FIG. 1

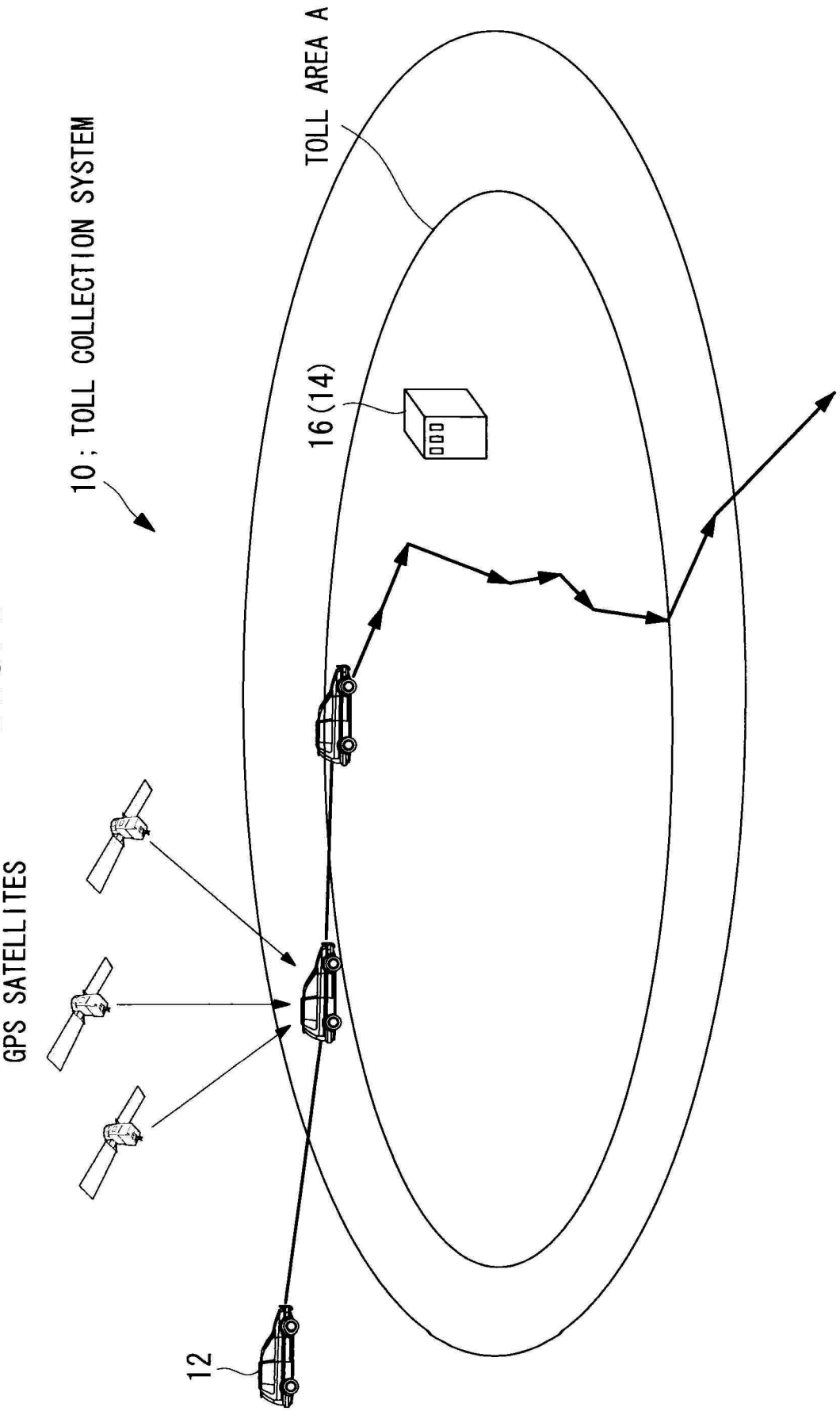

GPS SATELLITES
10 ; TOLL COLLECTION SYSTEM
TOLL AREA A
16(14)
12

FIG. 2

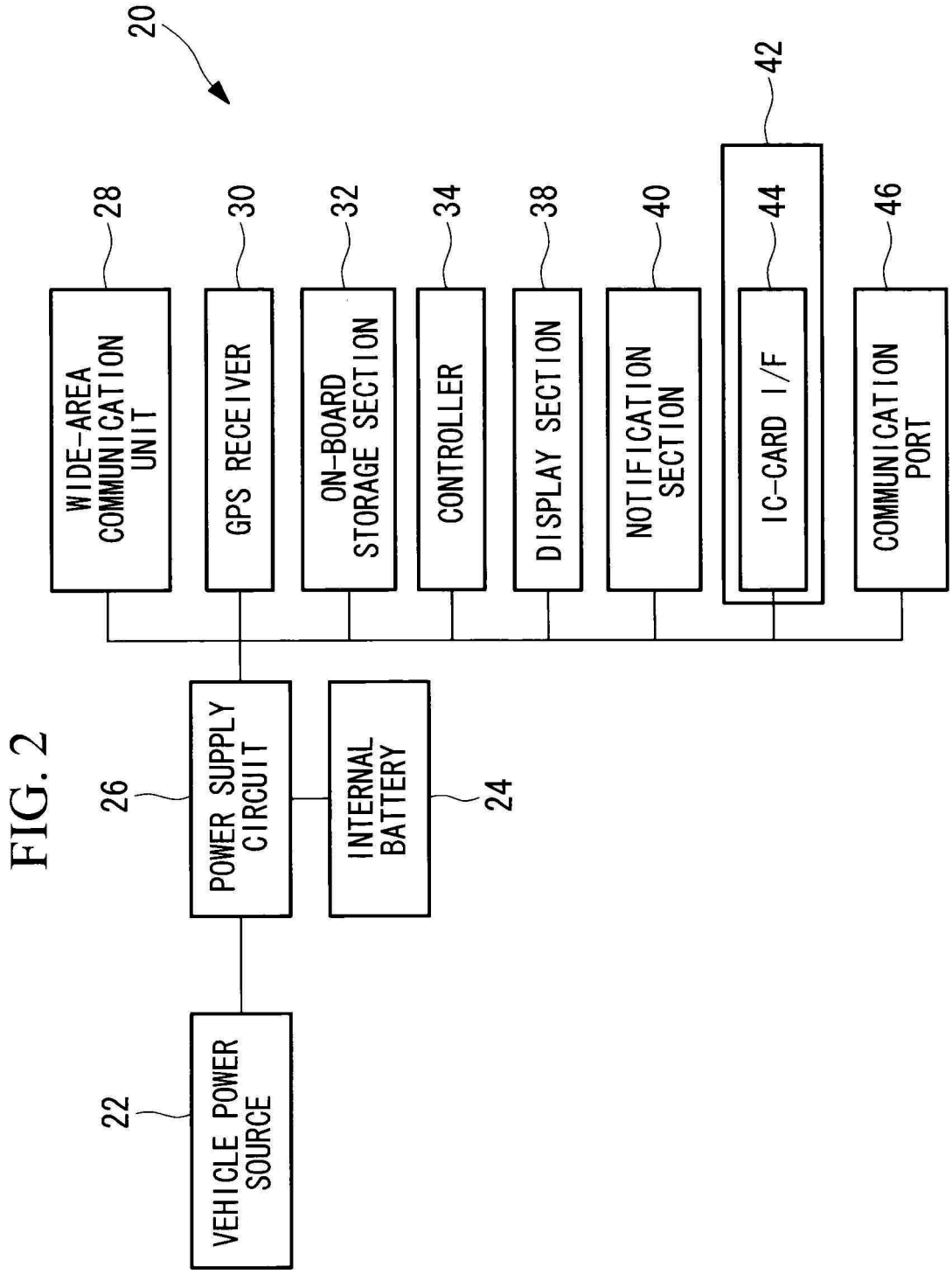

20
28
WIDE-AREA COMMUNICATION UNIT
30
GPS RECEIVER
32
ON-BOARD STORAGE SECTION
34
CONTROLLER
38
DISPLAY SECTION
40
NOTIFICATION SECTION
42
44
IC-CARD I/F
46
COMMUNICATION PORT
26
POWER SUPPLY CIRCUIT
24
INTERNAL BATTERY
22
VEHICLE POWER SOURCE

FIG. 3

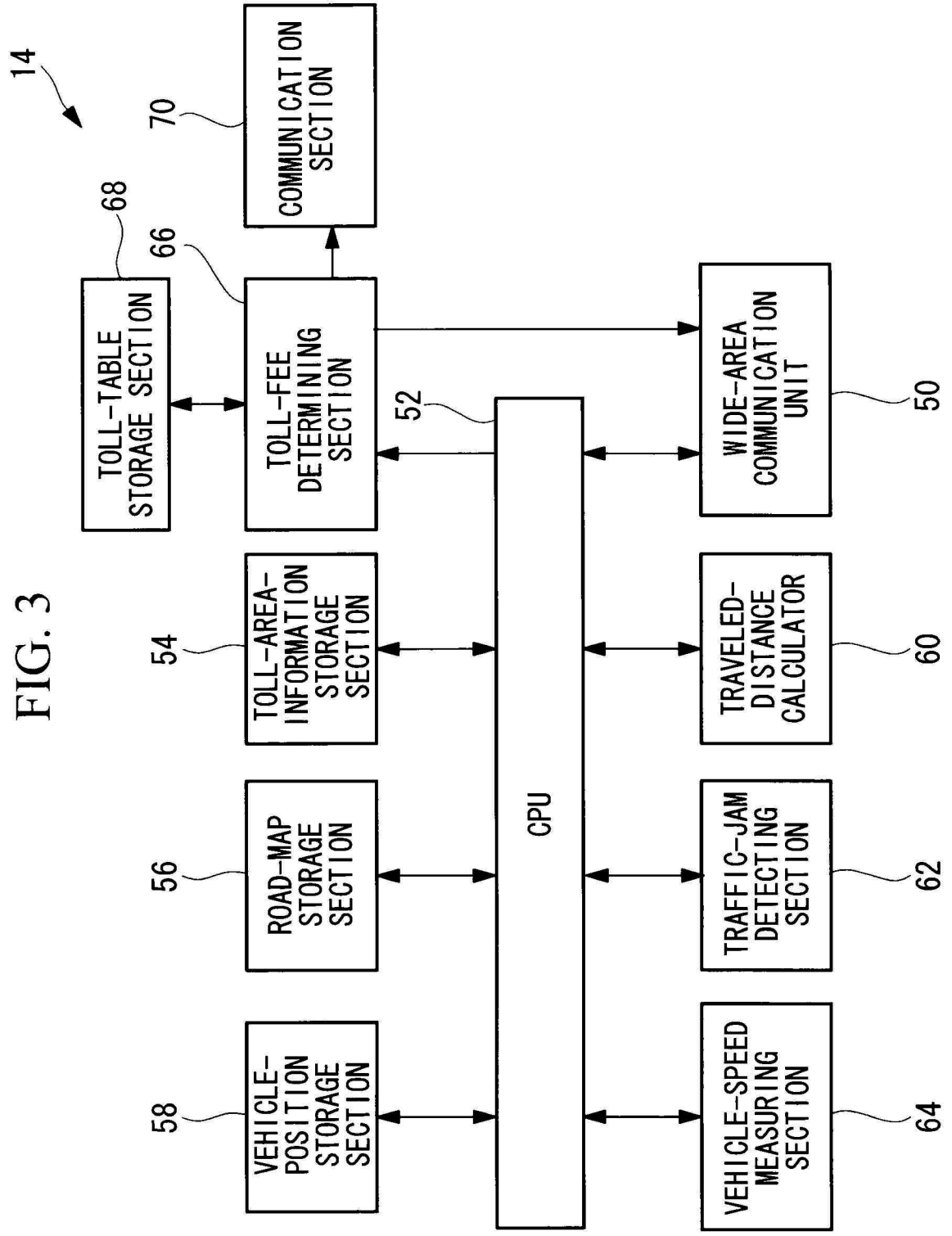

14
70
COMMUNICATION SECTION
68
66
TOLL-TABLE STORAGE SECTION
TOLL-FEE DETERMINING SECTION
52
WIDE-AREA COMMUNICATION UNIT
50
54
TOLL-AREA-INFORMATION STORAGE SECTION
TRAVELED-DISTANCE CALCULATOR
60
56
ROAD-MAP STORAGE SECTION
CPU
TRAFFIC-JAM DETECTING SECTION
62
58
VEHICLE-POSITION STORAGE SECTION
VEHICLE-SPEED MEASURING SECTION
64

FIG. 4

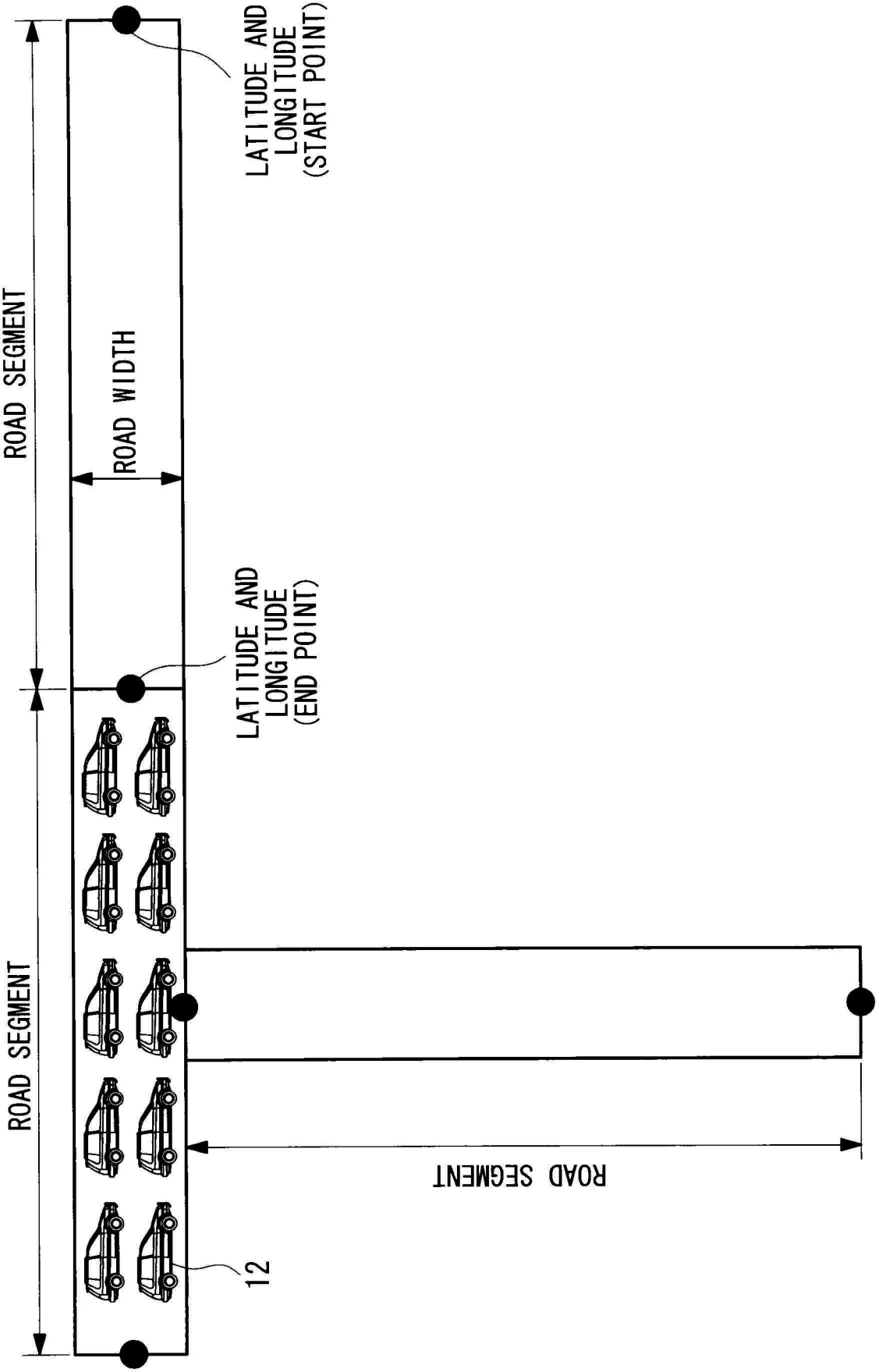

LATITUDE AND LONGITUDE (START POINT)
ROAD WIDTH
ROAD SEGMENT
LATITUDE AND LONGITUDE (END POINT)
ROAD SEGMENT
ROAD SEGMENT
12

FIG. 5

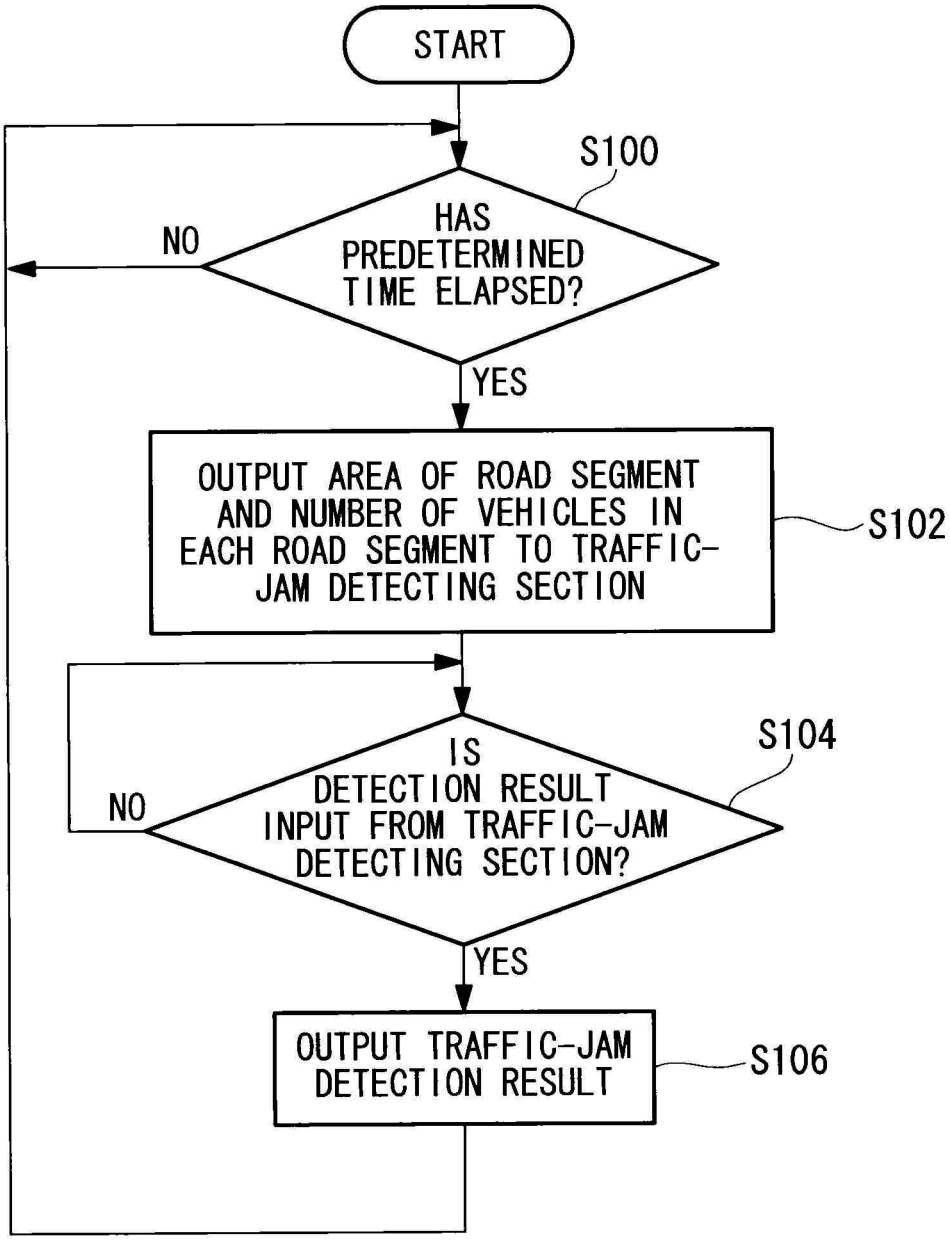
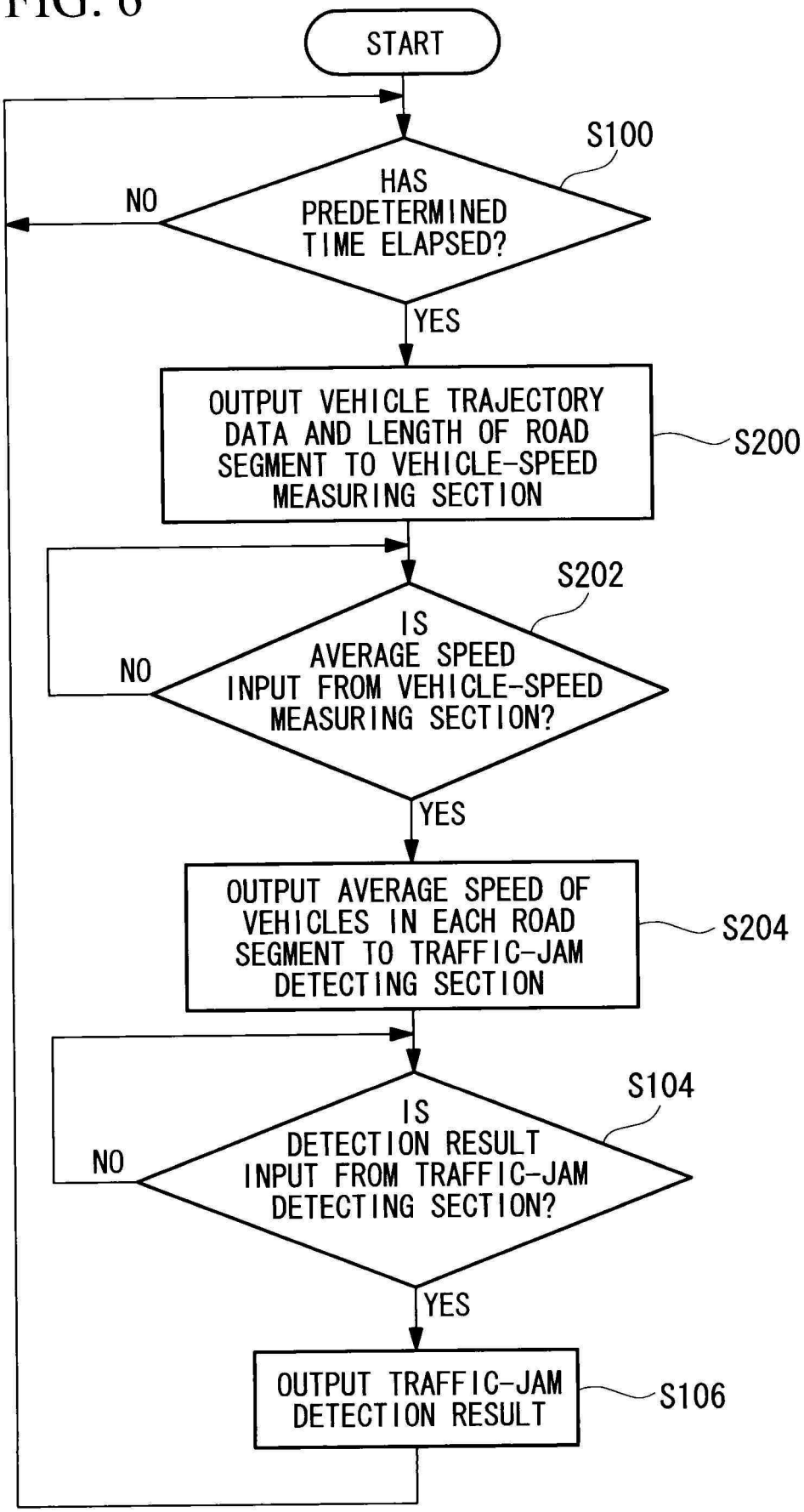

START
S100
HAS PREDETERMINED TIME ELAPSED?
NO
YES
OUTPUT AREA OF ROAD SEGMENT AND NUMBER OF VEHICLES IN EACH ROAD SEGMENT TO TRAFFIC-JAM DETECTING SECTION
S102
IS DETECTION RESULT INPUT FROM TRAFFIC-JAM DETECTING SECTION?
S104
NO
YES
OUTPUT TRAFFIC-JAM DETECTION RESULT
S106

FIG. 6


START
S100
HAS PREDETERMINED TIME ELAPSED?
NO
YES
OUTPUT VEHICLE TRAJECTORY DATA AND LENGTH OF ROAD SEGMENT TO VEHICLE-SPEED MEASURING SECTION
S200
S202
IS AVERAGE SPEED INPUT FROM VEHICLE-SPEED MEASURING SECTION?
NO
YES
OUTPUT AVERAGE SPEED OF VEHICLES IN EACH ROAD SEGMENT TO TRAFFIC-JAM DETECTING SECTION
S204
S104
IS DETECTION RESULT INPUT FROM TRAFFIC-JAM DETECTING SECTION?
NO
YES
OUTPUT TRAFFIC-JAM DETECTION RESULT
S106