FIG. 1

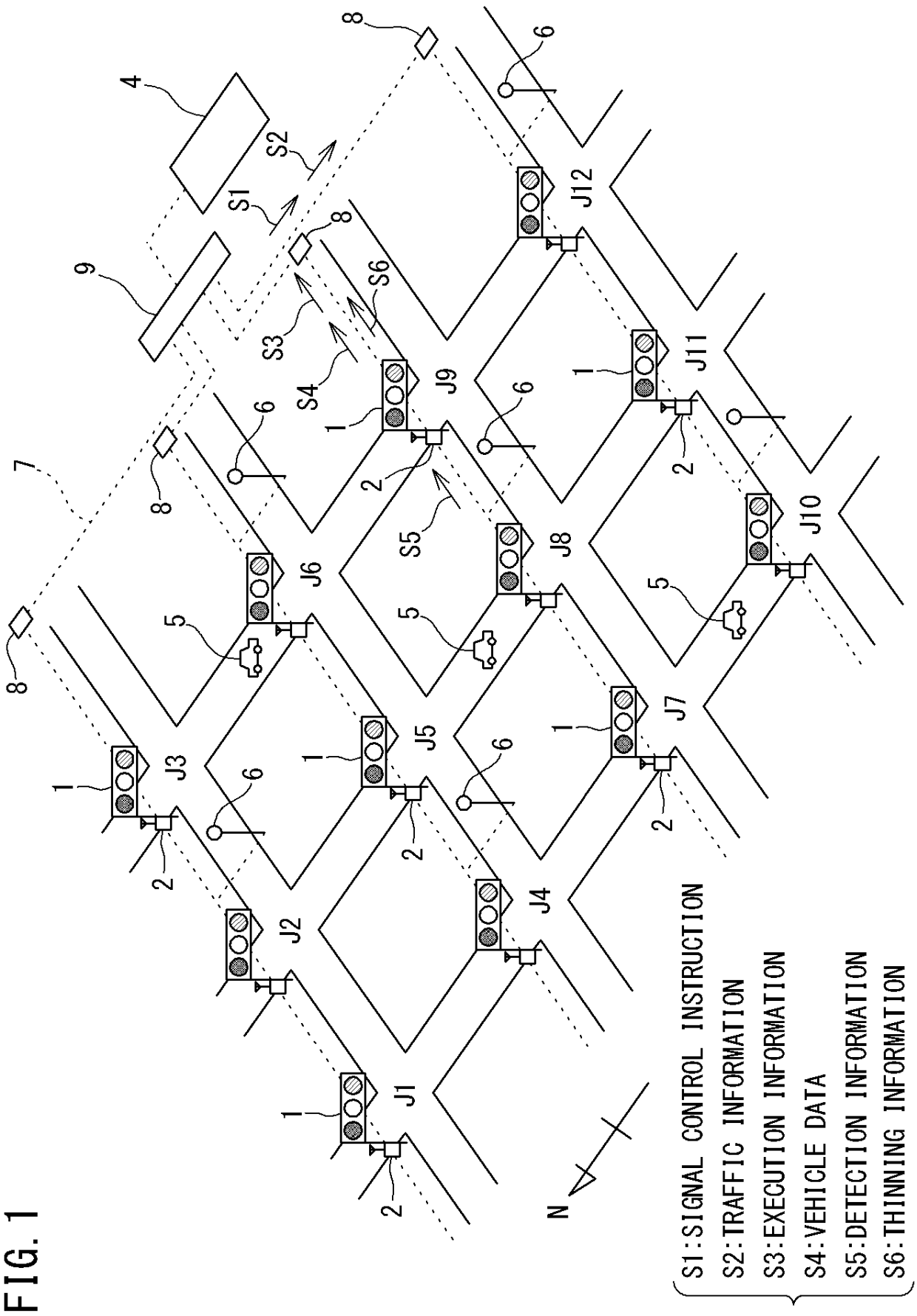

J1
J2
J3
J4
J5
J6
J7
J8
J9
J10
J11
J12
S1
S2
S3
S4
S5
S6
N
S1:SIGNAL CONTROL INSTRUCTION
S2:TRAFFIC INFORMATION
S3:EXECUTION INFORMATION
S4:VEHICLE DATA
S5:DETECTION INFORMATION
S6:THINNING INFORMATION

FIG. 2

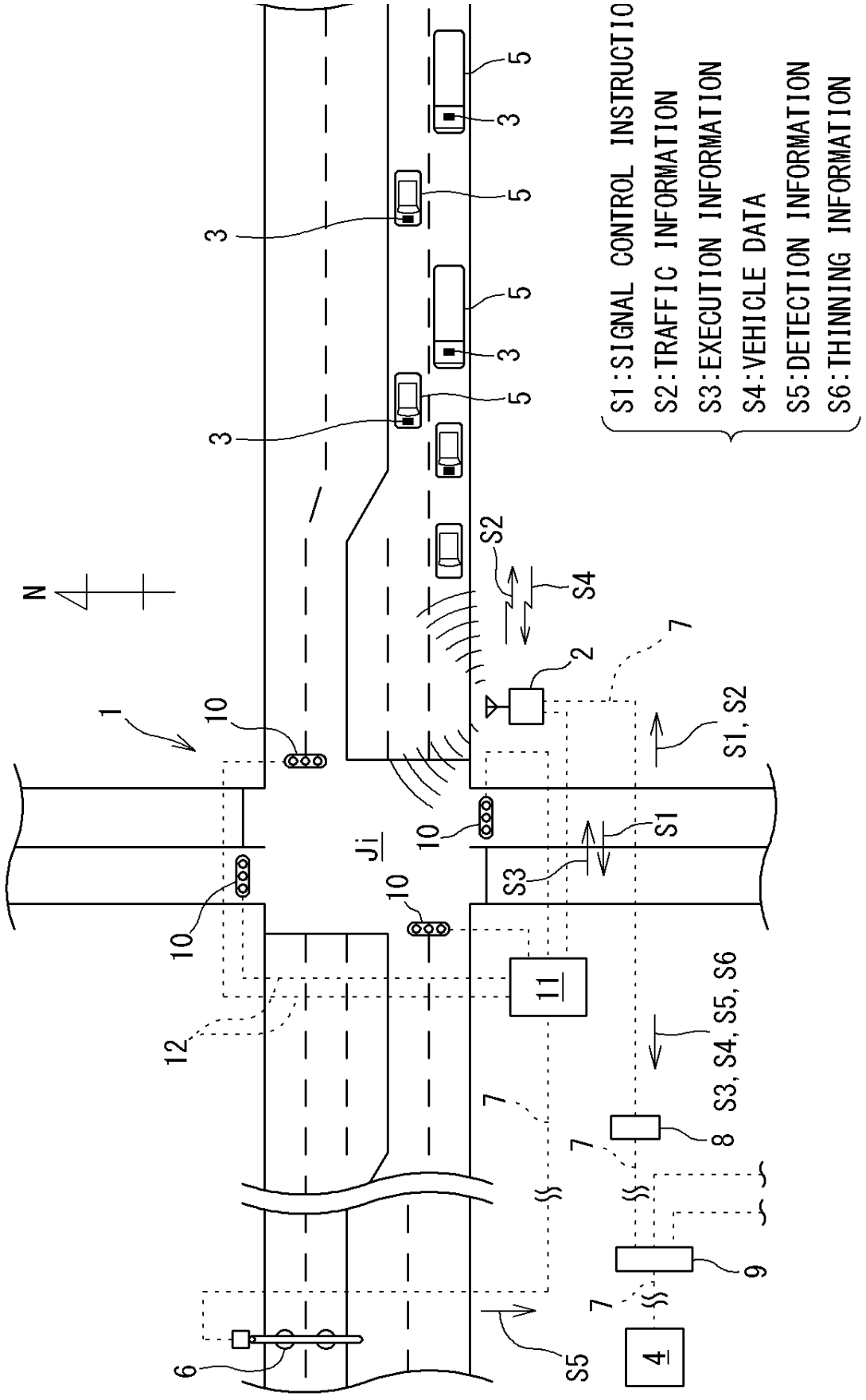

S1:SIGNAL CONTROL INSTRUCTIO
S2:TRAFFIC INFORMATION
S3:EXECUTION INFORMATION
S4:VEHICLE DATA
S5:DETECTION INFORMATION
S6:THINNING INFORMATION
N
1
2
3
4
5
6
7
8
9
10
11
12
Ji
S1
S1, S2
S2
S3
S3, S4, S5, S6
S4
S5

FIG. 3

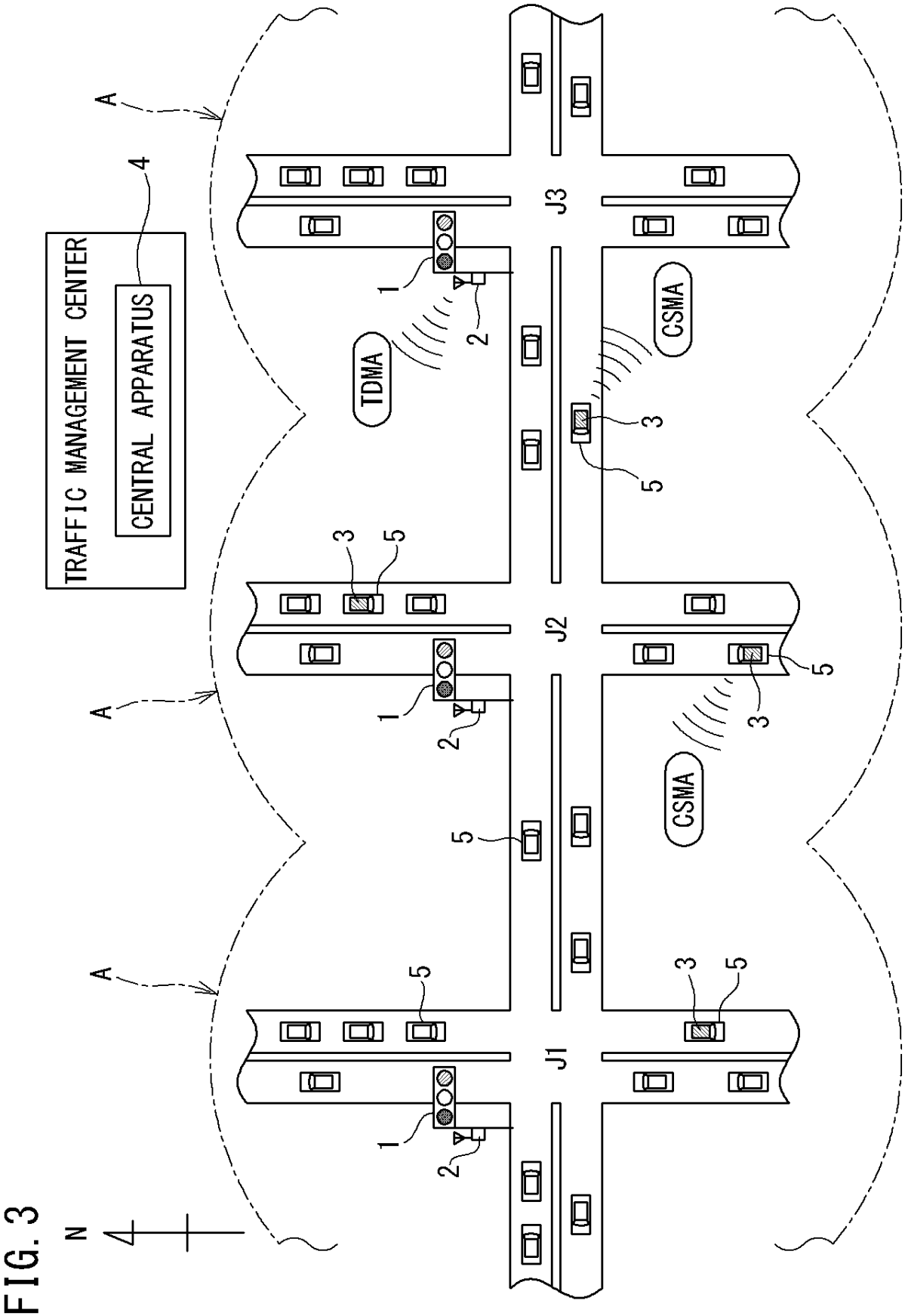

TRAFFIC MANAGEMENT CENTER
CENTRAL APPARATUS
4
A
A
A
J3
J2
J1
TDMA
CSMA
CSMA
1
2
3
5
N

FIG. 4

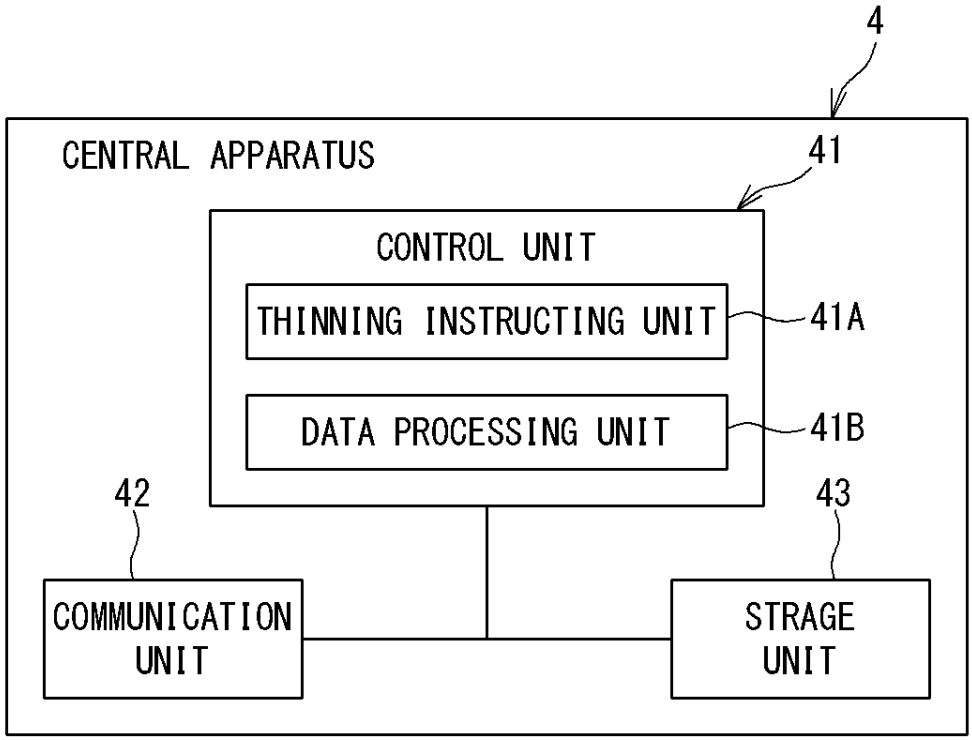

4
CENTRAL APPARATUS
41
CONTROL UNIT
THINNING INSTRUCTING UNIT
41A
DATA PROCESSING UNIT
41B
42
43
COMMUNICATION UNIT
STRAGE UNIT

FIG. 5

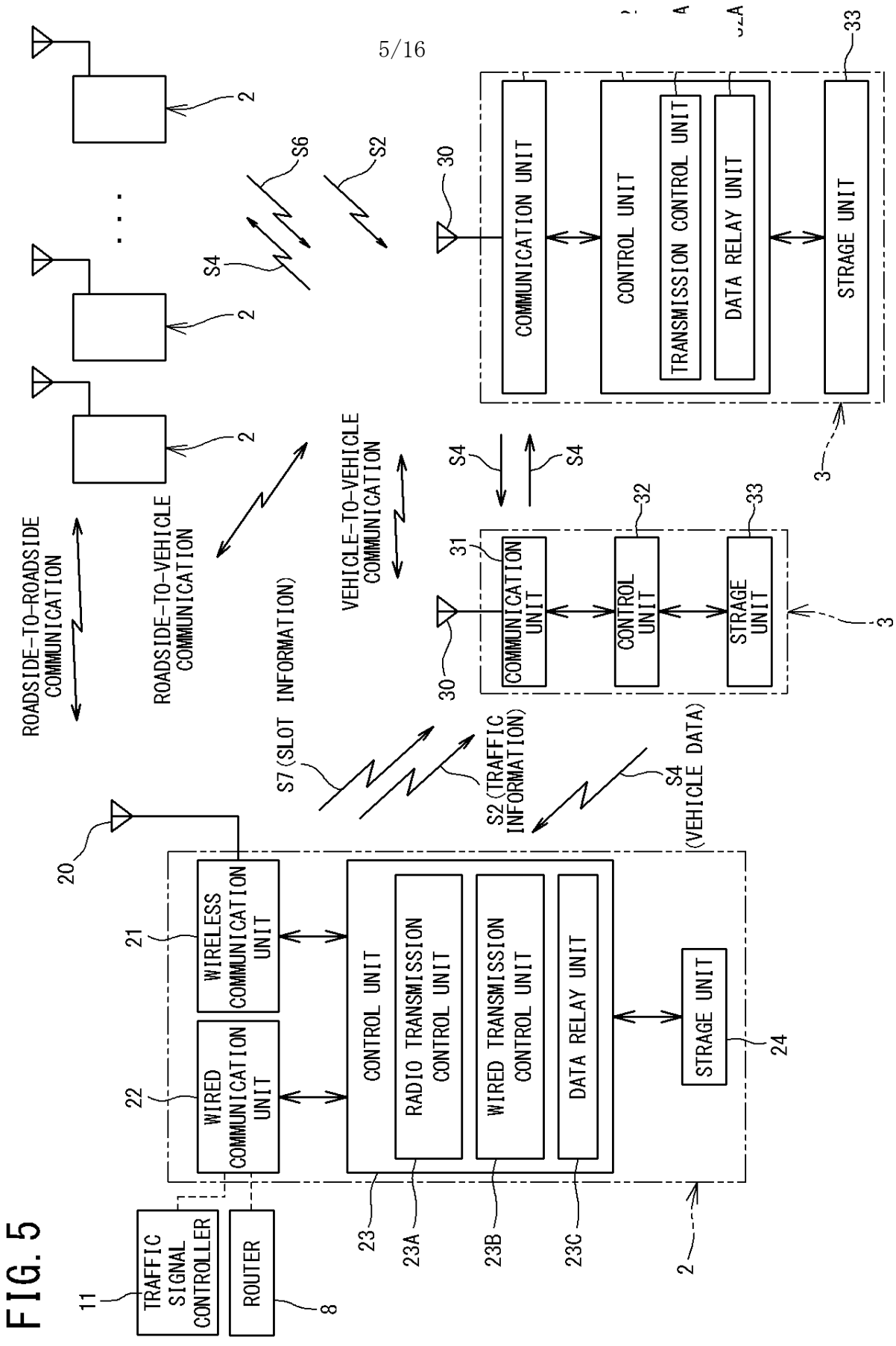

TRAFFIC SIGNAL CONTROLLER
11
ROUTER
8
20
21
WIRELESS COMMUNICATION UNIT
22
WIRED COMMUNICATION UNIT
CONTROL UNIT
23
RADIO TRANSMISSION CONTROL UNIT
23A
WIRED TRANSMISSION CONTROL UNIT
23B
DATA RELAY UNIT
23C
STRAGE UNIT
24
2
ROADSIDE-TO-ROADSIDE COMMUNICATION
ROADSIDE-TO-VEHICLE COMMUNICATION
VEHICLE-TO-VEHICLE COMMUNICATION
S7 (SLOT INFORMATION)
S2 (TRAFFIC INFORMATION)
S4 (VEHICLE DATA)
S4
S6
S2
30
31
COMMUNICATION UNIT
32
CONTROL UNIT
33
STRAGE UNIT
3
TRANSMISSION CONTROL UNIT
DATA RELAY UNIT

FIG. 6

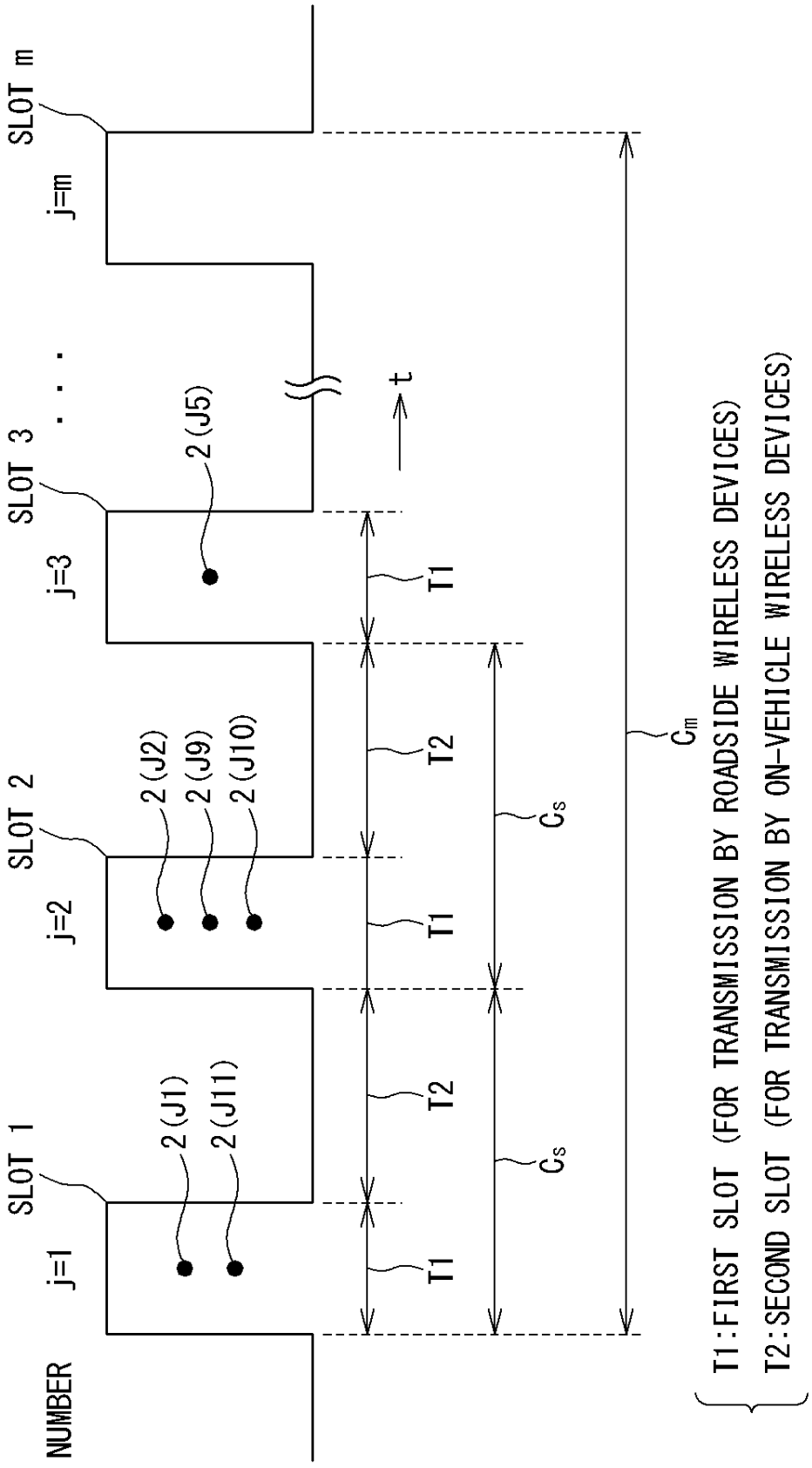

SLOT NUMBER
SLOT 1
j=1
SLOT 2
j=2
SLOT 3
j=3
. . .
SLOT m
j=m
2(J1)
2(J11)
2(J2)
2(J9)
2(J10)
2(J5)
t
T1
T2
T1
T2
T1
C_s
C_s
C_m
T1:FIRST SLOT (FOR TRANSMISSION BY ROADSIDE WIRELESS DEVICES)
T2:SECOND SLOT (FOR TRANSMISSION BY ON-VEHICLE WIRELESS DEVICES)

FIG. 7

[FRAME FORMAT FOR VEHICLE-TO-VEHICLE COMMUNICATION]

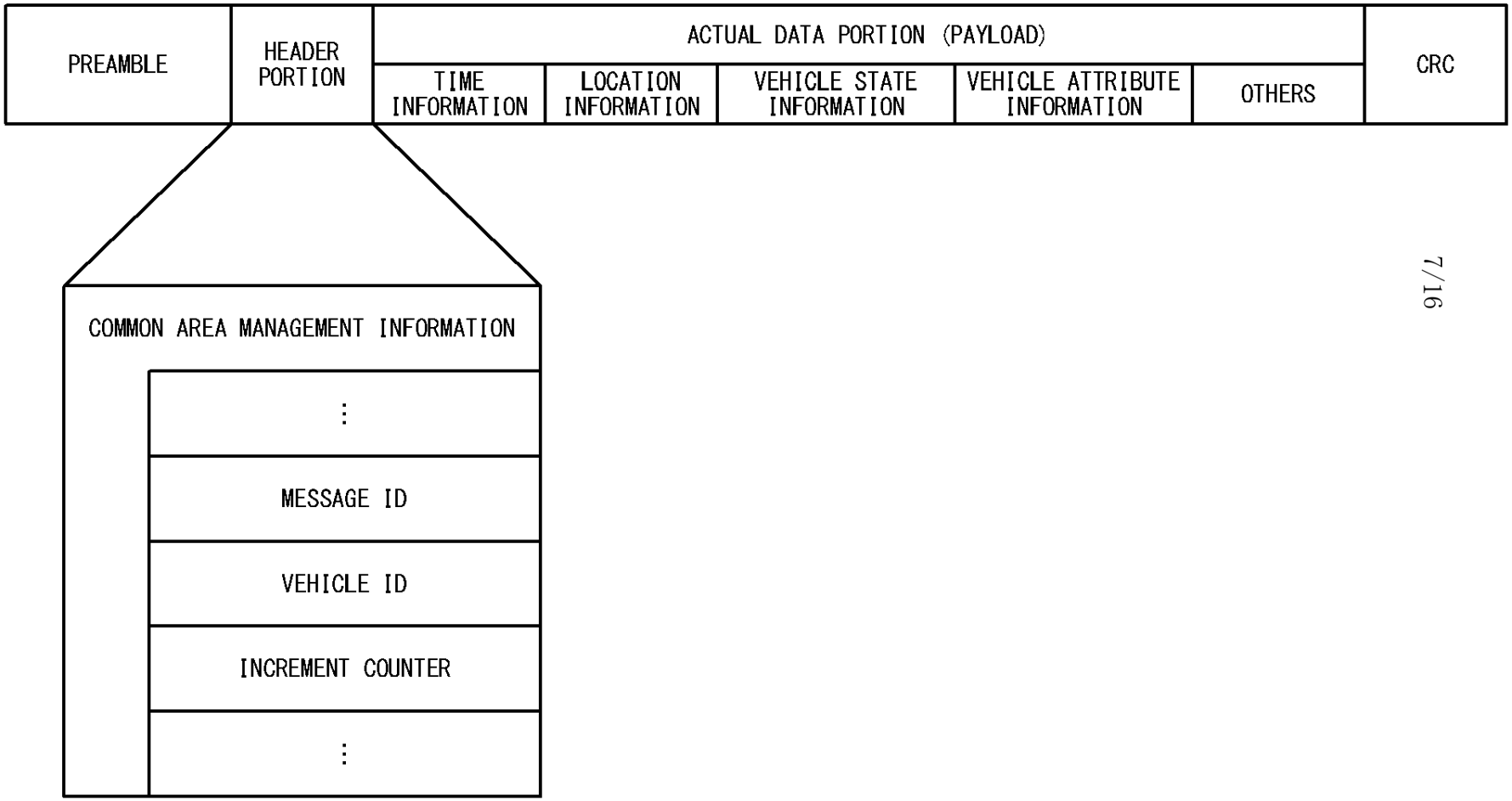


FIG. 8

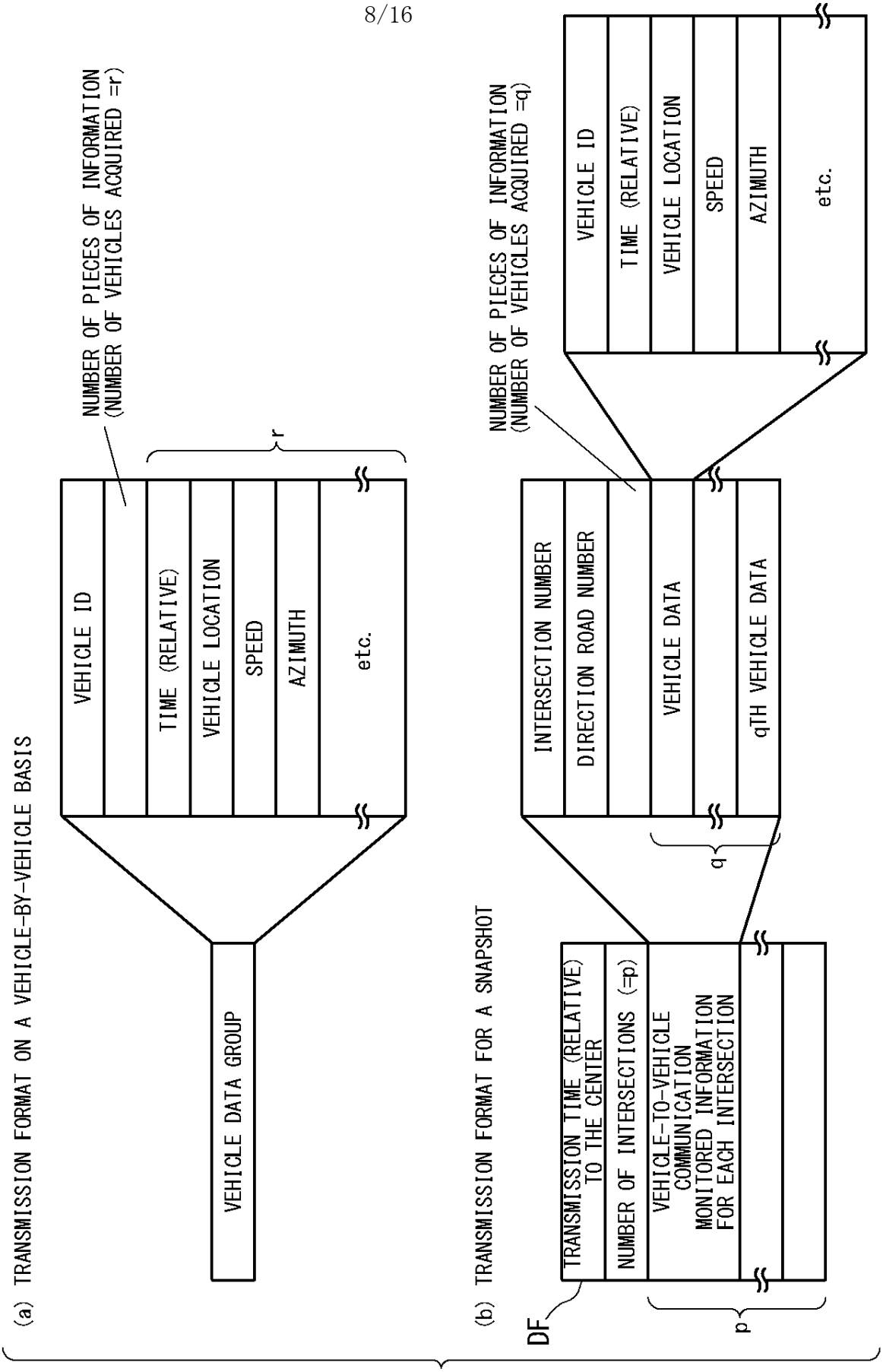

(a) TRANSMISSION FORMAT ON A VEHICLE-BY-VEHICLE BASIS
VEHICLE DATA GROUP
NUMBER OF PIECES OF INFORMATION
(NUMBER OF VEHICLES ACQUIRED =r)
VEHICLE ID
TIME (RELATIVE)
VEHICLE LOCATION
SPEED
AZIMUTH
etc.
r
(b) TRANSMISSION FORMAT FOR A SNAPSHOT
DF
TRANSMISSION TIME (RELATIVE) TO THE CENTER
NUMBER OF INTERSECTIONS (=p)
VEHICLE-TO-VEHICLE COMMUNICATION MONITORED INFORMATION FOR EACH INTERSECTION
p
INTERSECTION NUMBER
DIRECTION ROAD NUMBER
NUMBER OF PIECES OF INFORMATION
(NUMBER OF VEHICLES ACQUIRED =q)
VEHICLE DATA
qTH VEHICLE DATA
q
VEHICLE ID
TIME (RELATIVE)
VEHICLE LOCATION
SPEED
AZIMUTH
etc.

FIG. 9

THINNING LEVEL	THINNING PROCESS TYPES					
	DATA ITEM	SAMPLING INTERVAL	POSITIONING ACCURACY	VEHICLE LOCATION	VEHICLE STATE	AGGREGATION
0	NO THINNING	NO THINNING	NO THINNING	NO THINNING	NO THINNING	NO THINNING
1	FREE AREA	0.5s	CLASS 100 m OR MORE	PREDETERMINED LOCATION OR SMALL AND NARROW AREA	STOP - START TO MOVE	VEHICLE DATA OF VEHICLE PASSING THROUGH SPECIFIC SLAVE STATION INTERSECTIONS
2	UNNECESSARY DATA ITEMS (INCLUDING DATA ITEM INDICATING ABNORMAL VALUE)	1.0s	CLASS 30 m OR MORE	AREAS OTHER THAN ROADS (PARKING LOTS, ETC.)	START TO MOVE - STOP	VEHICLE DATA OF VEHICLE PASSING THOUGH MASTER STATION INTERSECTION WITHOUT PASSING THROUGH SPECIFIC SLAVE STATION INTERSECTIONS
3	DATA ITEMS NOT NECESSARY FOR TRAFFIC FLOW DIAGNOSIS	2.0s	CLASS 10 m OR MORE	ROADS OTHER THAN CONNECTING ROADS AT INTERSECTION (SIDE ROADS)	ENTER AREA - ENTER INTERSECTION LEAVE INTERSECTION - LEAVE AREA	-
4	DATA ITEMS OTHER THAN VEHICLE ID, LOCATION, AND TIME	4.0s	CLASS 5 m OR MORE	SPECIFIC DIRECTION ROAD OF CONNECTING ROAD AT INTERSECTION	ENTER INTERSECTION - STOP START TO MOVE - LEAVE INTERSECTION	-
5	DATA ITEMS OTHER THAN VEHICLE ID	6.0s	CLASS 1 m OR MORE	DIRECTION ROADS OTHER THAN SPECIFIC DIRECTION ROAD OF CONNECTING ROAD AT INTERSECTION	-	-
6	THIN ALL	THIN ALL	THIN ALL	THIN ALL	THIN ALL	THIN ALL

FIG. 10

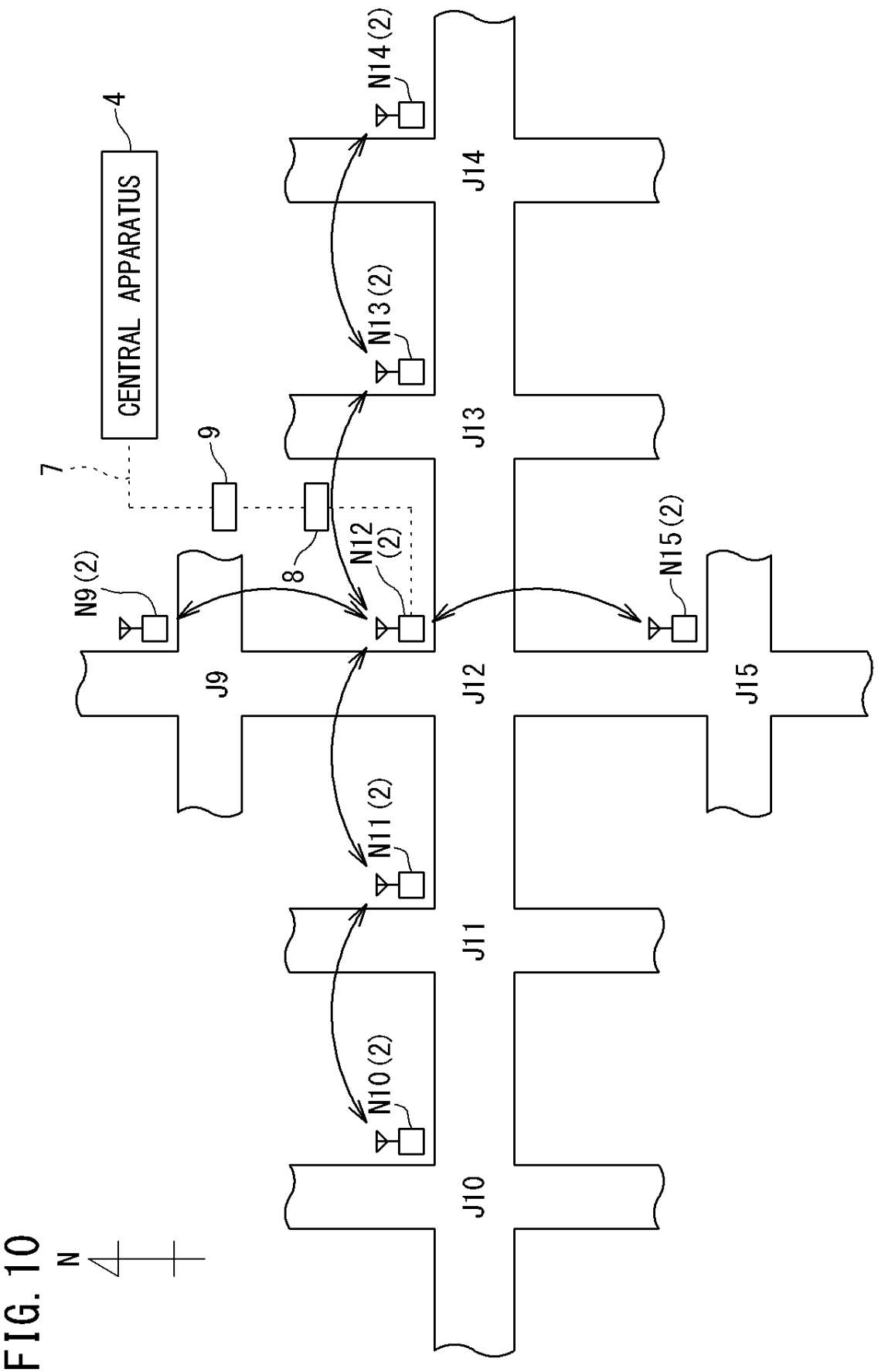

N
CENTRAL APPARATUS
4
7
9
8
N9(2)
N10(2)
N11(2)
N12(2)
N13(2)
N14(2)
N15(2)
J9
J10
J11
J12
J13
J14
J15

FIG. 11

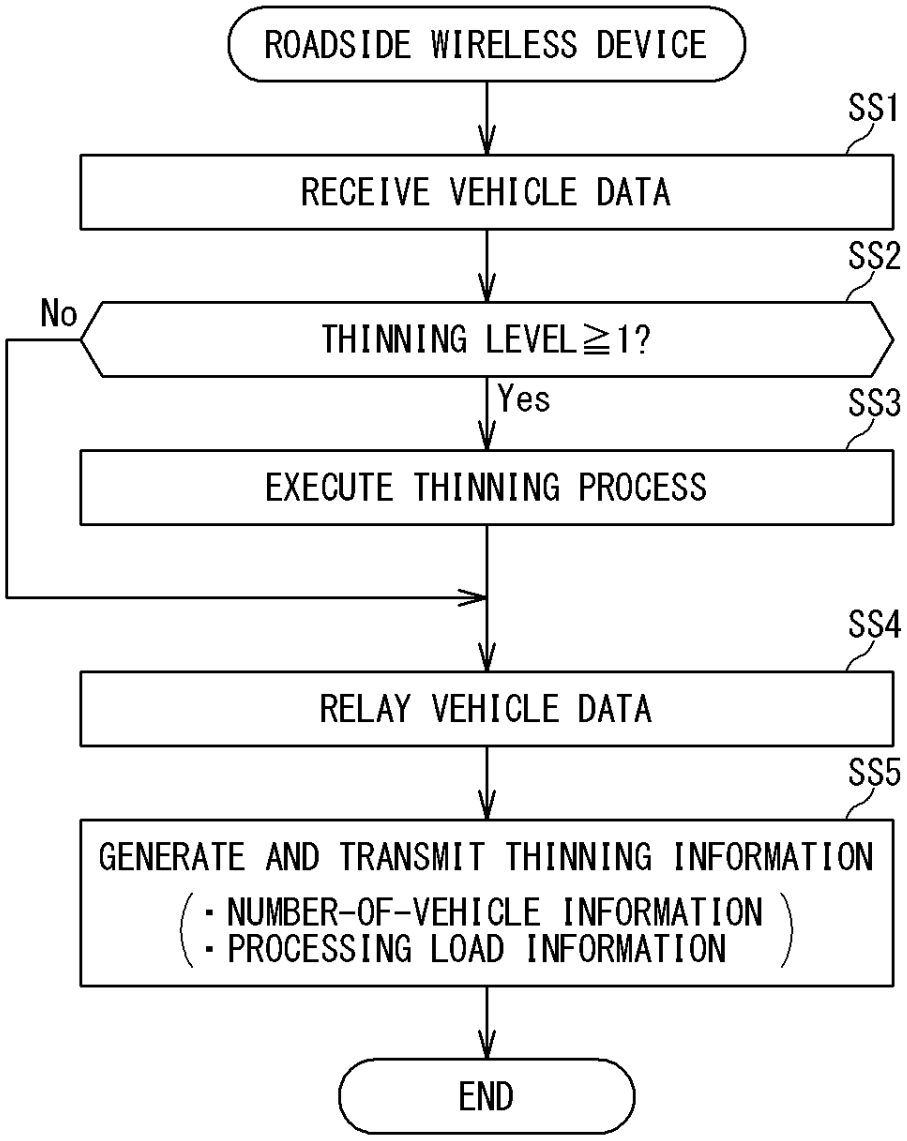

ROADSIDE WIRELESS DEVICE
SS1
RECEIVE VEHICLE DATA
SS2
No
THINNING LEVEL≧1?
Yes
SS3
EXECUTE THINNING PROCESS
SS4
RELAY VEHICLE DATA
SS5
GENERATE AND TRANSMIT THINNING INFORMATION
・NUMBER-OF-VEHICLE INFORMATION
・PROCESSING LOAD INFORMATION
END

FIG. 12

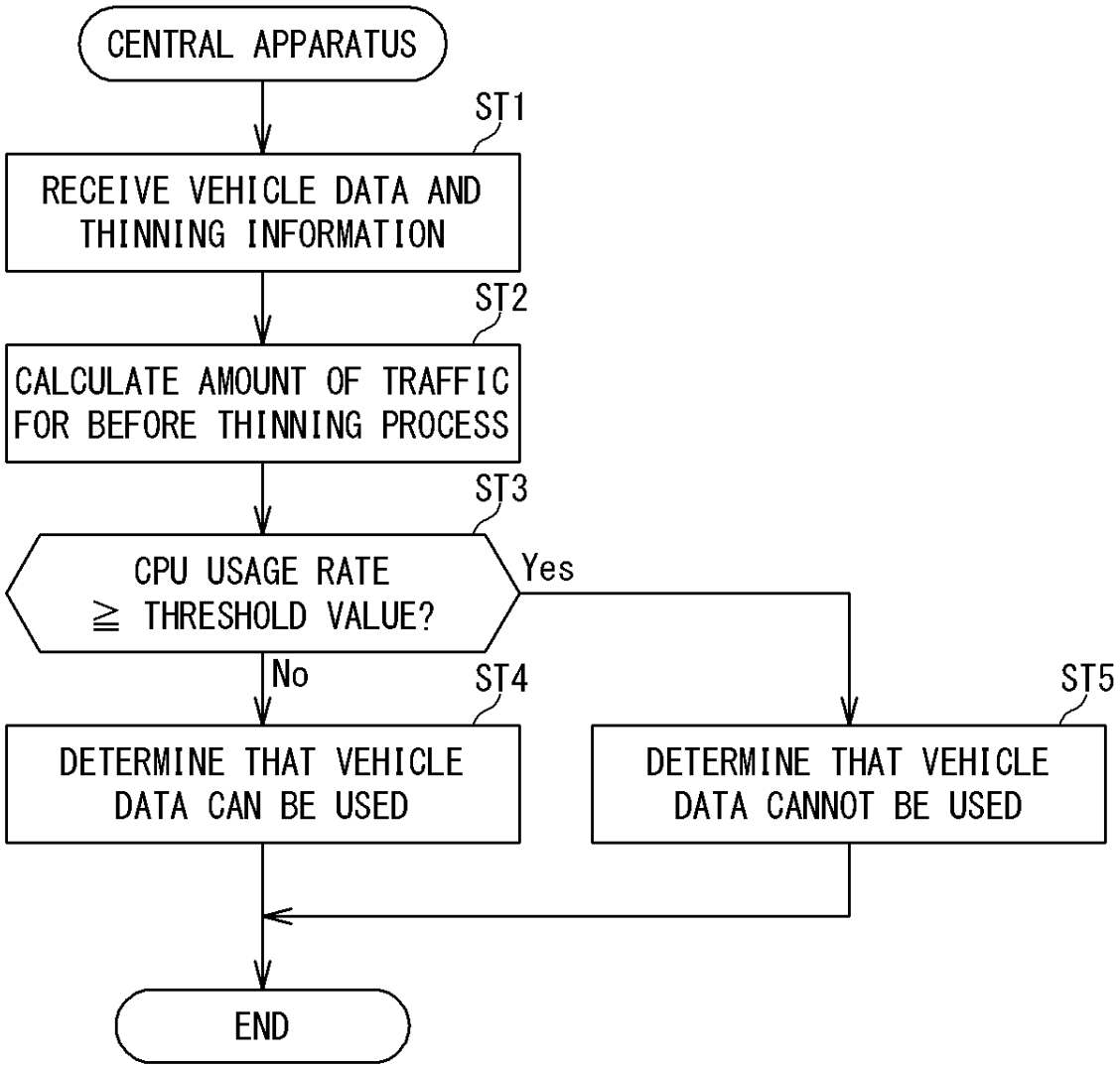

CENTRAL APPARATUS
ST1
RECEIVE VEHICLE DATA AND THINNING INFORMATION
ST2
CALCULATE AMOUNT OF TRAFFIC FOR BEFORE THINNING PROCESS
ST3
CPU USAGE RATE ≧ THRESHOLD VALUE?
Yes
No
ST4
DETERMINE THAT VEHICLE DATA CAN BE USED
ST5
DETERMINE THAT VEHICLE DATA CANNOT BE USED
END

FIG. 13

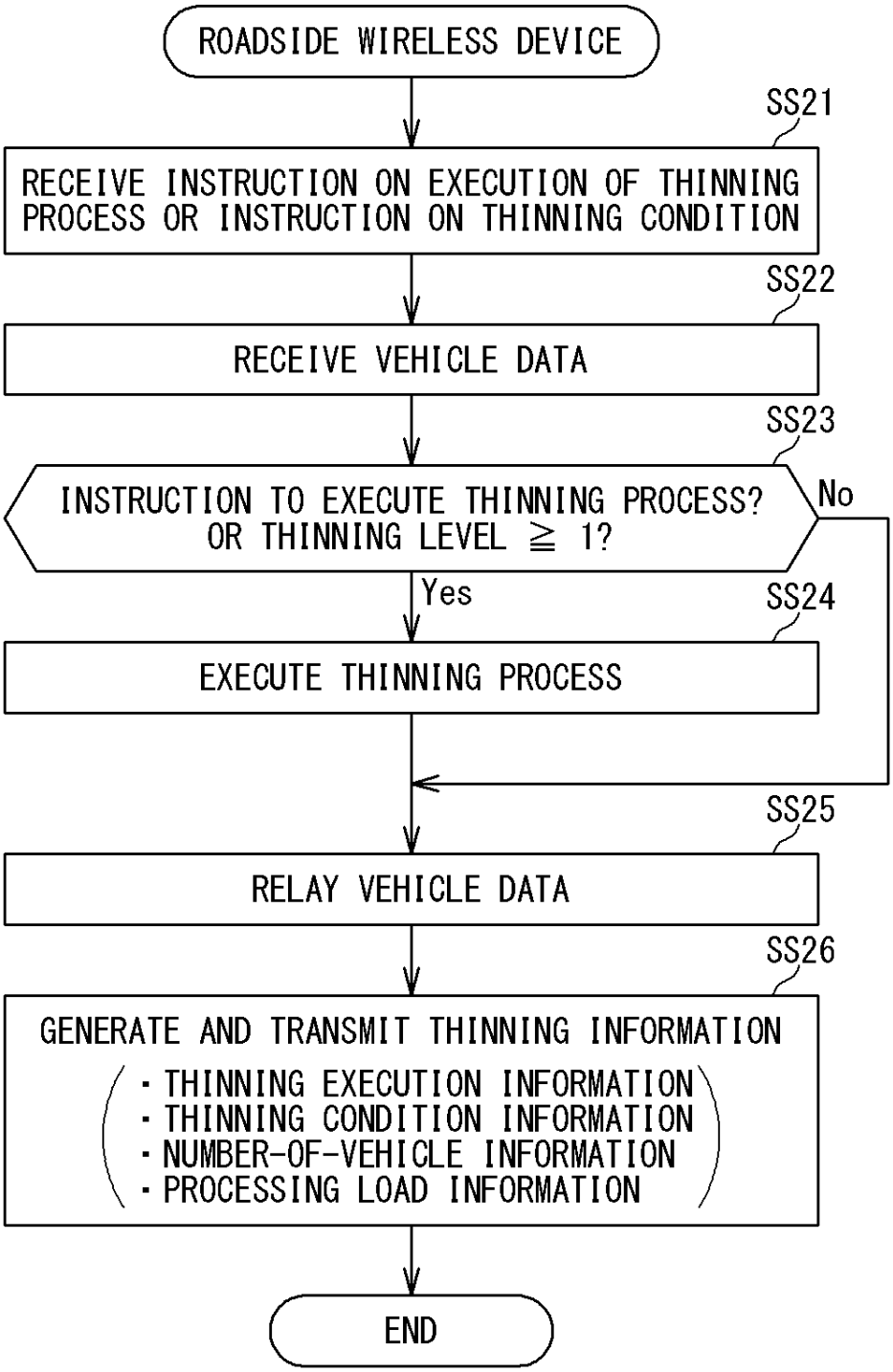

ROADSIDE WIRELESS DEVICE
SS21
RECEIVE INSTRUCTION ON EXECUTION OF THINNING PROCESS OR INSTRUCTION ON THINNING CONDITION
SS22
RECEIVE VEHICLE DATA
SS23
INSTRUCTION TO EXECUTE THINNING PROCESS? OR THINNING LEVEL ≧ 1?
No
Yes
SS24
EXECUTE THINNING PROCESS
SS25
RELAY VEHICLE DATA
SS26
GENERATE AND TRANSMIT THINNING INFORMATION
・THINNING EXECUTION INFORMATION
・THINNING CONDITION INFORMATION
・NUMBER-OF-VEHICLE INFORMATION
・PROCESSING LOAD INFORMATION
END

FIG. 14

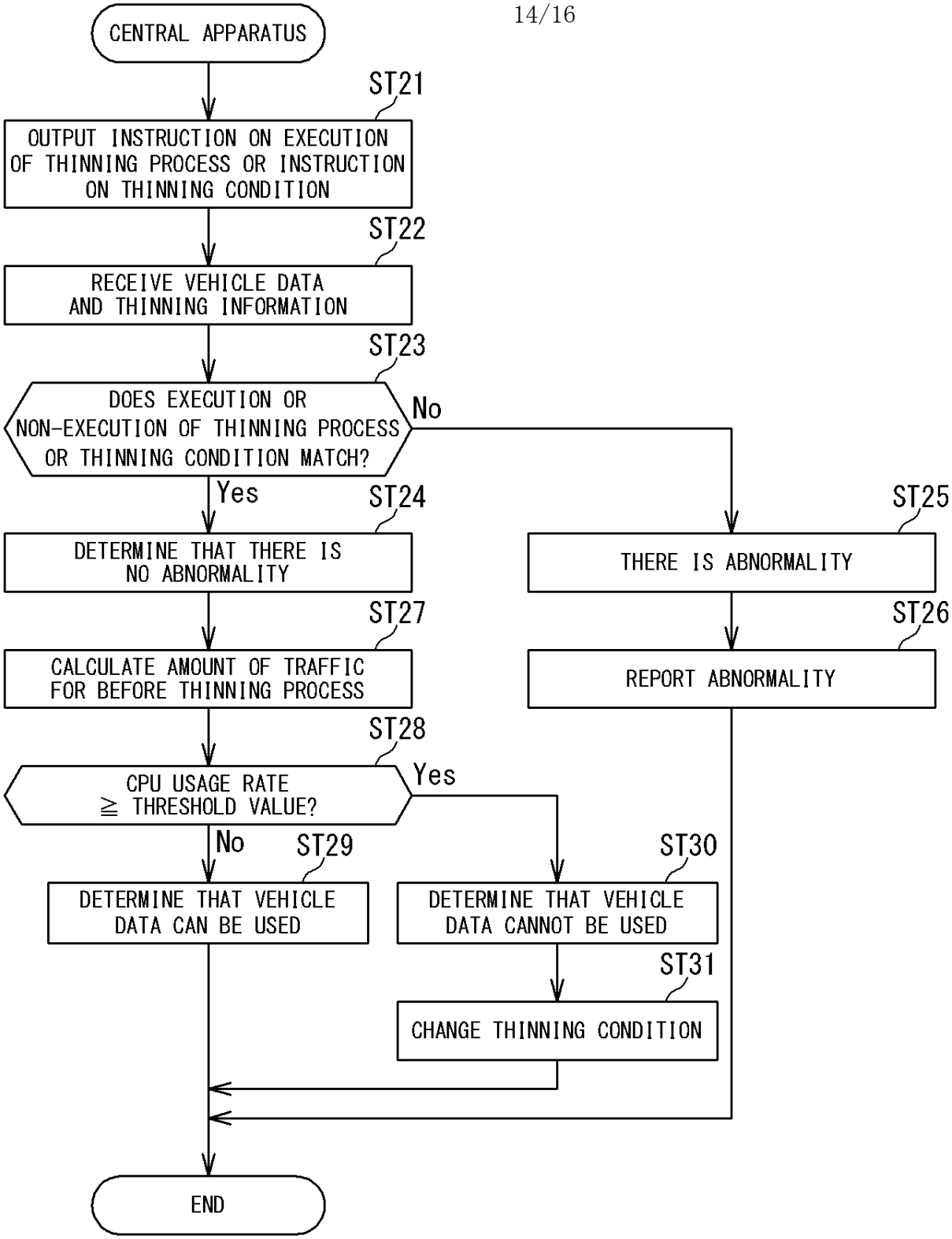

CENTRAL APPARATUS
ST21
OUTPUT INSTRUCTION ON EXECUTION OF THINNING PROCESS OR INSTRUCTION ON THINNING CONDITION
ST22
RECEIVE VEHICLE DATA AND THINNING INFORMATION
ST23
DOES EXECUTION OR NON-EXECUTION OF THINNING PROCESS OR THINNING CONDITION MATCH?
No
Yes
ST24
DETERMINE THAT THERE IS NO ABNORMALITY
ST25
THERE IS ABNORMALITY
ST27
CALCULATE AMOUNT OF TRAFFIC FOR BEFORE THINNING PROCESS
ST26
REPORT ABNORMALITY
ST28
CPU USAGE RATE ≧ THRESHOLD VALUE?
Yes
No
ST29
DETERMINE THAT VEHICLE DATA CAN BE USED
ST30
DETERMINE THAT VEHICLE DATA CANNOT BE USED
ST31
CHANGE THINNING CONDITION
END

FIG. 15

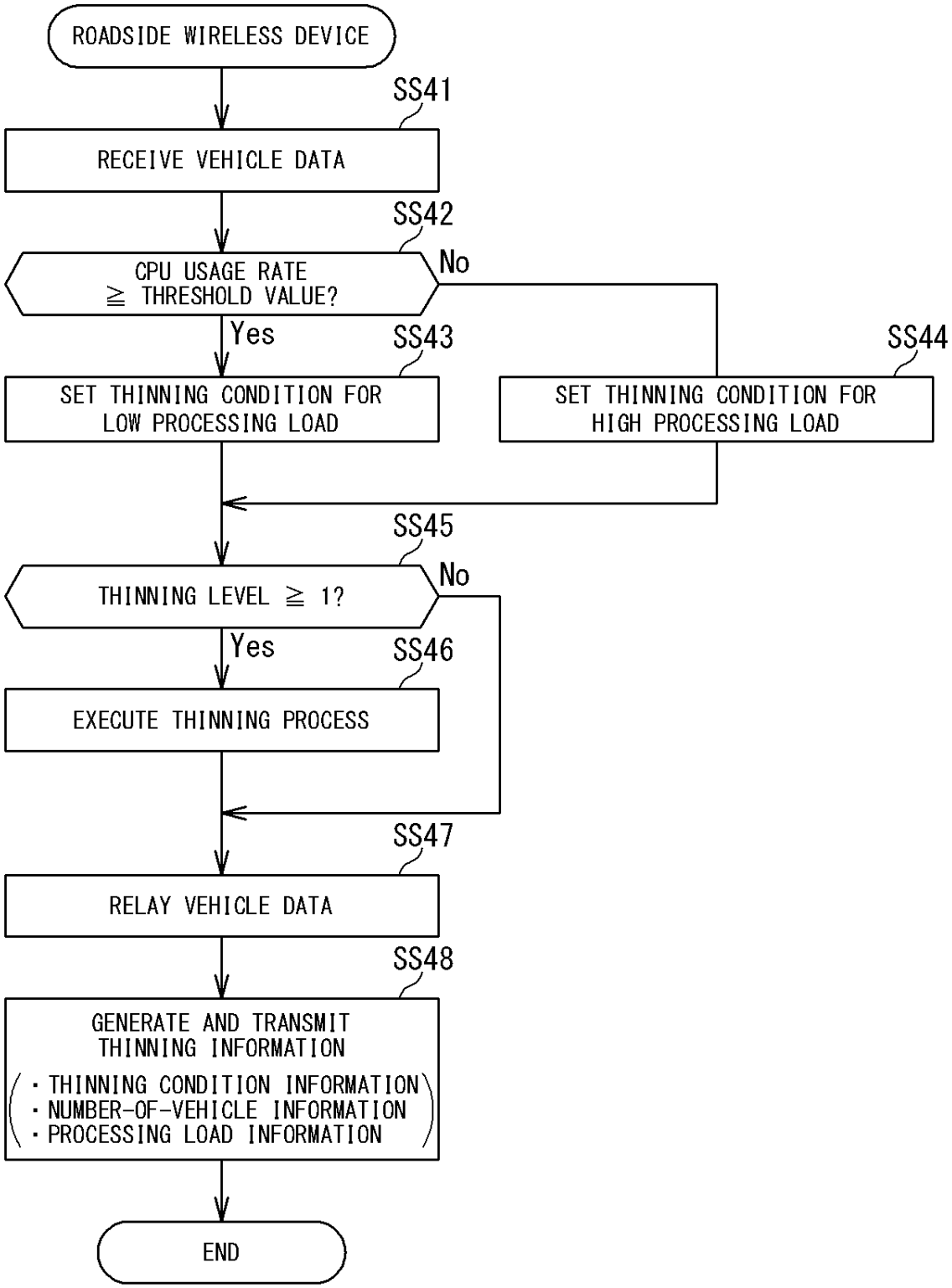
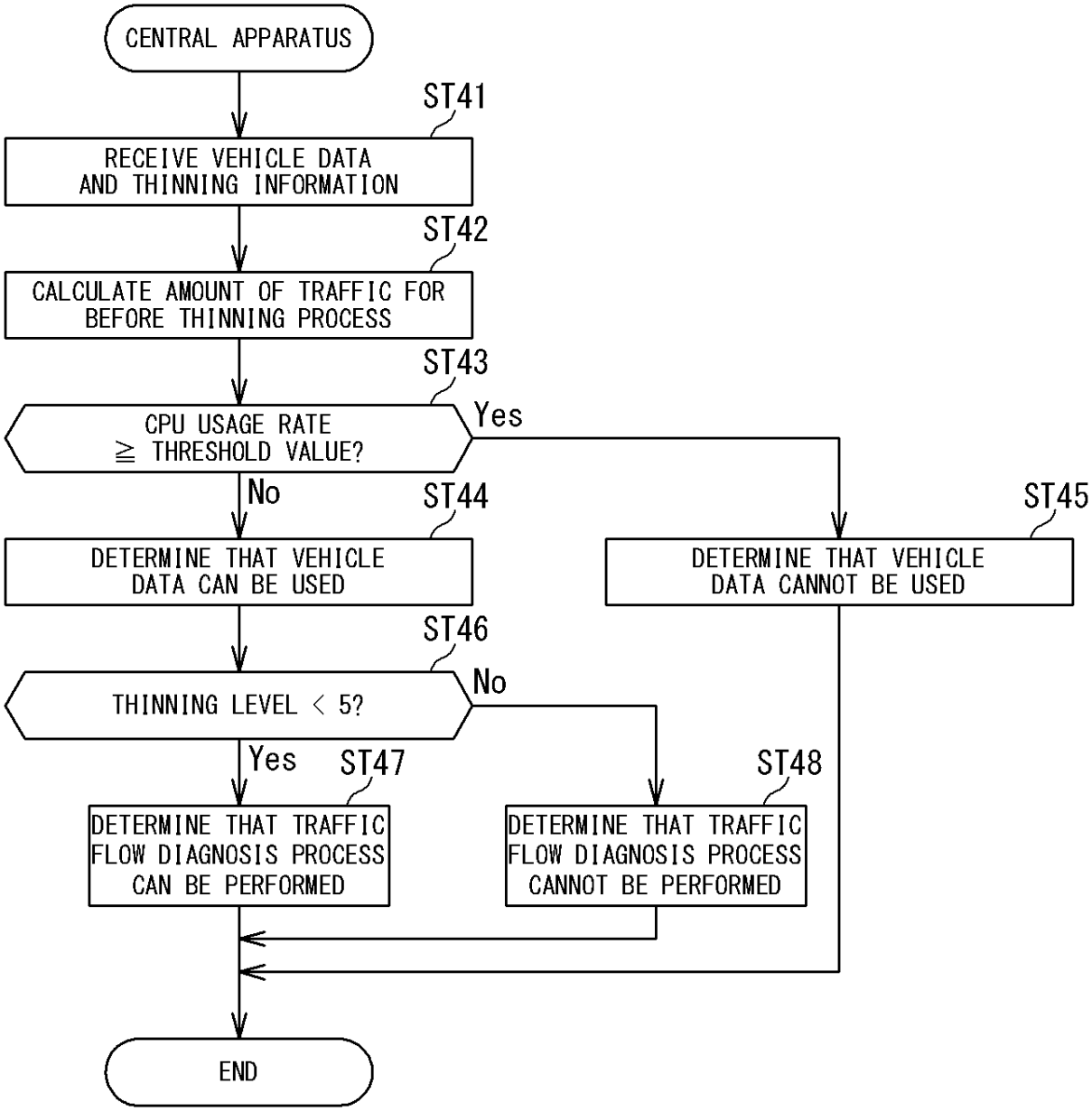

ROADSIDE WIRELESS DEVICE
SS41
RECEIVE VEHICLE DATA
SS42
CPU USAGE RATE
≧ THRESHOLD VALUE?
No
Yes
SS43
SET THINNING CONDITION FOR
LOW PROCESSING LOAD
SS44
SET THINNING CONDITION FOR
HIGH PROCESSING LOAD
SS45
THINNING LEVEL ≧ 1?
No
Yes
SS46
EXECUTE THINNING PROCESS
SS47
RELAY VEHICLE DATA
SS48
GENERATE AND TRANSMIT
THINNING INFORMATION
・THINNING CONDITION INFORMATION
・NUMBER-OF-VEHICLE INFORMATION
・PROCESSING LOAD INFORMATION
END

FIG. 16


CENTRAL APPARATUS
ST41
RECEIVE VEHICLE DATA AND THINNING INFORMATION
ST42
CALCULATE AMOUNT OF TRAFFIC FOR BEFORE THINNING PROCESS
ST43
CPU USAGE RATE ≧ THRESHOLD VALUE?
Yes
No
ST44
DETERMINE THAT VEHICLE DATA CAN BE USED
ST45
DETERMINE THAT VEHICLE DATA CANNOT BE USED
ST46
THINNING LEVEL < 5?
No
Yes
ST47
DETERMINE THAT TRAFFIC FLOW DIAGNOSIS PROCESS CAN BE PERFORMED
ST48
DETERMINE THAT TRAFFIC FLOW DIAGNOSIS PROCESS CANNOT BE PERFORMED
END