUP, EUROMASTER, TOYOTA TSUSHO

Financiers

Amadeus Capital Partners Limited, INVESTCORP, Leonardo & Co., zouk, RENOVA GROUP, Goldman Sachs, NOMURA, Cinven, HUTTON COLLINS PARTNERS LLP, HELLMAN & FRIEDMAN, CVC Capital Partners, MONTEZEMOLO & PARTNERS, DISRUPTIVE CAPITAL FINANCE, INTEK GROUP

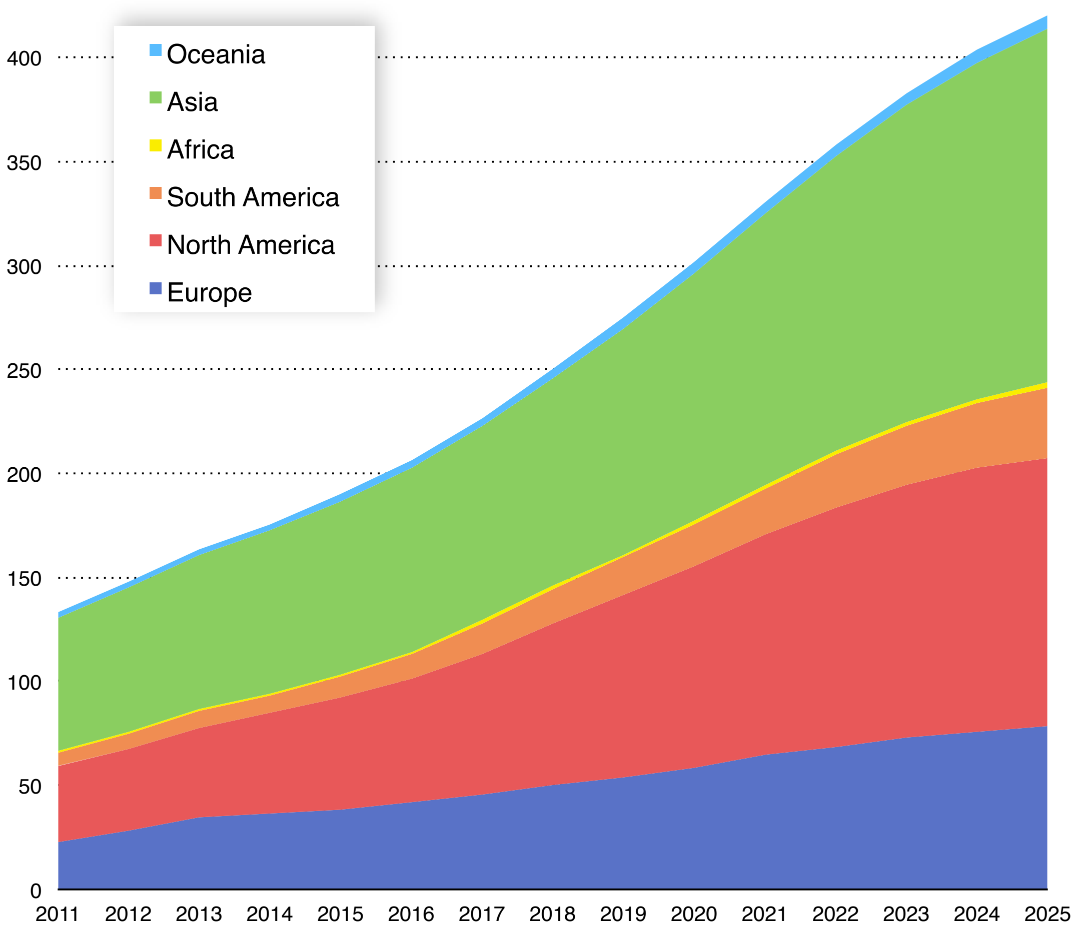
Road tolling is becoming global and progressing fast



Source: PTOLEMUS Consulting Group

Worldwide ETC subscriptions will reach 425 million vehicles in 2025, driven by North America, China and India

Cumulative number of ETC subscriptions worldwide (in millions)

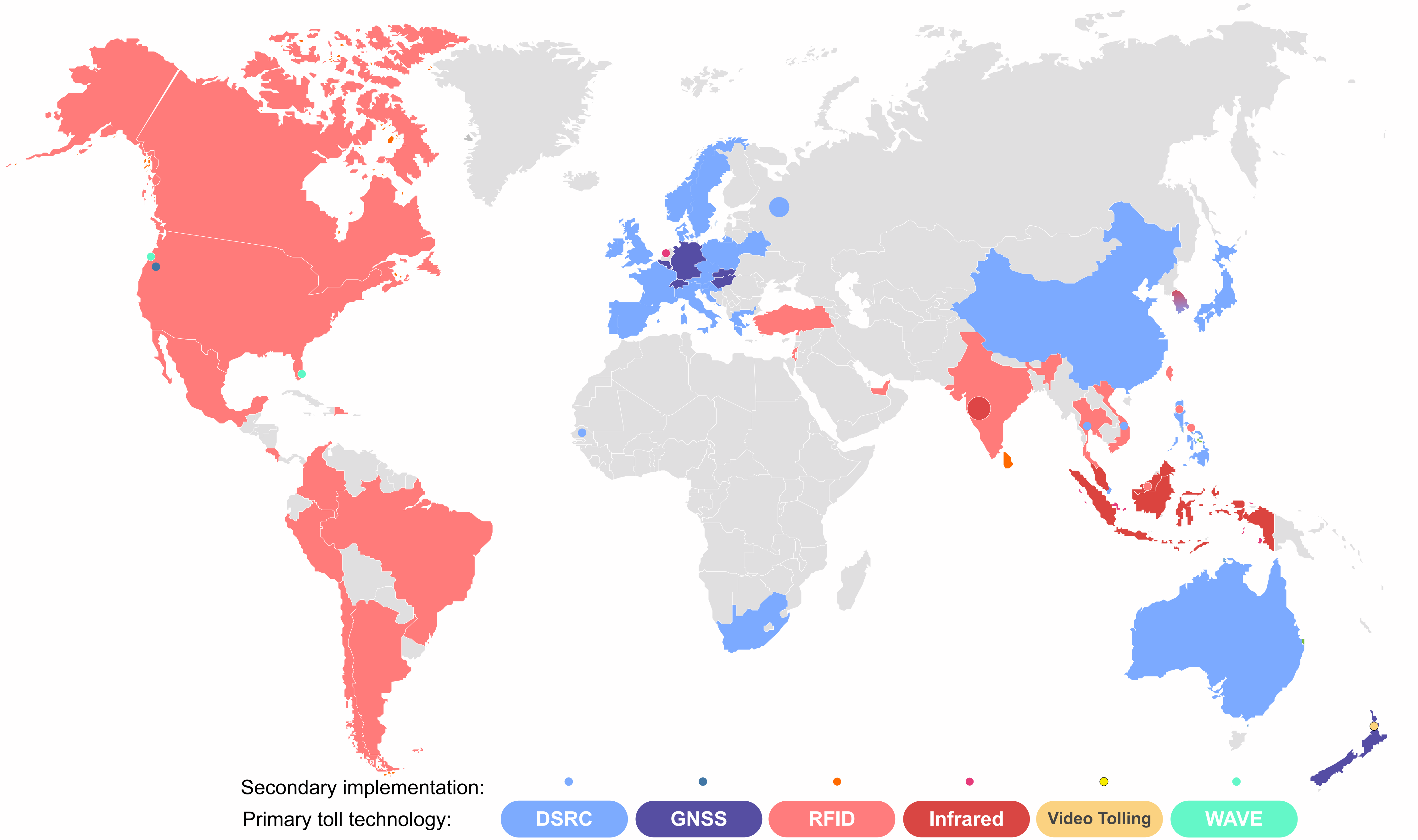


Key influencing factors

- **By 2025,** the global market will nearly double to **425 million subscriptions**
- **Global revenues are estimated to grow to €160 billion**
- The **bulk of the growth will come from North America and Asia**
    - The Interstate Highway System will become a tolled network
    - China, which has about 70% of the world's total length of tolled roads will move to ETC
    - ETC is also starting in India
- **In Europe,** the biggest markets are **Italy**, **Turkey**, **France** but **Russia** could become the largest market overnight

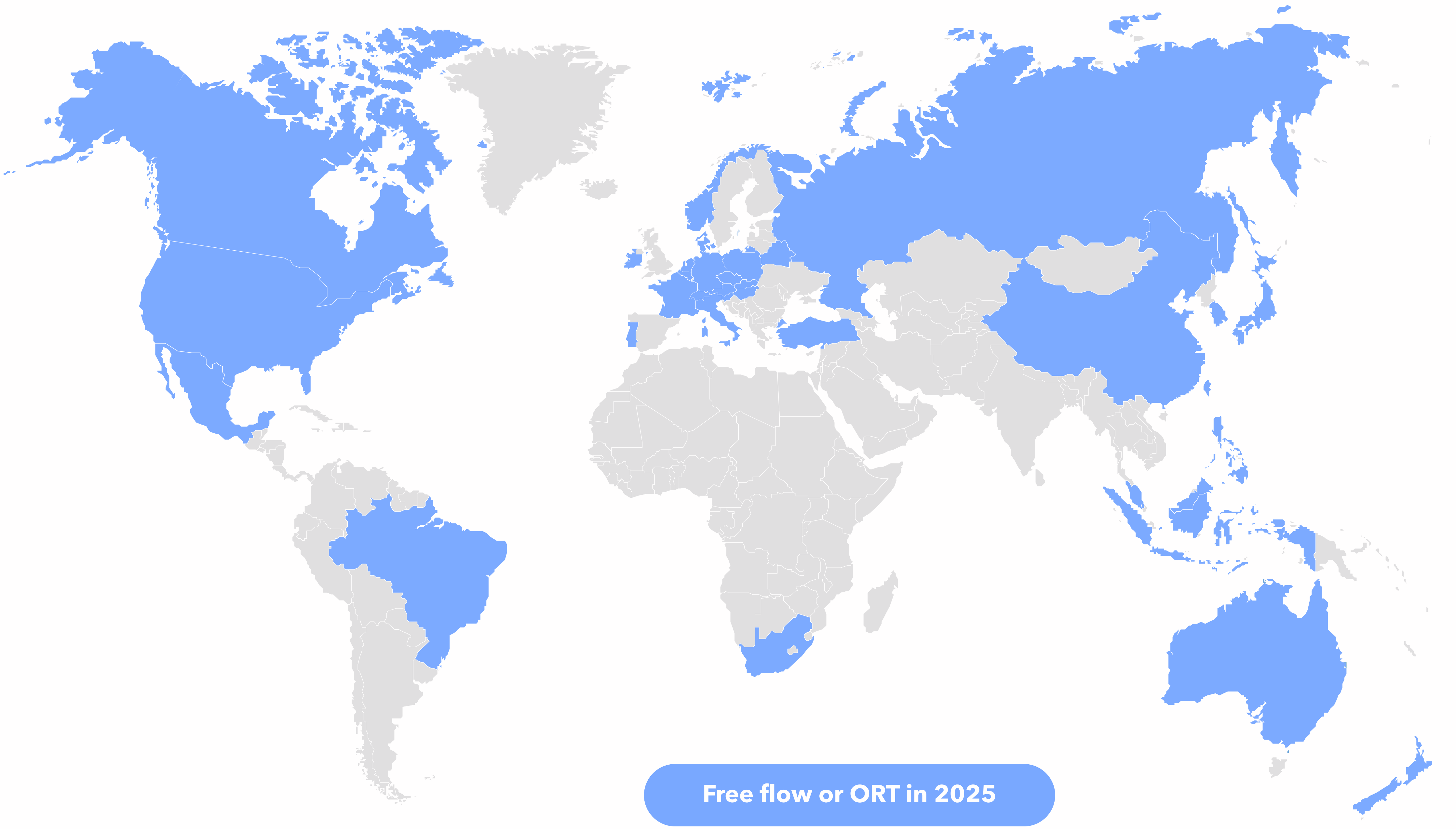
Source: PTOLEMUS market forecasts

The toll technology world is split into 2 camps



Source: PTOLEMUS. Note: Enforcement technologies not showed

Road charging will lose its physical barriers



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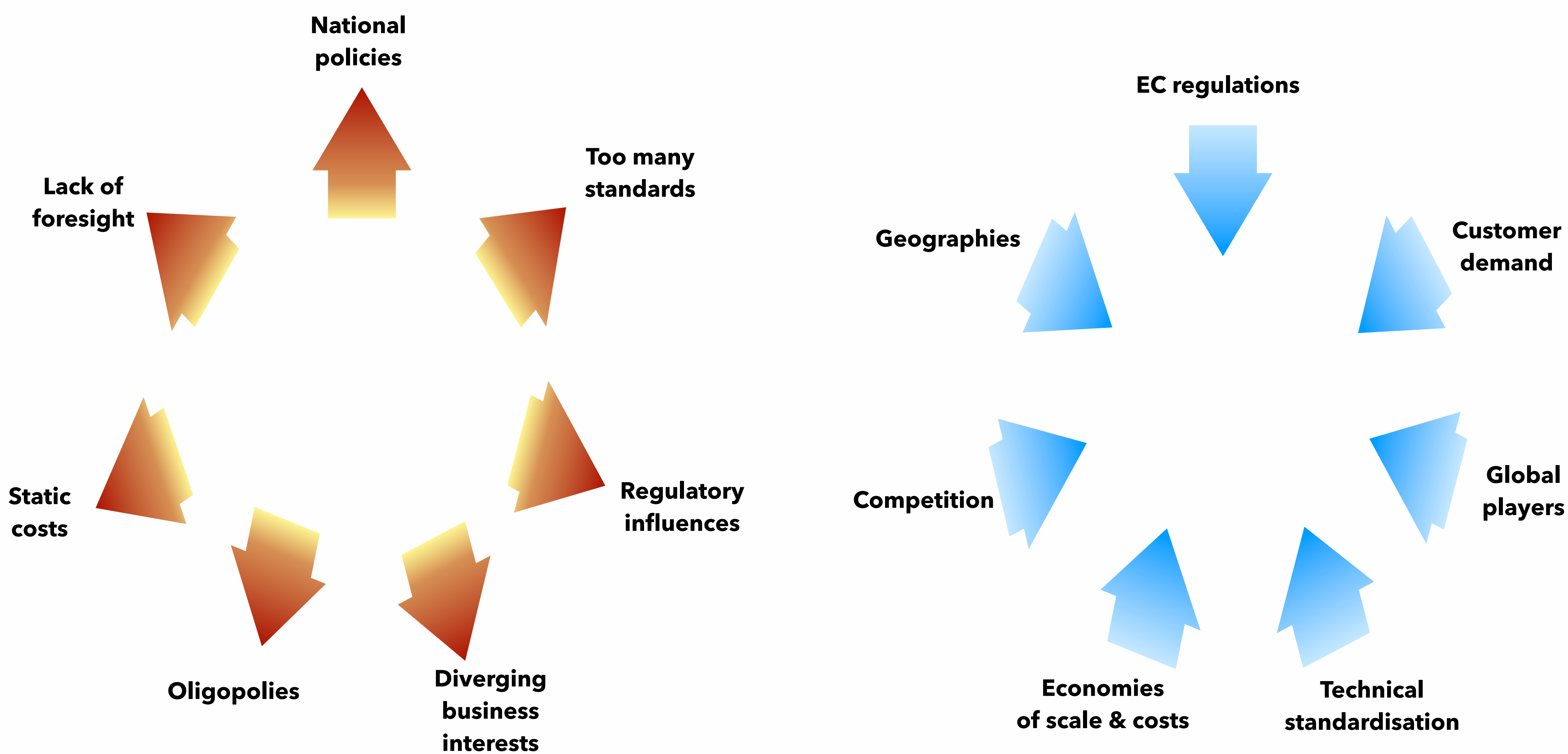
Source: PTOLEMUS Consulting Group - Note: ORT: Open Road Tolling, i.e. GNSS-enabled tolling systems

History progresses through contradictions

The drivers of tolling technologies' fragmentation and unification



Source: PTOLEMUS Consulting Group

The toll device of the future could take many faces

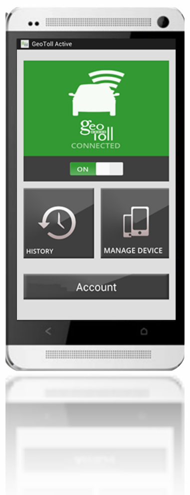
Digital tachograph

Telematics insurance device

eCall device

Dedicated tolling device

Smartphone



On-board computer

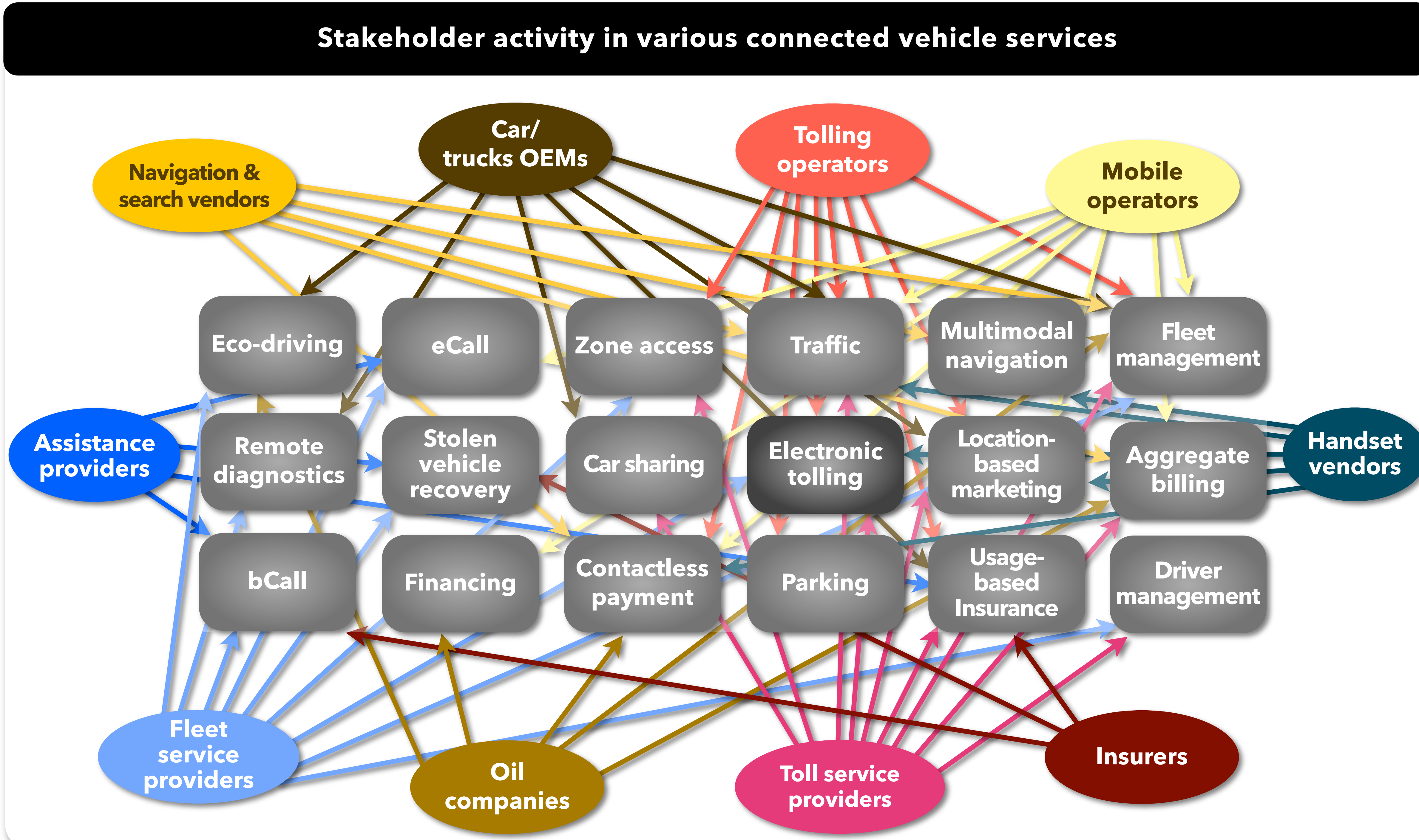
Fleet telematics black box

Source: PTOLEMUS Consulting Group

Five types of players could position as Toll Service Providers

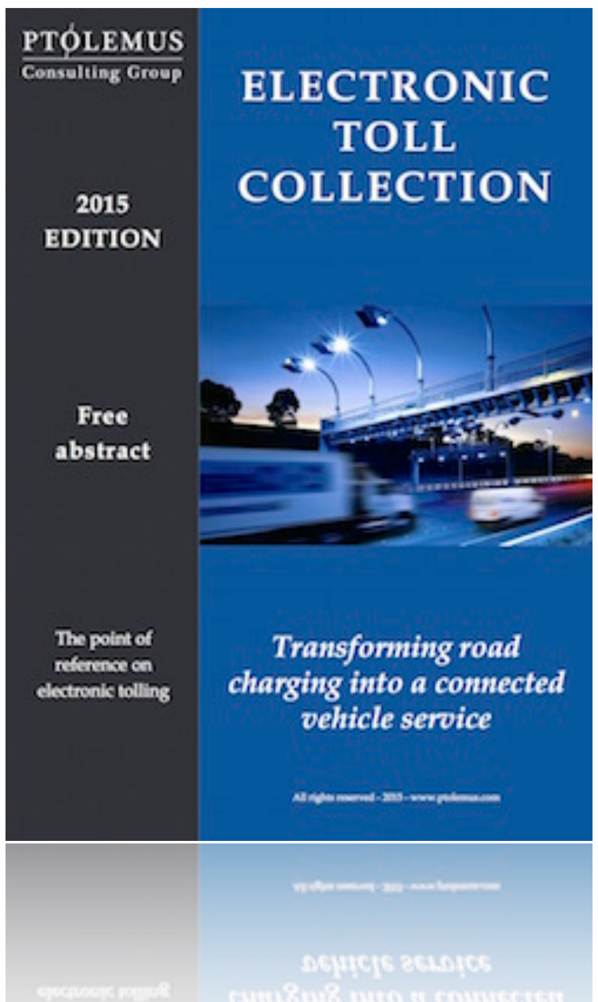
	TOLLING SPECIALISTS	ENERGY COMPANIES	FUEL CARD SPECIALISTS	FLEET MANAGEMENT PROVIDERS	ROAD OPERATORS
aetis members	LOGPAY Financial Services	OMV	DKV	Astrata	Brisa
	Axxès YOUR GATEWAY TO EASY TOLL	Shell	RESSA EUROPA	TOMTOM TELEMATICS	VINCI
	eurOTOLL	TOTAL	UTA	masternaut	cintra
	TELEPASS	TRAFINEO	eurowag payment solution on the road	vehco vehicle communications	kapsch >>>
Likely future EETS providers	AGES	eni		Transics	sanef
	ASFINAG				
	BRO-BIZZ				
	egis				

The competition for connected services will only accelerate



Source: PTOLEMUS Consulting Group

To identify the future opportunities in tolling, PTOLEMUS publishes the most comprehensive analysis of the market

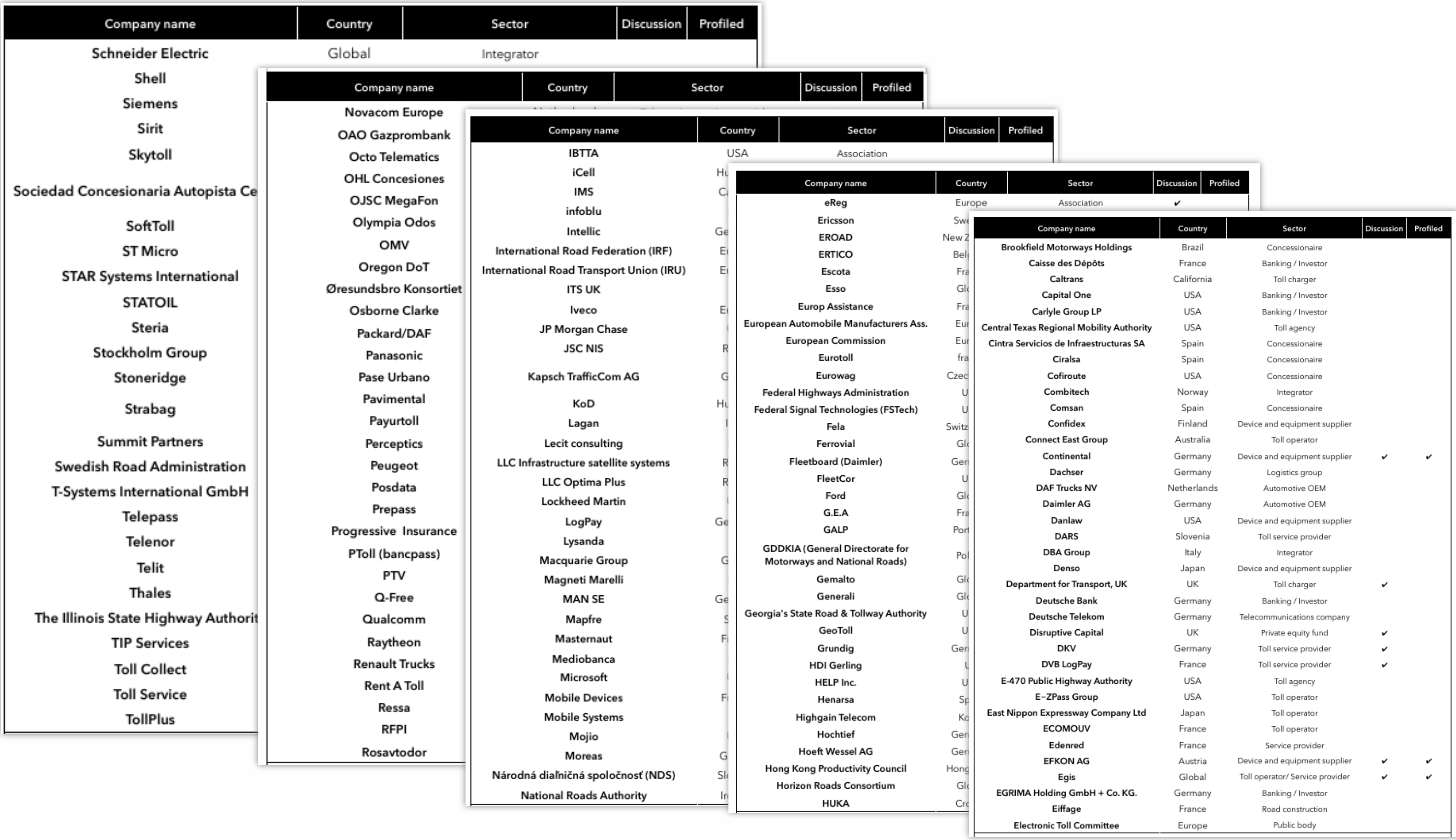


More than a report, a real strategic market analysis

- **650-page analysis of the global electronic tolling landscape based on:**
  - 120 interviews in 12 countries
  - 230 figures and charts
  - 3 years of hands-on experience advising key players in the ecosystem
- **A comparative assessment of all tolling technologies, models and trends**
  - ANPR, DSRC, Infrared, GNSS, RFID & WAVE technologies & business models compared
  - Evolution path from toll gates, ETC to MLFF
  - The new trends: big car data, mobile tolling, mobility pricing and sustainable mobility
- **An in-depth review of ETC markets worldwide**
  - 35 countries in Europe, America, Asia & Africa profiled and analysed
  - 14 case studies including ATI, AutoPass, BroBizz, Ecotaxe, e-way, Hu-Go, LKW Maut, PrePass, Via Verde, etc.
- **A decryption of regulatory evolutions**
  - Bill 810, eCall, EETS, ERA Glonass, REETS, Resolution 005 AGEPAR
  - 43 standards & all major patents listed: 6C, ARTEFATO, CEN, ETSI, ISO, etc.
- **A detailed analysis of all major players' strategies & solutions**
  - Their development strategies in the new value chain compared
  - 23 company profiles, from Atlantia to Xerox
  - 35 tolling markets compared
- **Toll operator market models**
  - Toll connected services opportunity analysis
  - Markets' readiness for connected services
  - Integration with 11 VAS and 5 connected services
- **2010-25 bottom-up market forecasts**
  - Estimates of the number of devices sold, vehicles subscribed by technology & vehicle type
  - **36 countries covered** in Europe, North America, South Africa, India, China, Japan, Korea and South East Asia

Note: A free abstract is also made available to download on www.ptolemus.com/etc-study

The study, result of 3 years of research and 120 interviews, mentions 246 companies



Company name	Country	Sector	Discussion	Profiled
Schneider Electric	Global	Integrator		
Shell				
Siemens				
Sirit				
Skytoll				
Sociedad Concesionaria Autopista Ce				
SoftToll				
ST Micro				
STAR Systems International				
STATOIL				
Steria				
Stockholm Group				
Stoneridge				
Strabag				
Summit Partners				
Swedish Road Administration				
T-Systems International GmbH				
Telepass				
Telenor				
Telit				
Thales				
The Illinois State Highway Authorit				
TIP Services				
Toll Collect				
Toll Service				
TollPlus				

Company name	Country	Sector	Discussion	Profiled
Novacom Europe				
OAO Gazprombank				
Octo Telematics				
OHL Concesiones				
OJSC MegaFon				
Olympia Odos				
OMV				
Oregon DoT				
Øresundsbro Konsortiet				
Osborne Clarke				
Packard/DAF				
Panasonic				
Pase Urbano				
Pavimental				
Payurtoll				
Perceptics				
Peugeot				
Posdata				
Prepass				
Progressive Insurance				
PToll (bancpass)				
PTV				
Q-Free				
Qualcomm				
Raytheon				
Renault Trucks				
Rent A Toll				
Ressa				
RFPI				
Rosavtodor				

Company name	Country	Sector	Discussion	Profiled
IBTTA	USA	Association		
iCell				
IMS				
infoblu				
Intellic				
International Road Federation (IRF)				
International Road Transport Union (IRU)				
ITS UK				
Iveco				
JP Morgan Chase				
JSC NIS				
Kapsch TrafficCom AG				
KoD				
Lagan				
Lecit consulting				
LLC Infrastructure satellite systems				
LLC Optima Plus				
Lockheed Martin				
LogPay				
Lysanda				
Macquarie Group				
Magneti Marelli				
MAN SE				
Mapfre				
Masternaut				
Mediobanca				
Microsoft				
Mobile Devices				
Mobile Systems				
Mojio				
Moreas				
Národná diaľničná spoločnosť (NDS)				
National Roads Authority				

Company name	Country	Sector	Discussion	Profiled
eReg	Europe	Association	✔	
Ericsson				
EROAD				
ERTICO				
Escota				
Esso				
Europ Assistance				
European Automobile Manufacturers Ass.				
European Commission				
Eurotoll				
Eurowag				
Federal Highways Administration				
Federal Signal Technologies (FSTech)				
Fela				
Ferrovial				
Fleetboard (Daimler)				
FleetCor				
Ford				
G.E.A				
GALP				
GDDKIA (General Directorate for Motorways and National Roads)				
Gemalto				
Generali				
Georgia's State Road & Tollway Authority				
GeoToll				
Grundig				
HDI Gerling				
HELP Inc.				
Henarsa				
Highgain Telecom				
Hochtief				
Hoeft Wessel AG				
Hong Kong Productivity Council				
Horizon Roads Consortium				
HUKA				

Company name	Country	Sector	Discussion	Profiled
Brookfield Motorways Holdings	Brazil	Concessionaire		
Caisse des Dépôts	France	Banking / Investor		
Caltrans	California	Toll charger		
Capital One	USA	Banking / Investor		
Carlyle Group LP	USA	Banking / Investor		
Central Texas Regional Mobility Authority	USA	Toll agency		
Cintra Servicios de Infraestructuras SA	Spain	Concessionaire		
Ciralsa	Spain	Concessionaire		
Cofiroute	USA	Concessionaire		
Combitech	Norway	Integrator		
Comsan	Spain	Concessionaire		
Confidex	Finland	Device and equipment supplier		
Connect East Group	Australia	Toll operator		
Continental	Germany	Device and equipment supplier	✔	✔
Dachser	Germany	Logistics group		
DAF Trucks NV	Netherlands	Automotive OEM		
Daimler AG	Germany	Automotive OEM		
Danlaw	USA	Device and equipment supplier		
DARS	Slovenia	Toll service provider		
DBA Group	Italy	Integrator		
Denso	Japan	Device and equipment supplier		
Department for Transport, UK	UK	Toll charger	✔	
Deutsche Bank	Germany	Banking / Investor		
Deutsche Telekom	Germany	Telecommunications company		
Disruptive Capital	UK	Private equity fund	✔	
DKV	Germany	Toll service provider	✔	
DVB LogPay	France	Toll service provider	✔	
E-470 Public Highway Authority	USA	Toll agency		
E–ZPass Group	USA	Toll operator		
East Nippon Expressway Company Ltd	Japan	Toll operator		
ECOMOUV	France	Toll operator		
Edenred	France	Service provider		
EFKON AG	Austria	Device and equipment supplier	✔	✔
Egis	Global	Toll operator/ Service provider	✔	✔
EGRIMA Holding GmbH + Co. KG.	Germany	Banking / Investor		
Eiffage	France	Road construction		
Electronic Toll Committee	Europe	Public body		

It comes with 650 pages of facts, figures, examples, case studies, forecasts and recommendations

Table of Contents

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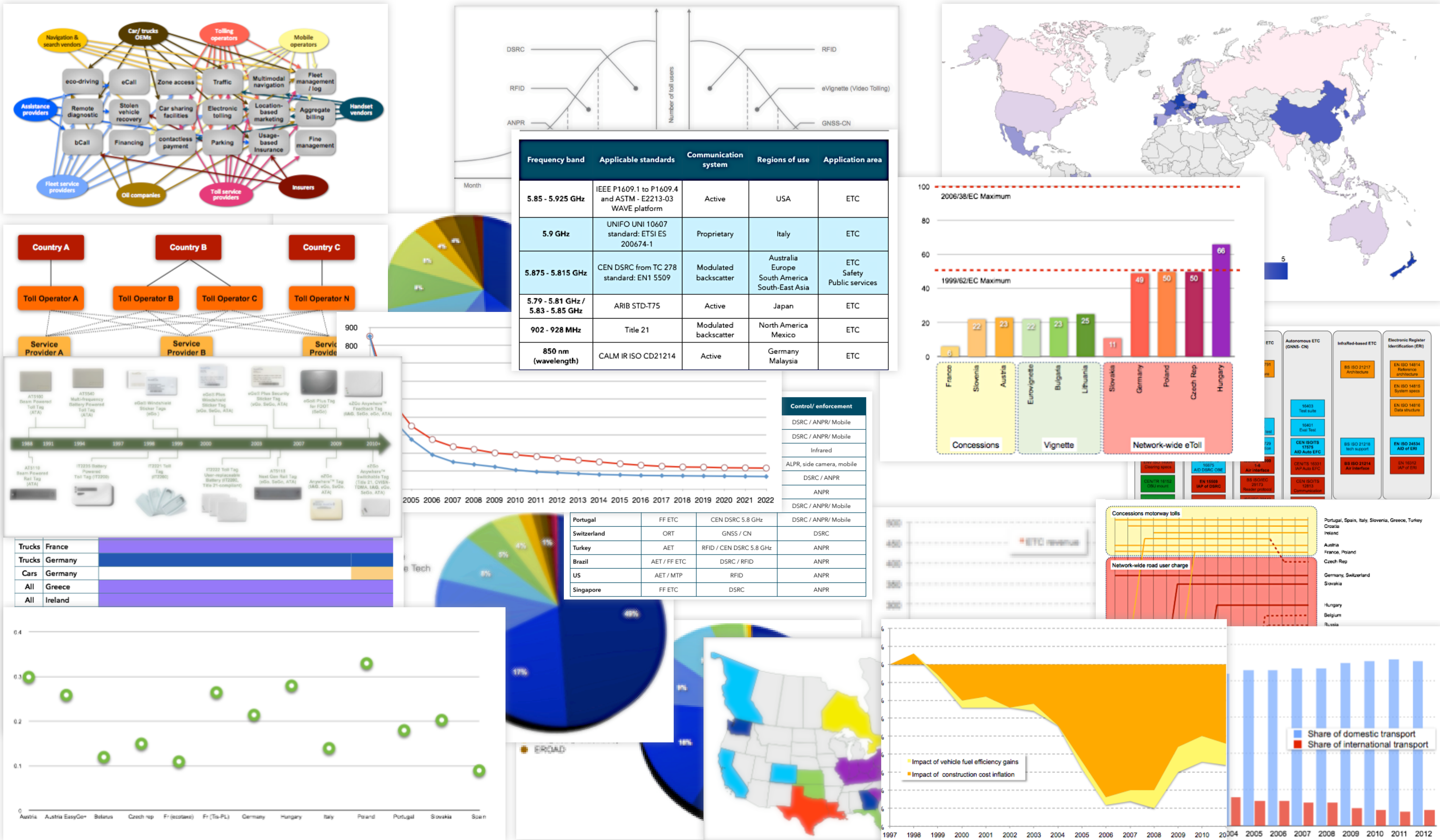
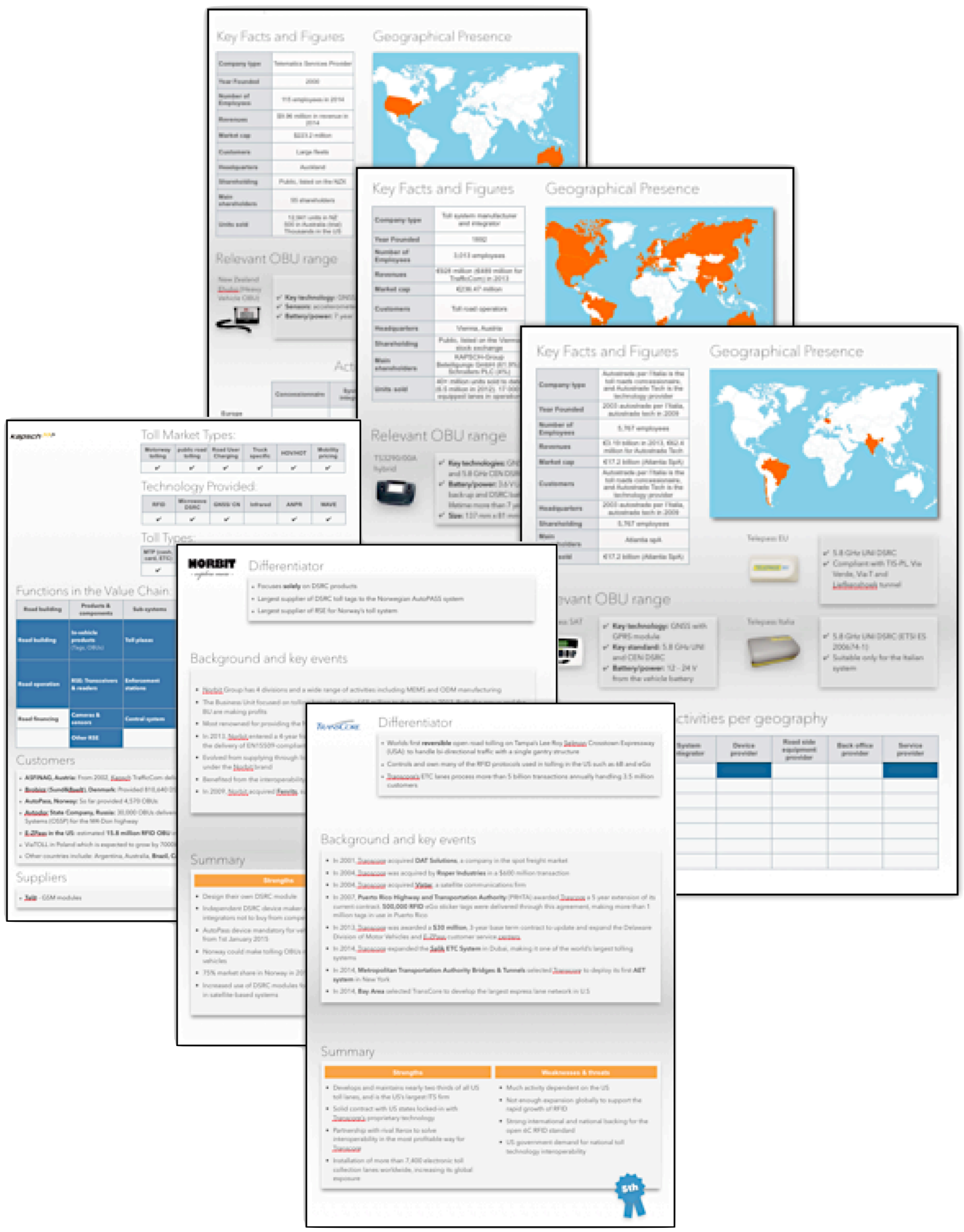
Source: PTOLEMUS Consulting Group

… Over 220 charts, diagrammes, illustrations and tables

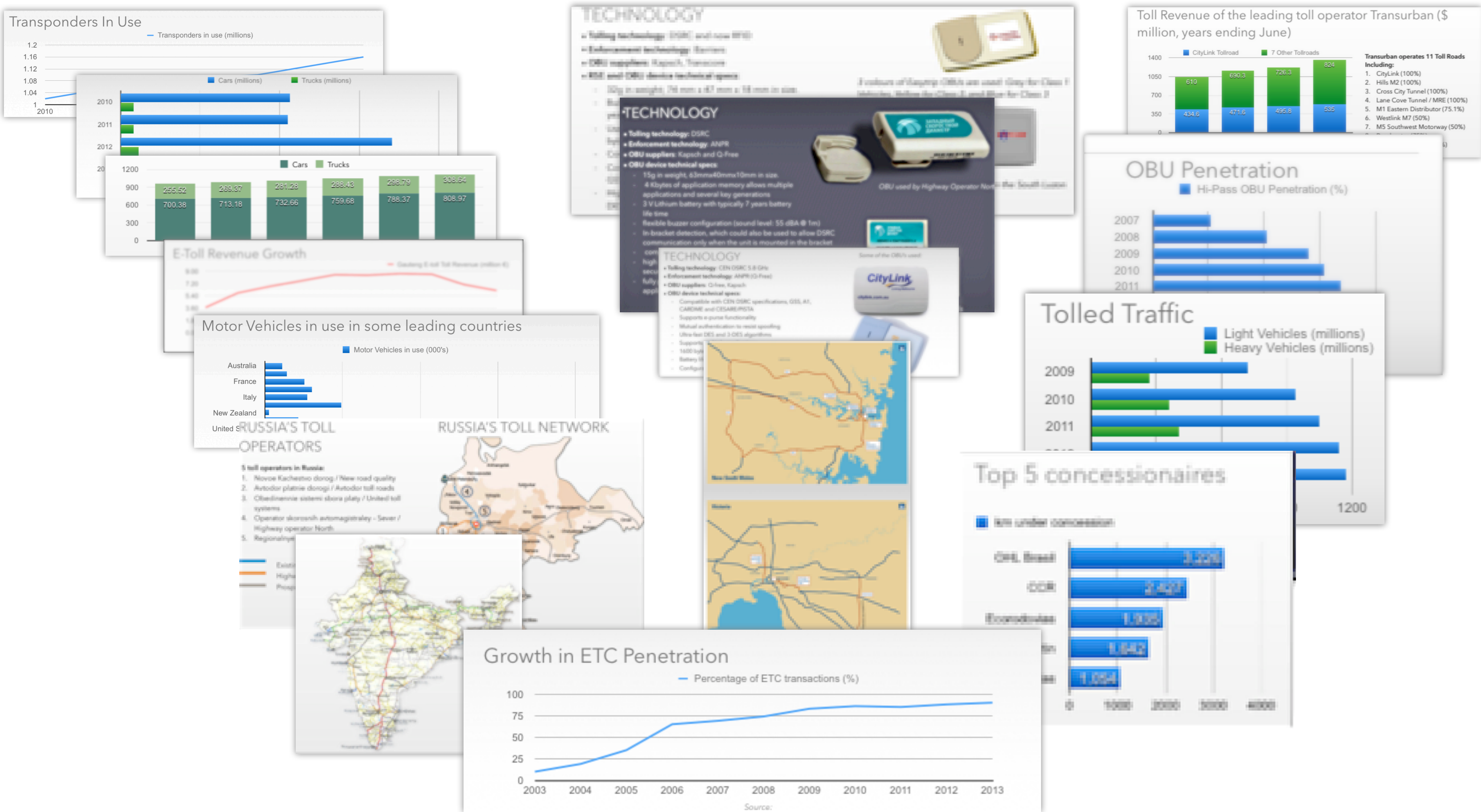


Source: PTOLEMUS Consulting Group

… A unique handbook including profiles of no less than 25 companies and 35 countries



Including 170 charts, the country profiles assess the opportunities for road chargers as well as solution providers



Source: PTOLEMUS Consulting Group

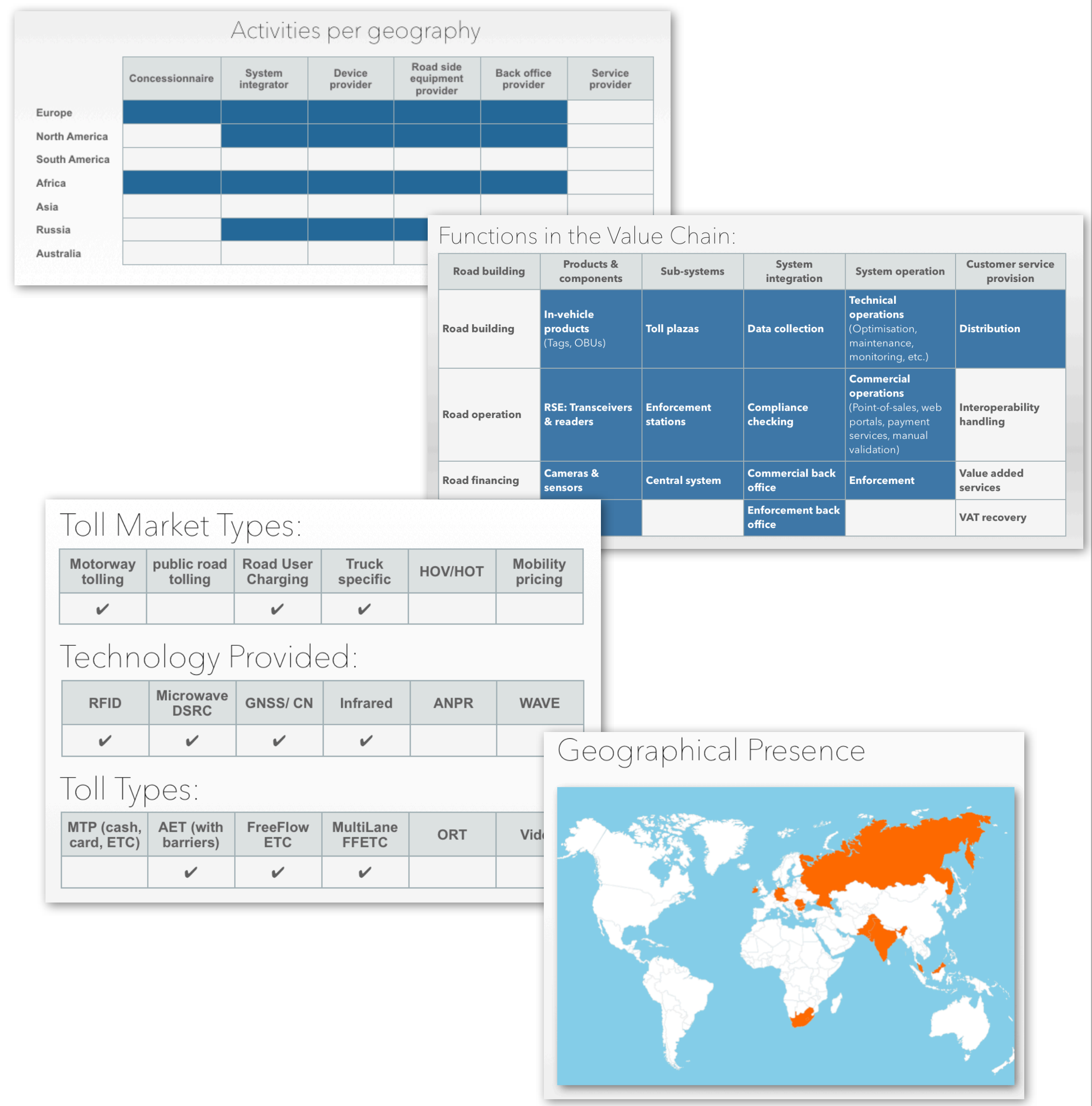
Our company assessment is based on our interviews and the analysis of key performance indicators

Detailed descriptions of relevant device offerings

The most complete analysis of the key toll stakeholders

- 80-page analysis of the service and technology solutions
- Market and geographic positioning
- Main customers and suppliers
- Background, key events and latest deals
- Assessment and ranking

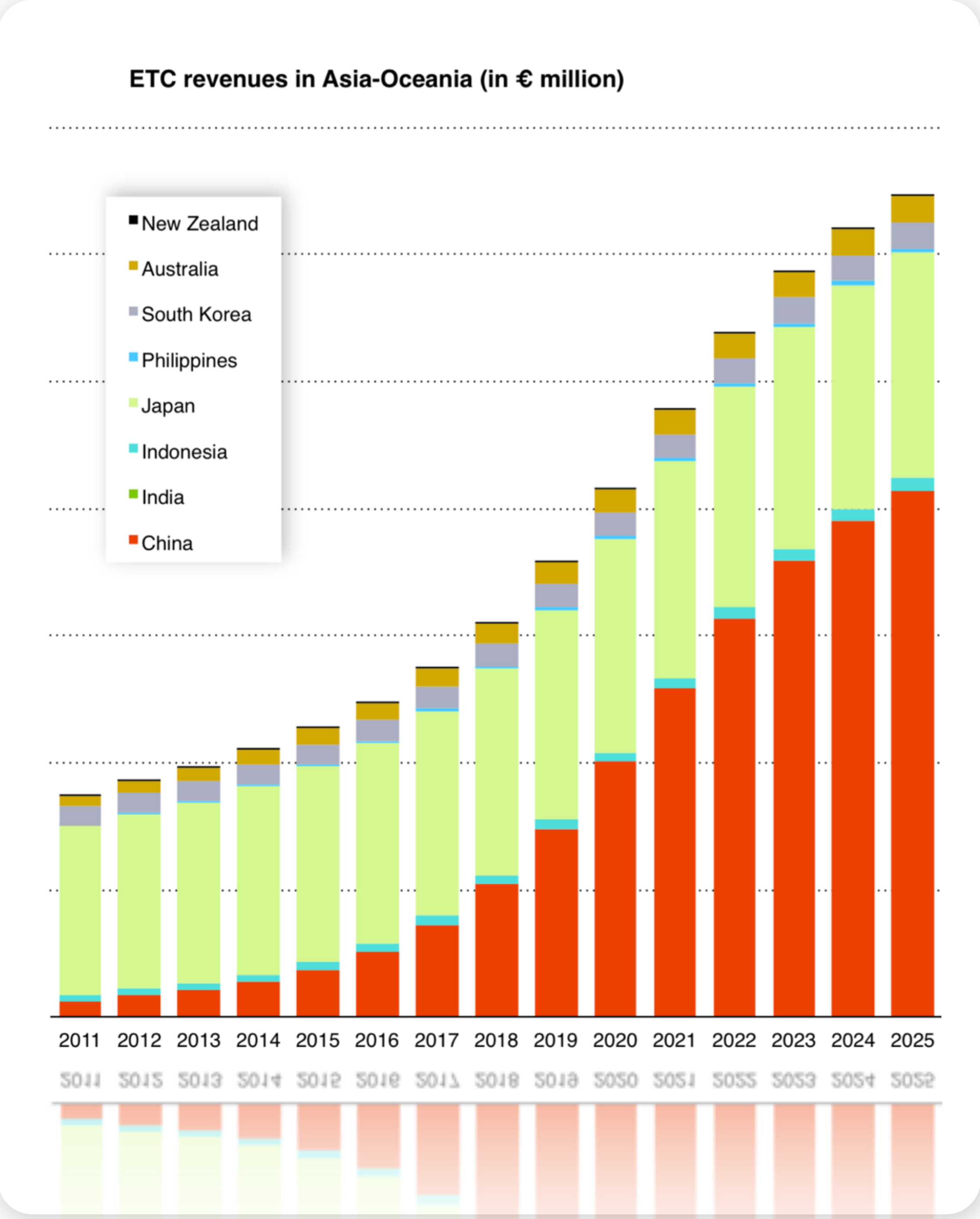
175 tables and maps illustrated



Source: PTOLEMUS Consulting Group

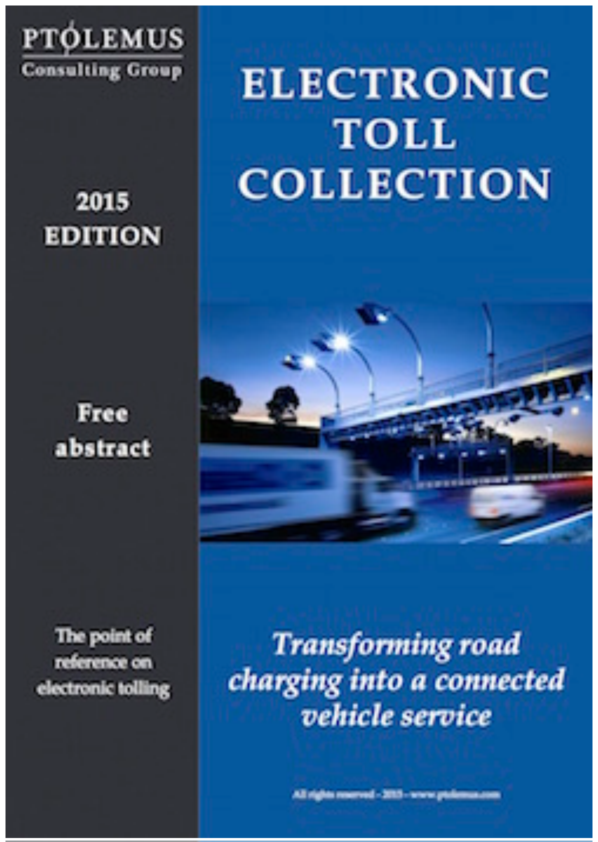
The study also includes 10-year forecasts of the tolling market globally

- **10 year (2015-2025) market forecasts**
  - Built bottom up (over 1 300 rows in the output alone)
  - Updated from interviews and current research
  - Provided with 38 charts
- **A comprehensive analysis and decision-making tool**
  - 5 toll technologies analysed in depth (GNSS, DSRC, RFID, Hybrid, Infrared)
  - 36 countries in 5 continents: all Europe, North and South America, Africa, Asia, Oceania
  - 3 vehicle types: passenger cars, LCVs and HGVs
  - 2 markets: commercial and consumer vehicles
- **Market size (volumes & revenues) are provided** for toll chargers, operators and OBU vendors



Source: PTOLEMUS Consulting Group - Note: LCVs: Light Commercial Vehicles; HGVs: Heavy Goods Vehicles

The 650-page study is provided as a searchable PDF document with a global company licence



More than a report, a real strategic market analysis

Reports	Full Study	Full Study with market forecasts
Contents	• 650 pages • Electronic version (pdf format, password-protected)	• 650 pages • Electronic version (pdf format, password-protected) • 10-year market forecasts outputs & charts (Excel, password-protected)
Company-wide licence	**€ 4 995** *Approx. $5 695*	**€ 5 995** *Approx. $6 895*

For more information, contact Thomas Hallauer at thomas@ptolemus.com

Alternatively call direct on +44 7973 889 392

Road charging has never been more relevant

ETC will soon morph into wireless payment

- As more players enter your domain of activity, benefit from a ***global perspective on the key trends*** that affect you
- As hundreds of billions are invested in building & maintaining roads, ***you need a global evaluation & quantification*** of the relevant technologies / models to make strategic decisions
- Since competition in tolling is not transparent, it is crucial to be able to ***compare what you are paying*** for technology and services
- Technologies, regulations, trials, models, communication lines… learn ***innovative new ways to approach road charging***

Road charging is now an opportunity for FMS providers, OEMs, insurers and connected vehicle service providers

- GNSS-based road charging will represent the ***majority of device revenue globally***, until the smartphone replaces it
- As interoperability covers larger geographies, ***vehicle-embedded tolling*** functions will start to appear
- The technology standard evolution points to DSRC becoming the ***communication channel for V2V and V2I***

- **Tolling** was controlled by the toll chargers
- **Road charging** is handled by toll chargers, operators and service providers
- **Mobility pricing** will be shared between of a multitude of service providers including road operators, OEMs, insurers, smartphone vendors, payment providers, etc.

Note: The photograph represents MyJini, a connected vehicle device used in mobility pricing in Holland

PTOLEMUS Consulting Group

Strategies for Mobile Companies

Brussels - Boston - Chicago - Hamburg - London
Milan - New York - Paris - Vienna

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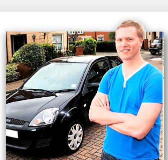
+44 7973 889 392

	Assignment	Client
	Performed the feasibility study of a shadow electronic tolling system	Publicly-owned toll charger
	Conducted the technology due diligence of a major fleet management service provider	Major private equity fund
	Defining strategic positioning in insurance telematics value chain	Global tier-1 automotive supplier
	Defined strategy & business plan of its telematics business	Pan-European insurance company
	Defined its strategy in mass cellular positioning data	Mobile operator
	Defined strategic positioning in the field of fleet connected vehicle services	Major motorway operator
	Led commercial due diligence of a UK data management service provider	Financial investor
	Assisted in sourcing a driving behaviour database across Europe	Global tier-1 automotive supplier
	Assisted in developing its usage-based charging telematics business	MAGNETI MARELLI
	Evaluated the technologies & business potential of the EU & Russian electronic tolling markets	Major embedded electronics vendor
	Assisted in sourcing the navigation engine of its next generation in-car system	Consumer electronics device supplier
	Assisted in designing a digital roadside assistant solution using OBD dongles	Global roadside assistance group
	Defined & implemented partnership strategy in connected commercial vehicle ecosystem	Tolling service provider
	Appraised future telematics technology & market trends and their impacts	Leading EU insurance group

A growing recognition

They mentioned PTOLEMUS

Online Auto Insurance
Aplicom
Insurance Chat
T-Systems
francetvinfo
the Balkan Chronicle
Mobile devices
news-assurances pro
POST
The Economist
FleetNews
m2m apps
ERTICO ITS Europe
ITS International
drivefactor
WIPRO
insurancenewsnet.com
m2m now
orange Business Services
PRWeb
sas
BERENBERG
Quindell
DISRUPTIVE Capital Finance
Cognizant
vodafone
NBC
FINANCIAL TIMES
Notes: Prices in Euros excluding VAT
Scope Technologies
7PM Auto
CONNECTED WORLD
KENNEDY Consulting Research & Advisory
EARNIX
Baseline telematics
ETSI
cnews
carfinance 24/7
AW Automotive World
SAP
Forbes
Business Record
amz
Ctrack
Il Sole 24 ORE
Telematics Update
GoMo News
SPIRENT
112
THE WALL STREET JOURNAL.
TeliaSonera
LIVE INSURANCE NEWS
ACTUARIAL POST
Embedded Computing Design
La Tribune de l'assurance
gemalto
L'USINE NOUVELLE
GSA
ERICSSON
REUTERS
KTH
DAN TRI
HiMEX
telit 2 market
InsideGNSS
CORRIERE DELLA SERA
SMARTPLANET
INSURANCE NETWORKING NEWS
Osborne Clarke
TELEMATICS WIRE
ATrack
RADIO WORLD
IMS
EUROPEAN COMMISSION
Department for Transport
PROPERTY CASUALTY 360°
GPS Business News
TRUCK & BUSINESS
cobra
Bank of America Merrill Lynch