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***Case No COMP/M.4942
- NOKIA / NAVTEQ***

Only the English text is authentic.

**REGULATION (EC) No 139/2004
MERGER PROCEDURE**

Article 8 (1)
Date: 02/VII/2008



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 02/VII/2008
C (2008) 3328

PUBLIC VERSION

COMMISSION DECISION

of 02/VII/2008

**declaring a concentration to be compatible with the common market
and the EEA Agreement**

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(Text with EEA relevance)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to the Agreement on the European Economic Area, and in particular Article 57 thereof,

Having regard to Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings¹, and in particular Article 8(1) thereof,

Having regard to the Commission's decision of 28 March 2008 to initiate proceedings in this case,

After consulting the Advisory Committee on Concentrations,

Having regard to the final report of the Hearing Officer in this case,

Whereas:

I. INTRODUCTION

- (1) On 19 February 2008, the Commission received a notification of a proposed concentration pursuant to Article 4 and following a referral pursuant to Article 4(5) of Council Regulation (EC) No 139/2004 ("the Merger Regulation") by which the undertaking Nokia Inc. (United States of America) belonging to the group Nokia Corporation (together "Nokia", Finland) acquires within the meaning of Article 3(1)(b) of the Merger Regulation control of the whole of the undertaking NAVTEQ Corporation ("NAVTEQ", United States of America, "United States") by way of purchase of shares.
- (2) By Decision dated 28 March 2008, the Commission found that the notified operation raised serious doubts as to its compatibility with the common market and the European Economic Area Agreement ("EEA"). The Commission therefore initiated proceedings in this case pursuant to Article 6(1)(c) of the Merger Regulation.
- (3) On 9 April 2008, Nokia submitted its Reply to the Commission's Article 6(1)(c) Decision.

1 OJ L 24, 29.1.2004, p. 1.

- (4) On 21 April 2008, the Commission provided Nokia with non-confidential versions of several key third-party submissions.
- (5) On 1 May 2008, Nokia submitted a general Response to the third-party submissions.
- (6) Nokia's replies were examined in-depth by the Commission and new factual elements were cross-checked with third parties. Further investigative measures were taken, in particular by sending out a second set of questionnaires to producers of mobile handsets, mobile network operators ("MNOs") and on-line providers of Location-Based Services ("LBS"). As an integral part of its in-depth investigation, the Commission carried out an empirical study which analyses the merged undertaking's incentives to engage in vertical foreclosure and the impact of the proposed transaction in the downstream market for the provision of navigation applications on mobile handsets and the downstream market for the provision of mobile handsets. The robustness of the study's conclusions was thoroughly tested.

II. THE PARTIES

- (7) Nokia provides equipment, solutions and services for electronic communications networks. It is principally known as a manufacturer of handsets for mobile telephony ("mobile handsets"). Nokia also intends to develop mobile online services offered via its "OVI" portal, including so-called LBS.
- (8) NAVTEQ is a supplier of navigable digital map databases used in navigation devices and to provide a wide range of LBS.

III. CONCENTRATION

- (9) On 1 October 2007, Nokia announced the signing of an agreement according to which it will acquire all shares and outstanding options in NAVTEQ. The acquisition will be made by North Acquisition Corp. (United States), a special acquisition vehicle and a wholly-owned subsidiary of Nokia Inc. (United States), the latter being a wholly-owned subsidiary of Nokia. On completion, North Acquisition Corp. will merge with NAVTEQ and cease to exist as a corporate entity and NAVTEQ will become a wholly-owned indirect subsidiary of Nokia.
- (10) As the proposed transaction confers sole control of NAVTEQ to Nokia, it constitutes a concentration within the meaning of Article 3(1)(b) of the Merger Regulation.

IV COMMUNITY DIMENSION

- (11) The parties to the proposed concentration do not meet either of the alternative turnover thresholds set out in Article 1(2) and (3) of the Merger Regulation. NAVTEQ's aggregate Community-wide turnover does not exceed EUR 250 million and it does not have an aggregate turnover of more than EUR 25 million in three Member States. Therefore, the proposed transaction does not have a Community dimension within the meaning of Article 1 of the Merger Regulation.

V. ARTICLE 4(5) REFERRAL

- (12) The proposed transaction would have been capable of being reviewed under national merger control law in eleven Member States, [Business secrets]*
- (13) On 22 November 2007, the Commission received a reasoned submission by Nokia in which the company requested a referral to the Commission pursuant to Article 4(5) of the Merger Regulation. No Member State objected to the referral of the proposed transaction to the Commission. The proposed transaction was therefore deemed to have a Community dimension and has been examined by the Commission.

VI RELEVANT MARKETS

6.1. Introduction

- (14) The proposed transaction is of a purely vertical nature, since it involves two companies operating at different levels in the supply chain. The proposed merger is a case of backward vertical integration in the sense that a producer of a good acquires its main provider of an important input.
- (15) The acquirer, Nokia, is principally active in the downstream market for the provision of mobile handsets. To an increasing extent, mobile handsets are used as navigation devices.² In order to provide navigation functionality³ in its handsets, Nokia sources navigable digital map databases from the target company, NAVTEQ, and integrates them into the navigation software produced by the Nokia subsidiary, gate5 AG (Germany). A navigation application is currently pre-installed in a limited number of Nokia handsets (for example, Nokia's N95 handset) but in the future Nokia intends to pre-install navigation applications in a wide range of handsets. For navigation-enabled handsets

* Parts of this text have been edited to ensure that confidential information is not disclosed; those parts are enclosed in square brackets and marked with an asterisk.

² In addition to mobile handsets, there are three additional types of navigation devices: portable navigation devices ("PNDs" - also called Satellite Navigation Devices or SatNavs), personal digital assistants ("PDAs") and "in-dash" systems (the latter being navigation devices permanently installed in the dashboards of cars). Nokia does not produce PDAs or in-dash devices and has only a marginal presence in the market for PNDs. It currently produces [Business secrets]* and its market share is negligible. [Business secrets]* See the Reply by Nokia of 9 April 2008 to the Article 6(1)(c) Decision, page 24, and Nokia's Reply of 1 May 2008 to the Commission's request for information, page 2. Due to Nokia's marginal market presence, the downstream market for the provision of PNDs is not analysed in this Decision.

³ For the purposes of this Decision, the term navigation denotes the use of Global Positioning System technology ("GPS") to display the user's current position and provide turn-by-turn directions to guide the user to a destination in real time. Guidance is provided in visual form on the screen of the navigation device, usually complemented by voice guidance. In addition, re-routing ("back-on-track") functionality is usually provided.

without pre-installed navigation applications, Nokia provides map display and routing⁴ free of charge and turn-by-turn navigation on subscription.⁵

- (16) Most manufacturers of mobile handsets do not produce navigation software in-house but purchase the integrated product (consisting of navigation software and a digital map database) from third-party providers for inclusion in their handsets. Alternatively, the bundled product may be purchased by MNOs and providers of internet-based⁶ navigation solutions which then offer navigation services to consumers on mobile handsets (server-based navigation services). The market for navigation software is therefore an intermediate market situated between the upstream markets (the provision of non-navigable or navigable digital map databases) and the downstream markets (the provision of navigation applications for mobile handsets and the provision of mobile handsets) in the vertical supply chain.
- (17) Nokia is active in the market for the provision of navigation software via its gate5 subsidiary.
- (18) In order to assess the proposed transaction's impact on competition, the upstream, intermediate and downstream markets must first be defined.

6.2. The Upstream Markets – Non-Navigable and Navigable Digital Map Databases

6.2.1. Definition of the relevant product markets

Introduction

- (19) A digital map database is a compilation of digital data which typically includes (i) geographic information which contains the position and shape of each feature on a map (such as roads, railways, rivers and indications of land use), (ii) attributes which contain additional information associated with features on the map (such as street names, addresses, driving directions, turn restrictions and speed limits) and (iii) display information. Suppliers keep map data in a relational database which is not in itself a digital map⁷. The relational database is used by customers to generate digital maps and provide services based on map information. The map data included in the databases is derived from a multitude of sources such as aerial photographs, satellite images, official government map databases and other government sources as well as from data generated by field forces using customised vehicles.

⁴ For the purposes of this Decision, the term routing denotes the provision of a sequential description of a route from origin to destination. The calculated route is usually shown on a map with step-by-step directions in text form. The route description may be displayed on the screen of a mobile handset but is often provided on-line and printed out by the user.

⁵ Notification, page 73.

⁶ It should, however, be noted that providers of internet-based LBS generally develop their own navigation software internally, and acquire digital maps from external providers.

⁷ In a relational database the data is internally structured in tables.

- (20) In addition to the base map (the core database containing basic information which enables the display of a digital map), several layers of add-on information are provided by the providers of digital map databases. These additional layers consist of points of interest ("POIs", such as restaurants, hotels, petrol stations and landmarks), phonemes (enabling the provision of vocal instruction), truck-specific attributes (such as height and weight restrictions, lane restrictions and ideal routes), postal codes, 3D landmarks, and Advanced Driver Assistance Systems (ADAS) attributes⁸. However, customers do not necessarily buy all layers offered by the map database supplier. Alternatively, customers may source add-on layers such as POIs from third party suppliers. [Business secrets]*
- (21) Digital map databases are sold to manufacturers of navigation devices, producers of navigation software and providers of non-navigation applications (such as internet maps, various government uses and corporate solutions such as fleet management). Digital map databases are used for a variety of purposes, the most important being map display, address location, routing and navigation. To provide navigation, the digital map database must be combined with a system for instant geographic positioning, primarily using Global Positioning System (GPS) technology.
- (22) The most important applications for NAVTEQ's digital map databases sold in the EEA in 2007 were PNDs and in-dash systems (automotive applications). Sales of digital map databases for use in mobile handsets only accounted for [0-5]*% of NAVTEQ's EEA turnover in 2007.

Non-navigable versus navigable digital map databases

- (23) It must be considered whether or not digital map databases for navigation purposes and non-navigation purposes constitute separate relevant product markets.
- (24) Nokia considers that the provision of navigable digital map databases constitutes a relevant product market which is separate from the supply of non-navigable digital map databases⁹. It recognises the fact that non-navigable digital map databases would be a poor substitute for navigable digital map databases when used for vehicular navigation provided by PNDs and in-dash systems. However, Nokia claims that from the point-of-view of a mobile handset user, there is a degree of substitutability between navigable and non-navigable databases. A wide range of LBS are provided on mobile handsets which do not necessitate a navigable map database. According to Nokia, most LBS provided on mobile handsets do not require navigation. Nokia claims that while the provision of pedestrian navigation services via mobile handsets does require the display of a digital map, it does not necessarily require turn-by-turn guidance. Nokia concludes that non-navigable digital map databases – while constituting a separate product market - are likely to function as an effective substitute for navigable digital map databases for the provision of LBS (including navigation) on mobile handsets¹⁰.

⁸ Advanced Driver Assistance Systems provide "vehicle intelligence" including driver assistance, enhanced safety, advisory systems and fuel management systems.

⁹ Notification, page 42 and reply by Nokia of 9 April 2008 to the Article 6(1)(c) Decision, page 23.

¹⁰ Reply by Nokia of 9 April 2008 to the Article 6(1)(c) Decision, page 23.

- (25) NAVTEQ argues that digital map databases may be divided into four main categories depending on the intended end use for the database. The more demanding the LBS to be provided, the more detailed and accurate the digital map database has to be¹¹.
- (26) Databases of the first category enable pedestrian routing and LBS without guidance. Services include map display, POI display, POI finder and pedestrian routing based on manual input of origin. To provide these services, the digital map database must have accurate relative roadway geometry and include road names and administrative boundaries. This basic type of database cannot be upgraded to offer more advanced LBS because it would require a full geometry replacement.
- (27) Databases of the second category enable pedestrian guidance. Features include user positioning and tracking, routing based on automated input of origin (position obtained by GPS), pedestrian guidance and rudimentary vehicle routing. To provide these services, the digital map database must have *absolute* roadway geometry and include road names and administrative boundaries.
- (28) Databases of the third category enable vehicle routing and rudimentary vehicle navigation. To provide these services the digital map database must have absolute roadway geometry, include road names and administrative boundaries and, in addition, it must include "direction of travel" attributes.
- (29) Databases of the fourth category enable vehicle navigation. In addition, robust vehicle routing and enhanced guidance services may be provided. To provide these services the digital map database must have absolute roadway geometry, include road names, administrative boundaries and "direction of travel" attributes. In addition, the database must include a number of enhanced road attributes such as turn restrictions, speed limits, access restrictions and guidance signs.¹²
- (30) For the purposes of this Decision, digital map databases of the first, second and third categories are considered as non-navigable, and databases of the fourth category are considered as navigable.
- (31) The degree of demand-side substitutability between navigable and non-navigable digital map databases has been evaluated by the Commission. The primary use of a navigable digital map database is vehicular navigation. Today, vehicular navigation is predominantly provided by PNDs and "in-dash" systems and to a limited but increasing extent by mobile handsets¹³. For the purposes of vehicular navigation, non-navigable digital map databases are very poor substitutes to

¹¹ "Digital Map Entry – Decreasing Costs and Increasing Efficiencies", NAVTEQ presentation of 6 May 2008.

¹² "Digital Map Entry – Decreasing Costs and Increasing Efficiencies", NAVTEQ presentation of 6 May 2008, page 4.

¹³ Mobile handsets are less suited for vehicular navigation because the screens are smaller, the user interface is designed to accommodate a multitude of functions (such as telephony, messaging, camera, audio playback) which may make the input of navigation data more cumbersome and voice guidance is not always offered.

navigable databases because a PND, "in-dash" system or mobile handset (used for navigation) simply will not function or at the very best will function very poorly if a non-navigable digital map database is used instead of navigable one. Notwithstanding the possibility – as argued by Nokia - that less advanced LBS provided on mobile handsets may function as a partial substitute to navigation for consumers using mobile handsets, the degree of demand-side substitutability between digital map databases for navigation purposes and for non-navigation purposes is considered to be limited.

- (32) The degree of supply-side substitutability must be regarded as one-directional, because a provider of navigable digital map databases (category four, referred to in Recital 29) would be able to easily switch production to provide non-navigable digital map databases of a lesser quality. The core databases of categories two and three (referred to in Recitals 27 and 28) are the same as the databases of category four.
- (33) However, there is a limited degree of supply-side substitution in the other direction, due to the substantial costs and time required to upgrade a non-navigable database to navigable quality. As stated in Recital 31, a navigable digital map database must fulfil demanding quality requirements. Such a database must be sufficiently detailed, accurate and updated and must contain the necessary attributes.
- (34) In order to compile the data necessary for navigation, all features of each road in the database have to be recorded. NAVTEQ - as well as Tele Atlas N.V. ("Tele Atlas", the Netherlands) (NAVTEQ's competitor supplying navigable digital map databases with EEA coverage) - compile such data by operating field forces using a fleet of vehicles that drive along each road in the database. The use of field surveys is crucial for the accuracy as well as for the completeness of the databases because they are used both to verify data accumulated from other sources and to record additional data not available by other means.
- (35) NAVTEQ recognises the fact that field surveys are necessary to compile a digital map database of navigable quality¹⁴. NAVTEQ and Tele Atlas rely upon field surveys to a large extent and neither company has indicated any intentions to stop using field surveys in the future.
- (36) It is currently indispensable to carry out extensive field surveys to produce a navigable digital map database.
- (37) A producer of basic digital map databases that wants to switch its production to digital map databases of navigable quality would therefore have to commit substantial resources to collect the additional information necessary for navigation capability. Once a complete database has been compiled, it has to be constantly updated so that it incorporates all changes made to the road network. Field surveys are needed also for updating the database. Even if the database provider obtains information about changes from various external sources (for instance, from local authorities) the veracity and accuracy of the information

¹⁴ "Digital Map Entry – Decreasing Costs and Increasing Efficiencies", NAVTEQ presentation of 6 May 2008, page 9.

supplied have to be checked by means of a field survey. Once the data has been compiled, very large volumes of data have to be processed and incorporated into the database.

- (38) Compiling and processing the data necessary for a navigable digital map database is a very time-consuming process. In its recent Decision authorising TomTom's acquisition of Tele Atlas, the Commission considered that upgrading to navigable quality a basic non-navigable digital map database covering the Community, is likely to take several years¹⁵.
- (39) Creating and maintaining a navigable digital map database of sufficient quality is much costlier than creating and maintaining a basic non-navigable digital map database. NAVTEQ's competitor Tele Atlas has estimated the cost of the former at approximately [EUR 5 to EUR 10] per km whereas the cost of the latter is estimated at [EUR 0 to EUR 5] per km¹⁶.
- (40) Those findings are supported by the Commission's market investigation in this case.
- (41) Given the lack of demand-side substitutability and the one-directional nature of the supply conditions – it is easy to downgrade a navigable digital map database to non-navigable specification but time-consuming and costly to upgrade a non-navigable digital map database to navigable quality. Accordingly, it must be concluded that digital map databases for navigation and non-navigation applications constitute separate product markets.
- (42) Because both navigable and non-navigable digital map databases are used to provide LBS on mobile handsets, both the market for the provision of non-navigable digital map databases and the market for the provision of navigable digital map databases are relevant for the present case.

Different end-uses and customer categories

- (43) The feasibility of sub-dividing the market for non-navigable digital map databases according to their end-use or type of customer purchasing the product must be considered.
- (44) Nokia considers it inappropriate to define separate product markets for different end-user segments.¹⁷
- (45) Non-navigable digital map databases are used to provide LBS (excluding navigation) via two main distribution channels: mobile handsets and the internet¹⁸. These channels are partially overlapping in the sense that mobile handsets may be used to access web-sites offering LBS. NAVTEQ delivers

¹⁵ Commission Decision of 14 May 2008 in Case No COMP/M.4854 – *TomTom/Tele Atlas*, Recital 26.

¹⁶ Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 26.

¹⁷ Notification, page 69.

¹⁸ Per definition, non-navigable digital map databases are not used in navigation devices like PNDs and in-dash systems. Basic LBS may be provided on PDAs but this end-use is likely to be negligible.

digital map databases for non-navigation purposes to mobile handset manufacturers, MNOs and internet companies.¹⁹

- (46) The non-navigable digital map databases used to provide LBS through these distribution channels and to these customer categories are identical or nearly identical and the LBS provided are the same (mainly map display, POI display, POI finder and routing).
- (47) There is therefore no reason to sub-divide the market for the provision of non-navigable digital map databases according to distribution channel.
- (48) The feasibility of sub-dividing the market for navigable digital map databases according to the type of navigation device used to deliver the service, namely PND, "in-dash" device, PDA or mobile handset or according to the type of customer to which the databases are delivered. NAVTEQ supplies navigable digital map databases to PND manufacturers, car makers, original equipment manufacturer ("OEM") suppliers to car makers, navigation software providers, mobile handset manufacturers and MNOs has also been considered by the Commission.²⁰
- (49) Although certain features may possibly vary between, for instance, PNDs and mobile handsets and different customers may offer different services requiring different attributes, the databases used for all types of navigation devices are technically and performance-wise very similar.
- (50) It would therefore be inappropriate to sub-divide the market for navigable digital map databases according to the type of navigation device.

Database formats

- (51) It must be considered whether it would be appropriate to sub-divide the respective markets for non-navigable and navigable digital map databases depending on the database formats in which they are delivered to customers.
- (52) Nokia considers it inappropriate to define separate relevant product markets for particular types of map data.²¹
- (53) Digital map databases are provided to customers in a number of different formats, dictated by customers' application requirements. NAVTEQ and Tele Atlas are capable of supplying map data in all available formats²² and customers can switch between data supplied in different formats. Format switching may necessitate reconfiguration of the data so that it is compatible with the navigation

¹⁹ Notification, page 48.

²⁰ Notification, pages 47 and 48.

²¹ Notification, page 69.

²² NAVTEQ provides its database in a number of formats. Many customers purchase data in the Geographic Data File ("GDF") format, an industry-wide standard approved by the Center for European Normalization ("CEN"). The GDF format is predominantly used by the automotive industry. ArcView, MapInfo and Oracle are other formats supplied by NAVTEQ. In addition, NAVTEQ has developed two formats itself, SIF and RDF. Notification, page 57. Tele Atlas provides its database in major formats including GDF, Shape (used by most PND manufacturers) and Oracle. See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 20.

software used by the customer. Reconfiguration costs and delays are not prohibitive.

- (54) Therefore it is not appropriate delineate separate product markets for digital map databases depending on the format in which the data is delivered to the customers. This conclusion applies both to non-navigable and navigable digital map databases.

Geographic coverage of digital map databases

- (55) It must be considered whether the respective markets for the provision of navigable and non-navigable digital map databases ought to be sub-divided according to the geographic coverage of the databases sold. The geographic coverage of navigable digital databases is a product feature relevant for the delineation of the relevant product market in this case. The geographic coverage of the database must not be confused with the geographic scope of the market, which is dealt with separately in Section 6.2.2..
- (56) NAVTEQ and Tele Atlas license the use of their navigable digital map databases. They usually grant non-exclusive, perpetual, "per device" licences that allow the licensed database to be used on the device for the duration of its useful life. The level of the licence fee depends on several elements, including the extent of the geographic coverage and the content of the map data. The greater the geographic coverage of map data and content, the higher the licence fee. The main determinant for the licence fee, which is defined in the customer contracts concluded by NAVTEQ and Tele Atlas, is the geographic coverage of the database being licensed, that is to say, the licensed territory²³.
- (57) From the demand side, the substitutability of digital map databases with different geographic coverage must generally be regarded as limited. A device manufacturer that intends to sell a navigation device in a particular territory must include a digital map database with a corresponding geographic coverage, otherwise the device will simply not function and cannot be sold. Similarly, MNOs or other companies offering server-based navigation services (or other LBS) must provide customers with access to digital map databases which cover the territory in which the service is provided. However, digital map databases with partial geographic overlaps may be partially substitutable. For example, a digital map database with regional coverage (including several countries) is partially substitutable to a database with national coverage, provided that the country covered is included in the regional database. A device maker could possibly substitute the larger regional database with the smaller national database and install it into those navigation devices it intends to sell in the country in question. Similarly, MNOs and other companies offering server-based navigation services (or other LBS) may substitute a larger regional database with a smaller national database covering the country in which the service is provided.
- (58) The degree of supply-side substitutability for digital map databases with different geographic coverage is relatively limited. This is particularly the case for navigable databases, due to the resources and time required to build a navigable digital map database from the very beginning.

²³

In this context, the term licensed territory refers to the geographic coverage of the database being licensed and not the territory in which the licence is valid as in most other industries.

- (59) The territories licensed by NAVTEQ and Tele Atlas are either individual countries or supra-national regions which consist of several countries bundled together. Examples of such regional licences found in contracts are the DACH-region²⁴, the ALPS-region²⁵, the BENELUX-countries²⁶, the Nordic region²⁷, the Iberian peninsula²⁸, Western Europe²⁹, Eastern Europe³⁰ and Europe, that is to say Western Europe and Eastern Europe as a whole. NAVTEQ and Tele Atlas rarely license territories smaller than an individual country³¹.
- (60) Currently a significant portion of the demand for navigable digital map databases for use in navigation devices is attributed to national or regional coverage, as opposed to broader European coverage. .
- (61) NAVTEQ operates a single database which is used to supply all customers for all types of applications³². The map data is supplied to customers by means of a licence. The customer selects what data he wishes to use and pays accordingly. NAVTEQ licenses the same database to all customers. If a customer does not require all the information in the database, the customer is required to suppress the information he will not use and will only pay for the data he has used.³³ NAVTEQ usually licenses its navigable digital map database on a continental basis. The customer then chooses the geographic coverage, that is to say, the whole database, a particular region or a country, and the functionality, such as map display, route planning or navigation he wishes to use. NAVTEQ is normally not aware which countries a customer will use, since the latter only pays afterwards for the geographic regions actually used.
- (62) Tele Atlas also maintains a single core map database which is supplied to all customers. Each customer chooses which geographic coverage and which functionalities he wants to use and pays licence fees accordingly³⁴.
- (63) It is therefore appropriate to sub-divide the respective product markets for the provision of navigable and non-navigable digital map databases depending on the geographic coverage of the database concerned.

²⁴ Germany, Austria and Switzerland.

²⁵ Typically Southern Germany, South-East France, Switzerland, Austria and Northern Italy.

²⁶ Belgium, the Netherlands and Luxembourg.

²⁷ Sweden, Denmark, Norway and Finland.

²⁸ Spain, Portugal, Andorra, Gibraltar and a small part of France.

²⁹ Usually Austria, Belgium, Denmark, Finland, France, Germany, Italy, Luxembourg, Norway, Portugal, the Republic of Ireland, Spain, Sweden, Switzerland, the Netherlands and the United Kingdom.

³⁰ Usually Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Turkey and connector maps for central Eastern Europe.

³¹ Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 34.

³² The only exception is South Korea, for which map data is kept in a different format (developed by a company subsequently acquired by NAVTEQ). Notification, page 45.

³³ Notification, page 46.

³⁴ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 36.

Conclusion

- (64) It must be concluded that the two relevant product markets upstream should be defined as the provision of non-navigable digital map databases and navigable digital map databases respectively. For both types of database, the geographic coverage of the licence determines the scope of the relevant product markets³⁵. However, for the purposes of this Decision the exact delineation of the relevant product markets - that is to say whether or not individual country or regional licences constitute separate product markets - may be left open, since it does not affect the Commission's assessment of the proposed transaction.

6.2.2. Definition of the relevant geographic market

- (65) Nokia considers the geographic market to be worldwide.³⁶
- (66) NAVTEQ maintains a single database which is kept on a server located in the United States. The database is made available to customers all over the world. NAVTEQ applies the same pricing regardless of the customer's location.³⁷
- (67) Similarly, Tele Atlas makes its databases available to customers all over the world from a server located in the Netherlands.³⁸ Smaller, regional providers of digital map databases are established primarily in Europe, North America and South-East Asia.
- (68) Device makers, software providers, MNOs providing LBS and companies offering LBS over the internet are primarily located in the Community, the United States, and South-East Asia.
- (69) NAVTEQ, Tele Atlas and other providers deliver their products to customers by sending a "master" CD-ROM containing map data or by allowing customers to download the licensed data over the internet. Transport costs are negligible and do not constrain the distribution of navigable digital map databases³⁹.
- (70) No quotas, tariffs or other trade barriers affect the import into the EEA or export from the EEA of digital map data. There are no material differences in the way in which navigable digital map databases are sold or distributed within the EEA and in other parts of the world.

³⁵ NAVTEQ and Tele Atlas distribute navigable and non-navigable digital map databases to customers all over the world (see Section 6.2.2.). It is conceivable that product markets for the sale of digital map databases with a coverage beyond European borders, in particular databases covering the United States, would be affected by the proposed transaction. However, the Commission investigation's is limited to those product markets which concern the provision of digital map databases which cover territories within the EEA, because any potential anti-competitive effects of the merger in the product markets for databases with a coverage beyond European borders are likely to have only marginal, indirect effects in the Community.

³⁶ Notification, page 69.

³⁷ Notification, page 69.

³⁸ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 39.

³⁹ The only case where a meaningful transport cost can be identified is the dispatch of larger volumes of CD-ROMs to the automotive industry for installation in "in dash" devices. This cost is only a fraction of the total licence fee.

- (71) It must therefore be concluded that the relevant geographic market for the provision of non-navigable digital map databases is worldwide. The market for navigable digital map databases is also worldwide in scope.

6.3. The Intermediate Market – Navigation Software

6.3.1. Definition of the relevant product market

- (72) To provide navigation services, navigation software must be used. Navigation software combines the data contained in a digital map database with geographic positioning from a GPS-receiver. The navigation software uses an algorithm to calculate routes and provide turn-by-turn directions on screen and via voice guidance.
- (73) Most manufacturers of mobile handsets and most MNOs do not produce navigation software in-house. These companies typically acquire navigation software from third party software developers.
- (74) There are three main types of navigation software:
- (i) On-board systems store the navigation software and map data in the navigation device. PNDs, "in dash" systems and certain mobile handsets use on-board navigation software.
 - (ii) Off-board systems are based on client-server architecture where a client application is installed on a device to access a navigation server that performs route calculations and stores the map data.
 - (iii) Hybrid systems include an on-board system which combines locally stored information with dynamic information such as traffic information from external sources.⁴⁰
- (75) In 2006, Nokia acquired navigation software provider gate5. The company supplies on-board and hybrid systems for PNDs, PDAs and mobile handsets under the Smart2Go brand. Following the acquisition by Nokia, gate5 has increasingly focused on providing navigation solutions on mobile handsets. Gate5 currently supplies navigation software for mobile handsets under the Nokia Maps brand. The Nokia Maps software is a hybrid system which enables on-board route calculation and turn-by-turn guidance on the basis of off-board map data obtained via wireless access. The system stores frequently used map data on-board. The Nokia Maps navigation software is currently pre-installed on a limited number of Nokia mobile handsets (for example, the Nokia N95 handset). In addition, this software can be downloaded over the internet for self-installation on compatible mobile handsets.⁴¹
- (76) Nokia is of the opinion that a single relevant product market should be defined for all supply of navigation software.⁴²

⁴⁰ Notification, page 71.

⁴¹ Notification, page 73.

⁴² Notification, page 80.

- (77) Firstly, it must be considered whether it is appropriate to demarcate separate relevant product markets for each category of navigation software set out in Recital 74.
- (78) From an end-user perspective, the degree of substitutability must generally be regarded as relatively high. The different types of navigation software perform identical tasks, that is to say calculating routes and providing turn-by-turn guidance. For the end-user, it is of limited importance whether the software is located on-board, off-board or whether a hybrid system is employed as long as the navigation device provides a functioning navigation service. However, different business models are currently used to distribute on-board and off-board systems respectively, a fact which reduces the substitutability between the two types of systems⁴³. At this point in time, it is uncertain which of the two business models will prevail.
- (79) Demand-side substitutability must be regarded as relatively limited. A company offering server-based navigation services is not interested in acquiring navigation software for on-board use and a manufacturer of on-board navigation devices (most PNDs) would not find an off-board system suitable for its purposes. However, the substitutability between hybrid systems and on-board systems and between hybrid systems and off-board systems is likely to be higher. In addition, the distinction between on-board and off-board systems has become increasingly blurred due to the development of hybrid systems.
- (80) From a supply-side perspective, the degree of substitutability must be regarded as high. Some providers of navigation software - for example Garmin Ltd (Cayman Islands), Idevio AB (Sweden), Jentro Technologies GmbH (Germany) and NAVIGON AG (Germany) - offer both on-board and off-board solutions.⁴⁴ Given the fact that the algorithms employed and the functions of different types of navigation software are very similar if not identical, it may be presumed that barriers to switching production from on-board systems to hybrid or off-board systems or vice versa are limited.
- (81) Due primarily to the high degree of supply-side substitutability and the increasingly blurred distinction between the different categories of navigation software, it is inappropriate to delineate separate relevant product markets for on-board, off-board and hybrid systems.
- (82) Secondly, it must be considered whether it is appropriate to define separate relevant product markets depending on the map database format used by the navigation software.
- (83) As stated in Section 6.2.1., digital map databases are delivered in a number of formats. Interoperability between the navigation software and the database format must be ensured. The Commission's market investigation indicates that

⁴³ It should be noted that the choice of navigation solution has certain cost implications. Buying a navigation device with on-board software only requires an up-front, one-off fee and no running costs whereas buying a navigation device with an off-board or hybrid system will involve paying connection fees including roaming fees if the end-user is away from his home country.

⁴⁴ Notification, page 72.

most navigation software is compatible with several database formats and software may be adapted to different formats at costs which are not prohibitive.

- (84) It is therefore not necessary to sub-divide the market for the provision of navigation software depending on the database formats used to integrate the data with the navigation software.
- (85) Finally, it must be considered whether it is feasible to delineate separate relevant product markets depending on the type of navigation device in which the navigation software is installed, that is PNDs, "in-dash" systems, PDAs, or mobile handsets.
- (86) Although navigation software for these end-uses may differ technically in certain respects, these technical differences are not crucial. Technical differences often relate to the graphic interface. For example, PNDs and PDAs require larger and more detailed images than mobile handsets.
- (87) In addition, the core functionality of the navigation software, that is algorithms calculating routes, is identical for all types of navigation devices and the software always uses identical inputs. GPS-signals are identical for all types of devices and digital map databases do not differ depending on the type of device within which they are installed. For these reasons, the degree of supply-side substitutability for navigation software designed for use in different types of navigation devices must be regarded as very high, a circumstance which is corroborated by the fact that most producers of navigation software supply software for use in several types of navigation devices.⁴⁵
- (88) It is therefore inappropriate to demarcate separate relevant product markets depending on the type of navigation device in which the software is used.
- (89) For the purposes of this case, it must therefore be concluded that the relevant intermediate product market is the market for the provision of navigation software.

6.3.2. Definition of the relevant geographic market

- (90) Nokia considers that the relevant market is worldwide.⁴⁶
- (91) Navigation software providers are typically active in several parts of the world (in particular in Europe and North America). Navigation software providers licence their software wherever the customer is located.
- (92) Although the digital map databases used with the navigation software differ in geographic coverage, essentially the same navigation software may be used for the provision of navigation services in the EEA, the United States and other parts of the world (albeit possibly with certain adjustments to accommodate particular market requirements).

⁴⁵ Notification, page 72.

⁴⁶ Notification, page 80.

- (93) Transport costs are negligible and to the extent that such costs arise (software may be provided over the internet at nearly no cost) transport costs account for a fraction of the price paid for the software licence.
- (94) No quotas, tariffs or other trade barriers affect the import into the EEA or export from the EEA of navigation software. There are no material differences in the way in which navigation software is sold and distributed within the EEA and in other parts of the world.
- (95) It must therefore be concluded that the relevant geographic market for the provision of navigation software is worldwide in scope.

6.4. The Downstream Markets

6.4.1. Navigation applications for mobile handsets

- (96) The Commission's analysis has focused on the markets downstream to the market for the provision of navigable digital map databases. As indicated in Section VII Market conditions, the market for non-navigable digital map databases is not subject to competition concerns, and there is therefore no need to explore competition problems arising in its downstream markets.
- (97) Two relevant downstream markets have been identified: (i) Navigation applications for mobile handsets; and (ii) Mobile handsets. Navigable digital map databases are an input for all navigation applications, and also for a growing number of mobile handsets with navigation functionality pre-installed.

6.4.1.1. Definition of the relevant product market

- (98) A navigation application for mobile devices consists of a digital map database and navigation software which uses the database and the information from a GPS chipset to provide information about the current location of the user, as well as graphical and voice instructions on how to get to a chosen destination.
- (99) Navigation applications on mobile handsets are commercialised by MNOs, navigation software providers or via mobile web-browsers (for instance, Google Maps). Certain handset manufacturers also commercialise navigation applications as add-ons to their handsets.
- (100) The development of triangulation technology, which can determine the location of a handset based on its distance from cell phone towers, has contributed to the dynamic growth of LBS on mobile handsets. However, the precision of triangulation is more limited in comparison to solutions based on a GPS⁴⁷ and is not sufficient for turn-by-turn navigation applications used on mobile handsets. Such navigation applications have been developed for handsets with embedded GPS and also for java-enabled handsets and smartphones with external Bluetooth GPS receivers.

⁴⁷ Triangulation technology allows a precision of about 100 to 150 meters, whereas GPS technology generally gives a precision of about 10 meters for civil applications.

- (101) Navigation applications for mobile handsets use geographic positioning technology (predominantly GPS or assisted GPS), navigable digital map databases and navigation software to provide navigation functionality. They provide users with real-time, turn-by-turn instructions and additional information about chosen routes, such as speed limits and height-restrictions, as well as POIs such as restaurants, parking spaces and fuel stations.
- (102) Applications offering basic routability (allowing users to find their location on a digital map and receive instructions presented in a static way about how to get from point A to B) present characteristics similar to navigation applications but require less precise maps which are generally not navigable. Applications offering basic routability are, however, analysed in Recitals 104 to 107 as these applications are generally based on navigable digital map databases for which the right of use has been limited.
- (103) The provision of navigation applications on Mobile handsets is an emerging market and as such, a variety of business models co-exist. Navigable digital map databases offered by Tele Atlas and NAVTEQ are an essential input in navigation applications for mobile phones.

Basic routability

- (104) On-line navigation applications such as Google Maps, Mappy or Map24 offer basic routing in the form of text instructions usually displayed next to the map on how to get from point A to B. Users are not informed in real time about the direction they need to take and the instructions are generally less exact than in the case of turn-by-turn navigation.
- (105) That type of application is accessible via a mobile web-browser and is generally offered for free (for example, Google Maps). Mobile web sites such as Google Maps, Map24 and Mappy generate revenues via the display of advertisements when users use the application. It is not uncommon that Mobile Network Operators inform their customers about the existence of these websites, and even that MNOs develop partnerships with these websites, because the use of such mobile web application generates the transmission of data on the MNO network, which is charged to the end-consumer. Manufacturers of mobile phones also sign partnership agreements with these sites and put direct links to them on their devices. Examples of such partnerships include Apple's iPhone and Sony's new Walkman phone, both of which use Google Maps.
- (106) Applications offering basic routability do not require maps which are as accurate as those used in turn-by-turn navigation applications. They do, however, rely on navigable digital map databases purchased from NAVTEQ and Tele Atlas. While they do not use all the features of navigable digital map databases⁴⁸, they rely on NAVTEQ and Tele Atlas because of the wide coverage of their maps, significantly exceeding the coverage of any potential competitor. Although smaller map manufacturers such as Automotive Navigation Data International Publishers N.V. ("AND") could deliver maps of a quality required for web-based navigation applications offering basic routability, they currently do not have the resources needed to offer world-wide coverage. Digital map databases with

⁴⁸ For instance, the contracts they sign with map manufacturers do not allow them to offer real-time, turn-by-turn navigation.

world-wide coverage can only be purchased from NAVTEQ or Tele Atlas. However, due to lower map quality requirements in the market for applications offering basic routability, entry might be less expensive and more timely than in the case of real-time, turn-by-turn navigation. While the deployment of a fleet of specialised vans is required to collect information for digital map databases used in real-time, turn-by-turn navigation, basic routability can be achieved with the use of satellite and aerial photos.

- (107) While these types of applications offering basic routability can be suitable for pedestrian use in cities, they are clearly inferior to more advanced turn-by-turn navigation as far as in-car use is concerned. The user needs to plan the route himself and is not instructed in real-time in which direction to go. There is, therefore, limited substitutability from the point of view of the user between the two types of applications. While turn-by-turn navigation certainly exerts a significant constraint on applications offering basic routability, the inverse relationship is much weaker. For the purpose of this Decision, applications offering basic routability and the more advanced real-time, turn-by-turn navigation applications are considered to be in different markets. It cannot be excluded however that, due to the dynamic nature of the industry, this might change in the future.

Turn-by-turn navigation

- (108) In contrast to on-line applications offering basic routability, the advanced navigation applications offer real-time, turn-by-turn navigation accompanied by voice instructions. They also require special navigation software to be installed on the device.
- (109) Navigation applications on mobile handsets allow route calculation and give navigation instructions in the form of arrows displayed on the screen or voice instructions. Such navigation applications installed on mobile handsets make them similar to PNDs. Due to the fact that mobile phones are much more likely to be used beyond the car, navigation applications for mobile handsets are characterised by an additional focus on pedestrian guidance.
- (110) Navigation applications can be embedded on-board a mobile phone or stored on a central server and accessed wirelessly from the handset. In the first case, the map database and the navigation software are stored in the internal memory of the device. In the latter case, the navigation software and the map database is accessed from a distance and downloaded on the handset. For both on-board and off-board services, the GPS capability can be added by integrating a GPS chipset into the phone or connecting a GPS module or headset with GPS chipset to the handset via a Bluetooth connection.

Off-board applications

- (111) Server based navigation applications can be accessed directly from handsets. The user is able to access and view, directly on his mobile phone, maps which are hosted on a central server. They can be accessed when the handset is connected to a wireless network. They require a subscription and are usually provided for a per-use, monthly or annual fee. Off-board applications can offer advanced functionalities, such as traffic information or weather updates. This requires a transfer of significant volumes of data to the handset, for which the customer is charged. It is also not excluded that navigation services via a subscription fee

could in the future be accessible via a Mobile web-browser, although it does not seem that it is the business model currently followed by web companies.

- (112) In the case of server-based applications the map database is not located on the handset. Maps and real time turn-by-turn directions are sent from a central server to the handset via a wireless data connection. The main advantages of off-board applications is that the maps are constantly updated and that the internal memory of the device can be used for other purposes, for example storing music, photos or other software. The main disadvantage of off-board solutions is their reliance on a wireless connection, without which maps cannot be accessed. Off-board solutions are offered for devices with Enhanced Data Rates for GSM Evolution ("EDGE") or 3G (Third generation of mobiles standards and technology) connectivity. High speed of data transfer ensures that the user experience in areas with network coverage is not different from PNDs.
- (113) Off-board applications are generally available from Mobile Network Operators who increase their revenues thanks to increased volumes of data transfer. These applications are developed for MNO's by navigation software developers such as Apello, Jentro, Networks in Motion, TelNav, Wayfinder and Webraska. For example, Orange in the United Kingdom and Vodafone in Italy and Romania sell navigation applications under their own brand which have been developed by Webraska.⁴⁹ Navigation applications developed by TeleNav are sold in Europe by T-Mobile. Nokia has also developed a subscription navigation service, Smart2go which can either be sold directly to end-customers or in partnership with a MNO. Subscribers can usually download these applications from the websites of the operators. In addition, software developers also increasingly offer own-branded services through operators or on-line.

On-board applications

- (114) On-board navigation applications are available from a large number of developers, including ALK, Destinator, Garmin, Navicore, Navigon, Route66 and TomTom. They can be purchased by end-customers in brick-and-mortar outlets or online. In contrast to off-board navigation applications, on-board applications do not require a wireless connection. Maps and the software are stored locally on the device, usually on Secure Digital (SD) cards. All data can be accessed locally on the device and therefore no wireless data transfer needs to be made. The advantage of on-board applications is that they can be used even when there is no network coverage.
- (115) Customers usually pay a one-off fixed fee to use the application. In addition, the navigation applications are ready to use 'out of the box' when purchased as a bundle with a new handset. The major disadvantage of pure on-board navigation applications is that users do not have access to dynamic information such as traffic or weather and do not receive map updates instantaneously. Upgrades of maps can only be obtained from the internet via a PC and are usually costly. The one-off cost of purchasing an application including maps of a wide region or an entire continent might be relatively high. In addition, the memory needed to store the maps can no longer be used for other purposes.

⁴⁹ Orange UK offers Orange Navigation software. Vodafone offers Vodafone Navigator software in Italy and Romania.

Hybrid applications

- (116) Hybrid systems combine features of off-board and on-board applications. Some applications of this type are based on locally stored information and rely on wireless connectivity to download dynamic data such as information about the weather and traffic conditions from an external source. Other types of hybrid applications use map data stored on the device for frequently travelled routes. Additional maps can be accessed wirelessly by the user for a fee just like in the case of off-board applications. The advantage of hybrid applications is that they reduce the volumes of data transferred between the server and the handset and at the same time free up memory space on the handset.
- (117) Nokia Maps is a good example of a hybrid navigation application. Following the acquisition of gate5, Nokia now supplies a handset navigation application under the Nokia Maps brand. Its navigation application is a hybrid system which enables on-board route calculation and turn-by-turn guidance, wireless access to map data, and the ability to store frequently used map data on-board. Nokia Maps provides map display and basic routing free of charge, with more advanced turn-by-turn guidance available for a subscription.
- (118) Nokia Maps will in the future be part of Ovi, Nokia's new Internet services business. [Business secrets]*
- (119) Hybrid applications are also available from specialised software developers. Webraska has recently put on the market a navigation application which allows the user to download and store on the device frequently used maps. Maps which are used less frequently can be accessed on the central server from a handset for a fee.
- (120) TomTom, a hardware manufacturer and navigation software developer sells Navigator 6, a navigation application for mobile phones. It is an on-board application which can be combined with TomTom's Plus services. Plus services give TomTom's customers access to real-time traffic and weather data which can be accessed wirelessly and requires a subscription.
- (121) Due to rapid innovation, the constant introduction of new business models and the development of hybrid applications, the boundaries between the off-board and on-board navigation applications are being blurred. From the point of view of the end-user, these different types of applications deliver the same navigation experience. Although their pricing models are different, the price paid for a navigation application with updated maps over the lifetime of the device is similar. The suppliers can change and adjust their business model combining different elements of on-board and off-board applications. [Business secrets]* This is consistent with the view that the two are close substitutes. Accordingly, it is not necessary to define separate markets for off-board, hybrid and on-board navigation applications.

Different sales channels

- (122) Map applications can be sold through various channels. On-board navigation applications are usually sold on a stand alone basis through specialised stores or via websites of the software developers. TomTom's Navigator 6 can be bought

on-line or in specialised computer stores and is shipped on a DVD. Navigon's MobileNavigator 6.3 can be downloaded directly from Navigon's website. Some on-board navigation applications are pre-installed on mobile phones by handset manufacturers. For instance, Samsung's new SGH i560 and i550 models running a Nokia's Symbian operating system are delivered in Europe with an on-board Navigon's Mobile Navigator 6 application using NAVTEQ's maps. Nokia's 6110 Navigator is sold with a navigation application from Route 66. Sony Ericsson's new Walkman W760 will be sold in Europe with a pre-installed hybrid navigation application, Wayfinder Navigator which uses the maps of Tele Atlas.

- (123) Off-board and hybrid applications are sold by MNOs and other service providers (including Nokia). The software allowing the handset to access the digital maps located on the central server can be downloaded on-line. It can also be pre-installed by the MNO as is the case with Nokia N95 phones sold by SFR in France which come with SFR Navigation software.
- (124) From the point of the end-user, the navigation applications delivered through these different channels are essentially very similar. The suppliers can change and adjust the supply channel depending on user demand. Accordingly, it is not necessary to define separate markets for navigation applications depending on the sales channel.

Conclusion

- (125) Most MNOs in the EEA have started, or intend, to offer such navigation services to their customers. Navigation applications for mobile handsets can consist of navigation software directly purchased by end-customers in shops or on websites of the software developers (for instance, TomTom Mobile navigator 6). They can also be bundled with handsets, for instance when a MNO promotes a handset and includes in it its own-branded navigation service. Navigation applications for mobile handsets can also be accessed via a web browser (for instance, Google Maps).
- (126) Navigation applications for mobile handsets are a nascent market, and as such are subject to constant change. Various business models co-exist and compete with each other. However, from the point of view of the end-customer, on-board, hybrid and off-board navigation applications delivered through various channels are very similar. Although further differentiation cannot be excluded in the future, for the purpose of this Decision a single relevant market for navigation applications for mobile handsets, offering turn-by-turn navigation, may be defined.

6.4.1.2. Definition of the relevant geographic market

- (127) With regard to geographic scope, the supply of navigation applications is considered to be at least EEA-wide for the purposes of this Decision. Ultimately, the Commission's assessment is not affected by the geographical scope of the downstream markets. The transport cost of the software is not significant and can be dramatically reduced if the applications are downloaded on-line.
- (128) Although MNOs only commercialise navigation applications on the territory for which they have a telecommunication licence, they compete against mobile web-sites and navigation software providers who do not face territorial restriction.

Suppliers of navigation applications are typically active in Europe, the US and Asia. They make available similar products tailored to particular market requirements in different geographic regions.

6.4.2. Market for mobile handsets

6.4.2.1. Definition of the relevant product market

- (129) Today, the vast majority of mobile handsets have multimedia functionalities, such as digital camera and MP3 player. To an increasing extent, mobile handsets in the medium and high end price segments have navigation functionality.

Mobile handsets and other navigation devices

- (130) Mobile handsets equipped with navigation applications are one of four main types of navigation devices. Other devices with a navigation functionality are PNDs, and PDAs without wireless connectivity (wireless PDAs are essentially smartphones).
- (131) PNDs are predominantly single purpose devices but may sometimes include multi-media and photo functionalities. The screen size and user interface are optimised for navigation purposes. The digital map database and the navigation software are stored on-board in the device's internal memory or on memory cards, such as Secure Digital Cards (SD), and MultiMedia Cards (MMC). In contrast to mobile phones, most PNDs currently on offer do not have wireless connectivity.
- (132) PDAs are portable with a wide range of mainly data-centric applications often including navigation. PDAs normally do not include mobile telephony but may incorporate local connectivity such as Bluetooth or Wi-Fi. Recently sales of PDAs have decreased due to competition from other devices. Wireless PDAs compete directly with smartphones and can therefore be included in the same market.
- (133) It must be assessed whether it is appropriate to define separate relevant product markets for each main type of mobile navigation device or whether the definition of a single product market comprising all types of devices better reflects market realities. While recognising the fact that these markets may be converging to a certain extent due to rapid technical evolution, the Commission's market investigation indicates that a number of circumstances distinguish smartphones from other types of navigation devices.
- (134) PNDs, PDAs and mobile handsets with navigation functionality meet different consumer needs. A PND is primarily a navigation device, while a mobile handset is primarily a communication device. A mobile handset with navigation functionality usually incorporates a wide range of functions allowing the user to make calls, send SMS and MMS messages, take photographs, listen to music, access the internet and send e-mails. Navigation is only one of many functions. The different functionalities are reflected in the price. While mid-range PNDs retail at approximately EUR 200, mobile handsets with navigation functionality typically cost approximately EUR 500.

- (135) In comparison to PNDs, mobile handsets usually have less sensitive GPS receivers and poorer antennas. They also have smaller screens and are less adapted to inputting geographic data, due to the smaller keypads.
- (136) Wide-area wireless connectivity differentiates mobile handsets from other types of navigation devices including PNDs, PDAs without wireless connectivity and in-dash car navigation systems. The substitutability between mobile handsets and other types of navigation devices is likely to be limited for consumers who are interested in a multi-function communication device. Due to different functionalities, different types of navigation devices are not fully interchangeable. It must therefore be concluded that mobile phones are a separate relevant market.

Mobile phones and smartphones

- (137) It is common for the latest features to be introduced into high-end handsets and relatively quickly become adopted in a wider range of handsets if the feature is attractive to consumers. The most advanced handsets are currently referred to as "smartphones", due to their developed operating systems which enable them to hold multiple applications and carry out some of the functions of a computer. However, many functions introduced into smartphones, such as internet connectivity, have been included in a wider range of handsets. Both smartphones and the majority of mid-range to high-end handsets currently have operating systems that are capable of supporting navigation solutions. The boundaries between smartphones and other mobile handsets are therefore blurred. It is therefore not necessary to define separate relevant product markets for smartphones and other mobile phones.

Mobile phones with and without GPS sensors

- (138) The Commission has also analysed whether it is appropriate for the purpose of market definition to differentiate between mobile phones with and without embedded GPS. It has concluded that this is not the case. First of all, the majority of mobile phones currently being sold can be used for navigation thanks to relatively inexpensive external GPS sensors which can be linked to a mobile phone via a Bluetooth connection. Secondly, according to analyst predictions, in 2011 approximately [65-75]*% of mobile phones sold in Western Europe will have an embedded GPS sensor⁵⁰.

Conclusion

- (139) For those reasons, for the purpose of this Decision, the relevant product market encompasses all mobile phones, including handheld computers with wide area connectivity.

6.4.2.2. Definition of the relevant geographic market

- (140) The relevant geographic market must be considered to be at least EEA-wide for the purposes of this Decision. Ultimately, the Commission's assessment is not affected by the geographical scope of the downstream markets. Manufacturers distribute essentially the same products in the EEA to all of their customers regardless of their geographic location. There are no major price differences

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Annex 36C of Form CO – Forecasts for handsets with GPS

between the same products offered in different regions of the EEA. In addition, transport costs do not limit cross-border trade.

VII. MARKET CONDITIONS

7.1. Upstream markets – digital maps

7.1.1. Non-Navigable Digital Map Databases

- (141) Non-navigable digital map databases account for a fraction of NAVTEQ's total database sales. In 2006, [0-5]*% of NAVTEQ's total sales concerned non-navigable digital map databases.
- (142) For NAVTEQ's main competitor Tele Atlas, sales of digital map databases for non-navigation purposes accounted for [20% to 30%] of the company's sales.⁵¹
- (143) Source maps covering the EEA (or parts of it) of sufficient quality for non-navigation purposes are available from a large number of providers, for example Europa Technologies Limited (United Kingdom), Collins Bartholomew Limited (United Kingdom) and American Digital Cartography, Inc. (United States)⁵². In addition, digital map databases may be purchased from public agencies in Western Europe, for example, the Institut Géographique National ("IGN") in France, the Bundesamt für Kartographie und Geodäsie ("BKG") in Germany and the Ordnance Survey in the United Kingdom.⁵³ Finally, a number of private companies provide digital map databases with national (or wider coverage). In Eastern Europe, private companies supply digital map databases, for example Emapa sp. z o.o. (Poland), Datecs Ltd (Bulgaria), Top-Map Kft of Hungary (the company was acquired in 2007 by the Hungarian navigation software provider, Nav N Go Kft⁵⁴) and Regio Ltd (Estonia).⁵⁵
- (144) Given NAVTEQ's limited turnover generated by sales of non-navigable digital map databases and the existence of numerous competitors in the EEA, it may be presumed that NAVTEQ's shares of the markets for non-navigable digital map databases with EEA coverage are limited.⁵⁶
- (145) As regards market entry, NAVTEQ considers that a non-navigable digital map database of the third category, as described in Recital 28 of Section 6.2.1., – that is to say a database enabling vehicle routing - covering the EEA could be built

⁵¹ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 21.

⁵² "Digital Map Entry – Decreasing Costs and Increasing Efficiencies", NAVTEQ presentation of 6 May 2008, page 7.

⁵³ Notification, Annex 25.

⁵⁴ Nav N Go press release of 3 January 2008, available at: http://upload.navngo.com/marketing/Vegyess/press/januar/topmap_press_release_EN_web.doc

⁵⁵ "Digital Map Entry – Decreasing Costs and Increasing Efficiencies", NAVTEQ presentation of 6 May 2008, page 7; Notification, Annex 25.

⁵⁶ When referring to digital map database 'markets with EEA-coverage', the Commission – for the purposes of this Decision - includes all the alternative product market definitions depending on the geographic coverage of the database as described in Section 6.2.1., that is to say national, regional or EEA-wide.

from "scratch" in [less than 2 years]* at a cost of approximately [less than 40 million]*. Creating the map would involve sourcing a basic map database from a third-party supplier (for example, the companies referred to in Recital 143. According to NAVTEQ, certain source maps already include the "direction of travel" attribute necessary for routing. In some cases, additional attributes are available from third-party suppliers. For areas where the necessary attributes are not available, they may be obtained from satellite imagery. Limited field surveys are usually necessary, for example to collect "direction of travel" attributes in rural areas. Thereafter, the collected information needs to be analysed and integrated with the base map database. Database software to perform these tasks is commercially available from third-party suppliers. Finally, limited post processing (coding) may be necessary.⁵⁷

- (146) The Commission's market investigation confirms NAVTEQ's claim that the barriers to enter the market for non-navigable digital map databases are moderate.
- (147) More generally, it must be concluded that no competition concerns may arise in the upstream market for non-navigable digital map databases, principally because a number of competitors are active in this market, and because barriers to entry are limited.

7.1.2. Navigable Digital Map Databases

7.1.2.1. Market shares

- (148) There are two providers of navigable digital map databases which cover States situated in the EEA, namely NAVTEQ and Tele Atlas. These companies account for all sales of navigable digital map databases with EEA coverage. The markets for the provision of navigable digital map databases covering EEA States may therefore be regarded as a duopoly⁵⁸.
- (149) NAVTEQ typically licenses its European digital map database on a continental basis but also makes pricing available for the use of databases with regional and national coverage.
- (150) In 2007, Tele Atlas's sales of national, regional and European licences each accounted for [20% to 40%] of the number of licences sold by the company⁵⁹.
- (151) In its recent Decision in Case No COMP/M.4854 TomTom/Tele Atlas, the Commission noted a trend of increasing sales of navigable digital map databases with wider geographic coverage and concluded that this trend is consistent with developments in the downstream markets for navigation devices, where

⁵⁷ "Digital Map Entry – Decreasing Costs and Increasing Efficiencies", NAVTEQ presentation of 6 May 2008, page 7.

⁵⁸ This view is supported by industry analysts that consistently characterise the market as a duopoly. See for instance: "Tele Atlas – Potential still there but pricing is an issue", SNS Securities report of 1 August 2006.

⁵⁹ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 74.

increasingly powerful (as regards data storage capacity) and sophisticated devices are introduced into the market at an increasing pace⁶⁰.

- (152) In that Decision, the Commission made the following alternative estimations of NAVTEQ's and Tele Atlas's respective market shares.⁶¹
- (153) If it is assumed that all navigable digital map databases with EEA coverage, whether national, regional or European, constitute a single relevant product market, the following market shares may be calculated. NAVTEQ's market share in 2006 was [40% to 45%] whereas Tele Atlas's share was [55% to 60%].
- (154) If it is assumed that all navigable digital map databases with regional and European coverage belong to the same relevant product market⁶², the following market shares may be calculated. NAVTEQ obtained a market share of [45% to 50%] and Tele Atlas's market share was [50% to 55%].
- (155) Finally, if all navigable digital databases covering a particular State located in the EEA are considered as belonging to the same relevant product market, the market shares indicated in the following table may be estimated (all figures concern 2006)⁶³.

⁶⁰ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recitals 74 and 76.

⁶¹ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recitals 77 to 80.

⁶² Tele Atlas, but not NAVTEQ, has provided data that separates sales for smaller regions such as BENELUX, DACH and the Nordic countries from larger regions such as Western Europe, Eastern Europe and Europe as a whole.

⁶³ Tele Atlas does not have access to precise country-by-country sales data, because customers paying licence fees for digital map databases with national coverage are not required to report to Tele Atlas which specific country the licence covers. Tele Atlas has used management estimates and allocations based on third-party sources in order to calculate its sales for each licensed country. In contrast to data which the company's customers are required to report, that is to say, national, regional or European, the country-by-country breakdown must be regarded as estimates.

NAVTEQ's and Tele Atlas's market shares based on the companies' estimated sales of navigable digital map databases with national coverage in 2006.

COUNTRY	NAVTEQ's SHARE (%)	TELE ATLAS's SHARE (%)
Belgium	[80-100]	[0-20]
Bulgaria	[80-100]	[0-20]
Czech Republic	[80-100]	[0-20]
Denmark	[80-100]	[0-20]
Germany	[20-40]	[50-70]
Ireland	[0-20]	[80-100]
Greece	[20-40]	[60-80]
Spain	[30-50]	[50-70]
France	[40-60]	[40-60]
Italy	[20-40]	[50-70]
Hungary	[80-100]	[0-20]
Netherlands	[80-100]	[0-20]
Norway	[0-20]	[80-100]
Austria	[30-50]	[50-70]
Poland	[80-100]	[0-20]
Portugal	[80-100]	[0-20]
Romania	[80-100]	[0-20]
Slovenia	[80-100]	[0-20]
Finland	[80-100]	[0-20]
Sweden	[80-100]	[0-20]
United Kingdom	[0-20]	[80-100]

- (156) The same conclusion emerges from the market share analysis regardless of which alternative product market is used. The worldwide market(s) for the provision of navigable digital map databases with EEA-coverage is a duopoly where Tele Atlas is the larger player as evidenced by its larger market shares in the total market, in the market for databases with regional and European coverage and in the larger markets for individual countries such as databases covering France, Germany, Italy, Spain or the United Kingdom⁶⁴.
- (157) The Commission's market investigation in this case has confirmed the market share estimates calculated in the TomTom/Tele Atlas Decision.
- (158) NAVTEQ and Tele Atlas have slightly different customer emphases. A substantial part of NAVTEQ's sales go to producers of "in-dash" systems (car makers and OEMs), whereas a large share of Tele Atlas's sales go to PND manufacturers.
- (159) Due to the nascent nature of the market, no reliable sales data is available for NAVTEQ's and Tele Atlas's sales of navigable digital map databases to mobile handset manufacturers and to providers of navigation applications on mobile handsets.
- (160) It ought to be emphasised that the markets for the provision of navigable digital map databases are evolving at a fast pace. The customer segment "personal navigation" accounted for [0-10]*% of NAVTEQ's sales in the EEA in 2004, the year when the first PNDs were introduced. In 2007, the share of sales for "personal navigation" had risen to [30-40]*%. In the same year, NAVTEQ's sales

⁶⁴

Measuring market shares for databases covering smaller countries is not very meaningful since the volumes sold are very limited. This is explained by the fact that coverage of many smaller countries are included in regional packages (for instance databases covering Belgium or Sweden are almost exclusively sold in BENELUX and Nordic country regional packages and hardly ever on a stand-alone basis) or because the sales of navigation devices have still to take off in other countries (such as Bulgaria and Romania). However, the larger countries are large enough with regard to their population and geographically to constitute stand-alone markets.

of navigable digital map databases for use in mobile handsets accounted for less than [0-10]*% of NAVTEQ's sales in the EEA. It is predicted that NAVTEQ's (and Tele Atlas's) sales to this customer segment will increase rapidly. NAVTEQ estimates that its sales to mobile handset makers will account for [5-15]*% of the company's turnover in 2010. This segment is currently the fastest growing segment in the market.⁶⁵

7.1.2.2. Price developments

Historic price developments

- (161) Average selling prices of navigable digital map databases have declined over the last few years.
- (162) An industry analyst looking into NAVTEQ's market performance estimated that prices for navigable digital map databases decreased by 6% to 8% in 2006⁶⁶.
- (163) Another analyst stated that prices for navigable digital map databases decreased by 6% to 15% in 2006. However, a large part of this decrease concerned prices of producers of "in-dash" devices. In addition, if only databases destined for personal navigation are considered, pricing was relatively steady in 2006 compared to the significant price decreases in 2004 and 2005⁶⁷.
- (164) The Commission's market investigation in the *TomTom/Tele Atlas Decision* confirmed the trend towards falling average selling prices for navigable digital map databases. One PND manufacturer stated that the company's average purchase price for databases used in PNDs fell by 40% to 50% between 2005 and 2007 and another producer of navigation devices indicated that the prices the company paid for its navigable digital map databases decreased by 10% to 15% during the same period. Another PND manufacturer stated that the prices the company paid for its navigable digital map databases decreased by 1% to 10% during the last three years.⁶⁸
- (165) The Commission's market investigation in the present case confirms the trend towards decreasing prices.⁶⁹ [Mobile Handset Manufacturer] stated that prices for digital map databases decreased by 20% to 25% during the last three years.⁷⁰ [Provider of on-line map services] estimated that average prices have decreased by 15% over the last three years.⁷¹ [Navigation Device Manufacturer] stated that prices have decreased by 15% per year.⁷²

⁶⁵ Nokia's Reply to information request of 6 February 2008. 2

⁶⁶ "NAVTEQ, Opportunities and Challenges Aplently", CIBC World Markets report of 20 May 2007.

⁶⁷ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 82.

⁶⁸ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 85.

⁶⁹ See also Reply by [Navigation Device Manufacturer] of 4 March 2008, Reply by [Navigation Device and Navigation Software Provider] of 6 March 2008, and Reply by [Navigation Device Manufacturer] of 4 March 2008.

⁷⁰ Reply by [Mobile Handset Manufacturer] of 18 March 2008.

⁷¹ Reply by [Provider of On-line Map Services] of 3 March 2008.

⁷² Reply by [Navigation Device Manufacturer] of 5 March 2008.

- (166) The price decreases referred to in the preceding Recitals vary substantially and come from a limited number of sources. Price decreases of different magnitude may be partly explained by the differences in bargaining power of device makers with regards to the suppliers of navigable digital map databases. A major producer of PNDs, for example, may be expected to negotiate greater price reductions than smaller device makers. Another explanation may be changes in the product mix, a certain customer may have bought more databases with regional coverage and fewer databases with full European coverage. For that customer, average purchase price will have decreased although the database provider's pricing matrix may have remained unchanged. Nevertheless, there is a clear trend towards decreasing sales prices for navigable digital map databases.

Future price developments

- (167) Before the announcement of the proposed merger between TomTom and Tele Atlas, and the subsequent announcement of Nokia's proposed acquisition of NAVTEQ, industry analysts predicted that average selling prices for navigable digital map databases would continue to decline.
- (168) In a report published in April 2007, Fortis forecasted that the prices of NAVTEQ's databases for personal navigation (that is to say, excluding databases for in-dash devices) would decrease by 7%, whereas a 10% price decrease was predicted for Tele Atlas. Fortis went on to make the following statement: "Given the trend towards more content in general, we believe that map price erosion for the various market segments will be limited in the coming years. [...], volume growth in the navigation industry is driving down the cost per map each year"⁷³.
- (169) Predicting the future evolution of prices for navigable digital map databases is a difficult exercise. Extrapolating the substantial decreases in recent years and assuming that prices will continue to decrease at the same rate as in the recent past, would be overly simplistic. However, the Commission's market investigation and the general characteristics of the industry indicate that prices are likely to continue to decrease in the next few years, albeit possibly at a more moderate pace than before.

7.1.2.3. Contractual relationships

- (170) With the notable exception of Nokia and Motorola, Inc. (United States), mobile handset manufacturers tend not to have direct contractual relationships with NAVTEQ and Tele Atlas. Most mobile handset manufacturers – for example, Sony Ericsson Mobile Communications AB ("Sony Ericsson", Sweden)⁷⁴ - source their navigable digital map databases bundled with navigation software from navigation software providers.
- (171) **Nokia** currently sources navigable digital map databases from both NAVTEQ and Tele Atlas. Nokia has concluded a framework contract with NAVTEQ which expires in 2010. In addition, Nokia and NAVTEQ have concluded several contracts concerning particular projects. These contracts expire when the respective projects have been terminated.⁷⁵ Tele Atlas is Nokia's current provider

⁷³ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 90.

⁷⁴ Reply by Sony Ericsson of 14 March 2008.

⁷⁵ Notification, Annexes 57 and 63.

of navigable digital map databases with European coverage for the company's Nokia Maps application.⁷⁶ [Business secrets]*

- (172) **Motorola** [currently sources navigable map databases from NAVTEQ]*. [Business secrets]*
- (173) **Sony Ericsson** has concluded agreements with Google Mobile Maps and Wayfinder Systems AB ("Wayfinder", Sweden).⁷⁷
- (174) Mobile handsets made by **Samsung** (South Korea) sold in Europe will be equipped with navigation software from Garmin.⁷⁸ Both companies signed an agreement in March 2008 to supply Garmin navigation solutions on Samsung mobile handsets.
- (175) The typical duration of the current contracts of NAVTEQ and Tele Atlas are [zero to five years].⁷⁹
- (176) Some contracts contain clauses in which NAVTEQ and Tele Atlas undertake to supply updates of the database at regular intervals (for instance, twice per year or even more frequently), certain contracts stipulate that updates will be provided according to published schedules and some contracts do not mention updates at all. It follows that some, although not all, customers have contracts which protect them, at least partially, from possible attempts by the merged undertaking to 'hold back' upgrades of the database from competitors of NAVTEQ. The merged undertaking could start updating its database more frequently but only distribute updates with the minimum frequency stipulated in the contract. In such a scenario, these clauses would give only partial protection against delayed updates.
- (177) In the *TomTom/Tele Atlas Decision*, the Commission found that only a very small number of NAVTEQ's and Tele Atlas' customers have "most-favoured-customer" clauses guaranteeing access to digital map databases on conditions at least as good as any other customer or other clauses guaranteeing the quality of the data provided. Therefore, only a minority of customers would be protected from possible attempts by the merged undertaking to degrade the quality of the databases delivered to Nokia's competitors⁸⁰.
- (178) With a limited number of exceptions - dual sourcing of navigable digital map databases is common among car manufacturers - dual sourcing does not seem to be prevalent in the industry. Most customers prefer purchasing their navigable map databases for a given region from one supplier. In particular, customers tend to acquire databases "en bloc" for each continent (for instance, they acquire databases covering Western Europe and North America respectively from the same player). To the extent that dual sourcing occurs, customers procure

⁷⁶ Notification, page 56.

⁷⁷ Reply by Sony Ericsson of 14 March 2008.

⁷⁸ "Garmin Provides Navigator for Samsung Mobile Phones", Garmin press release of 31 March 2008 available at: <http://www8.garmin.com/pressroom/mobile/033108.html>

⁷⁹ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 95.

⁸⁰ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 97.

databases for different continents from separate suppliers. Dual sourcing for navigable map databases with EEA coverage is rare, as is dual sourcing for different device models (that is to say a device maker that uses NAVTEQ databases for one model or product line and Tele Atlas for another).⁸¹

7.1.2.4. Barriers to switching

- (179) When switching suppliers of navigable digital map databases, the customer must reconfigure the new database so that it works with the customer's navigation software. The main cost of switching is reconfiguration costs. Other switching costs include the cost of modifying production tools to handle different data formats as well as costs for changing product packaging and marketing materials.
- (180) NAVTEQ and Tele Atlas are capable of supplying map data in all available formats. The formats in which NAVTEQ and Tele Atlas provide their databases are largely overlapping. It follows that a customer may either switch suppliers while retaining the same database format or he may switch suppliers and change formats at the same time. Reconfiguration costs may be presumed to be higher in the latter case than in the former.
- (181) Once it obtains control of NAVTEQ, Nokia intends to switch from Tele Atlas to NAVTEQ for the supply of navigable digital map databases with EEA coverage. [Business secrets]* According to Nokia, customers do not find it difficult to switch map data suppliers. Navigation software providers often have expertise in compiling data from both NAVTEQ and Tele Atlas⁸².
- (182) In the TomTom/Tele Atlas Decision, NAVTEQ argued that switching is not costly. The costs of handling different database formats are not significant since customers typically purchase map data in publicly available, industry-wide formats. Knowledge about the definition of these formats and map data compilation methods are easily accessible on the internet. Therefore, any customer can compile data received in the industry format quickly and efficiently. NAVTEQ estimated that the process of switching between map data formats typically takes [less than one year]*⁸³.
- (183) In the TomTom/Tele Atlas Decision, the notifying party alleged that switching costs are low and estimated the cost of switching from one database provider to another to be [EUR 100 000 to EUR 300 000] and that it would take [zero to ten] software engineers approximately [zero to ten] months to develop the modified converter software and test its interaction with the new database. The lead-time may be shortened by using more than [0 to 10] engineers⁸⁴.
- (184) The Commission's market investigation in the TomTom/Tele Atlas Decision indicated that switching costs could exceed TomTom's estimate. Respondents estimated switching costs of up to EUR 1 million⁸⁵.

⁸¹ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 98.

⁸² Notification, pages 56 and 57.

⁸³ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 102.

⁸⁴ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 101.

⁸⁵ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 105.

- (185) The Commission's market investigation in this case largely confirms the Commission's findings in the TomTom/Tele Atlas Decision. [Navigation Device Manufacturer] considers switching costs to be high.⁸⁶ Another [Navigation Device Manufacturer] estimates it would require 200 men-months to change suppliers for the EEA.⁸⁷ A [Navigation Device Manufacturer and Navigation Software Provider] estimates switching costs to be EUR 1 million with a lead time of 18 months.⁸⁸ A third [Navigation Device Manufacturer] estimated that switching map database suppliers would cost between EUR 1 million and EUR 3 million and stated that the company would require approximately two years to adapt to the new map database.⁸⁹
- (186) Considering primarily the fact that switching has occurred in the recent past⁹⁰ - barriers to switching must be considered to be relatively limited. However, since switching costs, in particular reconfiguration costs, are likely to be the same irrespective of the size of the company that wishes to switch, the relative costs of switching are higher for a small device maker or navigation software provider than for a major manufacturer of navigation devices.

7.1.2.5. Market entry

Arguments by the parties

- (187) Nokia states that there are no intellectual property, legal or regulatory barriers to entry. A new entrant would ideally match the geographic coverage offered by the incumbents. Nokia estimates that a new entrant would require approximately [6-24 months]* to produce a "*rudimentary but fully navigable*" digital map database containing all core attributes necessary for navigation. However, this database will be limited in geographic coverage and functionality. In order to add extra coverage, functionality and complexity to the map database another [6-24 months]* would be required, that is to say [1-4 years]* in total. In the notification, Nokia states that – according to NAVTEQ estimates – a new entrant would have to invest approximately [Business secrets]*⁹¹ per continent for a navigable digital map databases containing a significant number of extra features available in the NAVTEQ database. Nokia states that the cost and timing of entry would be greatly reduced for companies that already have the experience of technology to develop digital map databases, such as Microsoft Corporation (United States) and Google Inc (United States)⁹².
- (188) At a later stage in the proceedings, NAVTEQ presented the Commission with revised estimates for entry. NAVTEQ estimates that it would take a new entrant [Business secrets] to create a "fully built" database with EEA coverage.

⁸⁶ Reply by [Navigation Device Manufacturer] of 4 March 2008.

⁸⁷ Reply by [Navigation Device Manufacturer] of 28 February 2008.

⁸⁸ Reply by [Navigation Device Manufacturer and Navigation Software Provider] of 4 March 2008.

⁸⁹ Reply by [Navigation Device Manufacturer] of 28 February 2008.

⁹⁰ In the Notification, Nokia lists numerous companies – mainly device makers and navigation software providers – that have switched between NAVTEQ and Tele Atlas in the last three years. Notification, pages 59 and 60.

⁹¹ [Business secrets]* converted to euro according to the exchange rate 1 USD = EUR 0.646682, quoted on www.XE.com on 14 May 2008.

⁹² Notification, pages 60 to 65.

NAVTEQ estimates the necessary investment to be [Business secrets]. NAVTEQ confirms that field surveys are necessary to create a navigable digital map database but points out that software for field collection of data is commercially available.⁹³

- (189) NAVTEQ argues that the costs of compiling digital map databases have decreased substantially over the years. Therefore, historic entry costs generated by NAVTEQ and Tele Atlas are not suitable as an indication of the current costs of entry. NAVTEQ mentions – *inter alia* - the following examples of decreased map making costs: Map sources are predominantly digital today and have higher absolute accuracy. In addition, many attributes necessary for navigation functionality are now available in digital form from third parties. In addition, data can be checked, verified and ordered online and new, up-to-date imagery is increasingly available (for example, EEA-wide satellite imagery with high resolution). Finally, field collection is becoming increasingly automated and third party software packages may be used to create customised tools at lower costs in less time.⁹⁴

Potential market entrants

- (190) There are several companies that provide navigable digital map databases covering other parts of the world. The Japanese firms, Zenrin Inc. and Toyota Mapmaster Inc. ("Mapmaster"), both offer databases covering Japan. Meanwhile, the South-Korean company, ThinkWare Inc. produces a navigable digital map database covering South Korea. These firms are likely to have the technological knowledge and industry experience to provide navigable digital databases of comparable quality to those provided by NAVTEQ and Tele Atlas.
- (191) Another potential market entrant is the United States firm, Facet Technology Corporation ("Facet"), that on 29 November 2007 announced the imminent availability of a navigable digital map database covering the continental United States. According to the company's own claims, Facet's United States database is more accurate than those offered by Tele Atlas and NAVTEQ. In addition, Facet announced its intention to expand its geographic coverage to Canada and Europe⁹⁵.
- (192) In addition, there are number of companies that provide digital map databases of lower quality than those supplied by Tele Atlas and NAVTEQ (see Section 7.1.). AND International Publishers N.V. ("AND", the Netherlands) in particular was cited by the notifying parties as a credible market entrant.
- (193) Finally, firms that currently do not supply navigable digital map databases at all could possibly enter the market. These companies, essentially Google and Microsoft (currently customers of NAVTEQ and Tele Atlas), provide map

⁹³ "Digital Map Entry – Decreasing Costs and Increasing Efficiencies", NAVTEQ presentation of 6 May 2008, page 9.

⁹⁴ "Digital Map Entry – Decreasing Costs and Increasing Efficiencies", NAVTEQ presentation of 6 May 2008, pages 10, 11 and 12.

⁹⁵ "Facet Technology Corp Announces Navigation Content for the Continental US", press release by Facet of 29 Novemeber 2007 at http://www.facet-tech.com/News/Facet_Announces_Navigation_Content_for_the_Continental_US.htm.

services over the internet. These firms could possibly use their technical knowledge and financial capabilities to upgrade their map databases to navigable quality, for instance by using feedback from user communities.

- (194) In the recent TomTom/Tele Atlas case, the Commission carried out a thorough entry analysis which remains valid also for the present case. In TomTom/Tele Atlas, the Commission examined the cost of entry, the time of entry, the feasibility of low-end, "country-by-country" entry. In addition, the Commission assessed the likelihood of AND and Facet entering the market⁹⁶.

Cost of entry

- (195) According to a study commissioned by Tele Atlas in relation to the merger with TomTom, market entry could occur within [one to five] years at a cost that does not exceed [EUR 100 million to EUR 300million].⁹⁷
- (196) The Commission considered that historic entry costs could serve as a starting point when estimating the cost of entry. In the TomTom/Tele Atlas Decision, the merging parties stated that Tele Atlas has made a cumulative investment of EUR 1 billion (1 000 million) to build and continually maintain and upgrade its worldwide map database for all applications.
- (197) Once the historic entry costs have been established, it must be considered whether a company entering the market today for the provision of navigable digital map databases with EEA-coverage would have to make an investment at the historic level or whether entry costs have changed since the two incumbents entered the market.
- (198) In the TomTom/Tele Atlas case, it was alleged that entry costs are falling, mainly due to improvements in aerial photography, increased availability of map data from public sources, the possibility to use community end-user and probe feedback data and the commercial ability of software that can handle large amounts of geographic data.
- (199) In the TomTom/Tele Atlas case, the Commission concluded that, while there could be cost savings due to increased availability of aerial photography and map data from public sources, the impact of these cost savings on the total cost for producing a navigable digital map database must be regarded as minor.
- (200) In the TomTom/Tele Atlas case, the Commission for several reasons, considered it unlikely that a "Wikipedia-like" collaborative approach using end-user feedback could be used to create a navigable digital map database. Firstly, developing an IT-tool making it easy for end-users to edit map data would be very complicated due to the very long list of inputs for navigable data (editing a digital map database is much more complicated than editing a text document like Wikipedia). Secondly, while users may have an incentive to edit an existing high-quality product they are already using, they have few incentives to help create a new product or increase the quality of a poor product that is functioning badly. Thirdly, the veracity of all edits must be checked by the mapping company, something which is very resource consuming. Fourthly, updating a digital map

⁹⁶ See Case No COMP/M.4854 - TomTom/Tele Atlas, [Recital 136 to 155]

⁹⁷ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 111.

database using customer feedback is unlikely to succeed simply because of information asymmetries. Unlike Wikipedia, where anyone of millions of users may possess the knowledge to update a certain topic, the number of people with sufficient local knowledge is very small (for any token street depicted in a database, very few people have the necessary detailed and up-to-date knowledge to make a correct edit).

- (201) In the TomTom/Tele Atlas Decision, the Commission emphasised the fact that it is still indispensable to employ field forces in customised vehicles which record and update very large volumes of road data in order to produce high-quality navigable digital map databases. The indispensability of field surveys is confirmed by Facet. According to that company, it is impossible today to build a truly navigable digital map database without conducting field surveys using dedicated vehicles because it is the only way to reliably record sign information and other road features such as barriers, gates and other obstacles. NAVTEQ confirmed that field forces are still important (albeit less crucial than when NAVTEQ first built its database in the 1980s). The Commission considered that the fact that Tele Atlas and NAVTEQ - companies that must be considered as world-leaders in digital map database making - continue to use field surveys despite technical developments, confirmed the indispensability of this form of data collection. Finally, the Commission noted that AND's problems in producing a well-functioning navigable digital map database without field surveys, is a further indication that field surveys are necessary to obtain a high-quality product.
- (202) In addition to the necessary technological knowledge, a credible market entrant needs to make substantial up-front investments in order to produce navigable digital map databases of a quality comparable to those supplied by Tele Atlas and NAVTEQ. The cost estimates for producing a digital map database covering the EEA today, vary greatly. In the TomTom/Tele Atlas Decision, the lowest estimate by far was made by Facet, which predicted that it would cost the company less than EUR 100 million to produce a navigable digital map database with a "broad European coverage". NAVTEQ estimated that it would cost approximately [Business secrets]* for a market entrant to build an EEA-wide database with the same features as the NAVTEQ database. A Japanese Digital Map Database Provider estimated that it would cost more than EUR 360 million to create a navigable map database covering the EEA. Finally, there is the historic cost benchmark of EUR 1 billion (1 000 million), confirmed by the parties in the TomTom/Tele Atlas case. However this worldwide estimate should be reduced by the cost of compiling North American data and data for other territories outside the EEA and the cost reductions generated by technical innovation.
- (203) In the TomTom/Tele Atlas Decision, the Commission considered that the estimate forwarded by Facet was surprisingly low, considering the fact that it was substantially lower than the broadly concurring estimates of NAVTEQ and Tele Atlas. Facet presumably based its estimate on the costs incurred for producing its United States database. However, it is doubtful whether the cost of producing a map database in the United States is a reasonable benchmark for the cost of producing a map database in the EEA. The cost of compiling map data in the United States, which is a largely homogeneous geographic area with regards to elements such as traffic regulation and signposting when compared to the EEA

which is a heterogeneous area consisting of 30 States with varying ways of regulating traffic. A simple linear extrapolation of Facet's costs based on kilometres of the road network in the United States as opposed to the kilometres of road network in the EEA is therefore likely to lead to an underestimation of the data compilation costs. Finally, it appeared that Facet's estimate did not include complete EEA-coverage. The company stated that it had yet to determine the scope of its future European map database but that it will be "broad" from the outset. For those reasons, the Commission considered it likely that Facet underestimated the cost of building a navigable digital map database with complete EEA-coverage.

- (204) Finally, it is also considered in this case that while the projected cost may certainly be debated, it is undisputed that building a navigable digital map database with EEA coverage is resource-intensive and expensive. In addition, the majority of these costs must be regarded as sunk costs.

Time of entry

- (205) In the TomTom/Tele Atlas Decision, the merging parties first submitted a study commissioned by Tele Atlas according to which entry could occur within [one to five] years. At a later stage of the investigation the parties alleged that entry is very likely to occur in the near future.⁹⁸
- (206) In the TomTom/Tele Atlas Decision, NAVTEQ made a similar estimate about the time of entry. The company considered that entry by the most likely entrants - which according to NAVTEQ are current suppliers of digital map data such as AND and current suppliers of internet-based map applications such as Google - would require between [Business secrets]*. However, NAVTEQ recognised that a new entrant would need more time to create a navigable database.
- (207) Some respondents to the market investigation in the TomTom/Tele Atlas Decision considered that market entry would take longer than estimated by the parties and NAVTEQ. The time-lag before full-scale entry may occur was estimated to be between five to ten years by several respondents to the market investigation.
- (208) The Commission noted in the case TomTom/Tele Atlas in that regard, that AND, which has dispensed with the use of a field force when compiling its data, has spent "*many years*" collecting the data for its navigable digital map databases⁹⁹.
- (209) Similarly, Facet claims to have been compiling its map data for the United States "*for years*"¹⁰⁰. When asked by the Commission, Facet stated that it took it [four to eight years] to create its United States database but that it would have been possible to shorten this time period with additional funding. Nonetheless, Facet estimated that it could create a database with broad European coverage in 18 months. Bearing in mind the time it took Facet to create its United States database, the Commission considered in the case TomTom/Tele Atlas it likely that Facet underestimates the time required to build a navigable digital map database with complete EEA-coverage.

⁹⁸ See Case No COMP/M.4854 *TomTom/Tele Atlas*, Recital 111.

⁹⁹ AND web-site, www.and.com.

¹⁰⁰ Facet press release of 29 November 2007.

- (210) In the TomTom/Tele Atlas Decision, a provider of internet-based mapping solutions estimated it would take five years to build its own digital map database which enables the features currently available from the company.
- (211) The Commission concluded in TomTom/Tele Atlas that it is beyond dispute that the creation of a navigable digital map database of a quality comparable to those created by NAVTEQ and Tele Atlas is a time-consuming exercise. To build a database covering the EEA, vast volumes of data have to be collected from various sources and field survey teams have to drive down every road in the EEA and record all features on the way.
- (212) It must therefore be concluded in the present case that entry by a credible entrant able to constrain the behaviour of the incumbents is unlikely to occur within the next three years

Low-end "country-by-country" entry

- (213) In the TomTom/Tele Atlas Decision, the merging parties alleged that the entry of a provider of a basic navigable map database with limited geographic coverage is likely and that such "low-end" entry would constrain the competitive behaviour of NAVTEQ and Tele Atlas. For several reasons, the Commission considered it unlikely that such entry, if it occurred, would have a significant impact on competition.
- (214) Firstly, a well-functioning navigation capability is crucial for the reputation and commercial success of device makers. Given the fact that the licence fee for the database constitutes a minor part of the total production cost of a navigation device, manufacturers have limited incentives to opt for a low cost, low quality map database instead of a fully navigable one because the risk to their reputation, and the commercial risk involved, is likely to outweigh the limited cost savings. In addition, any damage to the device maker's reputation caused by malfunctioning, low-end navigation devices is likely to spill over to the producer's mid-range and high end devices. Therefore, the future uptake of basic map databases for use in navigation devices is likely to be limited even in low-end devices.
- (215) Secondly, device manufacturers need to ensure "seamless" navigation as customers move across national borders. In order to ensure seamless navigation and minimise problems with compatibility, device makers tend to source their navigable digital map databases from the same supplier (at least for each region). The Commission's market investigation indicates that the industry practice is buying licences for databases "en bloc" for each continent. Given the economies of scale (volume discounts are prevalent in the industry) and scope (no costs for ensuring "seamless" map coverage) involved in buying from a single supplier as well as the transaction costs generated by sourcing databases from multiple suppliers, this buying pattern is unlikely to change in the future. These circumstances make a "country-by-country" entry strategy unlikely to be sufficient to constrain the competitive behaviour of NAVTEQ and Tele Atlas.

AND

- (216) In the TomTom/Tele Atlas Decision, the Commission evaluated in detail the role of AND in order to determine whether the company would be able to constrain

the competitive behaviour of NAVTEQ and Tele Atlas or whether it would be able to do so in the short or medium term.

- (217) AND has approximately 250 employees located in the Netherlands and India¹⁰¹. The company's worldwide turnover in 2006 was less than EUR 5 million. The company initially aimed to produce digital map databases covering countries which NAVTEQ and Tele Atlas had not yet covered. AND also supplies a World Map which covers more than 200 countries with a level of accuracy significantly lower than NAVTEQ and Tele Atlas. This non-navigable digital map database is mostly used for tracking and tracing, logistics solutions and online applications. Most AND customers use its digital map databases for non-navigation applications¹⁰².
- (218) In a press release issued on 17 September 2007, AND announced its release of "street level" map data for the BENELUX countries¹⁰³. On 19 November 2007, AND made a similar statement announcing "street level" data also for Germany. In addition, the company intended to release digital map databases covering the rest of Western Europe in 2008¹⁰⁴.
- (219) AND currently provides allegedly navigable digital map databases covering the following tSates in the EEA: Belgium, Bulgaria, Germany, Luxembourg, the Netherlands and Slovenia. The company claims that these databases "*have all attributes necessary for navigation and include select points of interest*". AND creates its navigable digital map databases by compiling map data from a variety of publicly available sources, supplements this data with aerial and satellite imagery and processes the collected data in its facility in India. The company does not, as do NAVTEQ and Tele Atlas, use field forces and specialised vehicles to record road information.
- (220) In the TomTom/Tele Atlas Decision, the Commission's market investigation indicated that the quality of AND's navigable digital map databases is clearly inferior as regards accuracy and completeness to those offered by NAVTEQ and Tele Atlas. Respondents indicated that the digital map databases supplied by AND only allows very basic navigation functionality. Neither the Commission, nor the merging parties were been able to identify a device maker or navigation software developer that uses navigable digital map databases with EEA coverage produced by AND. In addition, respondents raised the argument that AND lacks the financial resources necessary to expand, in the short or medium term, its coverage and improve the quality of its navigable digital map databases to a sufficient level. The Commission also concluded in this Decision that, in any event, the geographic coverage of AND's navigable digital map database is far from complete.

¹⁰¹ AND web-site, www.and.com.

¹⁰² AND web-site, www.and.com.

¹⁰³ "AND releases street level data for the Benelux", AND press release of 17 September 2007, <http://www.and.com/company/press/item80en.php>.

¹⁰⁴ "AND releases street level data for Germany", AND press release of 19 November 2007, <http://www.and.com/company/press/item83en.php>

Facet

- (221) In the TomTom/Tele Atlas Decision, the Commission also evaluated the likelihood of Facet entering the market for the provision of navigable digital map databases with EEA coverage in order to assess whether the company would be able to constrain the competitive behaviour of NAVTEQ and Tele Atlas in the short or medium term.
- (222) For a number of years, Facet has produced digital imagery for the United States Census Bureau and for Microsoft. It has developed and patented sophisticated software for image analysis and the identification of objects of interest. A few years ago, Facet decided to use its vast database of digital imagery to produce a navigable map database covering the continental United States. Facet's United States database, called SightMap, was ready for delivery to customers in April 2008.
- (223) According to Facet, the quality of the SightMap database has been validated by the United States Census Bureau and Microsoft. It intends to license its United States database at a price which is substantially lower than the prices currently charged by NAVTEQ and Tele Atlas. In addition, Facet is currently compiling a navigable digital map database covering Canada which it intends to launch on the market in early 2009.
- (224) Facet has publicly announced plans to create a navigable digital map database with European coverage¹⁰⁵. The company intends to team up with a European partner which will carry out the field surveys using vehicles equipped with Facet's patented technology for capturing road data.
- (225) None of the respondents in the Commission's market investigation in the TomTom/Tele Atlas Decision identified Facet as a potential market entrant.
- (226) As regards the potential entry by Facet into the market for navigable digital map databases with European coverage, the Commission noted in that Decision that the company had yet to capture a share of the United States market. It also noted that the company's plans to produce a map database with European coverage were very preliminary and considered it uncertain whether Facet would have the financial capability to build a European-wide database in a limited period of time. However, it did not exclude that Facet would be able to launch a viable product with European coverage in the foreseeable future but due to the time-lags inherent in the production process, it concluded that entry by Facet would not be timely enough to constrain the competitive behaviour of NAVTEQ and Tele Atlas.

Market entry - conclusions

- (227) When entering a market is sufficiently easy, a merger is unlikely to pose any significant anti-competitive risk. For entry to be considered as a sufficiently competitive constraint on the merging parties, it must be shown to be likely, timely and sufficient enough to deter or defeat any potential anti-competitive effects of the merger.

¹⁰⁵ Facet press release of 29 November 2007.

- (228) In the TomTom/Tele Atlas Decision, the Commission found no indications that any of the current providers of navigable digital map databases active in Japan and South Korea or elsewhere in the world plan to enter the markets for databases with coverage of States in the EEA. Entry by these firms must therefore be regarded as unlikely. Even if they had the intention to enter, the substantial time-lag involved in producing a navigable digital map database covering the EEA from beginning to end would prevent any potential future entry from being timely enough to constrain the competitive behaviour of the incumbents in the short or medium term.
- (229) A new entry by firms offering internet-based map applications was also regarded as unlikely in the TomTom/Tele Atlas Decision. None of the firms offering such services contacted by the Commission in this Case announced any intention to enter the market. Neither Google, nor Microsoft has developed its own map database covering the EEA. The same time-lag would apply as for existing providers of navigable digital map databases, which makes timely entry by such firms unlikely.
- (230) Apart from AND, the Commission's market investigation in the TomTom/Tele Atlas Decision contained no indications that any of the producers currently producing non-navigable digital map databases with European coverage intends to upgrade its databases to make them navigable. In any case, the Commission considered that the substantial time-lag involved in such an undertaking would make timely market entry unlikely. In addition, the same time-lag would apply before Facet could enter the market for digital map databases with EEA-coverage.
- (231) The possible financial constraints on small companies aiming to enter the market (such as AND and Facet) may possibly be overcome by users of digital map databases sponsoring the entry of a third market player. However, when queried by the Commission in the TomTom/Tele Atlas Decision, none of the respondents considered sponsoring entry as a viable option. Therefore, sponsored entry must be regarded as unlikely. Even if a sponsor should come forward, the time-lags outlined in Recital 212 would still apply.
- (232) The market investigation in the present case has not contradicted the findings in the TomTom/Tele Atlas Decision, neither as regards the estimated time and cost of entry, nor the likelihood and impact of entry by AND, Facet or other firms. It must therefore be concluded that - while marginal entry may not be excluded - entry into the markets for the provision of navigable digital map databases with EEA-coverage would be neither timely, that is to say sufficiently swift and sustained, nor sufficient, with regards to its scope and magnitude, to deter or defeat any potential anti-competitive effects of Nokia's acquisition of NAVTEQ.

7.2. Navigation Software

7.2.1. Introduction

- (233) Most manufacturers of mobile handsets – with the exception of Nokia – as well as MNOs, purchase navigation software from external providers. There are a

large number of suppliers of navigation software.¹⁰⁶ These suppliers are either specialised software companies or manufacturers of navigation devices themselves (such as Nokia/gate5, Garmin, NAVIGON and TomTom).

- (234) Navigation software is sold to mobile handset manufacturers and MNOs either on a stand-alone basis or as a part of package consisting of software and database. Since few MNOs and mobile handset makers – except Nokia and Motorola – have direct relationships with NAVTEQ or Tele Atlas, it is predominantly navigation software suppliers that purchase the navigable digital map databases which are subsequently used to provide navigation services on mobile handsets. In addition, navigable digital map databases are key inputs for navigation software. This applies both to those cases where the software provider sells the software and the database as a single package to the device maker and to those cases where the software and the database are procured independently by customer. In both cases, the navigation software provider must configure the software so that it is fully compatible with the database.
- (235) Following its acquisition of gate5, Nokia is active in the market for the provision of navigation software. Nokia's market share is below 25% but NAVTEQ has market shares exceeding 25% in the markets for the provision of navigable digital map databases with EEA coverage, such databases being key inputs for navigation software.
- (236) It must therefore be concluded that the market for the provision of navigation software is a market vertically affected by the proposed transaction.

7.2.2. Market shares

- (237) In the Notification, Nokia estimates that the worldwide market share of gate5 was [0-10]*% in 2007¹⁰⁷. However, the estimated market shares provided in the Notification include internal (captive) sales.
- (238) In order to reflect the competitive situation in a market, only the merchant market should be included (that is to say internal sales should be excluded). In the TomTom/Tele Atlas Decision, the market shares of the main providers in the merchant market were estimated as indicated in the following table.¹⁰⁸ These estimates also remain valid for the present case.

¹⁰⁶ In the Notification, Nokia lists 23 companies supplying navigation software for portable navigation devices. Notification, page 72.

¹⁰⁷ Market share by volume in the first half of 2007. This figure concerns the share of supply to producers of PNDs and mobile handsets and does not include sales to producers of "in-dash" systems and providers of internet-based mapping solutions. Including sales to those customer categories would not alter significantly the market share of gate5. Notification, Annex 33, page 2.

¹⁰⁸ See Case No COMP/M.4854 - *TomTom/Tele Atlas*, Recital 168.

Navigation software - market shares by volume in 2006 (merchant market)¹⁰⁹

<u>COMPANY</u>	<u>ESTIMATED MARKET SHARE</u>
NAVIGON	[20-30]*%
Nav n'go	[15-20]*%
Destinator	[15-20]*%
Elektrobit	[5-10]*%
gate 5 (Nokia)	[5-10]*%
Route 66	[5-10]*%
TomTom	[5-10]*%
Map & Guide	[0-5]*%
Alturion	[0-5]*%
ALK	[0-5]*%
Via Michelin	[0-5]*%
Navicore	[0-5]*%

7.2.3. Pricing

(239) Customers normally license the use of the navigation software. Licence fees are paid on a per-unit basis and are valid for the lifetime of the device in which the onboard software is installed. Alternatively and predominantly for off-board systems, licence fees may be paid by means of a subscription over time (on a daily, weekly or monthly basis). Prices typically vary according to the size of the licensed territory.

7.2.4. Distribution patterns

(240) Most software developers supply their navigation software to manufacturers of all types of devices. Currently, the market for navigation software is primarily driven by PND-manufacturers, which account for the largest part of sales. However, given the predicted substantial increase in sales of mobile handsets with navigation compatibility¹¹⁰ this is likely to change.

7.2.5. Market entry

(241) Basing itself – *inter alia* – on the fact that vast majority of the device manufacturers which participated in the Commission's market investigation responded that they were already able or would be able to develop their own navigation software in-house, the Commission considered in the TomTom/Tele Atlas Decision, that entry barriers appeared to be limited.¹¹¹ That conclusion also remains valid in the present case.

¹⁰⁹ This estimate is based on non-captive sales by volume of on-board navigation software in the EMEA-region (Europe, Middle East, Africa) in 2006. In order to be consistent with the market definition, the sales data ought to have covered worldwide sales as well as an alternative, combined market for on-board and off-board navigation software. Market shares calculated on the basis of sales value would also have been useful. However, none of these alternative calculations are likely to alter significantly the relative market shares of the main players and in particular, the relative insignificance of Nokia/gate5 in the open market for navigation software.

¹¹⁰ That is to say, mobile handsets with pre-installed navigation functionality and handsets capable of having a navigation solution installed after the initial purchase (aftermarket installation).

¹¹¹ See Case COMP/M.4854 - *TomTom/Tele Atlas*, Recital 173.

7.3. Downstream markets

7.3.1. Navigation applications for mobile phones

- (242) As the provision of navigation services on Mobile handsets is a nascent industry, no reliable market information, such as market shares, is available, irrespective of the distribution channel.
- (243) The market investigation indicates that there are a large number of competitors in this market. MNOs have the advantage of having an on-going direct commercial relationship with customers, and can leverage this position to sell navigation applications on mobile handsets. Navigation software providers have the necessary technical expertise but suffer from not having regular contact with customers. Finally, providers of on-line navigation applications have the advantage of being accessible on mobile browsers (for instance, Google Maps or OVI from Nokia).
- (244) It should be noted that almost all MNOs and handset manufacturers (with the notable exception of Nokia) do not develop in-house the navigation software they commercialise, but rather work with an independent provider. One of the consequences is that it is generally the navigation software provider that purchases maps.
- (245) Most MNOs only started proposing navigation services in 2007 or 2008 and have so far generated limited revenues. Some have not yet started to propose such services but are envisaging doing so in the short term. Along the same lines, navigation software providers and mobile online providers are developing their emerging offers. All players foresee very high growth for both the sales of navigation applications on mobile handsets.
- (246) It is worth noting that a large number of options are envisaged, by MNOs notably, to distribute such navigation services (for example, on-board versus off-board, fee-per-use or monthly fee, partnership with web companies proposing free services or dedicated service). This is a nascent market and no dominating business model has been identified by the Commission.

Off-board navigation applications

- (247) Sales of mobile navigation solutions via subscription fees are emerging and no market data is available. A number of MNOs reported minimal revenue so far during the Commission's market investigation.
- (248) Such services are principally distributed via MNOs that have entered into a revenue sharing agreement with an external navigation software provider. All MNOs have indicated that they will further develop navigation services made available from their network. All MNOs stated during the Commission's market investigation that, although they consider that LBS will be a key component of the mobile industry in the future, they consider working with independent navigation software providers rather than developing their in-house solutions.
- (249) Nokia is developing a web portal, "OVI", [Business secrets]*. Amongst other services (such as music, videos, messaging), OVI will provide navigation functionalities. Ovi.com is not yet operational. Nokia is currently providing maps

and navigation functionalities (for mobile handsets only) that can be downloaded from the Nokia website.

On-board navigation applications

- (250) As already stated in Section 7.2 navigation software providers do not usually commercialise navigation solutions directly to end customers. However, on top of its traditional activity as a navigation software provider working for third companies, TomTom commercialises a navigation solution for Mobile handsets directly to end consumers. TomTom Mobile Navigator 6 can be purchased in brick and mortar outlets or online shops and can be installed onto a handset via a USB cable connection. This software can work independently of any connection to the wireless network. The only requirement is that the device works with one of the platforms for which Navigator 6 is configured (for example, Symbian, WindowsMobile, Palm). The vast majority of handsets on the market comply with this requirement.
- (251) Garmin, Navigon, Route66, Webraska and Wayfinder also commercialise such software. Nevertheless, the Commission is presently not aware of any market analysis with regard to sales of navigation software directly to end-consumers.

Entry

- (252) Barriers to entry in the market for navigation application for mobile handsets are low. Even small companies with few staff members, such as Alturion S.A. and Destinator Technologies are able to compete in this market. In addition, due to high supply-side substitutability any general software developer would be able to enter this market. Although the sales of applications through some channels, such as MNOs or bundling them with mobile phones, would involve signing partnerships with operators or phone manufacturers, other sales channels, such as direct sales on-line, are open to all new entrants.

7.3.2. Mobile handsets

- (253) Mobile handset manufacturers can directly embed a complete navigation solution in the handsets. The end-customer therefore does not depend on the MNO to obtain a navigation service. As with a PND a complete service is available from a self-standing device.
- (254) A distinction could also be made between those mobile handsets that include navigation functionalities and those that do not. Such a distinction is however not necessary as: (i) the market position of Nokia and its main competitors only slightly diverges depending on the definition; and (ii) by 2011 mobile handsets with navigation functionalities will account for a significant share of the mobile handset market¹¹².
- (255) On the markets for the provision of mobile handsets, Nokia is the largest supplier by far. Nokia and its main competitors had the following market shares in 2007:

¹¹²

Annex 36C Form of CO - [Confidential information of a third party]*.

Worldwide & Western Europe Mobile Handset Sales to End-Users in 2007 (1 000 Units)

Company	Worldwide		Western Europe	
	Sales	Market Share (%)	Sales	Market Share (%)
Nokia	[...]*	[30-40]*	[...]*	[35-45]*
Motorola	[...]*	[10-20]*	[...]*	[5-15]*
Samsung	[...]*	[10-20]*	[...]*	[10-20]*
Sony Ericsson	[...]*	[0-10]*	[...]*	[10-20]*
LG	[...]*	[0-10]*	[...]*	[0-10]*
Others	[...]*	[10-20]*	[...]*	[0-10]*
TOTAL	[...]*	100.0	[...]*	100.0

Note* This table includes iDEN shipments, but excludes ODM to OEM shipments.
Source: Gartner (February 2008)

(256) [Business secrets]*

Nokia market shares (in units) – Telephone handsets with navigation capabilities 2006		
	Worldwide	Western Europe
Nokia	[35-45]*%	-
Motorola	[10-20]*%	-
Samsung	[10-20]*%	-
Sony Ericsson	[0-15]*%	-
LG	[0-10]*%	-
BenQ Mobile	[0-10]*%	-
Others	[10-20]*%	-

Source: notification, GfK

(257) There is a wide range of mobile handsets that are navigation compatible and Nokia is not unique in offering mobile handsets that can be used for navigation. Navigation applications are not currently a significant driver of handset sales, while the parties expect that navigation services will become more popular in the future.

Entry

(258) Like most electronics markets, the market for mobile handsets is characterised by intense competition and the frequent entry of new competitors. In addition to the traditional competitors who have origins in mobile phones, products competing with Nokia's mobile handsets are being introduced by competitors with origins in other electronics and hi-tech markets. Examples of devices gaining market share include RIM's Blackberry, Apple's iPhone, Garmin's Nuviphone and Palm.

(259) However, it seems unlikely that any new entrant could challenge the position of Nokia in the short term.

VIII. COMPATIBILITY WITH THE COMMON MARKET AND THE EEA AGREEMENT

8.1. Introduction

- (260) On 14 May 2008, the Commission authorised the acquisition without commitments by TomTom of Tele Atlas, the competitor of NAVTEQ in the supply of navigable digital map databases¹¹³. The acquisition of NAVTEQ by Nokia was notified to the Commission after the notification of the acquisition of Tele Atlas by TomTom. The Commission therefore conducted, before the 14 May 2008, its assessment of the merger between Nokia and NAVTEQ on the hypothesis that TomTom and Tele Atlas were vertically integrated.
- (261) Although the merger between Nokia and NAVTEQ is analysed independently and presents different characteristics – in particular in the downstream markets – the authorisation of the concentration between TomTom and Tele Atlas affects the competitive analysis conducted by the Commission because the market structure is impacted. Following the TomTom/Tele Atlas transaction, the concentration of Nokia and NAVTEQ will lead to the vertical integration of the two suppliers of navigable digital map databases with providers of navigation services. These parallel vertical integrations led to a number of concerns being raised by NAVTEQ clients in the Commission's market investigation.

8.2. Competition Concerns

- (262) The Commission's market investigation focused on assessing the likelihood of competitive harm arising as a result of the proposed transaction due to:
- (i.) Non-coordinated effects:
- Input foreclosure by the merged entity in the downstream market for navigation applications on mobile handsets and the downstream market for mobile handsets (together "the downstream markets"), and in the intermediary downstream market for navigation software.
 - Access by the merged entity to confidential information of its competitors acquiring navigable digital map databases.
- (ii.) Coordinated effects.
- (263) These competition concerns are dealt with separately. As the proposed concentration is unlikely to raise any competition concerns with regard to the provision of non-navigable digital map databases, the assessment focuses on competition concerns raised in relation to the provision of navigable digital map databases

¹¹³ Case No COMP/M. 4854 - TomTom/Tele Atlas.

8.3. Input foreclosure

8.3.1. Introduction

- (264) Mobile telephone manufacturers, MNOs and navigation software providers have expressed concerns that Nokia and NAVTEQ could foreclose them from the market of navigable digital map databases. Such foreclosure strategy could be achieved either by increasing prices, by providing degraded map sets, by delaying access to latest maps or attributes, or by reserving innovative features to Nokia.
- (265) An alternative total input foreclosure strategy, according to which the merged entity would stop supplying maps to Nokia's downstream competitors was not identified as a likely scenario by the Commission's market investigation.
- (266) In all categories of market actors referred to in Recital 264, the large majority of respondents expressed competition concerns along those lines¹¹⁴. Online map users also expressed concerns but were less consistent which might reflect the fact that not all online map users have the intention to make their services available on mobile handsets.
- (267) Although, the Commission's market investigation clearly highlighted concerns that Nokia and NAVTEQ could foreclose their competitors in the intermediary downstream market for navigation software and in the downstream markets, the concerns expressed presented a high degree of variety. This could be considered as an element supporting the arguments of the notifying parties who claimed that such concerns were hardly substantiated. Nevertheless, it should be recalled that the provision of navigation applications on mobile handsets is a nascent activity, where a variety of business models are experienced, and that, as such, it is still unclear to competitors what form a foreclosure strategy could take.
- (268) According to paragraph 29 of the Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings ("the non-horizontal merger guidelines"): "A merger is said to result in foreclosure where actual or potential rivals' access to supplies or markets is hampered or eliminated as a result of the merger, thereby reducing these companies' ability and/or incentive to compete...Such foreclosure is regarded as anti-competitive where the merging companies – and, possibly, some of its competitors as well – are as a result able to profitably increase the price charged to consumers.
- (269) When assessing the likelihood of such an anticompetitive input foreclosure scenario, the Commission therefore examined: (i.) whether the merged entity would have the ability post-merger to foreclose access to inputs; (ii.) whether it would have the incentive to do so; and (iii.) whether a foreclosure strategy would

¹¹⁴

Four Mobile handset manufacturers (80%) submitted such concerns. **Eight MNOs (73%)** submitted such concerns, two submitted that Nokia could pay its maps at lower prices, and one submitted that the concentration should not raise any change on the market. **Six Navigation Software providers (67%)** submitted such concerns, two submitted that large clients should have the capacity to protect their interests, and one submitted that the concentration should not raise any competitive concerns.

have a significant detrimental effect in the intermediary downstream market for navigation software and in the downstream markets.

8.3.2. Ability to foreclose

- (270) The analysis developed in the following Recitals focuses on whether the merged entity would be able to foreclose firms active in the downstream markets (mobile handset manufacturers, MNOs, navigation software providers or websites providing mobile navigation solutions) either by increasing prices, by providing degraded maps or delayed updates, or by restricting access to innovative map features. The intermediary downstream market for navigation software and the different downstream markets are analysed individually.
- (271) The notifying parties submitted that the merged entity lacks the ability to degrade the commercial conditions under which it commercialises navigable digital maps (by selling maps at higher prices than Tele Atlas, for instance) because it could not commit to such a strategy.¹¹⁵ However, since the analysis carried out in the following Recitals indicates that NAVTEQ would have no incentive to foreclose even if it could credibly commit to such a strategy, this question may be left open.
- (272) The non-horizontal merger guidelines point to three conditions which are necessary for the merged entity to have the ability to foreclose its downstream competitors, namely: (i) the existence of a significant degree of market power; (ii) the importance of the input; and (iii) the absence of timely and effective counter-strategies. These conditions are discussed in the following Recitals.

8.3.2.1. Existence of a significant degree of market power

- (273) The non-horizontal merger guidelines indicate that input foreclosure can only be a concern if the merged entity has a significant degree of market power in the upstream market. In the present case, NAVTEQ sells navigable digital map databases above marginal cost¹¹⁶ and has an overall market share of around 50% in the upstream market for navigable digital map databases (including sales to PND manufacturers, automotive manufacturers, and navigation software providers), Tele Atlas being the only other provider of navigable digital map databases with a similar coverage and quality level. NAVTEQ can, therefore, reasonably be expected to influence the conditions of competition in the upstream market.
- (274) That conclusion was contested by the notifying parties, who submitted that market shares are not a good proxy to measure market power in the present case, because both NAVTEQ and Tele Atlas face limited incremental costs to sell more copies of their map databases. The notifying parties also submitted that "*NAVTEQ's poor historic financial performance, [and] a trend of downward prices*" further indicate that NAVTEQ does not have substantial market power.

¹¹⁵ Reply to the Article 6(1)(c) Decision dated 28 March 2008 and RBB Economics, "Nokia/Navteq: Financial incentives for foreclosure", 28 February 2008.

¹¹⁶ Navteq gross margins are as high as [Business secrets]*%. However, high gross margins do not necessarily indicate supra-competitive profits in an industry with high fixed costs and low marginal costs.

Ultimately, the notifying parties indicated that "*the customisation of map data that differentiates navigation services happens at the intermediary software level*"¹¹⁷, further reducing the ability of Nokia and NAVTEQ to leverage over downstream rivals.

- (275) However, the arguments raised by the notifying parties do not indicate that NAVTEQ does not enjoy a significant degree of market power. Limited incremental costs imply that both Tele Atlas and NAVTEQ face no capacity constraints to expand their sales. Although it has not been contested in the Commission's market investigation that they compete against each other, these two companies have preserved a high level of gross margin. This ability to price well above marginal cost is indicative of market power, although it does not necessarily imply supra-competitive returns on investment in an industry with high fixed costs. Similarly, although it is not contested that activity by NAVTEQ did not generate substantial returns on investment so far, this is characteristic of nascent activities and does not reflect the market power of this company. Conversely, the price proposed by Nokia to acquire NAVTEQ reflects that a largely positive financial performance is expected. Ultimately, navigation software providers add value to digital maps by associating navigation services to these maps, but do not eliminate the market power of map suppliers, as was confirmed by the market investigation.
- (276) It must therefore be concluded that the merged entity enjoys a significant degree of market power on the market for navigable digital map databases.

8.3.2.2. Importance of the input for downstream competitors

- (277) Input foreclosure may raise competition problems only if it concerns an important input for the downstream product. Recital 34 of the non-horizontal merger guidelines precise that irrespective of its cost, an input may also be sufficiently important for other reasons. For instance, the input may be a critical component without which the downstream product could not be manufactured or effectively sold on the market.

Navigable maps vs non-navigable maps

- (278) The notifying parties submitted that navigation services (which require navigable maps) and more basic location services (which only require non-navigable maps) on mobile handsets are generally substitutable from the consumer perspective. The notifying parties argue that services on mobile handsets are and will be mainly used for pedestrian usage for which "*it is not clear that they necessarily require turn-by-turn navigation*"¹¹⁸. Under such conditions, the notifying parties submitted that they would not have the ability to foreclose their downstream competitors because the latter would have access to a significant number of providers of non-navigable digital map databases (such as AND, national geographical institutes.).
- (279) However, the notifying parties did not provide any evidence that navigation services on mobile handsets will exclusively or principally be used for pedestrian

¹¹⁷ Reply to Article 6(1)(c) Decision dated 28 March 2008

¹¹⁸ Reply to Article 6(1)(c) Decision dated 28 March 2008 - Paragraph 4.4

usages, nor that pedestrian navigation will be based on non-navigable maps. Conversely, an independent research firm has forecasted that in 2011 the navigation mobile application which will generate the largest revenue will be "turn-by-turn driving direction"¹¹⁹, which obviously requires a navigable map database. [Business secrets]*. It could also be argued that new smartphone models have larger screens and could be used for vehicular navigation.

- (280) The Commission's market investigation confirmed that vehicular navigation, which requires navigable maps, is and will certainly remain the first LBS used on GPS-enabled handsets. Seven MNOs out of ten submitted that vehicular navigation, or navigation more generally, is the most used service and will remain so in the future. In addition, several MNOs indicated that they expect pedestrian navigation to require navigable maps.
- (281) The notifying parties also submitted that LBS proposed via mobile web-sites currently do not propose turn-by-turn navigation services, and as such do not need to be based on navigable maps. Although, the Commission's market investigation confirmed that navigation applications via mobile web browsers do not currently propose solutions as precise as other mobile navigation solutions, it may still be argued that these solutions are nascent and could be upgraded to include turn-by-turn services
- (282) Nevertheless, it is unlikely that free services will offer the same functionalities as paying services. This would imply that for free online navigation services, non-navigable maps could be substitutable to navigable maps to a certain extent. However, these services will be much less advanced than the navigation services based on navigable maps.
- (283) In addition, the Commission's market investigation showed that downstream competitors who provide free navigation services via web browsers either rely on navigable maps or on non-navigable maps sourced to NAVTEQ or Tele Atlas, and still do not consider that the competitors of these two firms are acceptable maps suppliers.

Downstream competitors

- (284) The importance of the input has to be distinguished depending on the downstream market concerned.
- (285) In the market for mobile handsets, digital maps only account for a relatively limited share of the cost of handsets, approximately [0-15]*% of the total costs of producing mobile handsets with navigation functionality. Nevertheless, they constitute a component without which navigation services could not be proposed on mobile handsets.
- (286) In addition, a customer willing to purchase a mobile handset will consider a number of features, including price, design, and additional services available on

¹¹⁹ Annex 18 of Form CO. By 2011, Strategic Analytics forecasts that [20-30%]* of revenues of LBS on mobiles worldwide will be "turn-by-turn driving directions". Other important services will be "Peace of mind tracking" [10-20%]*, "Mobile city guide for restaurants, shopping." [10-20%]*, and "Pedestrian directions" [10-20%]*. Nothing allows concluding that these other services will not require navigable maps.

the device such as mobile TV, music or video player, navigation service or others. Therefore, the notifying parties submitted that digital maps are only one input among others, and that mobile handset manufacturers can differentiate their offers on the basis of services other than navigation. In addition, [An independent consultant firm forecasts that largely more than 50% of total sales of mobile handsets in the EEA will be achieved with mobile handsets embedding navigation functionalities]*. It could therefore be argued that digital maps are an input for only a share of mobile handsets.

- (287) The notifying parties have also submitted, in order to explain the rationale for the concentration, that the availability of navigation services on mobile handsets will become an important factor for the sales of smartphones. It may, therefore, be considered that a mobile handset manufacturer who would have a restricted access to digital map databases (in terms of update, quality or innovation features) would be at a competitive disadvantage for the sales of smartphones.
- (288) Nevertheless, considering that navigation applications are only one service among other services embedded in a multifunctional device, it is unclear whether navigable digital map databases are a critical input in the market of mobile handsets.
- (289) In the market for navigation applications on mobile handsets, the situation of MNOs and navigation software providers on the one hand, and web companies on the other hand can be distinguished.
- (290) Navigation software providers generally sell their navigation applications, together with maps, to MNOs who commercialise them directly to their customers. Navigation software providers can also directly commercialise navigation software, including maps, to end-customers. In both cases, maps account for a significant share of the costs (or wholesale prices) of the services. Although the results of the Commission's market investigation indicated that map costs can cover a large spectrum, several navigation software providers indicated that the map costs account for between 25% and 50% of their prices. For certain specific maps and software, maps can account for as much as 70% of prices at which the navigation software is sold (the price includes the cost of map). In addition, these services cannot be delivered without digital map databases, which are therefore a critical component.
- (291) Firms proposing navigation services via mobile web sites also depend on the availability of maps to deliver such services. It may, however, be argued that some web sites aim at developing multi-service mobile web portals and that the navigation service is only one service among others. Nevertheless, a mobile web portal that would propose a degraded navigation service would be at a competitive disadvantage for attracting traffic.

Unique database

- (292) The notifying parties argue that NAVTEQ would not be able to deprive Nokia's rivals access to its maps. In particular, the parties argue that quality degradation or delayed release of updates would be impossible because NAVTEQ has only one core digital navigable map database for any given geographic area.

- (293) While the notifying parties submit that having a single database may make quality degradation difficult from a technical point of view, nothing would prevent the merged entity from duplicating its database if it had an incentive to do so post-merger. In addition, having a single database does not prevent degradation by delaying upgrades, because NAVTEQ could still release the updated version of the database with some delay to Nokia's competitors.
- (294) Ultimately, NAVTEQ customers can already purchase a non-navigable version of the navigable digital map database (an artificial degradation of the navigable map) at a cheaper price. It is, therefore, technically and commercially feasible to offer different versions of the digital map database of NAVTEQ.

Conclusion

- (295) It must therefore be concluded that the navigable digital map databases supplied by NAVTEQ are largely a critical input in the market for navigation applications on mobile handsets. Non-navigable digital map databases would only be imperfectly substitutable to navigable digital map databases for downstream competitors who provide free location services, and these services would be imperfect substitutes to navigation services based on navigable maps.
- (296) Conversely, it is unclear whether navigable digital map databases are a critical input in the market for mobile handsets.

8.3.2.3. Timely and effective counter-strategies

- (297) The Commission considered whether there are effective and timely counter-strategies that rival firms could deploy. Potential constraints resulting from competition with Tele Atlas, from the threat of entry and from the role of intermediaries are discussed in turn in the following Recitals. Similarly, the possibility for the merged entity to develop a foreclosure strategy targeting only some of the downstream competitors is evaluated.

Tele Atlas reaction

- (298) Tele Atlas would still compete with NAVTEQ post-merger, thereby limiting NAVTEQ's ability to foreclose its competitors. However, Tele Atlas' best response to a price increase by NAVTEQ would likely be to also increase prices.¹²⁰ It must therefore be concluded that competition with Tele Atlas does not completely eliminate the merged entity's ability to increase prices or degrade quality.
- (299) The parties contest that finding by arguing that it is unlikely that Tele Atlas would increase its prices in the event that NAVTEQ were to do so, because NAVTEQ cannot commit to foreclose Nokia's downstream competitors. In particular, the parties argue that NAVTEQ would have an incentive to undercut

120 This does not mean, however, that Tele Atlas would necessarily match any eventual price increase by Navteq. Although Tele Atlas would likely respond to price increases by Navteq by increasing its own prices, Tele Atlas would still represent an (albeit imperfect) competitive constraint to any foreclosure strategy of the merged entity, in particular in light of the evidence on switching costs obtained during the Commission's market investigation. The extent to which the merged entity may profitably increase prices/degrade quality is discussed in Section 8.3.3 – Incentive to foreclose

Tele Atlas slightly to make a profitable map sale without impacting its downstream sales. The parties argue that this is true at any price above the pre-merger equilibrium price, and that, therefore, Tele Atlas has no incentive to raise its price for handset customers above the pre-merger price. However, that argument ignores that post-merger equilibrium prices may differ from pre-merger prices because the vertical integration modifies NAVTEQ's incentive to undercut. Since any price increase can therefore not be discarded a priori on the basis of this argument, the Commission carried out a more detailed economic analysis, which is discussed in Section 8.3.3.3. .

Entry

- (300) Entry in the market for the provision of navigable digital map databases is unlikely to provide an effective and timely counter-strategy that would constrain the merged entity's ability to foreclose its downstream competitors. As stated in Section 7.2.6. on market entry, the Commission considers it unlikely that a new map database provider would build a digital navigable map database with the same level of coverage and quality as Tele Atlas or NAVTEQ and provide a timely constraint on the merged entity.

Constraint from competitors not foreclosed by Nokia/NAVTEQ

- (301) The notifying parties submitted that a foreclosure strategy should encompass all competitors active in any of the downstream markets, otherwise the competitive constraint that competitors exert on each others would impair the ability of Nokia and NAVTEQ to successfully apply such a foreclosure strategy. For instance, in the event that Nokia were to foreclose handset manufacturers (in the market for mobile handsets), but not MNOs (in the market for the provision of navigation applications on mobile handsets), the latter could propose attractive navigation services. Therefore, end-customers would still have the choice, at least, between Nokia's offer and MNOs' offers, and could simply purchase non-Nokia handsets and obtain a navigation service from their MNO.
- (302) Although the different solutions to bring navigation services on mobile handsets exert a certain level of constraint on each other, some customers will have a preference for a certain type of solution. For instance, some customers might prefer to buy a handset including a navigation application for which they will not have to pay a recurrent monthly fee. Conversely, some customers might certainly prefer to subscribe to a server-based navigation service to a MNO that will include advanced functionalities such as real-time traffic information.
- (303) The substitutability of the different technical and commercial solutions is therefore likely to be imperfect. A foreclosure strategy where Nokia would only foreclose handset manufacturers, for instance, could be profitable for Nokia as it is likely that those customers who prefer to have an on-board navigation solution would purchase a Nokia handset.
- (304) To verify the notifying parties' theory, the Commission asked them, as well as different actors in the market, whether they had conducted surveys to analyse customers' preference in terms of technical and commercial solutions to access a navigation service on their mobile handsets. No such survey has been conducted so far to the knowledge of the Commission.

- (305) The Commission recognises that a foreclosure strategy that would not encompass all downstream markets, and therefore the two downstream markets (mobile handsets and navigation applications on mobile handsets), would be imperfect, as some competitors who propose navigation services on mobile handsets would not be affected. Nevertheless, as indicated in Recital 303, it is unclear whether downstream competitors who are not foreclosed (for instance, MNOs) could represent a timely and effective counter-strategy to the benefit of foreclosed competitors (for instance, handset manufacturers).

Contract NAVTEQ-Garmin

- (306) Another constraint to NAVTEQ's ability to increase prices or degrade quality could be provided by intermediaries that have a licence from Tele Atlas or NAVTEQ to provide the map database together with their navigation software. Such intermediaries constitute an effective constraint only if they are themselves protected from price increases and quality degradation. [Business secrets]* Garmin is one of the leading PND manufacturers and also sells navigation software.
- (307) Garmin and NAVTEQ have concluded a long-term contract (until 2015, with the possibility for Garmin to unilaterally extend it until 2019) for the supply of navigable digital maps. Garmin can embed these maps in its own PNDs or integrate NAVTEQ maps into navigation software that Garmin can sell to any type of users, including for navigation services on mobile handsets (on-board, off-board or web applications).
- (308) That contract concerns the digital map of NAVTEQ and covers its upgrades. [Business secrets]* Nevertheless, new features such as new layers of POIs can be added without the support of the map supplier, and could be developed by Garmin or its customers.
- (309) Garmin already contributes to providing navigation solutions on mobile handsets, although sales of PNDs still represent the bulk of its sales. It commercialises Garmin Mobile 10 for smartphones, a plug-and-play navigation solution that end-customers can purchase and install into their own mobile handsets. On 30 January 2008, Garmin also announced its entrance into the mobile phone market with the Nüvifone¹²¹. Finally, on 31 March 2008, Garmin announced that its navigation solution would be launched on Samsung handsets in Europe.
- (310) Garmin cannot sell copies of the digital map alone. It must integrate NAVTEQ maps into an application that it has developed. The constraint exerted by Garmin as a map database redistributor, therefore only applies to NAVTEQ customers that do not have in-house software capabilities. The Commission's market investigation confirmed that all handset manufacturers that produce GPS-enabled mobile phones and all MNOs¹²² purchase navigation software from independent navigation software providers. Therefore, for these map customers, Garmin would be a credible supplier. Conversely, navigation software providers who aim at developing their own navigation software for end customers could not rely on

¹²¹ The Nüvifone combines a premium phone, mobile web-browser, and personal navigator.

¹²² However, one MNO out of thirteen submitted that in one of the countries it covers, the navigation software is produced internally.

Garmin to source digital map databases. Similarly, firms providing navigation services on mobile web-sites develop their own software internally.

- (311) The contract between Garmin and NAVTEQ [Business secrets]*. The base fee for specific applications (different fees are applied to different applications, for instance the base fee for a European map for online application is different than the base fee for a European map for a PND) [Business secrets]* The notifying parties, at the Commission's request, calculated the ASP (Average Selling Price) of maps from NAVTEQ to Garmin during the period from 2008 to 2015¹²³, considering the [Business secrets]* granted within the Garmin-NAVTEQ contract. The results of that computation show that [Business secrets]*.
- (312) However, the main factor that the decrease of the ASP can be attributed to is the variation of the mix of products (more sales of cheapest maps due, for instance, to the development of sales of low-end smartphones that embed maps with less attributes or with a smaller footprint). The price decrease of the ASP, excluding that mix effect, is only [Business secrets]*% per year¹²⁴.
- (313) CIBC, a broker that issues regular reports on NAVTEQ activities, forecast in its report dated 5 November 2007¹²⁵, a decrease of the ASP of NAVTEQ maps for usage in PNDs and wireless applications by 11% to 12% in 2007 and 2008. In another report dated 16 April 2007¹²⁶, that broker forecast an annual decrease of the ASP of NAVTEQ maps for usage in PNDs by 6% over the period from 2007 to 2011. In an internal document¹²⁷ of Nokia, the ASP of digital maps is expected to decrease by [Business secrets]*% per year over the period [Business secrets]*.
- (314) Overall, predicting the evolution of the price of navigable digital map databases is a difficult and uncertain exercise. [Business secrets]*
- (315) The Commission therefore concluded that Garmin could represent, to a certain extent, a credible supplier of navigable digital map databases for handset manufacturers or MNOs. This conclusion particularly applies to the short term, but is less certain in the long term. The recent announcement of a partnership between Garmin and Samsung is illustrative of the nature of the partnerships that could be developed. Conversely, Garmin would not be an appropriate map supplier for navigation software providers and providers of navigation services on mobile web-sites.

¹²³ This computation was conducted on a number of reasonable assumptions: Garmin market share in the sales of maps for GPS-enabled mobiles in the range [0-10]*% to [0-10]*% with central scenario [0-10]*%; overall market for GPS-enabled mobile handsets will grow according to the estimations of Strategy Analytics (Annex 36_C of notification). In addition, it should be noted that Garmin will continue to purchase maps for inclusion in its own PNDs [Business secrets]*

¹²⁴ Response to questionnaire of 22 April 2008. Computation made on the assumption that Garmin market share remains stable in the PND market.

¹²⁵ Annex 3 to Questionnaire of 5 March 2008 (12).

¹²⁶ Annex 3 to Questionnaire of 5 March 2008 (03).

¹²⁷ Annex 12_A of notification – [Business secrets]*. COMP.M.4942 Nokia Navteq Response to questionnaire of 6 February 2008

Contract NAVTEQ-Motorola

(316) [Business secrets]*

(317) [Business secrets]*

(318) Motorola is the second largest handset manufacturer worldwide (fourth in Europe) and as such will therefore be in a position to exert a competition constraint on Nokia with regard to navigation services installed into mobile handsets.

Market power of MNOs

(319) The notifying parties have submitted that MNOs could easily counter a foreclosure strategy from NAVTEQ. In most European countries MNOs subsidise mobile handsets and can therefore favour one handset manufacturer to the detriment of another one. [Business secrets]*

(320) Nokia estimates that [60-70]*% of the mobile handsets it sold in Europe in 2006 were sold to MNOs. It therefore illustrates the countervailing buyer power that MNOs can exercise on mobile handset manufacturers. The notifying parties have provided an example of how MNOs have exercised their buyer power in the past¹²⁸ to exercise a constraint on Nokia.

(321) MNOs have generally submitted that there is a growing trend in the market for mobile handset manufacturers to include an increasing number of services and applications in their handsets. These applications can be in competition with similar services proposed by the MNOs, which can generate conflicts. The general outcome of such conflicts is, however, not systematically in favour of one or the other party. It can happen that the mobile handset manufacturer removes its application, or that two similar applications coexist on the handset, one supplied by the handset manufacturer and the other by the MNO. In the latter case, it can be argued that the application from the mobile handset manufacturer gets prime position on the screen of the handset and is likely to be used more.

(322) In addition, all mobile handsets that are not commercialised via a MNO only embed Nokia services. Customers can, therefore, easily use this service, whereas they would have to download the same service from the MNO to be able to use it.

(323) Nevertheless, MNOs have a strategic position in the distribution of handsets, and to distribute services on mobile handsets, and as such they exert a certain degree of countervailing buyer power on Nokia.

(324) However, should Nokia successfully foreclose mobile handset manufacturers and navigation software providers, MNOs could decide to support Nokia mobile handsets in order to propose best available navigation services to their customers. In addition, the strategy of MNOs with regard to the development of navigation services is still to be decided, and the business model that will best suit their needs is not yet identified.

¹²⁸ Notification, page 92: [Business secrets]*

- (325) Ultimately, although MNOs exert a certain degree of buyer power on Nokia, it remains unclear whether they could effectively counter any strategy of NAVTEQ to foreclose Nokia's downstream competitors from digital maps.

Conclusion

- (326) It cannot be excluded that there would exist timely and effective counter strategies to a foreclosure strategy developed by Nokia and NAVTEQ, partly because of the market power of MNOS, and because [Business secrets]* and also notably because the contract between Garmin and NAVTEQ creates *de facto* a third player in the market for the supply of maps (at least in the short term, and for those customers who purchase maps and navigation software together). However, this counter-strategy would neither protect navigation software providers, nor the providers of navigation services on web-sites.
- (327) Ultimately, the efficiency of such counter-strategy will depend on the pro-active behaviour of Garmin to sell navigation solutions to MNOs and mobile handset manufacturers (which is already the case between Garmin and Samsung).

8.3.2.4. Conclusion - Ability

- (328) Accordingly, it is unclear whether the merged entity would have the ability to increase prices, degrade quality/delay access, or limit access to innovative features for firms providing navigation services on mobile handsets (downstream markets) and for navigation software providers (intermediary downstream market).
- (329) It is particularly unclear whether navigable digital map databases are a critical input in the market for mobile handsets. In addition, some downstream competitors, such as [Business secrets]* and [Business secrets]*, are protected against price increases through long-term contracts and it cannot be excluded that there would exist timely and effective counter strategies to a foreclosure strategy developed by Nokia and NAVTEQ.
- (330) Ultimately, it may be left open whether the notifying parties would have the ability to foreclose their downstream competitors because, as shown in Section 8.3.3, Nokia and NAVTEQ have no incentive to do so.

8.3.3. Incentive to foreclose

8.3.3.1. 'Trade-off' between upstream and downstream profits

- (331) Post-merger, Nokia and NAVTEQ will take into account how the sales of map databases to Nokia's competitors will affect its profits not only upstream but also on the downstream markets. Therefore, when considering the profitability of an input foreclosure strategy, the merged entity faces a trade-off between the profits lost in the upstream market due to a reduction of input sales and the profit gained on the downstream market by raising its rivals' costs.
- (332) That trade-off depends on the level of profits that the merged entity obtains upstream and downstream. In addition, as described in the non-horizontal merger

guidelines¹²⁹, it further depends on two other critical factors: (i.) the extent to which downstream demand is likely to be diverted away from foreclosed rivals; and (ii.) the share of that diverted demand that the downstream division of the integrated firm can capture.

- (333) The Commission conducted an in-depth qualitative and quantitative analysis to characterize the incentive of Nokia and NAVTEQ in this respect. Data necessary to conduct such an analysis was available in the market of mobile handsets, but there was hardly any available in the market for navigation applications on mobile handsets. The novelty nature of the navigation services on mobile handsets explains the scarcity of data.
- (334) Although the profits obtained by selling a mobile handset are much higher than the profits realized on the sale of a map database,¹³⁰ the Commission has concluded that the merged entity would lack incentives to foreclose Nokia's downstream competitors manufacturing mobile handsets. While this analysis only relates to the foreclosure of competitors manufacturing mobile handsets, any incentive for the merged entity to engage in input foreclosure with regard to firms active in the market for navigation applications on mobile handsets (MNOs, navigation software providers or providers of navigation solutions on mobile web-sites) appears even less likely, in particular in view of the more limited presence of Nokia in these sectors and the smaller profits that could be captured in these sectors.

8.3.3.2. Market facts restricting the incentive to foreclose

- (335) A series of elements indicate that an input foreclosure strategy consisting in increasing prices or degrading quality/delay in access is likely to fail. NAVTEQ would be likely to lose significant sales to Tele Atlas, while the benefits from increasing map database prices to Nokia's competitors are likely to be relatively limited. The main qualitative elements supporting this conclusion are the following.
- (336) Firstly, since map databases account on average for less than [Business secrets]*% of the mobile handsets wholesale prices, map database prices would have to increase substantially to have an effect on mobile handset prices and allow the merged entity to capture a significant amount of sales on the downstream market. In addition, the impact of the foreclosure strategy depends on the extent to which Nokia's competitors would pass on the map database price increase to end-consumers. For example, a 10% price increase of the map would only lead to a [Business secrets]* % price increase for the mobile handset if the price of the map represents [Business secrets]* % of the price of a mobile handset and the manufacturers pass on [Business secrets]* % of the change in their cost. Under any reasonable own-price elasticity and diversion rate to the

¹²⁹ Paragraph 42.

¹³⁰ [Business secrets]* Navteq has submitted that the wholesale price of its digital maps sold to telephone manufacturers is around [Business secrets]* and that its gross margins are as high as [Business secrets]*, leading to a gross margin around [Business secrets]* per handset, approximately [Business secrets]* times smaller than the gross margin generated by the sale of one mobile handset with navigation functionalities.

merged entity, such a small price increase would lead to very few additional sales for the merged firm.

- (337) Secondly, navigation services are only one of the factors influencing the purchasing decision of customers. Other factors, such as the subsidy from the MNO or the availability of other services like mobile TV, music or video software, are likely to significantly influence end-customers¹³¹. A partial foreclosure strategy, based on a degradation of the commercial conditions for sales of digital maps, would therefore have a relatively uncertain success, as Nokia's competitors could still propose a navigation service and develop marketing strategies enhancing features of their handsets that are different than navigation solutions.
- (338) [Business secrets]* As referred to in Recitals 309, Garmin is active in the mobile market and has recently entered into an agreement with Samsung to offer a navigation solution on mobile handsets. This protection from foreclosure for Garmin will limit the profits that Nokia could capture on the downstream market if it engaged in input strategy. Similarly, [Business secrets]*.
- (339) Fourthly, switching costs are relatively limited. As a result, NAVTEQ could lose significant amount of sales to Tele Atlas if it increased prices upstream or degraded map database quality/delays access to updates.
- (340) Finally, quality degradation only applies to NAVTEQ customers, since Tele Atlas would arguably continue to provide good-quality map databases to all mobile handset manufacturers in a non-discriminatory manner. TomTom/Tele Atlas is hardly present in the downstream market for the provision of navigation applications on mobile handsets¹³² and would gain very limited downstream sales in the mobile market by degrading the quality of its maps sold to handset manufacturers. It is also important to note that degrading map database quality would be less profitable for the merged entity than increasing prices since, unlike a price increase, degrading quality does not bring higher margins for the map databases that NAVTEQ would continue to sell upstream.¹³³

8.3.3.3. Empirical analysis carried out by the Commission

- (341) The Commission has analysed the extent to which the merged entity could actually capture sales on the mobile handset market by engaging in an input foreclosure strategy to the detriment of Nokia's competitors. This analysis is necessary to determine whether the profits that the merged entity could gain

¹³¹ [Business secrets]*.

- Annex 3E to response to questionnaire of 22 April 2008 - [Business secrets]*.

- Annex 3A to response to questionnaire of 22 April 2008 - [Business secrets]*.

¹³² TomTom sells navigation software to Mobile end-customers, which accounts for a marginal share of its activity.

¹³³ Quality degradation may have a strong effect on competitors downstream (such as delayed entry of new products) - but mobile handset manufacturers can always turn to Tele Atlas for a quality map database. Therefore, even in the case of quality degradation, there is an upper bound to the competitive harm that can be felt by competitors (that is to say, being supplied at a higher price by Tele Atlas).

downstream by increasing map database prices, would compensate the upstream losses.

- (342) In order to measure the amount of sales that the merged entity could capture if it increased map database prices to Nokia's competitors downstream the Commission carried out an econometric estimation of the demand for Mobile handsets.¹³⁴ On the basis of these estimates and other market data, the Commission conducted a simple analysis of the trade-off between upstream losses and downstream profits.

Total input foreclosure

- (343) The likelihood of a total input foreclosure strategy, whereby the merged entity would stop supplying map databases to Nokia's competitors downstream, is examined first. If such a strategy was implemented by the merged entity, the competitive pressure exercised on Tele Atlas would be reduced, which may allow Tele Atlas to raise the map database price it charges to Nokia's competitors downstream. In essence, a total input foreclosure by the merged entity would increase Tele Atlas's market power.
- (344) More specifically, if the merged entity were to stop selling map databases, it would lose all its profits on map databases but would only recuperate profits on the sales that it is able to capture downstream. For a total foreclosure strategy to be profitable for Nokia/NAVTEQ, it must recuperate enough profits downstream to at least compensate the lost profits on map databases.
- (345) The parties' economic submission calculates that a total foreclosure strategy would not be profitable for the merged entity assuming that Tele Atlas increases prices by [30-40]*% as a result of such a strategy.¹³⁵ Under the parties report's assumptions, it appears that total foreclosure would not be profitable for the merged entity if Tele Atlas did not raise prices by more than [100-200]* per cent. The Commission checked the robustness of the analysis submitted by the parties to a variety of alternative assumptions, regarding, for example, pass-through rates, downstream elasticities and market shares and concluded that the assumptions used in the analysis were conservative.
- (346) In order to measure more precisely the extent of sales that the merged entity would be able to capture downstream, the Commission estimated downstream price elasticities and found that the merged entity would only capture a relatively limited amount of sales downstream by increasing map database pricing for Nokia's competitors.¹³⁶ Since map database prices represent a relatively minor

134 The Commission estimated downstream elasticities using a nested logit model following "Estimating Discrete-Choice Models of Product Differentiation", Steven Berry, The Rand Journal of Economics, Vol. 25, No 2, 1994, pages 242 to 262. The Commission tested that the estimated elasticities are robust to a wide variety of assumptions, in particular concerning the nest structure, the size of the market and the instruments used. The estimated brand-level elasticities are also consistent with the level of gross margins for handsets.

135 RBB Economics, "Nokia/Navteq: Financial incentives for foreclosure", 28 February 2008.

136 The base specification of the nested logit demand system estimated by the Commission, where nests are defined depending on whether the handset is GPS-enabled, indicates that the elasticity of Nokia's demand with respect to other handset manufacturers [Business secrets]* is [Business secrets]*. If, for example, maps represent [Business secrets]*% of the cost of the handset and the

proportion of the price of mobile handsets, and given the elasticity estimates, the Commission's analysis indicates that it would be necessary for Tele Atlas to increase prices by a very substantial amount in order to ensure that an input foreclosure strategy would be profitable for the merged entity. In fact, the Commission calculated that if Tele Atlas does not raise prices by more than two hundred per cent, a total input foreclosure strategy would not be profitable for Nokia/NAVTEQ.¹³⁷ It appears unlikely that Navteq would risk losing all its map revenue without any guarantee that Tele Atlas would raise prices by such magnitude.¹³⁸

- (347) It could be argued that map database costs expressed as a share of the total production cost for a mobile handset could increase over the coming years because prices for other components, such as hardware, decrease faster than map database prices. In order to account for the possibility that the map database share of total production cost will increase in the near future, the Commission made alternative calculations where map databases represented a higher percentage of the total price of a mobile handset. The same conclusion is obtained on the basis of these assumptions.¹³⁹

Partial input foreclosure

- (348) The likelihood of a partial input foreclosure strategy, whereby the merged entity would have the incentive to increase prices or degrade the quality of map databases supplied to Nokia's competitors downstream, is discussed in the following Recitals.¹⁴⁰
- (349) As referred to in Section 8.3.3, the merged entity faces a trade-off between the profits lost in the upstream market and the profits in the downstream markets in order to determine its optimal price. If the merged entity decides to increase prices upstream, it would gain additional profits from customers that remain with NAVTEQ, but it would lose profits on customers that switch to Tele Atlas. In

pass-through rate is [Business secrets]*, this means that a [Business secrets]* increase of the map price by Navteq would only allow Nokia to increase its sales of Mobile handsets by less than [Business secrets]*. The Commission found similar results using alternative nest structures.

- 137 Considering gross margins for Nokia of [Business secrets]* and [Business secrets]* for Navteq, the share of the map database in the wholesale price for Nokia of [Business secrets]*, the rest of the market being divided equally between Navteq and Tele Atlas and a pass-through rate of [Business secrets]*, the upstream losses and downstream gains resulting from a total foreclosure strategy can be calculated. Using the estimated downstream elasticities [Business secrets]*, the critical map database price increase by Tele Atlas that makes a total foreclosure profitable for Navteq would be [Business secrets]*. Similar results were obtained by calculating how many sales of non-GPS enabled cell phones and of GPS-enabled cell phones Nokia would gain if the price of its competitors' GPS enabled cell phones also increased using the estimated cross-nest and own-nest parameters for these competitors.
- 138 In addition, such a price increase by Tele Atlas does not appear realistic in light of the industry characteristics. In particular, it would increase the prospect for entry, which would defeat the purpose of a total foreclosure strategy. This strategy may also not be credible for the merged entity which would have an incentive to undercut Tele Atlas.
- 139 For instance, if map databases represented [Business secrets]* of the total price of a Mobile handset, the critical price increase would be [Business secrets]* under the assumptions described above in footnote 143.
- 140 Following the non-horizontal merger guidelines, the term price increase in this section also refers to product degradation.

addition, the merged entity would gain additional profits due to the loss of competitiveness by Nokia's downstream competitors who manufacture mobile handsets.

- (350) As a price increase upstream will benefit the post-merger entity in a way it did not pre-merger, the merged entity would have an increased incentive to raise prices for Nokia's competitors. However, the results of the econometric analysis carried out by the Commission indicate that the merged entity would only capture a relatively limited amount of sales downstream by increasing map database pricing for Nokia's competitors,¹⁴¹ which implies that the incentive to foreclose competitors will be limited.
- (351) Even if it were supposed that Tele Atlas would match any price increase by Navteq, the merged entity would not have an incentive to increase map prices significantly. Indeed, the Commission's analysis indicates that the incentive to undercut prices to gain sales upstream dominates the possible benefit on the downstream market. In particular, on the basis of the assumptions described in footnote 143 and assuming that Tele Atlas matches any price increase by Navteq, the Commission calculated that the merged entity would have an incentive to undercut any price increase on the upstream market that would lead to a downstream price increase superior to [very minor percentage]*. The Commission checked the robustness of this simple profit test to a wide range of alternative assumptions concerning the pass-through rate, the upstream and downstream price elasticities, and the share of the map database in the handset price.
- (352) The results of that simple profit test indicate that any price increase that would have a non-negligible impact on the downstream market would not be profitable for the merged entity as the downstream gains would not be sufficient to compensate upstream losses.

8.3.3.4. Conclusion - Incentive

- (353) As already indicated, while the calculations presented in Section 8.3.3.3 only relate to foreclosure of competitors manufacturing mobile handsets, any incentive for the merged entity to engage in input foreclosure with regard to firms active in the downstream market for provision of navigation applications on mobile handsets (mobile navigation software providers, MNOs and providers of navigation solutions on mobile web-sites) appears even less likely, in particular in view of the more limited presence of Nokia in these sectors and the smaller profits that could be captured in these sectors.
- (354) Accordingly, it must be concluded that the merged entity would have no incentive to increase prices in a manner which would lead to anticompetitive effects in any of the downstream markets.

8.3.4. Effects in the downstream markets

- (355) The overall effects of the vertical integration of Nokia and NAVTEQ must be assessed in the downstream markets. As stated in the non-horizontal merger

141 As described in footnote 142.

guidelines, “a merger will raise competition concerns because of input foreclosure when it would lead to increased prices in the downstream market thereby significantly impeding effective competition”¹⁴².

- (356) There are a series of elements that indicate that the proposed vertical integration of Nokia and NAVTEQ is unlikely to have any effects in the downstream markets. The same factors that explained the lack of any incentive to engage in partial foreclosure also lead to a lack of effects in the downstream markets. For instance, the low percentage of the map database in the mobile handset costs, the limited switching costs and the competition with Tele Atlas all tend to limit the price increase that could be imposed by NAVTEQ on Nokia's competitors.

8.3.4.1. Intermediary downstream market: Navigation Software

- (357) The effect of the concentration on the intermediary downstream market, composed of navigation software firms providing navigation solutions to MNOs, handset manufacturers or to web companies, will notably be limited because of the lack of any incentive of the notifying parties to foreclose their downstream competitors.
- (358) In addition, the non-horizontal merger guidelines state at paragraph 50 that “[if there remain sufficient credible downstream competitors whose costs are not likely to be raised, for example because they are themselves vertically integrated or they are capable of switching to adequate alternative inputs, competition from those firms may constitute a sufficient constraint on the merged entity and therefore prevent output prices from rising above pre-merger levels].” This statement is illustrative of the situation of the navigation software provider Garmin, which has secured its access to digital maps via its long-term agreement with NAVTEQ. Garmin is therefore in a position to constitute a sufficient constraint in the intermediary downstream market, with the result to constrain prices of digital maps.

8.3.4.2. Downstream markets

- (359) Ultimately, the impact on end-customers, and the effects should be mainly analysed at the level of the downstream market for the provision of mobile handsets, and the downstream market for the provision of navigation applications on mobile handsets.
- (360) Mobile handset manufacturers will be hardly impacted by the concentration because the cost of digital maps only accounts for a minimal share of their costs ([0-10%]*) and because Tele Atlas will compete against NAVTEQ to increase sales of maps. MNOs, navigation software providers selling software packages to end-customers, and providers of navigation services on mobile web-sites will be hardly impacted because the parties lack the incentive to foreclose their downstream competitors.

¹⁴²

Paragraph 47.

- (361) In addition, handset manufacturers and MNOs will have the possibility to source their digital maps and navigation software to Garmin, which is protected from price increase via its long-term contract with NAVTEQ. [Business secrets]* Although the commercial behaviour of Garmin cannot be known in advance, it can reasonably be expected that Garmin will compete against Tele Atlas and NAVTEQ to supply digital maps (embedded into its navigation solutions) to MNOs or handset manufacturer¹⁴³. Ultimately, the presence of Garmin should guarantee that maps will continue to be available at reasonable prices, at least for mobile handset manufacturers and MNOs. [Business secrets]*
- (362) In addition, the profit trade-off described in Section 8.3.3 implies that the downstream market is unlikely to be affected in any significant way by the vertical integration of Nokia and NAVTEQ. On the basis of the market characteristics and, in particular, of the relatively limited price elasticities downstream and the small share of map databases in smartphones price, the profit test indicates that a significant price increase by NAVTEQ would lead to a decrease in revenue on the upstream market that will not be compensated by sufficient gains for Nokia downstream.
- (363) The same reasoning applies to partial quality degradation, except that degrading quality is less attractive for the merged entity than increasing price since it does not bring higher margins upstream.¹⁴⁴

8.3.4.3. _____ Efficiencies

- (364) The overall impact of the proposed transaction will also be affected by the likely efficiencies that are brought about by the merger and substantiated by the parties. While there is a lack of anticompetitive effects irrespective of efficiencies, these efficiencies form part of the overall competitive assessment.

Pricing efficiencies

- (365) As set out in the non-horizontal merger guidelines, "*a vertical merger allows the merged entity to internalise any pre-existing double mark-ups resulting from both parties setting their prices independently pre-merger.*"¹⁴⁵ In this case, the problem of double mark-ups cannot be disregarded since the marginal cost of map databases is close to zero and consequently gross margins on map databases are high. The Commission's analysis to evaluate the reduction of the double mark-up was conducted with regard to the price of mobile handsets. It does not concern other navigation services provided by Nokia, but it may be assumed that the reduction of the double-margin will also have positive impacts on the pricing of activities of Nokia, such as OVI or Nokia maps (Smart2Go).

¹⁴³ Garmin will enjoy a double benefit from such a strategy: (i) increase of its turnover; and (ii) [Business secrets]*.

¹⁴⁴ Overall quality degradation may have strong effects on competitors downstream (such as delayed entry of new products) - but they can always turn to Tele Atlas for a quality map database. Even in the case of quality degradation, there is an upper bound to the competitive harm that can be felt by competitors (that is to say, being supplied at a higher price by Tele Atlas).

¹⁴⁵ Non-horizontal merger guidelines, paragraph 55.

- (366) The impact of the elimination of double mark-ups may be illustrated in the following manner. Suppose for the sake of simplicity that the map database represents [0-15]*% of the price of the smartphone [Business secrets]*. Post-merger, the integrated company will realize that the true cost it has for an additional map database is not [0-15]*% of the smartphone price, but a small fraction of this amount. As a result, the merged entity will have an incentive to expand sales to take advantage of the higher profits it makes on the sale of a smartphone. If it is assumed that [30-60]*% of the cost decrease is passed on, it is found that the price of Nokia's smartphones would decrease by [<5]*%, which represents approximately a [<5]*% decrease in the average price of smartphones embedding navigation solutions (assuming Nokia sells [30-60]*% of smartphones with navigation solutions, and ignoring changes in market shares due to switching toward Nokia's smartphone as they have become cheaper).
- (367) The efficiencies described in Recital 365 are also merger specific. When assessing whether efficiencies generated by the elimination of double mark-ups are merger specific, the Commission examined whether vertical cooperation or vertical agreements may, short of a merger, achieve similar benefits. In particular, it examined whether it would be likely that the merging parties would in the absence of the merger conclude contracts with non-linear pricing with a price for marginal units close to the marginal cost of map databases, which in this case would be close to zero.
- (368) The provision of navigation services on mobile handset is a nascent activity and, as such, the analysis of contracts between map providers and their customers does not provide any example of a price structure where volume discounts could lead to low marginal costs. However, it could be argued, because the activity is nascent, that the absence of any such contract is not indicative of the nature of the contracts that could develop in the near future. Nevertheless, the Commission examined a more mature market for which navigable digital map databases are an important input in the TomTom/Tele Atlas Decision¹⁴⁶, and concluded that while volume discounts are common in the industry, these discounts are too limited to substantially eliminate double mark-ups. It is reasonable to anticipate that the pricing structure for sales of digital map databases for mobile applications should not be significantly different than those that currently exist in the PND market.
- (369) It must be therefore be concluded that the elimination of the double marginalization should be considered merger-specific to a large extent. Post-merger, Nokia's true cost for the map database should be NAVTEQ marginal cost for producing the map databases.

Non-price efficiencies

- (370) In addition to the elimination of the double marginalization, the notifying parties have submitted that the proposed operation is likely to create other efficiencies. The fact that vertical integration may lead to such efficiencies is explicitly referred to in the non-horizontal merger guidelines, which indicate at paragraph 57 thereof that vertical mergers "*may align the incentives of the parties with*

¹⁴⁶

Case No COMP/M. 4854 TomTom/ Tele Atlas – TomTom is a PND (Portable Navigation Device) manufacturer and Tele Atlas a digital map provider.

regard to investments in new products, new production processes and in the marketing of products."

- (371) In this case, the parties have submitted that thanks to the merger, NAVTEQ will develop map functionalities faster for pedestrian usage. In the absence of the merger, NAVTEQ would have less incentive to develop such pedestrian functionalities¹⁴⁷, until the sales of navigation applications on mobile handset take off. The merger-related efficiency would therefore be that NAVTEQ will share the risk with Nokia to develop pedestrian functionalities at an early stage of the development of the market.
- (372) The notifying parties have also submitted that NAVTEQ is currently particularly focused on developing maps in countries where automotive traffic is developed, because selling maps for vehicular navigation constitutes the core of its activity. As a consequence, NAVTEQ coverage is less developed in countries, such as India, for instance. Conversely, once NAVTEQ is integrated with Nokia, it will have a strong incentive to also develop digital maps in countries where automotive traffic is more limited, but where the mobile market is dynamic (for instance, India).
- (373) However, the future development of pedestrian usage and the need to develop digital map databases for new countries do not appear to be specifically related to the merger. Similarly, map suppliers will have an incentive to be present in this market at an early stage, even absent the merger. Therefore, the merger-related efficiency is limited to a gain in time that is not identifiable, and which cannot reasonably be estimated in terms of years, considering the rapid take off the notifying parties are anticipating for navigation services on mobile handsets.
- (374) In addition, a number of pedestrian functionalities correspond to additional attributes that can be developed without a direct cooperation with the map suppliers. Ultimately, it is not clear that an early commitment from NAVTEQ (or Tele Atlas) to develop pedestrian functionalities or to develop digital maps in new countries could not be made in the form of a contract with Nokia
- (375) It is, therefore, unclear whether the non-price efficiencies presented by the notifying parties would be merger specific, and whether they would be of a significant magnitude.
- (376) In any case, it is not necessary to precisely estimate the magnitude of those potential efficiencies, nor whether they are merger-specific, given the proposed transaction's lack of anticompetitive effect irrespective of efficiencies.

8.3.4.4. Conclusion – Effects in the downstream markets

- (377) Accordingly, it must be concluded that the proposed transaction will not lead to any anticompetitive harm on the downstream markets.

¹⁴⁷ For instance, localisation of pedestrian path or POI accessible to pedestrians.

8.3.5. Conclusion – Input foreclosure

- (378) The Commission assessed whether the proposed operation would lead to anticompetitive input foreclosure and concluded that it would be unlikely that the proposed operation would significantly impede competition to the detriment of end-users. It is unclear whether the merged entity has the ability to foreclose its downstream competitors and it particularly lacks the incentive to stop supplying digital map databases to its downstream competitors.
- (379) In addition, any foreclosure strategy in increasing prices/degrading quality for Nokia's competitors would not have a significant anticompetitive effect in the downstream market for mobile handsets, nor in the downstream market for the provision of navigation applications on mobile handsets. This conclusion does not rely on likely efficiencies brought by the proposed operation. However, it is strengthened further once efficiencies are taken into account.

8.4. Access by the Merged Entity to Confidential Information

- (380) According to paragraph 78 of the non-horizontal merger guidelines, a vertical merger may give the merged entity access to commercially sensitive information regarding the downstream activity of rivals. For instance, by becoming a supplier to its downstream competitors the merged entity may obtain critical information, which could allow it to compete less aggressively or could put competitors at a competitive disadvantage thereby making entry and expansion less attractive.
- (381) The confidentiality concern, as expressed by some third parties, is based on the premise that NAVTEQ's customers have to share information on their future competitive actions with their map supplier. They fear that this information could be used to their disadvantage by the downstream affiliate of the merged entity. In particular, third parties expressed concern that access to information about the future behaviour of its downstream customers, would allow the merged entity to pre-empt any of their actions aimed at winning more customers (through better prices, innovative features, new business concepts, increased coverage of map databases). The ability of Nokia to obtain confidential information about future actions of NAVTEQ's customers would reduce the incentive of Nokia's competitors on the downstream markets for navigation applications and mobile phones to co-operate with NAVTEQ on pricing policy, innovation and new business concepts. This would strengthen the market power of Tele Atlas, the only alternative supplier of navigable digital map databases with EEA-wide coverage, and could lead to increased prices or less innovation in the market for navigable digital map databases.

Access to confidential information

- (382) In their submissions, and in particular in the Reply to the Article 6(1)(c) Decision, the parties presented convincing evidence showing that such exchanges are limited and that they could even be reduced post-merger without any detrimental effect being caused to NAVTEQ's customers. Based on those submissions and its market investigation, the Commission has established that the amount of information of competitive value exchanged between NAVTEQ and its customers related to their future behaviour is limited and could be further reduced.

- (383) Customers do not need to pass information about the features sets in their new devices. NAVTEQ supplies to its customers the core navigable map database, which includes the basic geographic information, street names and other basic attributes, and several types of add-on features such as POIs, 3D images and phonemes. Most of the add-on features can be supplied by third companies and integrated with the core navigable map database through a simple process called 'geocoding'. [Business secrets]*
- (384) [Business secrets]*
- (385) In addition, Nokia's competitors on the market for handsets work with navigation software providers to create navigation applications for mobile devices. The involvement of independent software developers enables handset manufacturers to avoid direct contact with NAVTEQ and the exchange of sensitive information.
- (386) It is therefore unlikely that the merged entity will be in a position to obtain competitive information from its customers, should they fear that such information could be used to the advantage of the merged entity in the downstream markets for mobile phones or navigation applications. Even if the merged company had access to strategically important confidential information, it would have a strong incentive not to pass it to its downstream affiliate in order not to lose its customers.

Incentive to safeguard confidential information

- (387) The merged entity would have an incentive to mitigate third party concerns related to confidentiality. As demonstrated in Section 8.3.3 , the merged entity would not be able to recoup downstream the sales lost upstream. It would therefore have an incentive to keep existing downstream customers and to try to win new ones. Since any leak of confidential information to Nokia would severely damage NAVTEQ's relationship with customers and undermine NAVTEQ's reputation in the market, the merged entity can be expected to put in place confidentiality safeguards.
- (388) The Commission's market investigation indicated that the confidentiality concerns expressed by NAVTEQ's customers can be addressed. In view of the absence of any incentives for the notifying parties to engage in total or partial input foreclosure, it is likely that NAVTEQ would react to possible confidentiality concerns in various ways, most likely by offering conditions to its customers that would make switching to Tele Atlas unattractive. There are methods (contractual and otherwise) that can address any confidentiality concerns that may arise. [Business secrets]* Nokia has,[Business secrets]* experience of successfully implementing internal confidentiality safeguards.

Conclusion

- (389) Accordingly, it must be concluded that the proposed merger is not likely to significantly impede effective competition due to confidentiality concerns. It is unlikely that the merged entity will be in a position to obtain competitive information from its customers without their consent. In addition, the merged entity will have incentives to mitigate third party concerns related to confidentiality.

8.5. Coordinated effects

- (390) The Commission also examined whether the proposed vertical integration of Nokia and NAVTEQ would create any concerns as regards coordinated effects. Following recent Commission decisions on coordinated effects, as well as its application to vertical mergers as developed by the non-horizontal merger guidelines, the Commission found that the proposed transaction is unlikely to lead to anticompetitive effects through coordination for the reasons explained in the following Recitals.
- (391) The analysis is limited to coordination on the provision of navigable digital map databases, and excludes coordination on non-navigable maps. As more competitive constraints apply to NAVTEQ (and Tele Atlas) in the provision of non-navigable digital map databases, than in the provision of navigable digital map databases, it can nevertheless be concluded that if the concentration is unlikely to lead to anticompetitive effects through coordination with regard to the provision of navigable digital map databases, it is also unlikely to lead to anticompetitive effects through coordination with regard to the provision of non-navigable digital map databases.

8.5.1. Absence of coordination in downstream markets

- (392) TomTom and Nokia are not active in the same downstream markets and appeal to different customer categories. TomTom is the leading supplier of PNDs in Europe and has a marginal presence in the market for navigation applications on mobile handsets (via sales of TomTom Mobile Navigator 6). TomTom navigation software can also be embedded in some mobile handsets, but is not one of the leading players in this area. Conversely, Nokia is the leading manufacturer of mobile handsets, and it intends to develop its presence in the market of navigation application on mobile via the development of OVI, and it has a marginal presence in the sales of PNDs.
- (393) Although it is not excluded that navigation services on PNDs and navigation services on mobile handsets exert some influence on each other, they are considered as distinct markets. The Commission therefore considered that TomTom and Nokia are largely competing in different downstream markets.
- (394) As a consequence, the concentration between Nokia and NAVTEQ does not increase nor create an incentive for Nokia and TomTom to coordinate in a same downstream market.

8.5.2. Market structure is not conducive to coordination in upstream market

- (395) There is currently no indication of coordination between Tele Atlas and NAVTEQ in the upstream market for sales of navigable digital maps. On the contrary, the results of the Commission's market investigation indicate that, pre-merger, Tele Atlas and NAVTEQ competed on both price and non-price aspects. As a result, map database prices have been declining substantially and map innovations have been important over the last few years.
- (396) It could, however, be argued that the merger creates or facilitates the condition for coordination on this market. Following the completion of the concentration,

the structure of the market will be modified as such that the only two providers of navigable digital map databases will be vertically integrated with companies that compete for the provision of navigation services.

- (397) It could notably be argued that TomTom and Nokia could have a common incentive to degrade the commercial conditions under which Tele Atlas and NAVTEQ commercialise their digital maps, with the objective of rendering TomTom and Nokia devices and services more appealing if compared with those of their competitors. Such a strategy could increase sales of TomTom PNDs, and sales of Nokia Mobile handsets and navigation services.
- (398) It is, however, very unlikely that such a strategy would be sustainable. Market partitioning between PNDs on the one hand, and mobile handsets and navigation applications on the other hand, seems to be unlikely in view of very diverging growth expectations.
- (399) Nokia/NAVTEQ is hardly present in the sales of PNDs. This market is already an important market and is growing fast, leading to an important market for sales of digital maps¹⁴⁸. Therefore Nokia/NAVTEQ would have a strong incentive to aggressively sell maps to PND manufacturers in order to capture a substantial share of their map purchases, whereas selling maps to PND manufacturers above competitive prices would imply a risk to be undercut by Tele Atlas, and therefore foregoing sales of maps that would not be compensated by a decreased competitiveness of Nokia competitors, as Nokia is hardly active in sales of PNDs.
- (400) Similarly, TomTom/Tele Atlas is hardly present in the sales of navigation solutions on mobile handsets. Although this market is currently limited in value, it is expected to grow very substantially in the future. Therefore TomTom/Tele Atlas would have a strong incentive to sell digital maps for mobile navigation at prices below NAVTEQ's. Otherwise, TomTom/Tele Atlas would run the risk of being undercut by NAVTEQ, and would therefore forego sales of maps that would not be compensated by a decreased competitiveness of its direct competitors, as TomTom is hardly active in sales of navigation applications on mobile handsets.
- (401) The asymmetry in the structure of the two vertically integrated firms is, therefore, not conducive to coordination, as it renders such coordination likely unsustainable. In addition, a number of other conditions that are necessary to support coordination are not met.

8.5.3. Conditions for coordination are not met in the upstream market

- (402) Effective coordination in a market requires that companies are able to reach agreement on the terms of coordination, monitor deviations from the terms of coordination, and efficiently retaliate in case a deviation is identified, as well as an absence of destabilising reactions from outsiders. In light of these criteria, effective coordination appears unlikely in the market for navigable digital map databases.

¹⁴⁸ Navteq sales to PND manufacturers accounted for [Business secrets]* in 2005, [Business secrets]* in 2006 and [Business secrets]* for the first third quarters of 2007.

- (403) Firstly, it is unlikely that the parties could reach agreement on the terms of a collusive agreement. In particular, coordination on prices would be difficult since there is very limited transparency of prices of digital navigable map databases. More usually, contracts between map suppliers and their customers are not public and their terms are not known by other firms. In addition, there is no evidence of a geographic split between Tele Atlas and NAVTEQ, who essentially compete in the same regions, and therefore it is unlikely that both map suppliers could agree on a geographical division of the market. Finally, an allocation of customers would also be difficult, as in the PND market, and in the downstream mobile markets, the size of firms is far from stable and numerous new companies regularly enter one or other of those markets.
- (404) Secondly, it appears unlikely that effective monitoring could be established in light of existing market characteristics. For instance, map database prices are not transparent and there are large and infrequent contracts, which make deviation from a potential collusive arrangement more likely. In addition, the high fixed costs and low marginal costs in the industry may make deviation attractive.
- (405) Thirdly, it is unclear whether a prompt and sufficient retaliation mechanism could be established. It could, nevertheless, be argued that a return to competition could be a retaliation mechanism. However this point may be left open as the other conditions for coordination are not met.
- (406) Fourthly, Garmin would likely be in a position to destabilise such coordination between NAVTEQ and Tele Atlas in sales of maps for mobile handsets, via its long term contract with NAVTEQ that guarantees its supply of digital maps. Garmin has already announced its intention to launch a smartphone embedding navigation functionalities, and has also announced that its navigation solutions will be made available on Samsung handsets in Europe. [Business secrets]*
- (407) Finally, there is no clear evidence that the vertical integration of Nokia and NAVTEQ would increase the scope for coordination between map database producers. Unlike horizontal mergers, the proposed operation does not facilitate reaching agreement on the terms of coordination by removing one player in the market. The proposed operation notably does not increase price transparency.
- (408) The Commission therefore concludes that the proposed operation is unlikely to lead to anticompetitive effects through coordination.

IX. CONCLUSION

- (409) For these reasons, it is concluded that the proposed concentration would not significantly impede effective competition in the common market or in a substantial part of it. The concentration should therefore be declared compatible with the common market and the EEA Agreement, pursuant to Article 8(1) of the Merger Regulation and Article 57 of the EEA Agreement.

HAS ADOPTED THIS DECISION:

Article 1

The notified concentration whereby Nokia Corporation acquires sole control within the meaning of Article 3(1)(b) of Regulation (EC) No 139/2004 of the undertaking NAVTEQ Corporation is hereby declared compatible with the common market and the EEA Agreement.

Article 2

This Decision is addressed to:
Nokia Corporation
Keilalahdentie 4
P.O. Box 226
FIN-00045 Nokia Group Espoo
Finland

Done at Brussels, 02/VII/2008

*For the Commission
(Signed by)
Neelie KROES
Member of the Commission*

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