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WORK IN PROCESS

An Update of the Commercial ATIS Market

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Work in Progress: **An Update of the Commercial ATIS Market**

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Cambridge. Massachusetts
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This draft paper is the first installment updating the Volpe Center paper, *A Market Analysis of the Commercial Traffic Information Business* (March, 1994). This snapshot is comprised of a narrative analysis and matrix describing consumer ATIS products available for purchase today. A more comprehensive analysis will follow in May.

Summary: **What has changed in the ATIS market since 1993?**

There were no products commercially available in 1993 that provided any combination of location, navigation, and route guidance. The TravTek field test had just ended; Zexel Corporation was initiating a beta test of the in-vehicle navigation product that would become Guidestar; and, Siemens and Motorola were working with field test sites in Michigan and Illinois, respectively, exploring the costs, functionality, and value of potential future in-vehicle products. The digitized maps needed as a base for this family of products had been completed for only very few segments of the US. Similarly, other fundamental components of these systems were not ready for general consumer use.

Traffic information was available on radio in most US metropolitan areas through either Metro Traffic Control or Shadow Broadcast Systems. Larger markets also broadcast traffic information on morning television. Cellular phone service providers were experimenting with the value of network services and were making traffic information available in a limited number of cities, for the price of airtime, with mixed user response. One service provider in a heavily congested city discontinued the traffic service because only the company's regional sales representatives used it.

Other 1993 traffic information services included the SmarTraveler field test in greater- Boston; FastLine, a for-profit phone-based service in the San Francisco/Bay area selling advertising to support the service; AutoTalk, a second audio program receiver ($129) covering parts of greater Los Angeles; Roadirector, a pager and fax subscription service in Southern California; Shadow Fax, a subscription service; and Way-to-Go, a pager-based receiver ($200) that broadcast corridor-specific information in the San Francisco/Bay area.

A recent survey of 1995-96 trade magazines and retail outlets indicate that there are five manufacturers and approximately ten "brands" of in-vehicle navigation products currently for sale in the US. Company names include Clarion. Sony. Delco. Pioneer, Rockwell, and Alpine. Products are sold through Oldsmobile dealers (Rockwell's Guidestar), car audio stores, direct mail, and by rental from Avis and Hertz. Prices range from approximately $1,000 to $3,000 installed. Seven software products offer the possibility of attaching a GPS locator to a computer, equipping it with complementary map and navigation software, and achieving the same level of functionality as that offered by the in-vehicle devices for much less money, from approximately $50 to $800. depending upon features, functionality, and number of maps.

Radio is still the largest outlet for traffic information and dominant in this market niche. This free (of direct charge) service defines the threshold of traffic information for any potential competitor. However, SmarTraveler has moved beyond the field test stage and has expanded service to include Cincinnati, Ohio, and is negotiating with Bridgeport, Connecticut. In all three cities, a public transportation agency pays for the service. Many more cellular phone service providers are including traffic information as a matter of course, to avoid a competitive disadvantage in their service areas. Some cellular services, as with L.A. Cellular (greater Los Angeles), are experimenting with live operators providing personalized traffic and routing assistance. Roadirector in greater L.A. is planning to expand from its pager subscription base to include faxes and kiosks. A new computer-based traffic information product, TrafficAlert from Cue Network, broadcasts real time traffic information onto digitized maps.

The intemet offers subscribers access to a number of traffic services, generally provided by a state or regional transportation agency. As examples, intemet "pages" are maintained for greater Houston, Southern California, greater Chicago and the corridors to Wisconsin and Indiana, and greater Seattle.

Two start-up traffic businesses that were active in 1993, are no longer extant. Way-To-Go went out of business in late 1993, and Autotalk stopped broadcasting in 1995. Fastline' s status is uncertain. There are many reasons for small, new businesses to fail, and no conclusions can be drawn from so small a sample.

Introduction

The ITS consumer marketplace may eventually provide a great variety of products and services, on a variety of platforms, at many different prices for many different market segments. Following this trajectory of market evolution, it is expected that future ATIS products will range from local, route-specific travel information available free of user charge on commonly owned communications platforms, to a variety of multi-function products that provide complete, transportation system and traveler services visibility, including interactivity for planning, reserving, paying, and managing local and intercity travel and ancillary services. How this scenario plays itself out, over what period of time, and at what cost to industry and consumers is the subject of marketing research and analysis.

the safety and security components of ATIS services are evolving largely independently of the traffic and travel information components. They are nor addressed in this narrative. but are listed in the attached matrix.

What ATIS products and services arc currently on the market?

Currently, ATIS products and services fall into one of two categories: live traffic information, and location, route guidance, and navigation products'. Traffic information is available to consumers generally free of additional charge via existing broadcast and communications services, such as radio, cellular phones, and the intemet. Location, route guidance, and navigation products are sold through direct mail and audio and computer retail channels and may require separate purchase of location and interface hardware in addition to digitized maps and navigation and routing software. No product currently available on the market marries these two service sets into a product that can incorporate live traffic information into route guidance. A list of commercially available ATIS products is contained at the end of this briefing.

Traffic Information

Commercial radio traffic information broadcasts reach the largest number of travelers, and define [ravelers' expectations of the service, whether for good or bad. This service is available in varying intensities, depending upon local traffic conditions, throughout most of the country. It is supported by advertising and has value to the advertiser based on the belief that car radio listeners are listening attentively for location-specific information when traffic information is broadcast and will not have time to tune out the advertiser's message. Some transportation agencies broadcast traffic and incident information directly to travelers via highway advisory radio or local public radio, but most often this information is also available to the commercial broadcaster. Traffic information is also available for a limited number of metropolitan areas on the intemet, on cable television, during early morning local television news broadcasts, and on cellular telephones (generally provided by the same company that provides radio information).

Many cellular phone service companies provide traffic information as one of their information services. The decision is made at the regional level and is dependent upon local market factors. including whether or not their competitor offers the service. Examples of regional service variation include greater Los Angeles and St. Louis, where cellular providers offer subscribers access to a live operator who provides traffic information and route guidance. This level of service represents an increase over what was available to cellular subscribers 3 years ago, but cannot be said to represent a trend.

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1 In this document, *location* refers to the ability of a product to locate the user on a map. This implies the presence of GPS and related software. *Route guidance* refers to the ability to provide turn-by-turn directions from origin to destination. *Navigation* refers to the ability to provide a general direction, as in a directional arrow or a highlighted route on a map.

Since 1993, several companies have attempted to sell traffic information directly to travelers via phone. pager. fax, and stand-alone communications devices, without success. Following a federally-sponsored ITS field test in 1993-4, Smart Route Systems of Cambridge, Massachusetts. has been providing free access to "SmarTraveler" traffic information by phone, under contract to state or local governments in metropolitan Boston, MA, and Cincinnati, OH. Their efforts to sell the service directly to consumers have thus far been unsuccessful. As part of the operational test. an experiment in service pricing demonstrated conclusively that Cell One phone subscribers in greater Boston would not pay the cost of air time to access SmarTraveler, though they would use the service regularly if it were entirely free. Both Boston area cellular services now provide access to SmarTraveler free of all charges.

Cue Network Corporation offers TrafficAlert, a PC-based product that matches real-time traffic broadcasts to digitized maps in six counties in California, and metropolitan Portland OR, and Seattle, WA. Their belief is that the trip begins at the traveler's desk. This is currently the only computer-based traffic information product competing with free intemet sites. Consumer response to this product is unknown at this time.

Locution, Navigation, and Route Guidance

This set of products are based upon digitized maps, routing software, and GPS location devices. They can be grouped by platform, features, and functionality. At the high end of the spectrum, consumers can purchase dedicated in-vehicle navigation and route guidance products for approximately $3,000. This set of products includes the Rockwell Guidestar, Pioneer GPS-X77, and the Sony NVX-F160. The mid-level of the in-vehicle market offers less functionality and a lower price tag, generally under $1,000 for the base unit. This set includes Delco's Telepath 100, and Amerigon's Interactive Voice System sold under license to Clarion, Kenwood, and Pioneer through auto audio stores. The desk-top and portable computer are also platforms for location, navigation, and route guidance products, and prices in this niche are considerably lower as they do not include the hardware, ranging from ~$50 to ~$800. One stand-alone product designed for both OEM and direct mail sells for under $100-$250, depending on the level of functionality selected.

The most sophisticated are built from maps that contain road-segment intelligence, such as one-way restrictions, and integrate GPS with dead reckoning and map matching. These maps can support a full array of location and navigation functions, provide fully featured maps, a "yellow pages" of location-referenced points of interest (such as ATMs, service stations, and hotels) and provide the driver with both voice and visual turn-by-turn directions to a precise location. The least sophisticated products are digitized versions of 2-dimensional paper maps with riavigation.

What is known about the marketplace reception of these offerings?

An established market can be examined from the perspective of consumers, through survey research. Where the market is just emerging and there are few products available to consumers,

assessment of market response may be based on an analysis of industry behavior. While it is very unusual for industry to speak openly and honestly about consumers' response to their products. it is possible to discern some patterns through an historic review of industry and analysts statements. review of preliminary products' market positioning, and through survey of retail outlets.

As traveler information system concepts were developing in 1991-2, several truisms were frequently repeated: the price for any new in-vehicle ATIS product would need to be below that of an air conditioner, in-vehicle ATIS products will not debut as OEM equipment, and, as a communications application outside of the car, traffic information would never be a "kilter app"-- it would need to be combined with other services on a multi-purpose platform to be saleable. Current market observations support these early assertions.

Traffic Information

Traffic information is the laggard among early commercial ATIS offerings. This is probably attributable to a combination of market factors. Metro Traffic Systems, and others in the traffic information broadcast niche, have established a service threshold in the traffic information market that defines travelers' expectations for free and accessible traffic information. Cellular phone service providers have experimented with adding value to existing traffic information by providing subscribers with route specific information with limited success.

Metro and others have mastered a formula that maximizes the amount of traffic information produced in exchange for the minimum investment in surveillance and processing equipment. Commercial competitors have not yet discovered a cost-effective approach to improving the value of traffic information to travelers. The additional increment of traffic information required to create comparative consumer value would be disproportionately costly at this time, and no consumer study or market experiment to date has established that any traffic information short of time, location, and route specific information has market value. Field tests such as TravInfo in California hope to demonstrate that traffic information gathered and processed by a public agent will have commercial value when re-packaged as part of a value-added consumer product. Other traffic information businesses, most visibly Smart Route Systems, continue to explore the commercial value of proprietary traffic information services.

Location, Navigation, and Route Guidance

The array of prices and functionality of the early market ATIS entries, in-vehicle, desk-top, and portable, indicate that manufacturers believe that there will be a broad consumer market for these products. As with any market, there are very few products offered at the high end of the price spectrum, and a greater number at a lesser price. One market research study sponsored by Navigation Technologies (J.D.Power, 1995) on a high-function in-vehicle product supports the assertion, common among industry specialists, that market penetration concomitant with

manufacturing economies of scale will not begin until the product is priced below $500. Currently these products retail berwecn $2,000 and $3,000 installed.

Manufacturers' early product offerings are exploring the optimal value trade-off among price, function, market penetration, and return on investment. For example. Delco experimented with a high-end full-function "Telepath" prototype for several years before coming to market with a product priced at ~$995, or half that of the high-end competition, offering fewer high-function capabilities. This indicates that Delco does not believe there to be a sufficiently large market for high-priced in-vehicle location and navigation devices at this time, and that there is a sufficient market segment of consumers, likely to purchase the product today, who would value general directions to a chosen destination, but would not require turn by turn directions.

The current US in-vehicle ATIS market is strictly aftermarket. All but one in-vehicle ATIS product are being sold through retail, car rental, or direct sale channels. Guidestar, a high-function location, navigation, and route guidance system is being sold on certain Oldsmobiles as a dealer installed option. The value of such products to new car buyers has yet to be demonstrated such that they can compete for valuable dashboard real estate.

It should be noted that a newly formed company, Personal Onboard Information Systems, is reported to be selling low-end route guidance products, priced from under $100 to $250, and reports to have signed agreements with one or more automobile OEMs that will provide their product as standard equipment for 1997. This company, believing that there is likely to be great response from new car buyers to a low priced OEM unit, has staked out territory at the low end of the in-vehicle market with a lesser function product.

The car rental market has emerged quickly as a market for in-vehicle ATIS products. Promoting a variety of benefits highlighting personal security and convenience, Avis and Hertz have installed a portion of their high-end rental cars with products that feature location, navigation, route guidance and location-referenced service and tourism sites. These cars are available for rent at certain locations on high-end rental cars for no additional fee. The rental car companies report that these cars are in constant demand.

Because it is known that travelers begin their trips at their desks or in their homes, traffic information, trip planning, and other map-based ATIS products that operate on personal computers are available. Equally, there is known to be a segment of business travelers who travel with a combination of laptop computer and mobile telecommunications devices who value trip planning and location specific transportation information. This niche is also being explored with competitively priced (relative to other software programs) early product offerings'.

It should be noted that in a number of cases described above, the target customer is expected to find greatest product value during business-related travel, and thus may not be using personal funds to make the purchase. Where the product is an in-vehicle unit, the customer may be a salesperson who can expense the investment against earnings over time. Where the customer is a

frequent flier carrying mobile productivity tools, the cost of the route guidance and navigation software may be borne directly by the employer. Finally. where access is mediated via internet. it is as likely as not that the employing company has assumed the subscription costs of internet access.

An informal survey of 55 consumer and automobile electronics stores in metropolitan Boston, Washington, D.C., Atlanta, Chicago, San Francisco, and Los Angeles provides further insight into consumer response to in-vehicle navigation products. Retailers said that very few products are being properly promoted and supported by their manufacturers, and very few are being sold. The retailers said they themselves find the products very appealing and would like to promote them more actively, but cannot do so without marketing, product, and service support from the manufacturers. Most often the retailers cited lack of local maps as being the primary deterrent to sales; many of the retailers also felt that prices in excess of $1,000 were unrealistically high. One retailer in San Francisco reported that he had outfitted a fleet of 50 insurance company cars with a pre-market version of a Nippondenso location, navigation, and route guidance product as part of a demonstration.

Who are the consumers?

In the absence of direct survey and sales data, it is impossible to describe ATIS consumers with any precision or reliability. What data does exist is contained within some of the field test evaluations, but even this data has limited applicability. Where ATIS products are available for sale on the market, one can assume that the manufacturer is basing marketing, advertising, and retail channel choices on marketing research, and thus infer certain consumer features from this evidence.

Very little is known about traffic information consumers. Generally they appear to be employed drivers who listen to radio reports most frequently when driving to work in the morning. Some segment of commuters listen to traffic reports before leaving for their morning drive to work; far fewer tune in to traffic information in preparation for their trip home from work. The largest body of systematic data on this segment is contained in the SmarTraveler field test evaluations and indicates that most consumers are drivers who use the information mostly en-route and in the presence of bad weather or in the presence of a known incident or event. A small and unknown proportion of drivers who own cellular phones use them to obtain traffic information en-route, more often when confronted with evidence of unexpected congestion. An unknown number of computer owners with intemet access may consult on-line traffic information pre-trip. As non-radio, non-telephone access requires expensive media, assumptions can be made regarding income (higher than average), gender (male), and employment status.

The consumer segments that appear to have been targeted by location, route guidance, and navigation market offerings can be categorized similarly. Most obviously, they are consumers who spend a significant amount of time traveling in autos in unfamiliar locations. They travel in their own cars, in leased cars, and in short-term rental cars. They are employed. By and large

they have sufficient disposable income or business expense benefits to enable them to make elective comfort and convenience purchases. They are male, buyers of high end auto stereos, cellular phones. and computers.

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APPENDIX:
A Compilation of Consumer ITS Products and Services

-DOMESTIC CONSUMER ITS PRODUCTS AND SERVICES-

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
IN-VEHICLE NAVIGATION PRODUCTS:						
1) Guidestar Navigation and Route System 2) **Neverlost Navigation and Route System** 3) **Pathmaster Navigation and Route System** ***Navigation, Route Guidance, & Services Directory (Locationally referenced)*** **Rockwell International Anaheim, CA** **Tom Theisen, Rockwell Product Line Manager, Navigation Systems**	1) In vehicle navigational assistance using GPS. Geographic restrictions appear to be approximate tri-state region of rental location. A four-inch video screen located in the central console, providing turn by turn assistance via a simplified icon-based display and voice prompts when approaching an intersection. A directory of location referenced points of interests, incorporating restaurants and other travel services, is also included. • Map data supplied by Navigation Technologies. 2) In car navigational assistance, functionally the same as Guidestar. Neverlost Plus, an enhanced product. offering the packaged navigation system plus cellular phone, is also a customer option. 3) In car navigational assistance, functionally the same as Guidestar and Neverlost. However, this product emphasizes direct targeting of the consumer. Future models will incorporate product enhancements such as real time traffic information.	1) Avis charge, no charge; Oldsmobile. approximately $2000. 2) Similar to Avis' Guidestar version. 3) $3000.	1) A) Avis offers the system in Oldsmobile 88 and Sierra models, at selected NY, NJ, CA, FL, MI, IN, GA, and Wash, DC locations. B) Limited number of Oldsmobile auto dealers, an option on Eighty-Eighty models. 2) Hertz, to be offered in three Ford car classes. 3) Targeting OEMs, manufacturers and the automotive aftermarket. In addition retail.	Avis and Hertz utilize general print media (i.e. *Wall Street Journal* and *USA Today)*, to advertise respective Guidestar and Neverlost products. In addition, Avis employs television to advertise its Rockwell product. Pathmaster utilizes direct campaigns (i.e. direct mail and trade shows). In addition, specific print media, journals and magazines, will be utilized later this year.	Software supplied by Zexel USA. • <u>Target Market</u> #1) Consumers #2) Frequent Business Travelers #3) Mobile professionals • <u>Positioning Strategies:</u> 1) Satisfies consumers' safety needs (distress and navigational) 2) A value added service 3) Provides an in-vehicle navigational product directly to consumers with future addition of real time traffic information and	7/31/95 Inside ITS. p. 14 5/22/95 Inside ITS. p. 5-6 ITS America's International ITS Information Clearinghouse Fact Sheet #1 Route Guidance in the US. 2/95

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
714-762-8111	and emergency services. Product was officially launched during January 1996.		distribution is being planned. • Future Retail Channel: automotive electronic stores and automotive audio-security device stores.		Emergency services. • Competition: various mapping products (traditional and electronic) and other in-vehicle products.	
GPS-X77 *Location Navigation, Route Guidance & Location Referenced Points of Interest* Pioneer Electronics (USA), Inc. Long Beach, CA Michael Townsen, SVP Marketing 310-835-6177	A navigational device incorporating GPS receiver, LCD display, CD-ROM drive, antenna and remote control.. Provides directional assistance and allows users the option of a full map display or a simple arrow indicating upcoming turns. Travel data covers more than 90 categories. The system also offers route planning capabilities with voice guidance. By inserting arrows on the map, a traveler can program a particular route. The system then provides audible prompts, such as "right turn ahead". • Map data supplied by Etak	Retail price: $2,850, $150 for additional specific geographic regions.	Automotive Aftermarket, • Retail Channel: automotive electronic stores. Initially released in California and Pacific Northwest during first quarter '95.	Technical and automotive publications, in addition to automotive trade shows.	• Target Market: Business travelers and mobile consumers. • Positioning Strategies: providing directional assistance with map displays that remain on screen throughout the trip. • Competition: other in-vehicle products and lower cost portable/software products.	1/16/95 Inside IVHS. p. 4-5

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
NVX-F160 *Location Navigation, Route Guidance & Location Referenced Points of Interest* Sony Electronics, Inc. Park Ridge, NJ 201-930-1000	Similar product to aforementioned Pioneer product, utilizing GPS technology. Provides directional assistance and allows users the option of a full map display or a simple arrow indicating upcoming turns. Similar to Pioneer's product, the system offers route planning capabilities with voice guidance; in addition to a similar travel database of businesses and points of interest categories. • Map data supplied by Etak.	Retail price: $2,995	Automotive Aftermarket, • Retail Channel: automotive electronic stores. Initially released in CA and NV during first quarter '95.	Technical and automotive publications, in addition to automotive trade shows.	• Target Market: Business travelers and mobile consumers. • Positioning Strategies: providing directional assistance with map displays that remain on screen throughout the trip. • Competition: other in-vehicle products and lower cost portable/software products.	1/16/95 Inside IVHS. p. 5-6 ITS America's International ITS Information Clearinghouse Fact Sheet #1 Route Guidance in the US. 2/95
Telepath 100 *Navigation & Location Points of Interest* Delco Electronics Corporation, Kokomo, IN	A consumer navigational system, using GPS and dead reckoning to determine a vehicle's position. Incorporates a simple circle and arrow display (similar to an analog clock) to indicate general direction to destination. Does not use a digital map display or provide turn by turn guidance. Displays straight line	Initial Cost: $950, inclusive of audio system and PCMCIA cards providing a single metropolitan area map; additional maps $60/each or	Automotive Dealers, (GM). Customer can also order from Delco and have a GM dealer provide installation.	Point of purchase displays.	GPS based technology. • Target Market: Business travelers and mobile consumers.	12/5/94 Inside IVHS, p. 2 1/29/96 Inside ITS, p. 7-8 Ward's Auto World, August 1995, p. 45.

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
Randy Brunts, Delco Manager Navigation Systems Business 317-451-1921	Distance and direction from the vehicle's current position to the destination. The user can select a destination by choosing a street address or selecting a location from a directory of hotels, restaurants, tourist sites and other attractions. Sold in a unit that incorporated a car audio system. In addition, two value added resellers recently began offering the product under their own names: ORA Electronics, a distributor of cellular enhanced products, and Clarion. ORA will incorporate a cellular interface (a company manufactured device connecting the car audio to cellular phone) to allow the driver to select a destination and call it by pressing a button on Telepath. • Map data supplied by Etak.	The entire 70 metro area map database (encompassing the 70 largest metropolitan areas in the US) on CD-ROM for $150.	Clarion's price $800, exclusive of other car audio equipment. ORA anticipates offering the unit during late first quarter 1996. Approximate price: $1000. Retail Channel: (through Clarion and ORA) Clarion – high end automotive audio retail stores. ORA – automotive audio retail stores and some mass merchandisers.	Clarion and ORA are responsible for advertising.	• Positioning Strategies: Lower price and easier interface in comparison to other in vehicle navigation units. The lower cost was attainable due to its full integration within a car stereo. • Competition: other in-vehicle products.	ITS America's International ITS Information Clearinghouse Fact Sheet #1 Route Guidance in the US. 2/95
Interactive Voice System (IVS), (formerly, AutoNav Automobile-Navigation System)	Provides recorded voice directions in response to the driver's spoken commands, using a modified CD player and map databases converted to audio CD format. The unit (half the size of a videotape), incorporates a microphone clipped to the visor. Driver provides current location and	$600 - $800, $80 per metropolitan area. CD disks are provided with system for 7 geographic databases. New York/New	Marketed through manufacturers of audio CD players, Alpine, Clarion, Eclipse, and Kenwood, prices with CD	Each of the four manufacturers are responsible for their own advertisements. In addition, Amerigon	Name was changed after two years following product launch • Target Market: Mobile business	1/5/96, Inside ITS, p. 10-11 October 1994, Traffic Management p. 87

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
Navigation & Location Points of Interest Amerigon Monrovia, CA Paula Finnegan, Sales & Marketing Manager, Navigation Systems 818-932-1200	Intended destination by spelling out street addresses, cross streets, or landmarks. IVS also provides random-access memory, storing the vehicle's location when engine is turned off, allowing for return directions, with the system already knowing starting point. Originally provided maps for Los Angeles and Detroit, 12 other cities added during 1995. The system can also locate restaurants, hotels, cash machines, and other points of interest. • Map data initially provided by NavTech. The company has license agreements with both Etak and NavTech (Etak's may be used later). NavTech initially had better turn by turn databases.	Jersey, Washington, DC, Los Angeles, San Francisco, San Diego, Las Vegas, Chicago, Detroit, and Indianapolis (an additional 10 to follow this spring), with consumer to pay for activation.	Units approximate $1000. • Retail Channel: automotive audio electronic stores (as determined by the four audio manufacturers).	Benefits from public relations activities, i.e. news releases in *ITS America* and *Automotive News.* The company also places informative articles in various trade publications.	Professionals (primary), map intimidated consumers and innovative consumers. • Positioning Strategies: lower cost (in comparison to other in-vehicle systems), and a safer voice interactive system (for the driver), eliminating the need for maps. • Competition: other in vehicle systems.	
Siemens North America's in-vehicle navigational product, Ali-Scout, is not included among the complied in-vehicle navigation products (because it is not commercially available). Ali-Scout is the exact same product as the Euro-Scout model available in Europe (see appendix). The US version is utilized as part of the ITS Fast Trac project in Oakland County, MI and is not available for general consumer use. The company does not anticipate marketing Ali.-Scout. in its current state, to US consumers.						
NAVIGATION PRODUCTS						
Locator *Location & Navigation*	Trimble's 12 oz. Portable navigational-location device, incorporates a GPS receiver, which connects to the portable computer's serial port and runs on its own	$495, software separately purchased. City Streets for Windows will	Available to consumers through 1-800 number (1-800-827-8000).	On-line internet web page, various automotive parts catalogs, in	• Target Market: business travelers (primary) and consumers.	2/27/95 Inside IVHS. p 11 – 12 March 1995 TTP's Annual

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
Trimble Navigation, Sunnyvale, CA James Rutledge Project Leader City Streets for Windows published by Road Scholar 408-481-2900 800-959-9567.	batteries, rather than using the laptop's power supply. When combined with software, such as City Streets provides domestic digital mapping software with live position location, indicating user's location and destination, however, recommended routes are not generated. • Map data provided by Etak determined). The company also provides a handheld navigation unit (ScoutMaster), targeting hikers. The unit sells for $795 and is available at REI retail stores and through specialized outdoor catalogs. The ScoutMaster uses GPS technology to assist hikers with navigation.	add $330 - $380 to total cost (both must be purchased for traveler to be "located" on PC map).		addition to automotive trade shows.	• <u>Positioning Strategy:</u> a low cost mobile Navigational Device • <u>Competition:</u> in-vehicle and portable navigational devices and navigation software.	Special Meeting
Retki *Location & Navigation Software* Liikkuva Systems International, Inc.	Navigational software package that includes mapping software and GPS receiver, designed to run on a portable computer. Digital maps for displaying traveler's position on major roads throughout US and sector map (street level data for a metropolitan area). Coverage includes roads throughout all 50 states. The software also provides turn by turn instructions. The	Basic package: $595	<u>Distribution</u> through advertisements. mail order (via a relationship with Tiger Software), and a licensing arrangement with Toshiba (whereby the computer	Technical magazines, i.e. *BYTE and CPS World*, Flight magazines (such as American Airlines), and *ITS Deployment Strategies.*	• <u>Target Market:</u> business travelers (primary), in addition to recreational vehicle market • <u>Positioning Strategy:</u> offers an all inclusive	2/13/95 Inside IVHS, p. 9 - 10

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
Cameron, Park, CA Channing Boucher, Director Marketing & Sales 916-676-0690	company sells Rockwell's GPS receiver under its own name. • Map data provided by Etak. Retki has also targeted ITS projects as a potential target market, i.e. its involvement in the Phoenix, AZ *RAPID* project. The company expects 10 release two new location navigation software products by June 1996: Retki Metroguide, covering all metropolitan areas in the US, and Retki Euroguide, covering most of Western Europe's metropolitan areas.		manufacturer markets and sells Retki as a value added offering, at Liikkuva's established Prices). Seeking other distributors and retail dealers		product, GPS receiver, mapping and an in-vehicle environment (with lap-top flexibility). • Competition: In-vehicle Navigational Products and other software products	
1) TripMaker 2) StreetFinder *Route Generator Software* Rand McNally, New Media Division, Neil Vill, VP / GM (Skokie IL).	Both products are PC / desk top computer products, provides mapping software targeting vacationers and business travelers. *TripMaker*, focused on the North American highway network (incorporating US, Canada and Mexico roads), provides street data to route travelers to downtown areas. Software generates driving instructions (text and map formats), destination and route suggestions based *on* traveler's input criteria (i.e. interests, driving habits time allowance). Provides POI suggestions along the requested route. *Streetfinder*, provides specific directions, highlighted on maps,	1) Retail Price of $40. *2)* Retail price of $60.	Retail distribution. • Retail Channel: Software and computer stores. book stores and mass merchandise retailers (i.e. Wal-Mart).	Advertisements through various software and PC publications and in flight magazines.	• Target Market: Primarily vacationers and business travelers, in addition to the "the 27 million PC users in the home, and mobile lap top computers" • Positioning Strategy: a low cost multi-media trip planner.	8 / 15 / 94 Inside IVHS, p. 10

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
	based on input from the traveler. The database incorporates more than 28 million miles of roads and 28 million street segments in the contiguous 48 states and Hawaii. • Map data provided by Etak.				• Competition: other Navigational software manufacturers	
Autonav for Windows Software *Navigation Software* American Technologies, Inc., Fond du Lac, WI. Mike Barnett, VP Sales and Marketing. 414-922-7030 800-924-2141	Mapping software that can accept vehicle location data when packaged with GPS receiver from Trimble or can be used on its own. Provides digital maps showing continental US for portable computers. Map databases provided by Etak. The basic software provides highway maps, with street level maps for extra fee. Destination is displayed on screen and location is constantly updated (on GPS packaged version). Travel services, restaurants and service stations are also provided.	Basic package: $49.95, street level maps an additional $14.95. Trucker and RV version: $99.?5 Software with Trimble's GPS receiver package cost: $550-$600	Retail distribution • Retail Channel: software retail stores.	Advertisements through various technical software publications.	• Target Market: Travelers with access to PCs and lap-tops, and truckers. • Positioning Strategies: consumer are seeking "least expensive navigational solutions" • Competition: other navigational software manufacturers.	7/4/94 Inside IVHS. p. 8-9
Automap Streets *Direction* Microsoft	A CD-ROM software package that provides consumers with access to street level electronic maps covering United States, exclusive of Alaska. • Map database provided by Etak.	$70	Retail distribution • Retail Channel: software retail stores.	Software and travel magazines.	• Target Market: PC and lap lop Owners, Interested in trip planning.	8/14/95 Inside ITS, p. 12.

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
Corporation Redmond, WA 206-882-8080	Accepts data from GPS receivers sold by Rockwell and Trimble, to expand functions when connected.				• Positioning Strategies: convenience factor of providing a consolidated collection of maps. • Competition: value added software products.	
P*Nav *Navigation, Route Guidance & Location Services Software* Personal Travel Technologies, Inc. Mineola, NY Alan Danns, CEO 516-745-123	A windows based software package That accepts data from Trimble's and Rockwell's PCMCIA based GPS receivers that connect to the computer's serial port. The package generates routes, as well as locates the user's destination [and current location if a CPS receiver is used). Cross country directions and in-city directions for 40 metropolitan areas are available. Voice output to direct user. The system also provides electronic yellow pages. • Map data provided by several vendors provide map data, including Etak.	$150 Includes a US highway map and a city map of the user's choice. Individual databases retail for $70 - $120, depending upon the size of the metropolitan area. A GPS receiver would add approximately $500 to a travelers total cost.	Retail distribution • Retail Channel: software retail stores.	Advertisements through selective publications, in an attempt to maximize exposure within a limited budget, i.e. *Fortune*; in addition, the company utilizes mail order houses.	• Target Market: PC and mobile lap lop travelers, seeking Navigational assistance. • Positioning Strategies: Provide consumers with navigational software, in addition to offering value added yellow pages. • Competition: other	March 1995 TTP's Annual Special Meeting, p. 26.

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
					navigational software manufacturers	
GENERAL TRAVEL PRODUCTS						
1) Road Whiz Ultra 2) Ultrafinder 3) Greensfinder *Travel Information* Ultradata Corporation 3t. Louis, MO Duane Crofts VP Advanced Products 314-997-2250	Handheld computers, which provide travel-related information and can be adapted to provide travel information. The products are used for: pre-trip information, traveler services information and route guidance. Specifically, Road Whiz locates over 60,000 interstate services and provides city to city directions between hundreds of US cities; Ultrafinder provides an expanded version of Road Whiz, locating over 100,000 interstate services and services in more than 90 US and Canadian cities, in addition to providing directions between hundreds of US and Canadian cities; Greensfinder provides information and directions for more than 10,000 golf courses,. Source of Map data not determined. Approximately 1 million units have been sold thus far, individual product sales not provided.	All products priced below $100, with Road Whiz Ultra priced below $50.	All products available through Travel USA.	Internet listings, other channels not revealed.	• <u>Target Market:</u> travelers and mobile consumers / professionals. • <u>Positioning Strategies:</u> low cost directional and informational handheld consumer products. • <u>Competition:</u> other directional and informational products.	The International ITS Index. 1996 p. 28 Internet Listing Ultradata Systems / ad667 / page_ 1.html

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
TRAFFIC INFORMATION PRODUCTS						
1) Traffic Information by Fax Z) Traffic Information by Paging Service *Traffic Information* Roadirector Los Angeles, CA 310-641-8868 Hillary Sit	Utilizes the fax and pager to provide Live traffic information. Source of traffic information originates from Shadow Traffic and CalTrans. 1) Traffic information provided in text form, on demand by calling company (specific routes information is provided). 2) Pagers are programmed to receive traffic information, in addition to regular messages. A specific region is selected for the beeper, and user is alerted to information on congestion, road closures time of any incidents and an estimate of how long resolve the traffic problem. The company is also planning to incorporate kiosks, personal computers and audio voice text as additional delivery modes of traffic information in the future.	1) .95 per 3 reports 2) $10/month	1) Users call the company for fax reports. 2) Pager companies offer the service to individuals and corporate clients. Current firms offering the service include Satellite Paging, Paging Dimensions and ATP Paging (all southern CA based companies).	The company relies upon mass mailing and a sales force to advertise its products.	• Target Market: commuters and mobile professionals. • Positioning Strategies: convenience, accuracy, route specific, and low cost. • Competition: broadcast traffic Information	
TrafficAlert *Traffic Information* Cue Network Corp. Irvine, CA 7 14-752-9200	A PC based platform for live traffic information. Installed with Microsoft windows based version of Geofinder (digital mapping package). Data is broadcast to a receiver attached to PC, displayed graphically on Geofinder digital map. Traffic data originates from variety of sources, including CalTrans and Shadow Traffic. • Map data provided by Thomas.	Individual consumer: $250 plus fee for map database (approximate total cost of $400). Corporate: a package for ten individuals $500.	Retail distribution • Retail Channel: software and computer stores.	Software publications	Impetus: "desktop computer will be the dominant platform for real time traffic information" • Target Market: consumers and	11/21/94 Inside IVHS, p 4-5

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
Gordon Kaiser, Cue Chmn./CEO	Brothers Maps, (limited to six counties in CA, in addition to Portland, OR and Seattle, WA.)	annual license fee, plus one time $300 installation fee.			mobile professionals • Positioning Strategies: "strongest medium" for live traffic information. • Competition: Other PC based traffic information services. as well as traffic information provided over the radio.	
SmartTraveler Dialup Information System *Traffic Information* SmartRoute Systems, in cooperation with TRW,	A telephone call-in system, enabling consumers to obtain real time information, organized by specific traffic routes, as well as information on transit, airport shuttle schedules and carpools.	No Charge for service.	Direct consumer dial-up service. Service is available within thc Boston. MA, and Cincinnati, OH metropolitan areas.	The service is advertised on television and radio, and billboards.	• Target Market: commuters and mobile professionals. Positioning Strategies: convenience, accuracy, route specific and no cost.	7/31/95 Inside ITS. p 15 (see Inside IVHS 1/30/95) Discussion with Katie Miller, SmartRoute Systems.

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
David Stein EVP, (617) 494-8100					• Competition: broadcast traffic information	
SECURITY & SAFETY PRODUCTS						
Radar Sensor for Air Bag Deployment *Safety/Auto Protection* Amerigon, Inc. joint venture with Allied 3ignal) Scott Baysinger Director Corporate Development 818-932-1200	A consumer safety product for intelligent air bags activation, using ultra-wide band radar sensors. Radar sensors, placed within the vehicle, will be used for impact prediction to accelerate the activation of the airbag prior to impact.	Estimate $150	Estimated to be available to consumers during 1998, through OEMs.	N/A	• Target Market: consumers. • Positioning Strategy: a value added automotive component, to enhance air bag activation efficiency and effectiveness. • Competition: OEMs and other radar device manufacturers.	4/10/95 Inside IVHS, p. 11-12.
RESCU *Security* Westinghouse Electric Corporation Rory A. Williams Marketing	Remote Emergency Satellite cellular Unit, combines GPS and cellular technology, launched 2/96. Rescu is an overhead console placed in automobiles. By pushing one of two buttons, driver can: 1) activate transmission for roadside assistance, or 2) activate transmission for emergencies (health, crime, etc.). Assuming cellular coverage is available, the system transmits data	$1995, inclusive of Ford's security package: garage door opener, cellular phone, low pressure tire alert and zero pressure tires (which can be driven 50 miles when deflated).	Marketing to automobile manufacturers. Ford's Lincoln division to offer Rescu as an OEM option for 1996 Lincoln Continentals.	Ford is responsible for all advertising. Actual advertising is pending, with channels to include points of purchase displays at dealer showrooms, in	Global positioning satellite (GPS) based. The 1996 Lincoln Continental also can provide users the ability to receive exact direction from dispatcher if	8/28/95 Inside ITS, p 9- 10. 4/24/95 Inside ITS, p. 4 Ward's Auto World, August 1995, p. 45

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
410-765-8994	(vehicle location) and connects voice availability to a Westinghouse Emergency Response Center Operator in Texas. Information is then relayed to the appropriate local response agency. Trials reported 11 minutes for response vehicle to arrive on scene. The security device is sold through Ford Motor Company's Lincoln Mercury division.			addition to advertisement placements in automotive magazines and television.	driver is lost. • Target Market: upper income consumers • Positioning Strategy: improvement of emergency response. • Competition: other safety *P*roducts.	
-ADDITIONAL ITS CONSUMER SERVICES-						
Internet (on line) Services *Live Traffic Information*	Examples of services currently available, include: CalTrans / Maxwell Labs' *Traffic Report*, serving Orange County, CA, Los Angeles, and San Diego, with a live traffic map; Texas Department of Transportation's *Houston TranStar*, serving the greater Houston area with a live traffic map; Illinois Department of Transportation Traffic Systems' *Center Expressway Congestion Map* (provided by a joint venture of IDOT, INDOT, WISDOT and University of Illinois at Chicago's A1 Lab), serving Chicago with estimated travel times to cities and	Information provided over the internet at no cost to the consumer.	Available as an on-line service to all subscribers.	N / A Services are listed in the internet directory.	• Target Market: commuters and mobile professionals. • Positioning Strategy: a low cost, easy access source for traffic information. • Competition: other sources of low cost traffic information.	Internet listings

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
	congestion reporting; and Washington State Department of Transportation's *Seattle Area Traffic Map* providing a live traffic map and information within the Seattle/Puget Sound area.				including the radio, television and cellular telephone providers.	
Cellular Phones	Cellular telephone providers offer traffic information to cellular subscribers (as a value added offering). Actual provision decisions are determined on a decentralized basis, with Regional Managers determining the extent of traffic information (including actual deployment and logistical/pricing policies). Sources of traffic information vary, including Metro Traffic, Shadow Traffic and regional DOTs.	Typically, no charge is assessed for the value added service. Subscribers are charged for cellular air time, dependent upon the selected cellular package.	Service provided on a call-in basis.	Direct advertising, i.e. mail and billboards.	• Target Market: users of the value added offering encompass consumers and mobile professionals • Positioning Strategies: a low cost/easy access source for traffic information • Competition: other sources of low cost traffic information., including the radio, television and on-line internet services.	Conversations with cellular providers.

Product/Service/ Manufacturer	*Description*	*Price*	*Distribution Channels*	*Advertising Channels*	*Supplemental Information*	*Source of Data*
Broadcast Traffic Information *Traffic Information provided to radio stations (and other media) for distribution to travelers.*	The two largest providers of traffic information include Metro Traffic Control, providing live traffic information to radio stations and other media to 60 regional metropolitan markets, coast to coast.; and Shadow Information Systems, providing live traffic information within 10 regional metropolitan markets, coast to coast. Traffic information is packaged for sale or bartered to broadcasters (in exchange for embedded advertising time, which is later sold).	Traffic information is provided at no charge to the consumer. Commercial advertising air time compensates the costs of traffic information.	Information is distributed via the radio and television (among other modes).	Traffic information providers do not directly advertise.	• Target Market: commuters and mobile professionals (through various modes of distribution). • Positioning Strategies: Core competencies allow for the provision of accurate and newsworthy traffic reports. • Competition: other sources of traffic information.	Telephone interviews

Product/Service	*Description*	*Price*	*Sales Channels*	*Company Name*	*Source of Data*	*Summary*
NAVIGATION PRODUCTS						
Berlin Radio (Replaces Travelpilot) *Navigation, Route Guidance & Directory*	Berlin radio is comprised of media equipment and navigation equipment. A visual display unit that provides a diagram of forthcoming intersection, recommending suggested directions to the driver. Utilizes color icons on a color display, speech to provide route guidance instructions and GPS for vehicle location. Current edition limited to Germany, other countries to follow during 1996. Monochrome display placed in cassette location of driver's console. Utilizes Tele Atlas maps. Accuracy of 100 meters.	Priced at DM 10,000 (L5000), cost of the navigation unit priced at DM3,000 (BP1,500). Mercedes APS version priced at D M 1,500 (BP680) - DM4,000 (BP1812), depending on the particular model.	OEM, Mercedes Benz adapted and renamed Berlin Radio, Auto Pilot System (APS); includes Bosch navigation system and RDS radio, launched during March 1995. Mercedes only offering map of Germany, other countries to follow. Mercedes will also offer other information in the future such as hotel guides, restaurants and museums.	Robert Bosch Corporation Stuttgart, Germany 48 711 811 0 Jurgen Hodel. Mercedes Spokesperson, Stuttgart, Germany	8/7/95. The Intelligent Highway, p. 10 – 11	Unit could tie-in to TMC and RDS.
Carin *Navigation & Route Guidance*	A color display unit on driver's console, relying on digital map data. Data from European Geographic Technologies (EGT), a European partner of Nav Tech. Uses graphics (icons) and speech to provide details of the approaching junction.	DM 4.000, for board monitor DM6,990 (BP2890) for BMW packaged unit, board monitor and navigation.	The unit offered as original equipment options within the BMW Seven Series, as part of package w/ controls for the	Philips Car Systems International Wetzlar, Germany 49 6441 370 190 Andrew	8/10/95 The Intelligent Highway, p. 1	

Product/Service	*Description*	*Price*	*Sales Channels*	*Company Name*	*Source of Data*	*Summary*
		Facility (GPS antenna to assist with vehicle location function).	Car radio, on board computer, a television, and the car's heating system.	Bertslem, London Office		
Routefinder *Navigation & Route Guidance*	A text-based navigation system, desk option or in-vehicle mounted on driver's console. User inputs origin and destination details on keyboard, with route recommendation provided in less than a minute. Limited to UK, with map data supplied by UK Automobile Association. Geographic expansion expected in the future. Concentrates on road numbers and distances between points. "Yellow pages" type information available in the future	BP200	Retail Outlets	Philips Car Systems International Wetzlar, Germany 49 6441 370 190 Lance Condon, Press Officer, Bicester, UK	6/12/95 The Intelligent Highway, p. 12 – 13	A maximum of 4 – 5 lines of information per screen conforms with UK Department of Transport's code of practice for in-vehicle displays.
Route Planner *Navigation & Route Guidance*	The system provides audio route and turn instructions and displays the route on a color map. Intersections are shown at greater magnification, with an indication of proximity to intersection. Product is controlled by a remote control unit, which can be operated by the passenger. Unit provides navigation facilities through a map matching function supported by GPS. Anticipated launch is March 1996 (in Germany), with future expansion into France and Italy by May 1996. Map supplier is NavTech, with its European partner, EGT.	DM6,200 (BP2,740) To reduce the price, the company is seeking a less expensive version, providing the option for a monochrome display (vs. color).	Automotive aftermarket through automotive audio shops. In addition, OEMs are being sought.	TEC Mobility Torino, Italy 39 11 6878711 Fabrizio Righetti, Marketing Manager	10/16/95, The Intelligent Highway, p. 7-8. 2/19/96 The Intelligent Highway, p. 10 – 11	A version for fleet services, is also being planned by the company.

Product/Service	*Description*	*Price*	*Sales Channels*	*Company Name*	*Source of Data*	*Summary*
Euro-Scout *Route Guidance & Traffic Information*	An in-vehicle unit designed to communicate with roadside infrastructure. Copilot is a syndicate of private companies financing the roadside communications infrastructure, responsible for the for the route guidance system: a network of infrared beacons linked to control center, the beacons communicate optimal route information to equipped vehicles on current traffic conditions. Other services, such as park and ride, tourist information, and parking space information to follow. It was recently reported that Copilot will cease all activities effective March 31, 1996. The high installation cost of the infrared beacon infrastructure needed for the route guidance system contributed to the decision. It was also reported Copilot may re-emerge in the future with a communications system based on a combination of global system for mobile communications digital cellular radio service and the infrared beacon concept. Siemens continues to support the infrared beacon concept.	DM2,000 (BP831) w/ installation fee DM500 (BP208)	Sold as an aftermarket product, through Siemens' Authorized Dealer Network in-vehicle electronics retailers. Seeking German auto OEM.	Siemens AG Munich, Germany 49 89 722 252 36 Heinz Sodeikat, ITS Euro-Scout contact Sven Uwe Niemann, Marketing Manager, In-Vehicle Dept., Regensburg, Germany	2/6/95 The Intelligent Highway, p. 2-3.	Bosch developing competitive product.

Product/Service	*Description*	*Price*	*Sales Channels*	*Company Name*	*Source of Data*	*Summary*
Dynaguide driver information system *Route Guidance*	A color LCD, mounted near the dashboard, which reports accidents as symbols on a map. Symbols can be "interrogated" by the driver to give a detailed text version of the incident version. Dynaguide receives (RDS-TMC), will be offered with GPS receiver. User has option of selecting maps, map scales, and message filters using a remote control unit. Product uses a dedicated FM radio to receive and decode data from RDS data stream (map database producer not indicated).	Skr 15,000 (BP1,280) First quarter 1996 scheduled launch date.	To be available in aftermarket, retail stores in Gothenberg, Stockholm and Malmo, Sweden.	Volvo AB Goteborg, Sweden 46 31 7724075 Thomas Andersson, Gothenberg, Sweden	10/17/94 The Intelligent Highway, p 7-8.	
NAVIGATION SOFTWARE PRODUCTS						
Personal Navigator *Navigation ,Route Guidance & Directory Software*	Designed for use on personal computers, to provide users accurate locational and navigational details anywhere in the UK. Incorporates a GPS receiver. Locations are accurate within 25 meters. Waypoints for trip planning also can be created. Launched during the fall of 1995. Future enhancements include full scale route planning and travel information (i.e. hotels, pubs, restaurants, and other places of interest). Map database producer not indicated.	Equivalent $650	Retail outlets	Softwair Ltd. UK John Ross, Managing Director Fax: 44 171 499 7517	The International Journal of Advanced Transport Infrastructure, November 1995, p. 56.	

Product/Service	*Description*	*Price*	*Sales Channels*	*Company Name*	*Source of Data*	*Summary*
TRAFFIC INFORMATION PRODUCTS:						
Tel-Me System *Road Traffic Information & Directory*	Windows application on PCs, with connection to various databases via Phonelink. Traffic and travel planner information provided from UK's AA. Travel planner: user enter origin and destination, route is calculated on map display. Traffic information provided on a specific inquired route, via a set of traffic incident symbols (accidents, roadwork, adverse weather and special events), text form also available. Alternative routes not suggested. Other information includes updated news (from Press Association), weather, company profile data, hotels and restaurants.	Annual fee: Individual: BP300. Corporate: BP20,000 (includes a 500 user capacity), with inquiry charge of 12-50 pence and 30 pence for initial mapping	Direct inquiry.	Phonelink, Birkenhead, UK Chris Knowles, Business Development Manager	9/19/94 The Intelligent Highway	CompuServe to develop similar system, at equivalent L70 plus phone call.
Trafficmate YQ Unit *Traffic Information*	Trafficmate: A battery operated portable device [the size of a conventional pager) mounted on the dashboard, relying on synthesized speech to relay traffic speed information (such as severe congestion or slow traffic, below the 30 mph threshold), to the driver. Information is provided 10 miles or two junctions ahead of the vehicle on the entire UK motorway network. Allows consideration of an alternate route before reaching the junction. Geographic limitations limited to area coverage of 400 meters. Launched 10/95.	Trafficmate: BP50, with a key (subscription) charge of BP24/year, effective second year of ownership. YQ: BP150	Retail Outlets	Trafficmaster, Milton Keynes, UK 44 1908 249800. David Martell, CEO	10/2/95 The Intelligent Highway, p 8 Winter 1995, Traffic Technology International, p. 7.	Trafficmate a "budget voice only version of YQ", targeting mass consumer market sales Traffic information is broadcast to products from overhead infrared sensors installed on motorways

Product/Service	*Description*	*Price*	*Sales Channels*	*Company Name*	*Source of Data*	*Summary*
	YQ: Trafficmates' visual equivalency, a 10 cm LCD unit, presenting trafficmate information as part of a map. Coverage area of ten miles. Launched March '95.					
SECURITY AND SAFETY PRODUCTS:						
Skeye Protector System A*uto Security*	An in vehicle mounted recovering system, utilizing GSM and GPS to locate stolen vehicles. The passive system is automatically activated after a vehicle is reported stolen. A control center tracks a vehicle on an electronic display map based on GPS location information communicated from the vehicle's device IO the control center (via the GSM link) the Control center is linked to I20 security firms and the police. The unit can also be programmed to switch on hazard lights and block the ignition system upon notification of theft.	Unit: DM2,500, w/mo. fee of DM80	Retail Outlets, limited to Germany.	Deutsche Telekom Mobilfunk Nil Mathner Product Marketing Manager	5/1/95 The Intelligent Highway, p 7-8	Product is comparable to the system launched by Toad Innovations, Cambridge, UK (priced at BP800, w/ yearly fee of BP117, based on Datatrak network of land based location beacons. rather than GPS)
Parkpilot reversing aid system *Collision Warning*	Provides collision warning when reverse gear us activated. Audio: a pulse rate increases as distance is reduced and is continuous when vehicle is within 50 cm. Visual: a warning display (LCD) mounted near the rear window and is activated when in reverse. In addition to	As an aftermarket product: DM 855 (BP360) Also installed at Ford Scorpio facilities in	Retail outlets, wherever Bosch products are sold. OEM: Ford, discussions with BMW and Mercedes.	Robert Bosch Corporation David Vigor, Technical Service Manager, Uxbridge, UK	11/28/94 The Intelligent Highway, p. 11- 12	

Product/Service	*Description*	*Price*	*Sales Channels*	*Company Name*	*Source of Data*	*Summary*
	Showing distance to hazard, a green light is activated when obstacle is within 1.6 meters, red at 50 cm, and flashing at 30 cm.	Germany, Price N/A.				
Toad Tracking System *Auto Security*	A unit hidden on the inside of the car. Uses Securicor Datatrak network of land-based low frequency beacons to determine location. The system is passively activated when a thief circumvents an immobilizer. The system monitors stolen vehicles reporting to relevant police. The data trak beacons are connected by land lines to a central bureau, the vehicle is then monitored and superimposed on an ordinance map.	L800 Yearly fee of BP117	Retail outlets, limited to the UK.	Toad Innovations, Cambridge, UK 44 1223 214555 Brian Robin, Technical Director	3/6/95 The Intelligent Highway	Toad's UK competitor. Tracker activated (by owner calling the Tracker Centre) vehicle recovery system. Tracker's cost: BP199, w/ yrly fee of BP61 Toad's advantage: faster recovery due to a passively activated system.