FIG. 1

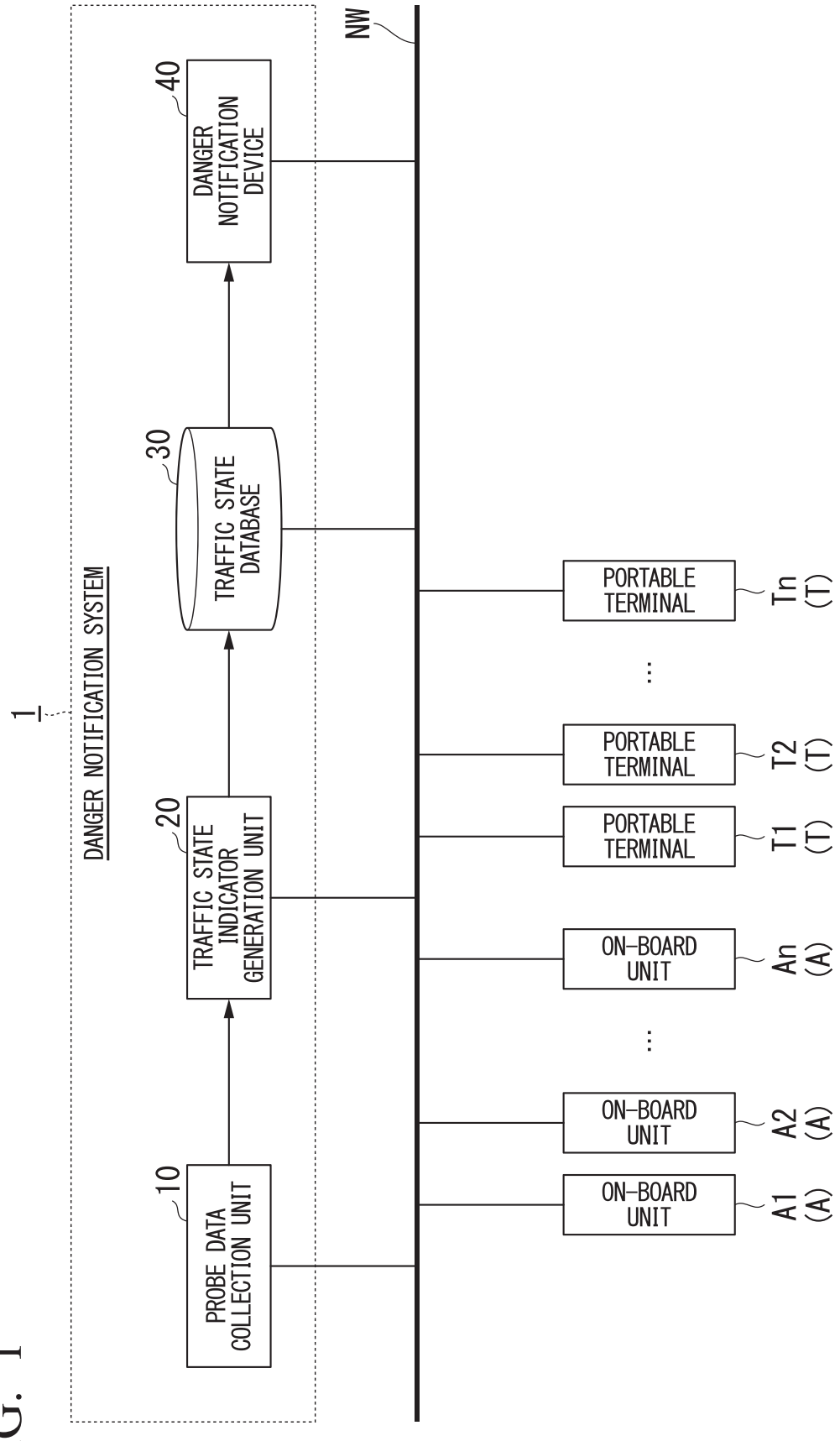

1
DANGER NOTIFICATION SYSTEM
10
PROBE DATA COLLECTION UNIT
20
TRAFFIC STATE INDICATOR GENERATION UNIT
30
TRAFFIC STATE DATABASE
40
DANGER NOTIFICATION DEVICE
NW
ON-BOARD UNIT
A1 (A)
ON-BOARD UNIT
A2 (A)
ON-BOARD UNIT
An (A)
PORTABLE TERMINAL
T1 (T)
PORTABLE TERMINAL
T2 (T)
PORTABLE TERMINAL
Tn (T)

FIG. 2

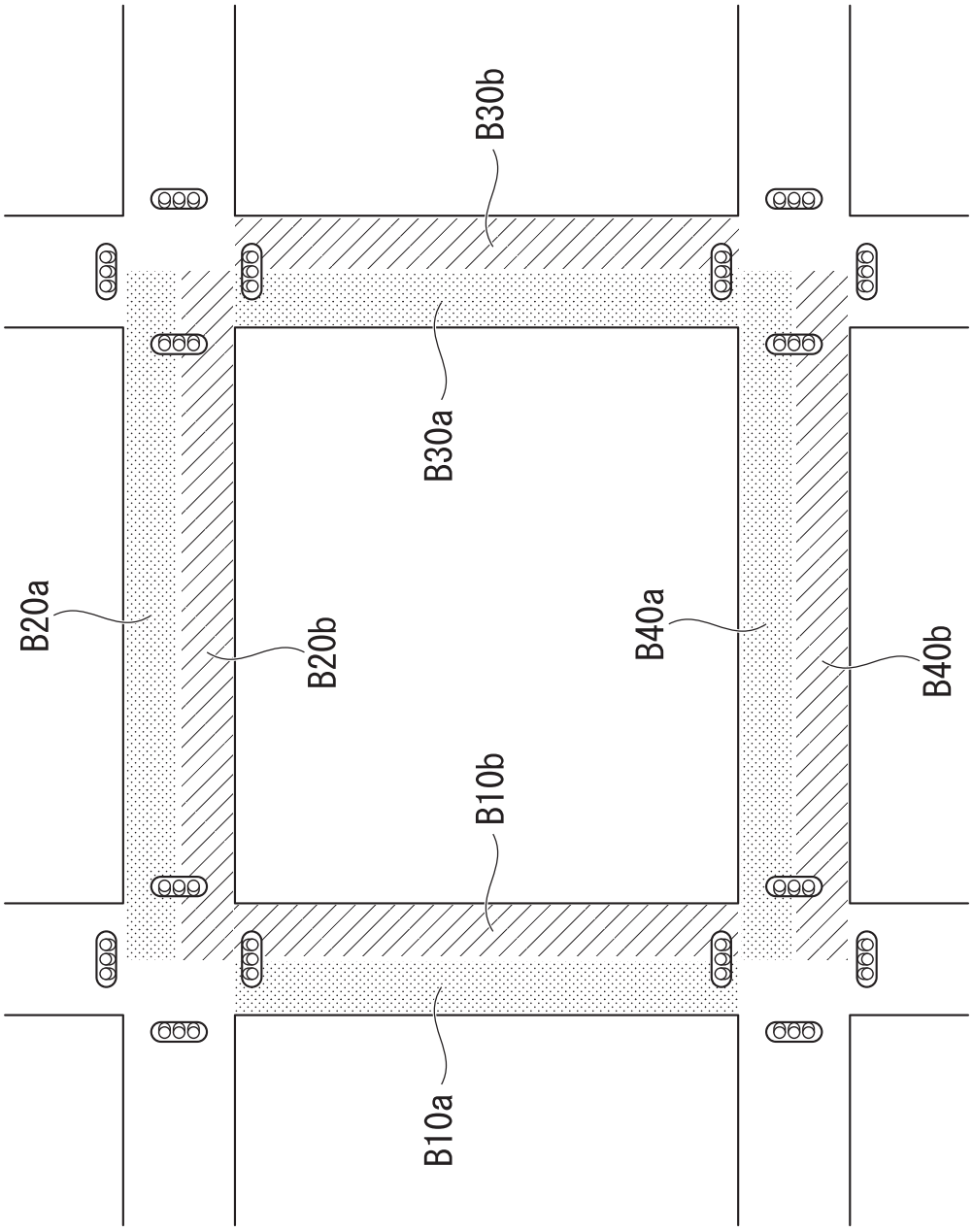


FIG. 3

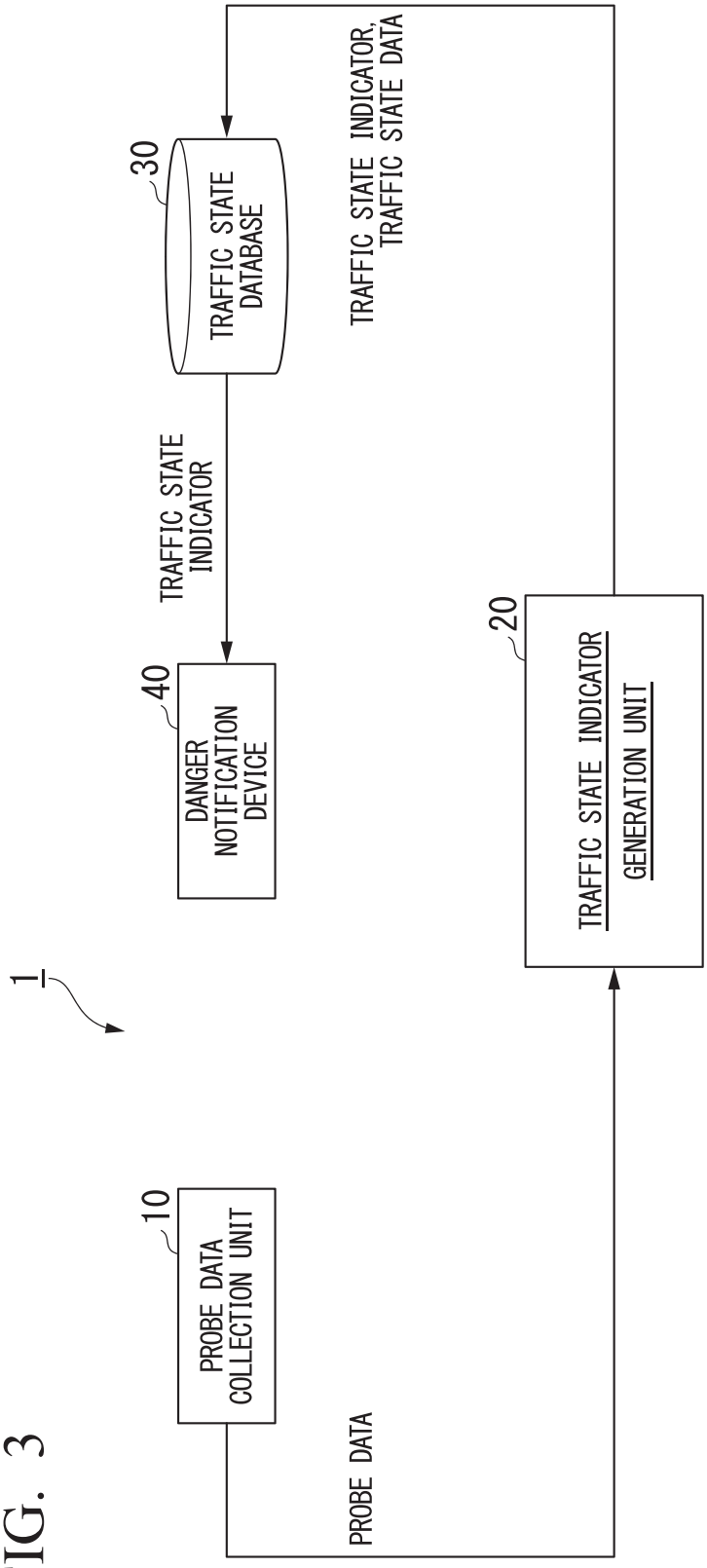

1
10
PROBE DATA COLLECTION UNIT
PROBE DATA
20
TRAFFIC STATE INDICATOR GENERATION UNIT
30
TRAFFIC STATE DATABASE
TRAFFIC STATE INDICATOR, TRAFFIC STATE DATA
40
DANGER NOTIFICATION DEVICE
TRAFFIC STATE INDICATOR

FIG. 4

D10

TRANSMISSION DATE AND TIME (YEAR/MONTH/DAY, TIME)	APPARATUS TYPE	APPARATUS ID	POSITION INFORMATION (LATITUDE, LONGITUDE)	ALERT SETTING	LINK ID
2016/02/01, 10:05:03	ON-BOARD UNIT	00000001	N**.******, E***.******	ON	B10a
2016/02/01, 10:05:03	PORTABLE TERMINAL	00000020	N**.******, E***.******	ON	B10a
2016/02/01, 10:05:03	PORTABLE TERMINAL	00000022	N**.******, E***.******	OFF	B10a
2016/02/01, 10:05:03	PORTABLE TERMINAL	00000030	N**.******, E***.******	ON	B20a
⋮	⋮	⋮	⋮	⋮	⋮

FIG. 5

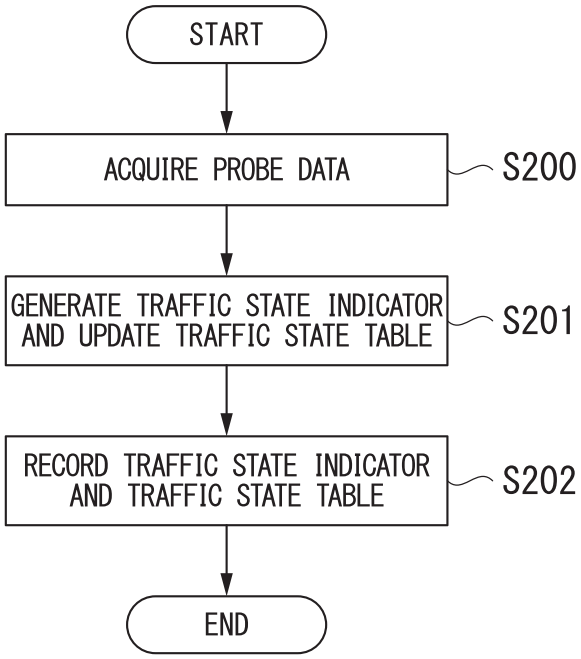

START
ACQUIRE PROBE DATA
S200
GENERATE TRAFFIC STATE INDICATOR AND UPDATE TRAFFIC STATE TABLE
S201
RECORD TRAFFIC STATE INDICATOR AND TRAFFIC STATE TABLE
S202
END

FIG. 6

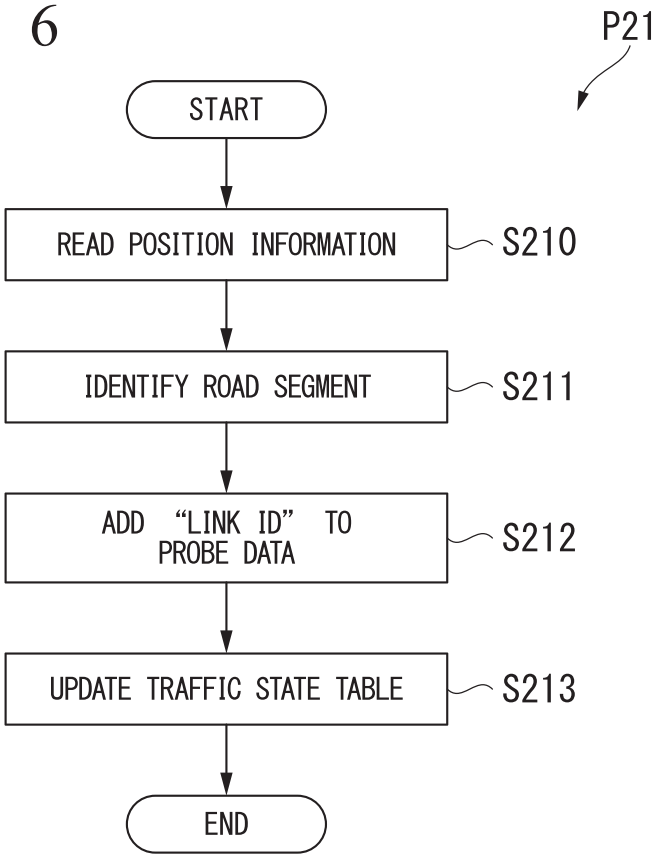

P21
START
READ POSITION INFORMATION
S210
IDENTIFY ROAD SEGMENT
S211
ADD "LINK ID" TO PROBE DATA
S212
UPDATE TRAFFIC STATE TABLE
S213
END

FIG. 7

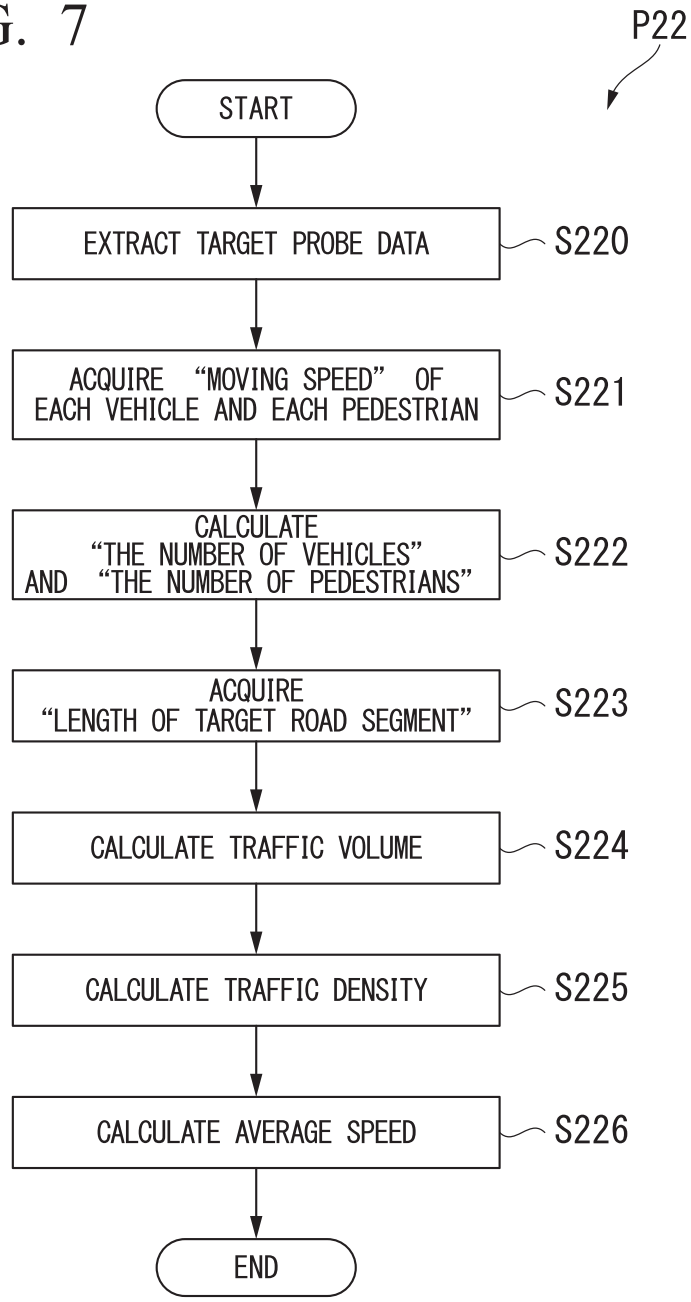

P22
START
EXTRACT TARGET PROBE DATA
S220
ACQUIRE "MOVING SPEED" OF EACH VEHICLE AND EACH PEDESTRIAN
S221
CALCULATE "THE NUMBER OF VEHICLES" AND "THE NUMBER OF PEDESTRIANS"
S222
ACQUIRE "LENGTH OF TARGET ROAD SEGMENT"
S223
CALCULATE TRAFFIC VOLUME
S224
CALCULATE TRAFFIC DENSITY
S225
CALCULATE AVERAGE SPEED
S226
END

FIG. 8

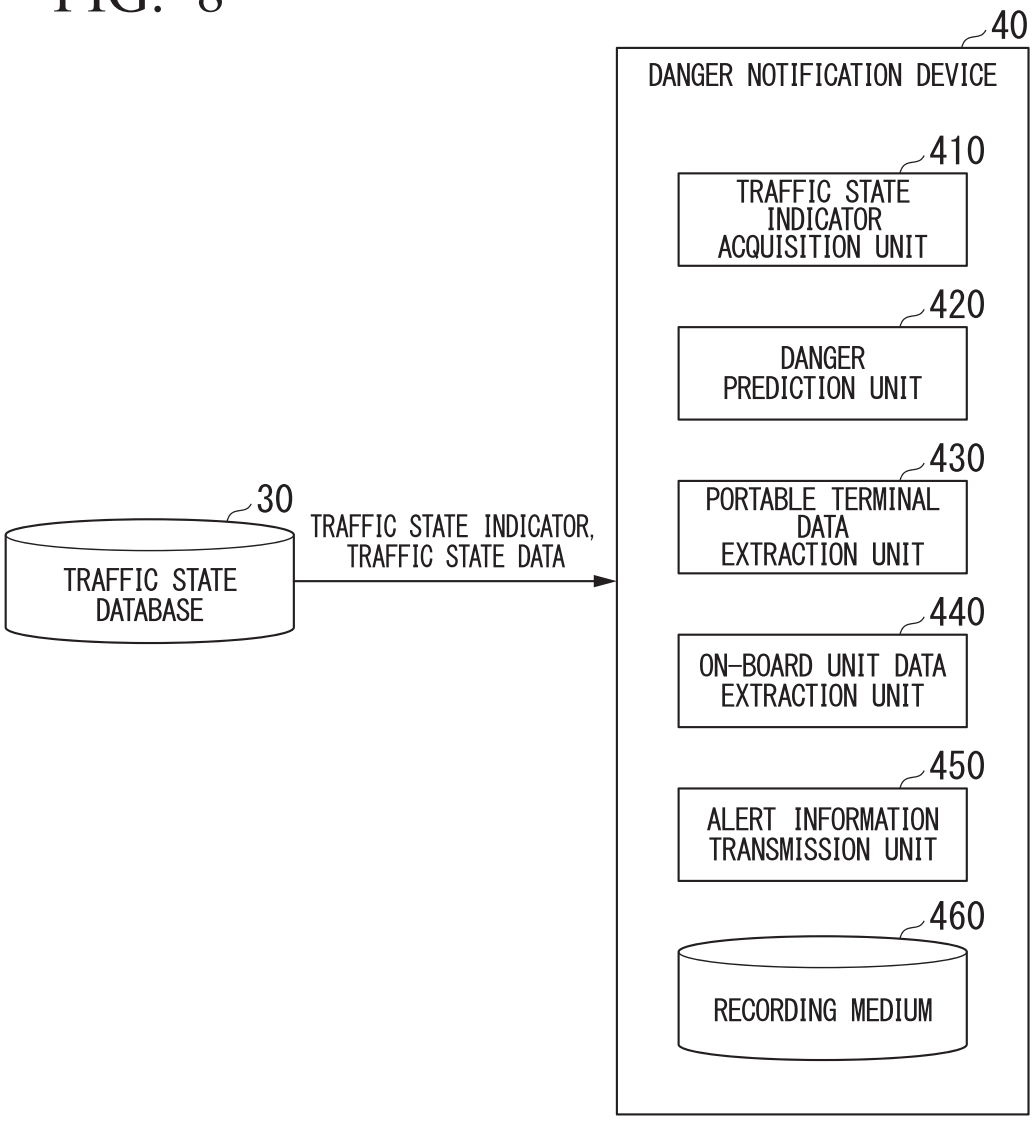

40
DANGER NOTIFICATION DEVICE
410
TRAFFIC STATE INDICATOR ACQUISITION UNIT
420
DANGER PREDICTION UNIT
430
PORTABLE TERMINAL DATA EXTRACTION UNIT
440
ON-BOARD UNIT DATA EXTRACTION UNIT
450
ALERT INFORMATION TRANSMISSION UNIT
460
RECORDING MEDIUM
30
TRAFFIC STATE DATABASE
TRAFFIC STATE INDICATOR, TRAFFIC STATE DATA

FIG. 9

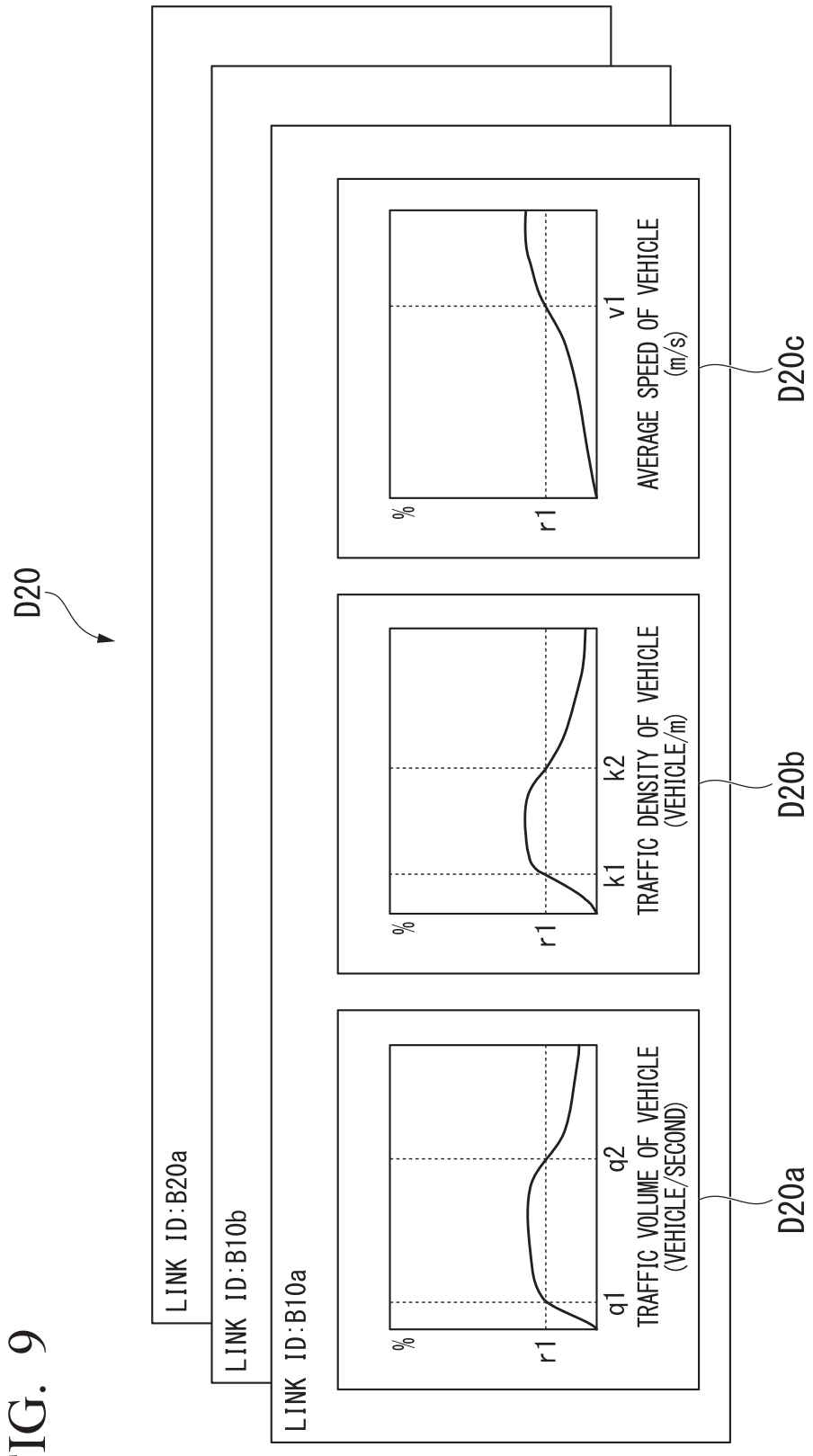

D20
LINK ID:B20a
LINK ID:B10b
LINK ID:B10a
%
r1
q1
q2
TRAFFIC VOLUME OF VEHICLE
(VEHICLE/SECOND)
D20a
%
r1
k1
k2
TRAFFIC DENSITY OF VEHICLE
(VEHICLE/m)
D20b
%
r1
v1
AVERAGE SPEED OF VEHICLE
(m/s)
D20c

FIG. 10

TRAFFIC ACCIDENT IS
LIKELY TO OCCUR.
PLEASE PAY ATTENTION
TO VEHICLE.

FIG. 11

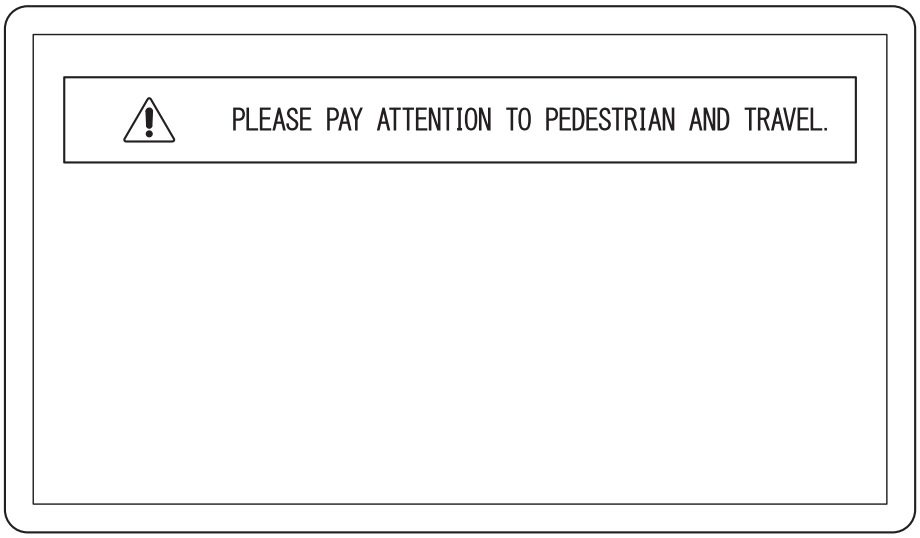


FIG. 12

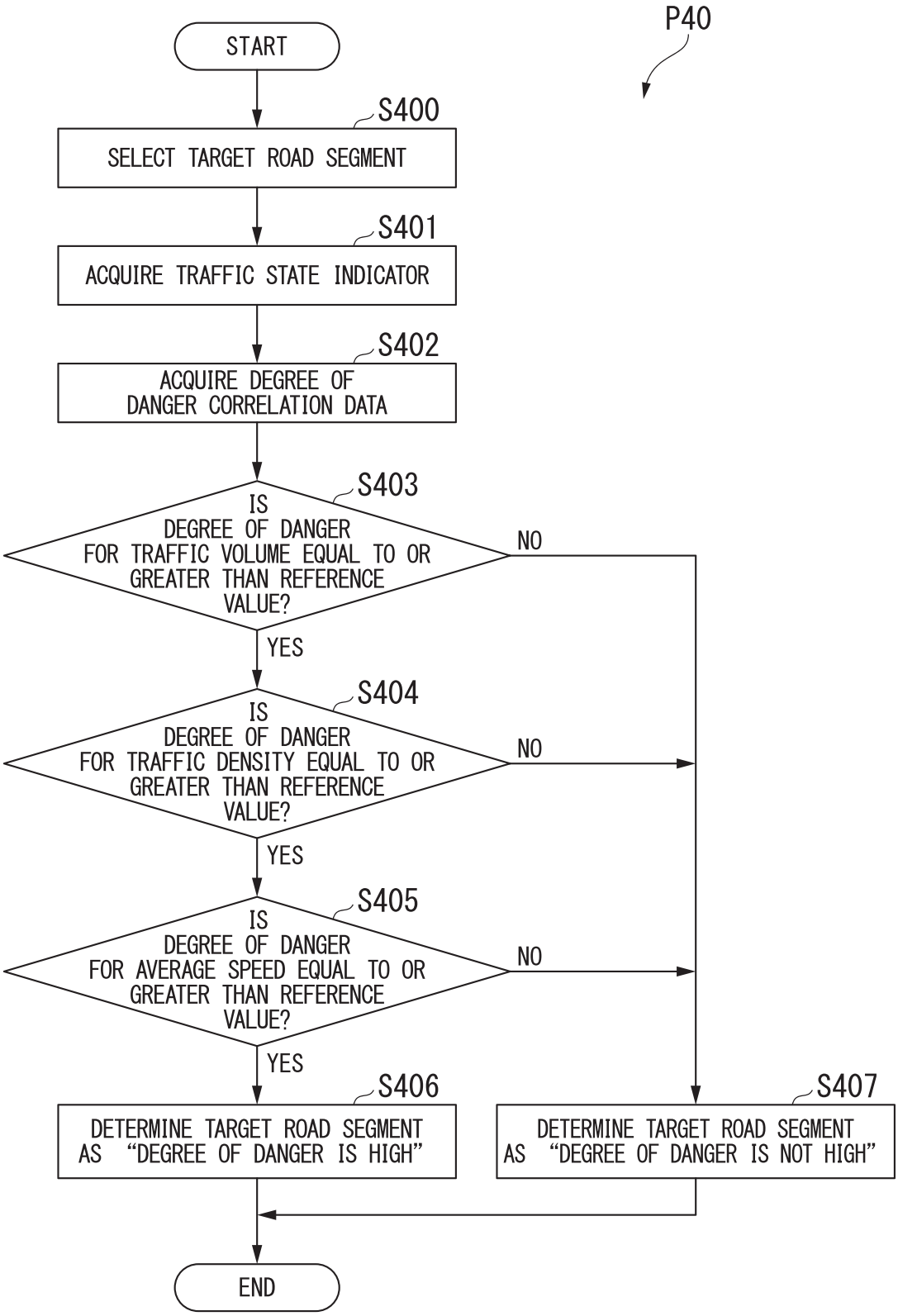

P40
START
S400
SELECT TARGET ROAD SEGMENT
S401
ACQUIRE TRAFFIC STATE INDICATOR
S402
ACQUIRE DEGREE OF DANGER CORRELATION DATA
S403
IS DEGREE OF DANGER FOR TRAFFIC VOLUME EQUAL TO OR GREATER THAN REFERENCE VALUE?
NO
YES
S404
IS DEGREE OF DANGER FOR TRAFFIC DENSITY EQUAL TO OR GREATER THAN REFERENCE VALUE?
NO
YES
S405
IS DEGREE OF DANGER FOR AVERAGE SPEED EQUAL TO OR GREATER THAN REFERENCE VALUE?
NO
YES
S406
DETERMINE TARGET ROAD SEGMENT AS "DEGREE OF DANGER IS HIGH"
S407
DETERMINE TARGET ROAD SEGMENT AS "DEGREE OF DANGER IS NOT HIGH"
END

FIG. 13

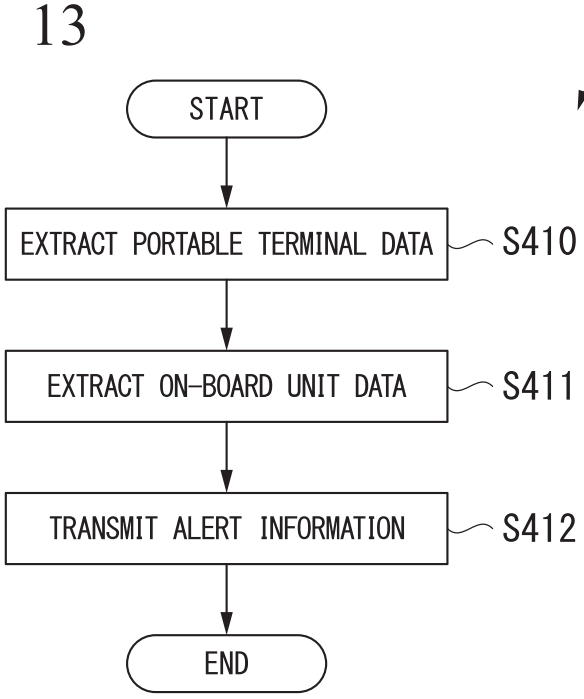

P41
START
EXTRACT PORTABLE TERMINAL DATA
S410
EXTRACT ON-BOARD UNIT DATA
S411
TRANSMIT ALERT INFORMATION
S412
END

FIG. 14

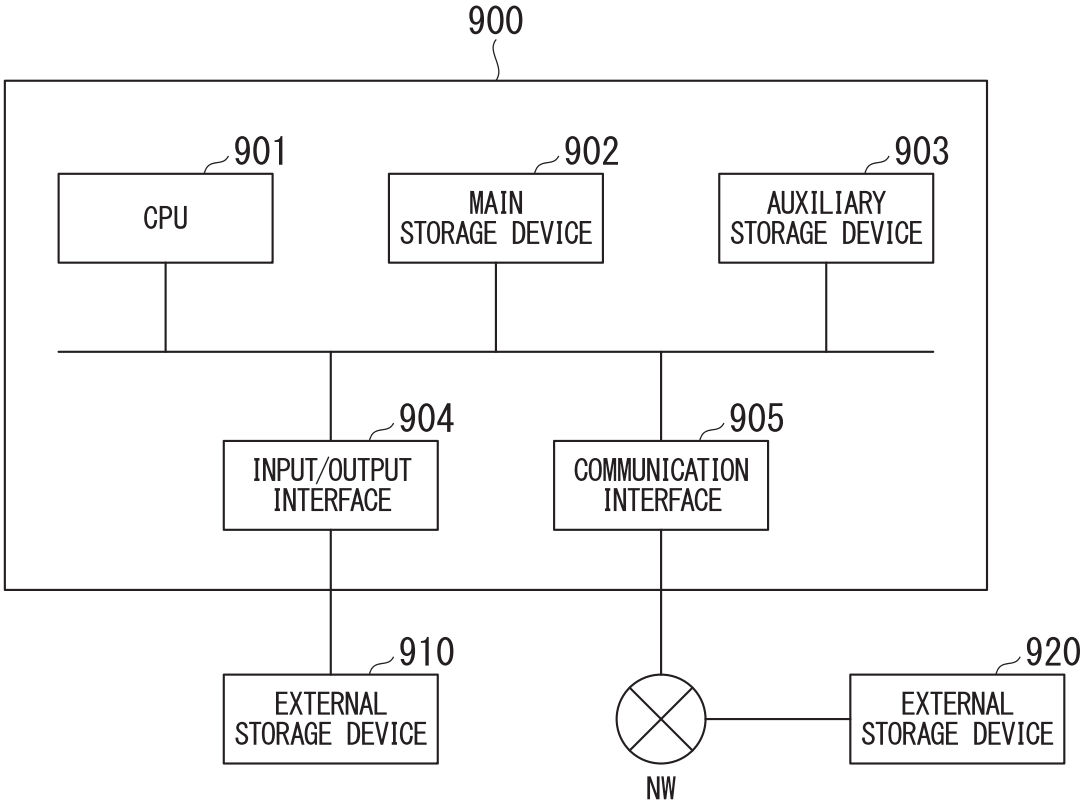

900
901
CPU
902
MAIN STORAGE DEVICE
903
AUXILIARY STORAGE DEVICE
904
INPUT/OUTPUT INTERFACE
905
COMMUNICATION INTERFACE
910
EXTERNAL STORAGE DEVICE
NW
920
EXTERNAL STORAGE DEVICE

FIG. 15

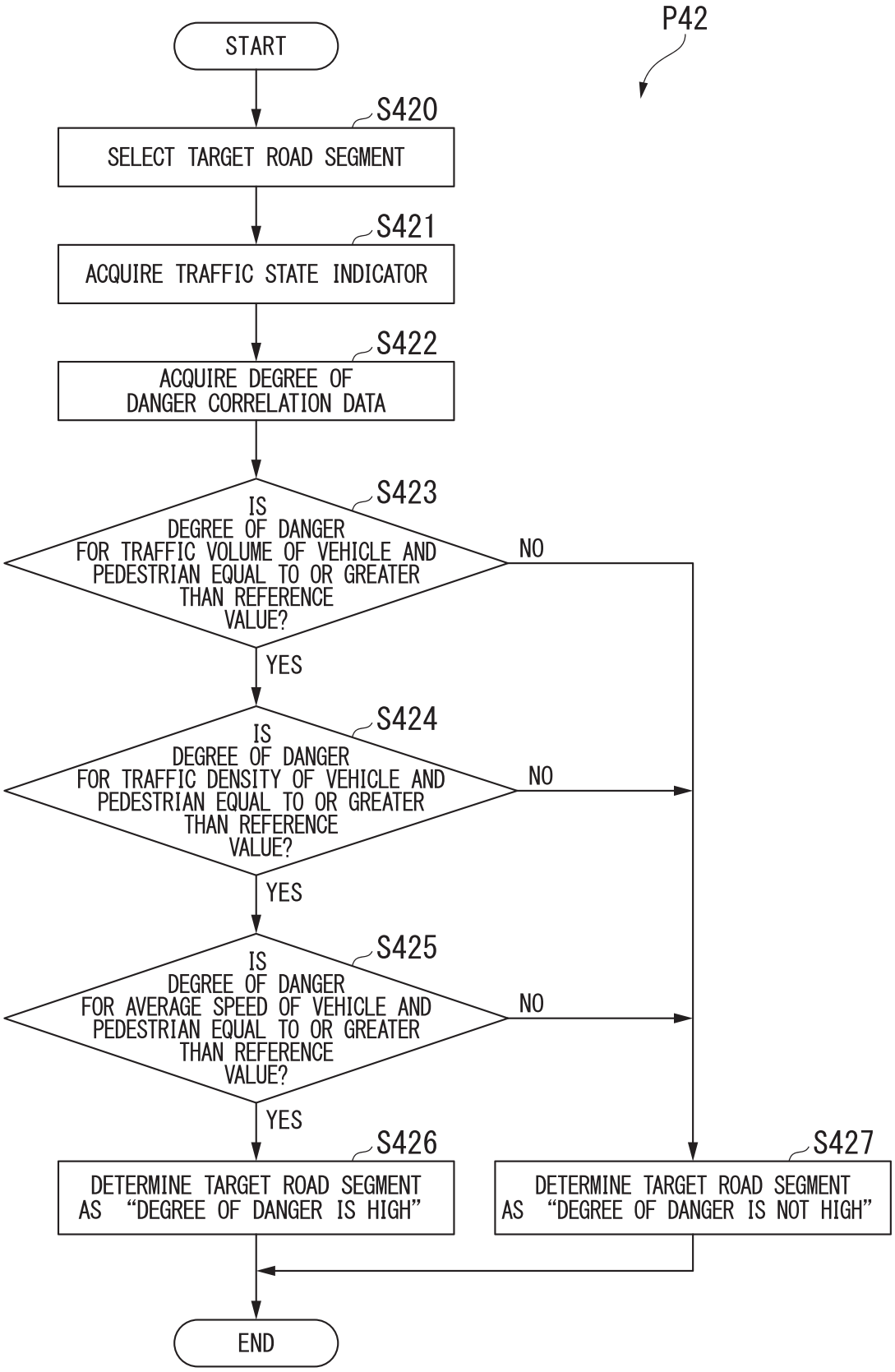
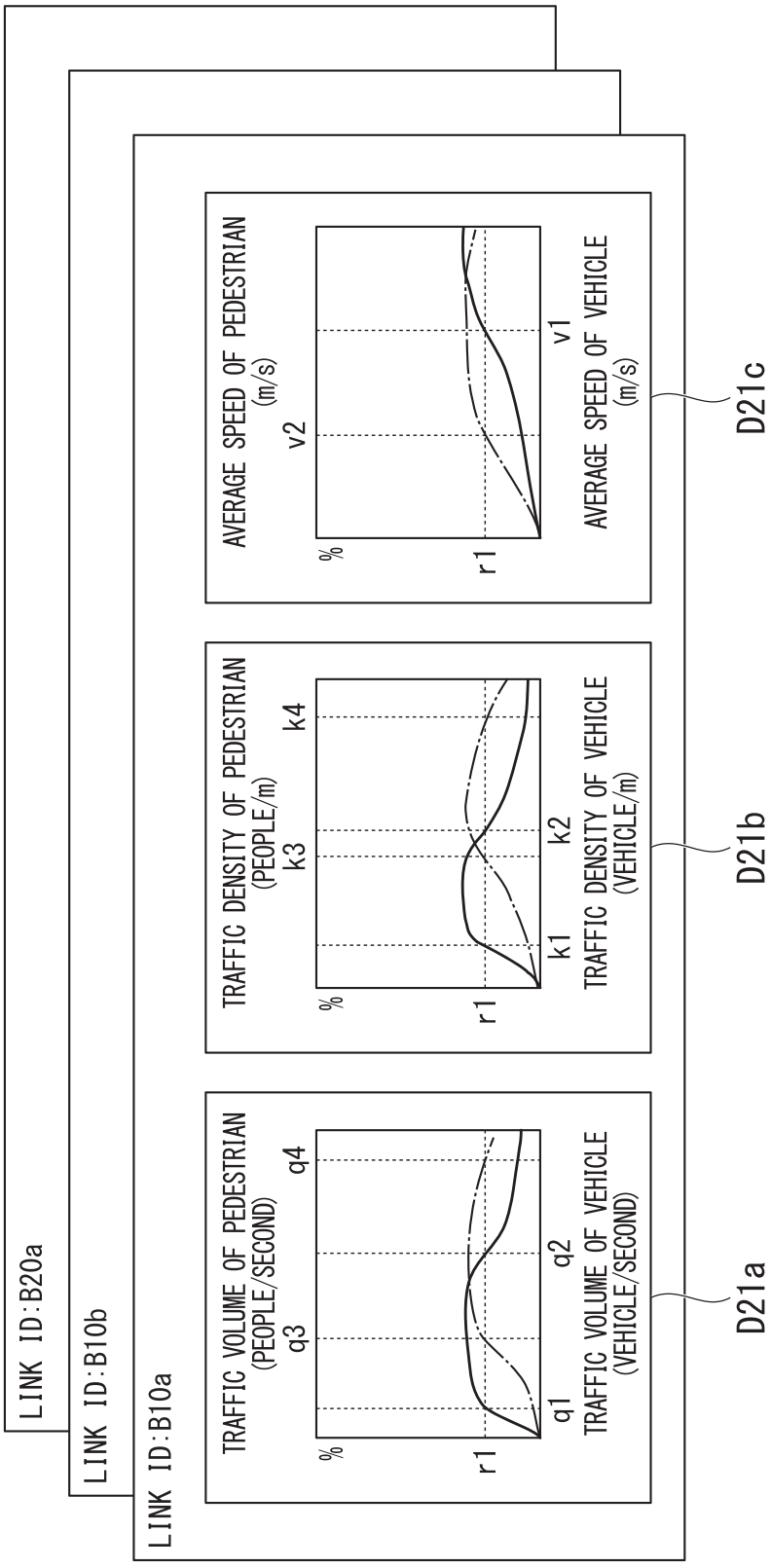

P42
START
S420
SELECT TARGET ROAD SEGMENT
S421
ACQUIRE TRAFFIC STATE INDICATOR
S422
ACQUIRE DEGREE OF DANGER CORRELATION DATA
S423
IS DEGREE OF DANGER FOR TRAFFIC VOLUME OF VEHICLE AND PEDESTRIAN EQUAL TO OR GREATER THAN REFERENCE VALUE?
NO
YES
S424
IS DEGREE OF DANGER FOR TRAFFIC DENSITY OF VEHICLE AND PEDESTRIAN EQUAL TO OR GREATER THAN REFERENCE VALUE?
NO
YES
S425
IS DEGREE OF DANGER FOR AVERAGE SPEED OF VEHICLE AND PEDESTRIAN EQUAL TO OR GREATER THAN REFERENCE VALUE?
NO
YES
S426
DETERMINE TARGET ROAD SEGMENT AS "DEGREE OF DANGER IS HIGH"
S427
DETERMINE TARGET ROAD SEGMENT AS "DEGREE OF DANGER IS NOT HIGH"
END

FIG. 16


D21
LINK ID:B20a
LINK ID:B10b
LINK ID:B10a
TRAFFIC VOLUME OF PEDESTRIAN (PEOPLE/SECOND)
q3
q4
q1
q2
%
r1
TRAFFIC VOLUME OF VEHICLE (VEHICLE/SECOND)
D21a
TRAFFIC DENSITY OF PEDESTRIAN (PEOPLE/m)
k3
k4
k1
k2
%
r1
TRAFFIC DENSITY OF VEHICLE (VEHICLE/m)
D21b
AVERAGE SPEED OF PEDESTRIAN (m/s)
v2
v1
%
r1
AVERAGE SPEED OF VEHICLE (m/s)
D21c