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Xu et al.

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- (54) **REMOTE ROAD TRAFFIC DATA COLLECTION AND INTELLIGENT VEHICLE HIGHWAY SYSTEM**
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- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

5,610,821 A	*	3/1997	Gazis et al.	364/444.2
5,635,924 A	*	6/1997	Tran et al.	340/905
5,801,943 A	*	9/1998	Nasburg	364/436
5,812,069 A	*	9/1998	Albrecht et al.	340/905
5,822,712 A	*	10/1998	Olsson	701/117
5,835,881 A	*	11/1998	Trovato et al.	701/211
5,862,510 A	*	1/1999	Saga et al.	701/211
5,889,477 A	*	3/1999	Fastenrath	340/905
5,908,464 A	*	6/1999	Kishigami et al.	701/208
6,023,655 A	*	2/2000	Nomura	701/208
6,047,234 A	*	4/2000	Cherveney et al.	701/200
6,072,409 A	*	6/2000	Fushimi et al.	340/988
6,098,015 A	*	8/2000	Nimura et al.	701/209

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- (30) **Foreign Application Priority Data**
Mar. 19, 1999 (CA) 2266208
- (51) **Int. Cl.**⁷ **G06F 163/00**; G06F 165/00; G08G 1/09
- (52) **U.S. Cl.** **701/117**; 701/207; 701/208; 340/988
- (58) **Field of Search** 701/117, 209, 701/201, 200, 207, 208, 212, 214, 118, 119; 340/988, 990, 995, 905

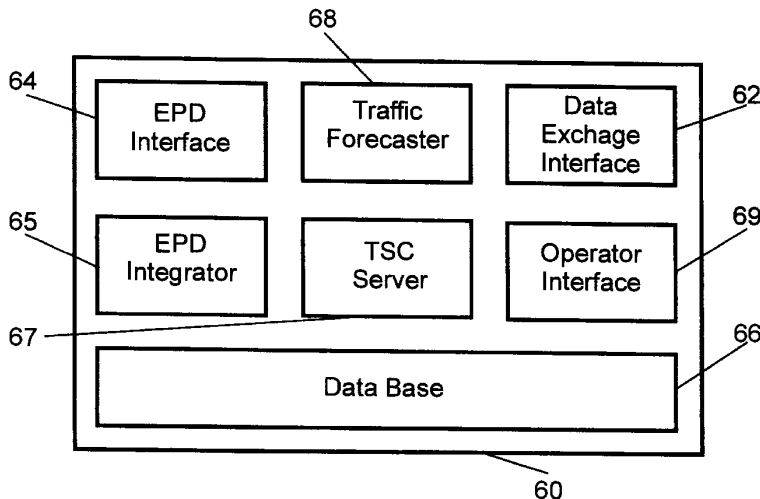
* cited by examiner
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(57) **ABSTRACT**

A remote traffic data acquisition and intelligent vehicle highway system for highway vehicles is provided. In-vehicle devices compute time-related vehicle locations on a digitized road network map using information received from a global position system (GPS) and transmit the time-related vehicle locations to a traffic service center. The traffic service center collects the data from all equipped vehicles that travel the roadway system in an area within range, processes the data and provide a real-time traffic forecasts. The in-vehicle devices receive the digitized road network map as well as the real-time traffic forecasts and provide route guidance and related services for the drivers using the traffic forecast information. The traffic forecast is based on projections from normal traffic conditions retrieved from archived data adjusted by factors related to real-time situations. The system provides a practical and economic solution for an intelligent highway vehicle system.

- (56) **References Cited**
U.S. PATENT DOCUMENTS
- 4,792,803 A * 12/1988 Madnick et al. 340/905
- 5,132,684 A * 7/1992 Pecker et al. 340/905
- 5,164,904 A * 11/1992 Sumner 364/436
- 5,347,456 A 9/1994 Zhang et al. 364/424.02
- 5,396,429 A * 3/1995 Hanchett 364/436
- 5,504,482 A 4/1996 Schreder 340/995
- 5,506,587 A * 4/1996 Lans 342/357
- 5,539,645 A * 7/1996 Mandhyan et al. 364/438
- 5,546,188 A 8/1996 Wangler et al. 356/376

33 Claims, 6 Drawing Sheets



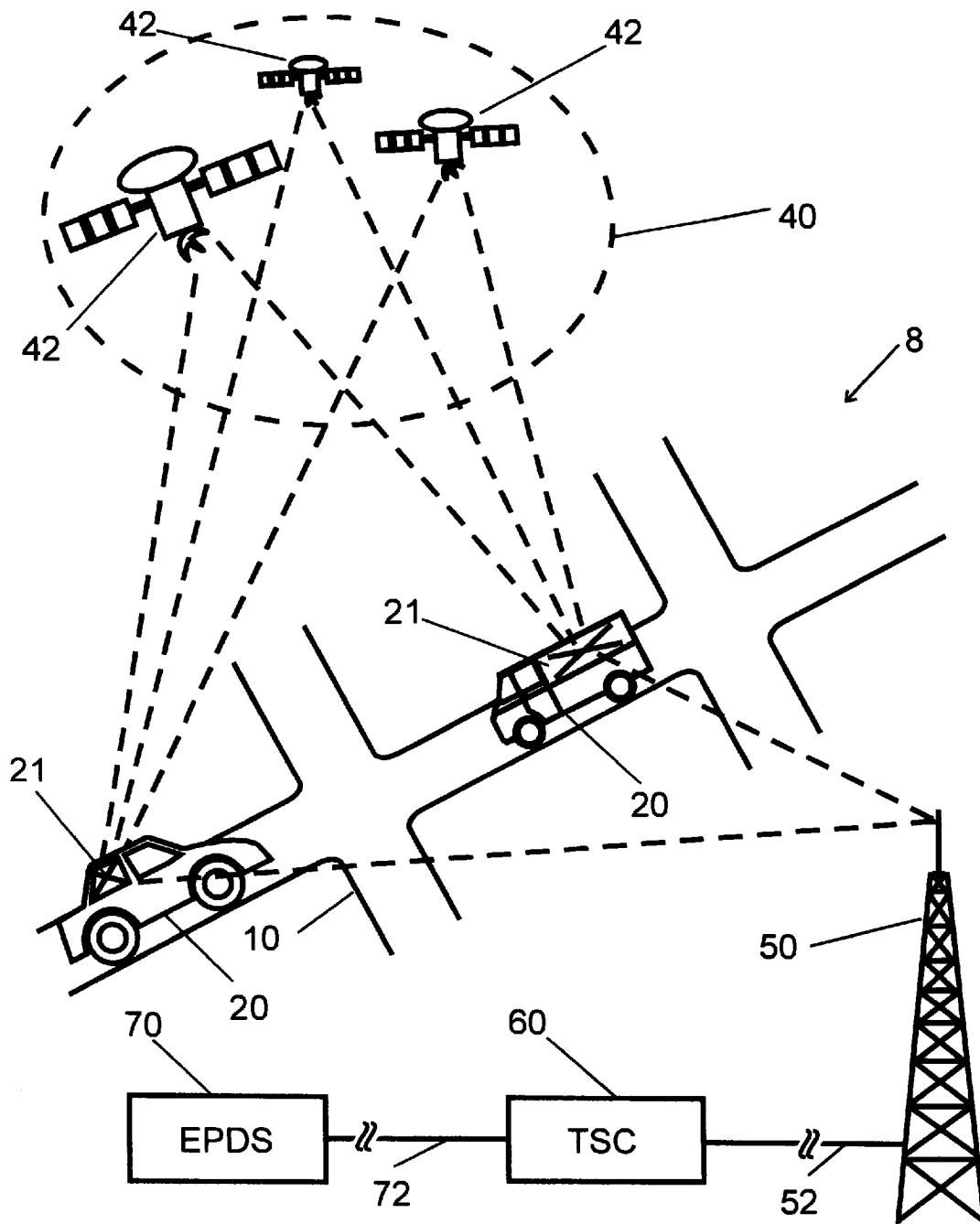


Figure 1

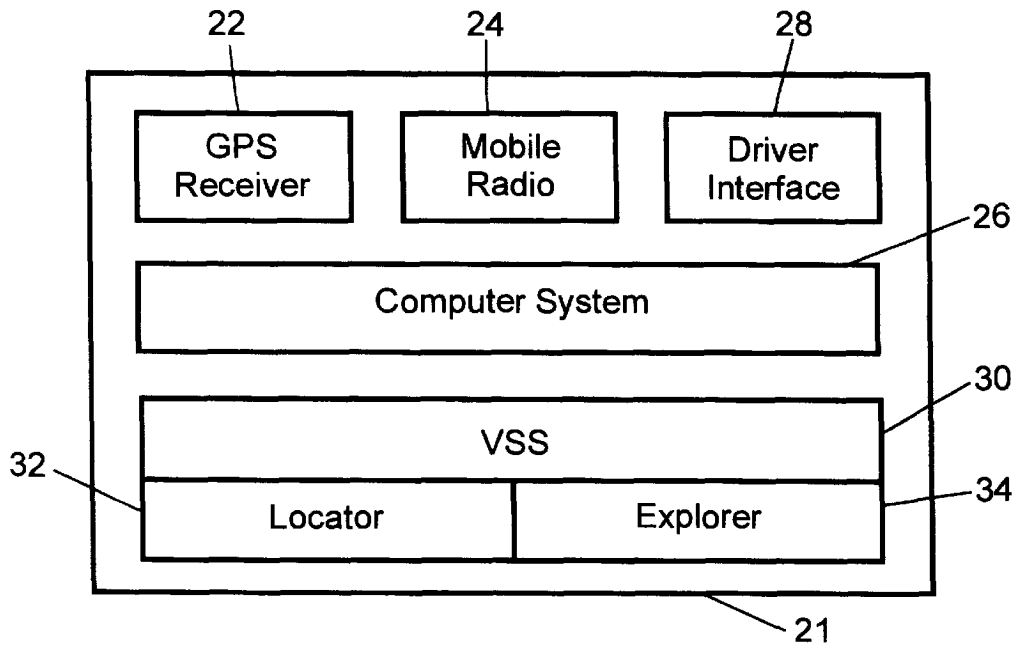


Figure 2

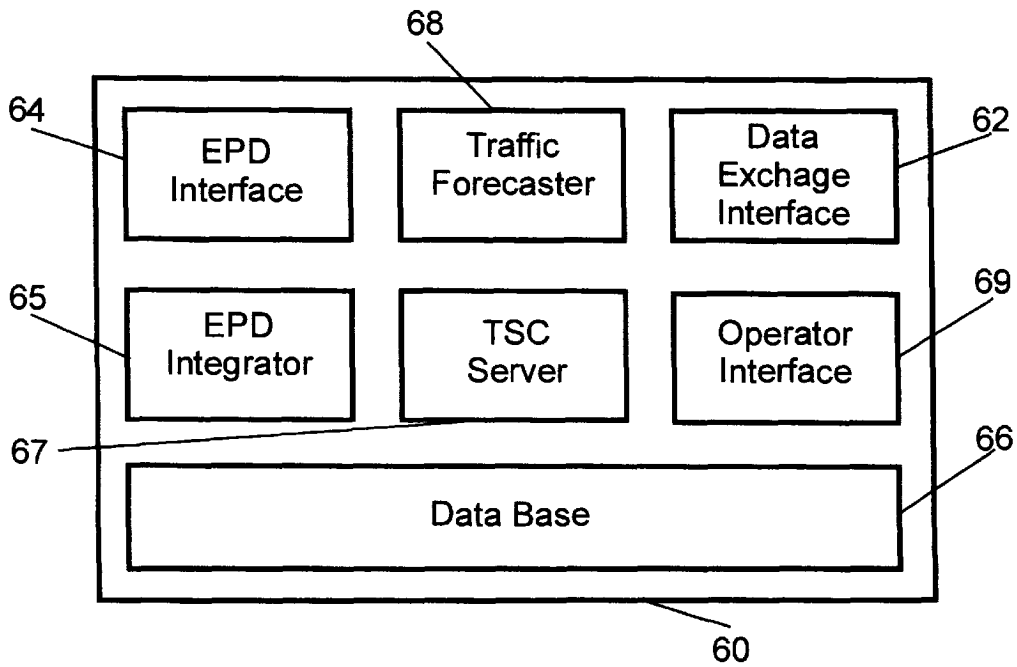


Figure 3

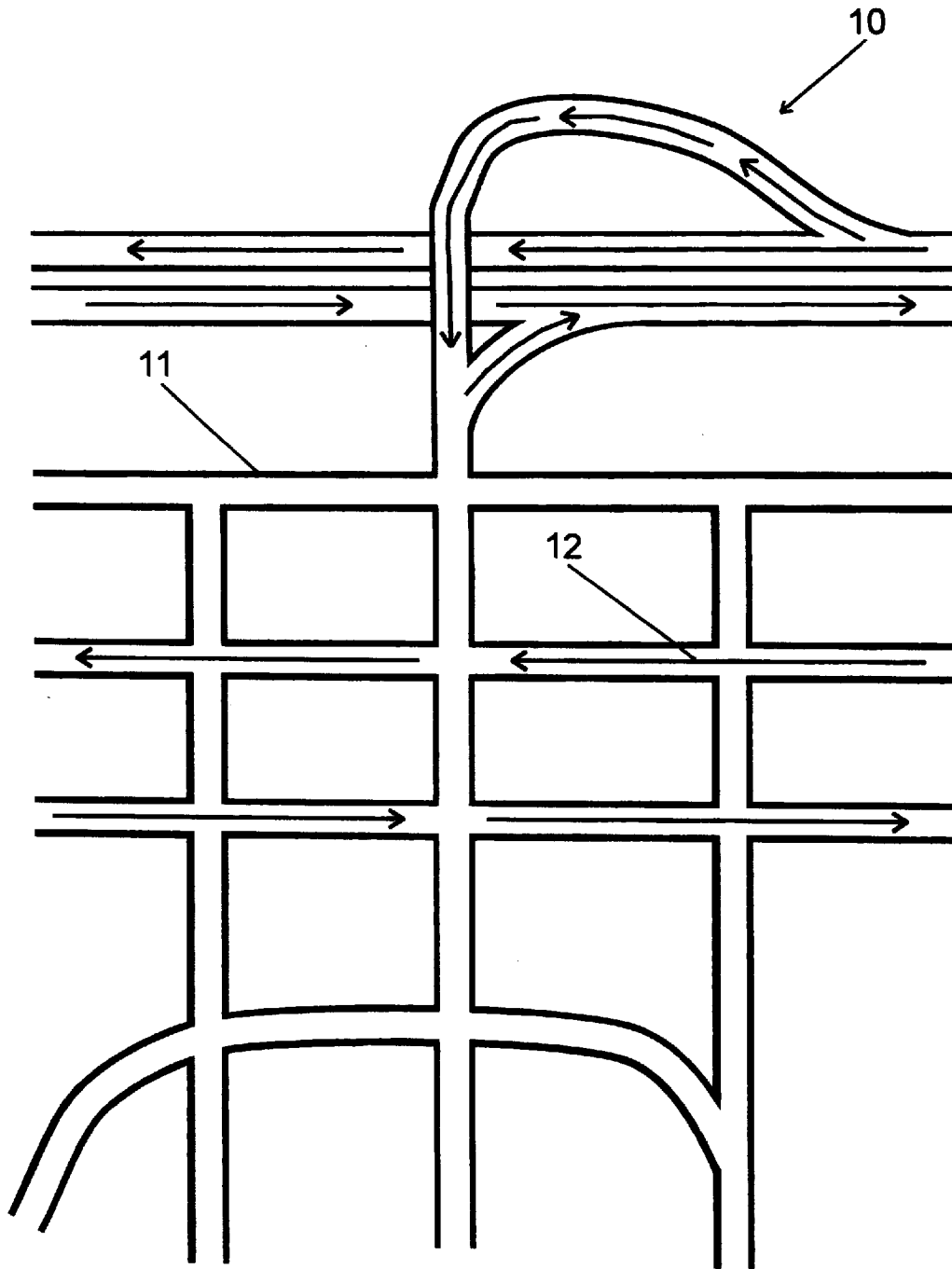


Figure 4

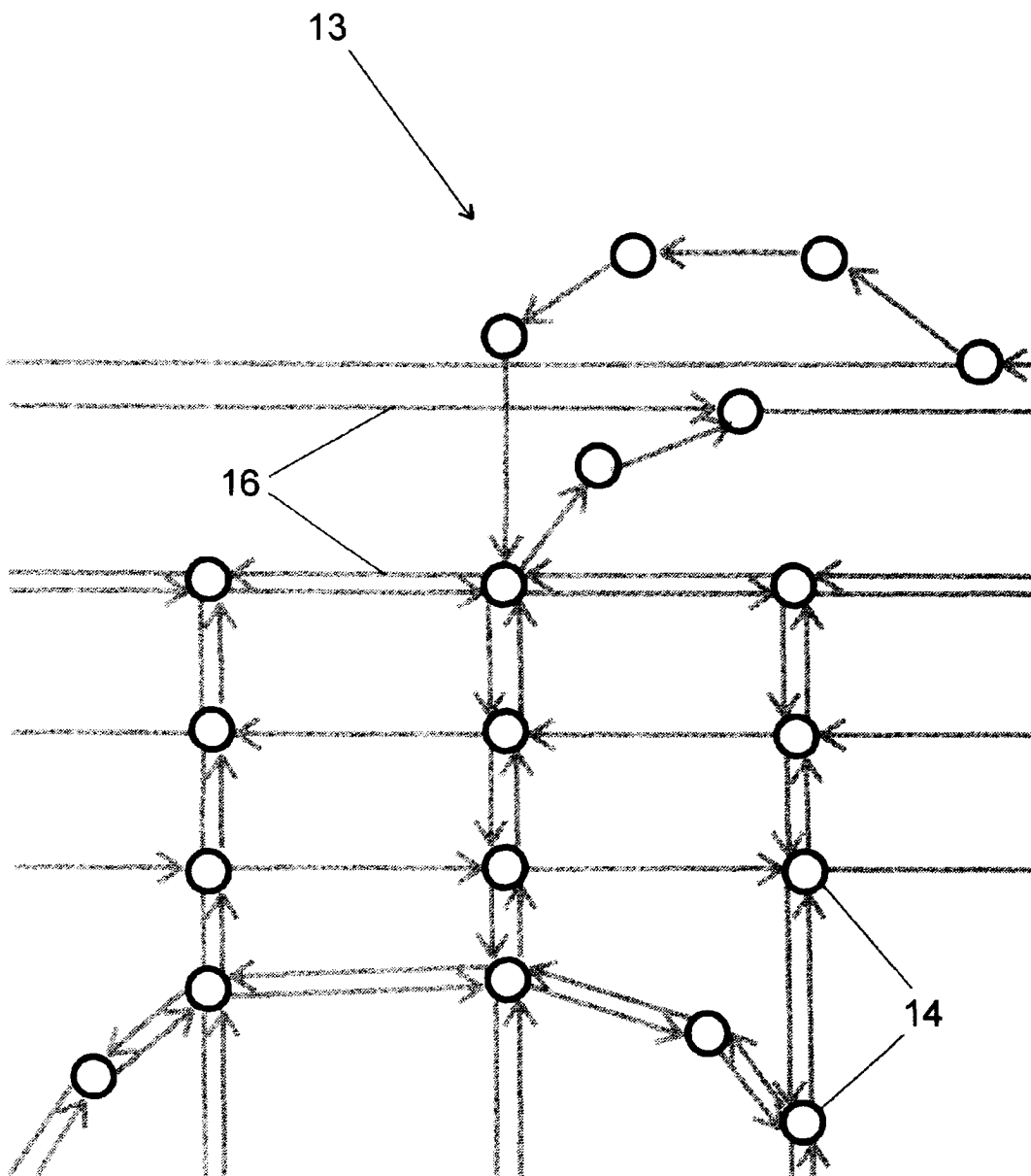


Figure 5

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