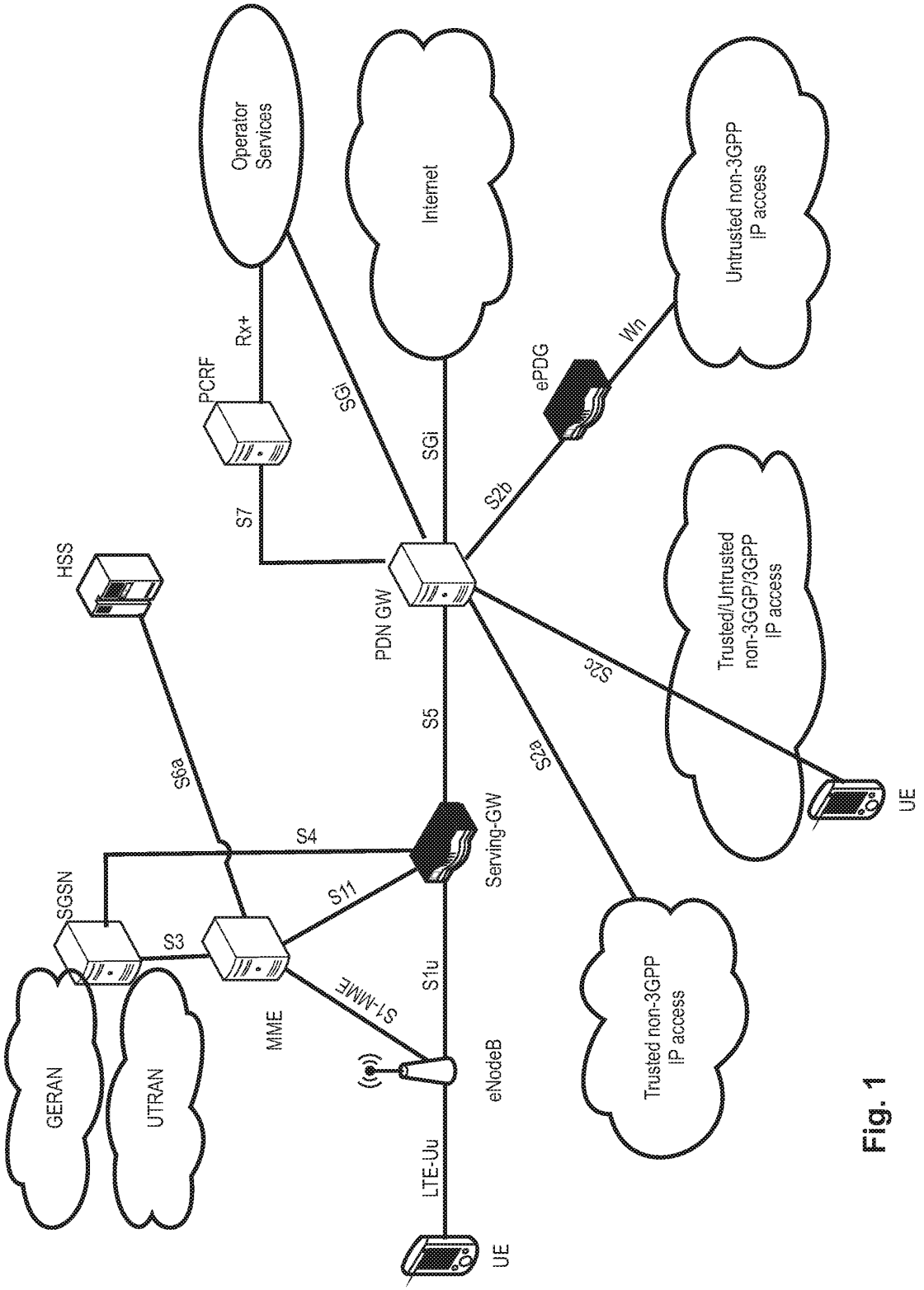
Operator Services
Internet
Untrusted non-3GPP IP access
Rx+
PCRF
SGi
SGi
ePDG
Wn
S7
S2b
HSS
PDN GW
Trusted/Untrusted non-3GGP/3GPP IP access
S2a
S5
S6a
S4
Serving-GW
UE
SGSN
S11
S3
S1u
S1-MME
Trusted non-3GPP IP access
GERAN
UTRAN
MME
eNodeB
LTE-Uu
UE

Fig. 1

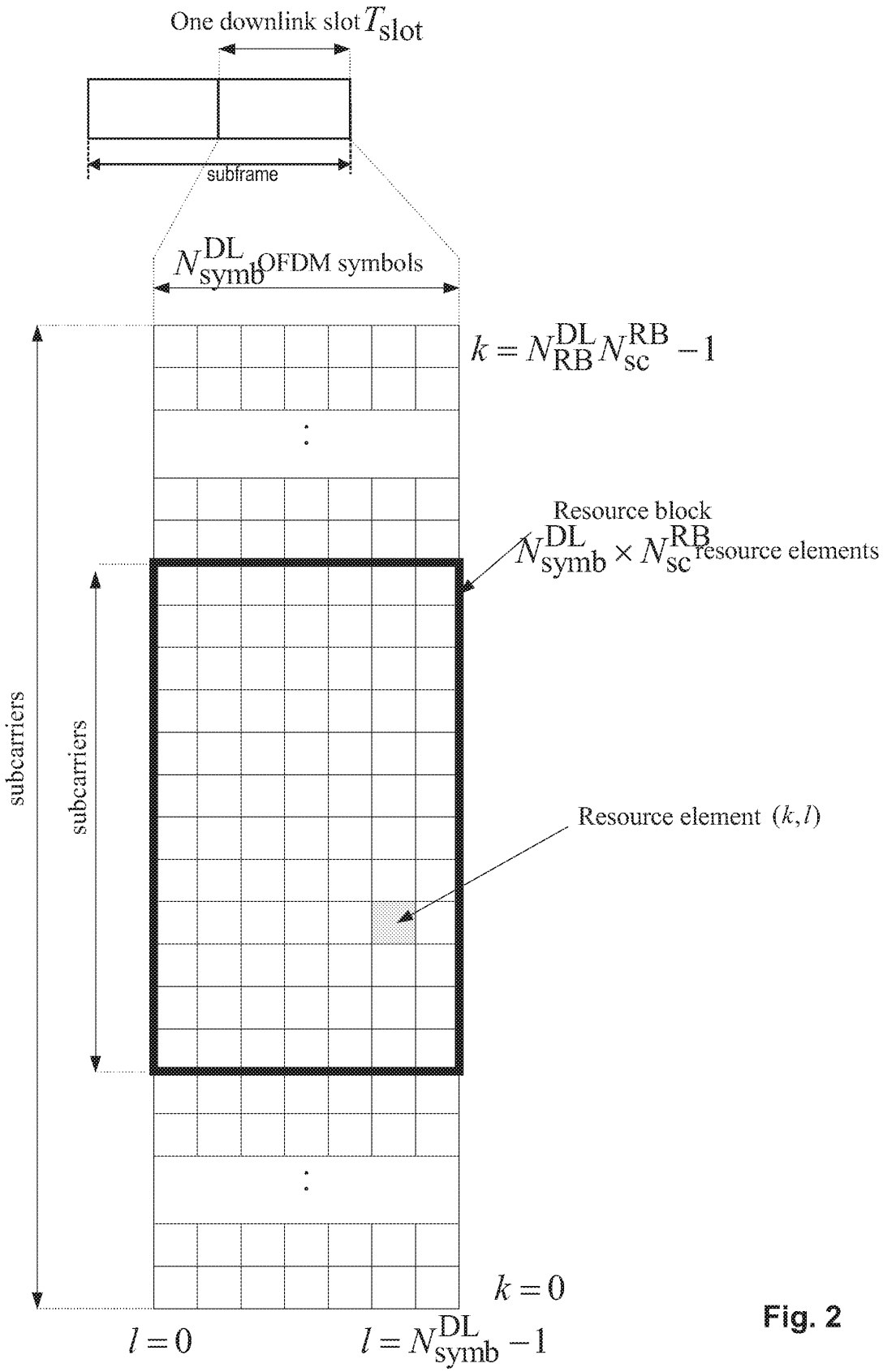
One downlink slot T_{slot}
subframe
N_{symb}^{DL} OFDM symbols
$k = N_{RB}^{DL} N_{sc}^{RB} - 1$
Resource block
$N_{symb}^{DL} \times N_{sc}^{RB}$ resource elements
subcarriers
subcarriers
Resource element (k,l)
$k = 0$
$l = 0$
$l = N_{symb}^{DL} - 1$

Fig. 2

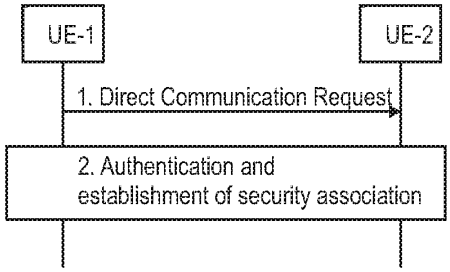

Fig. 3

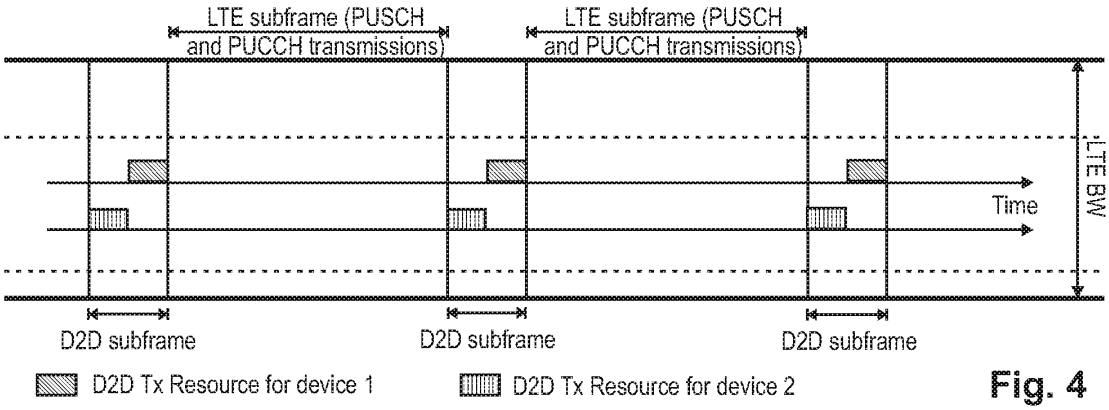

Fig. 4

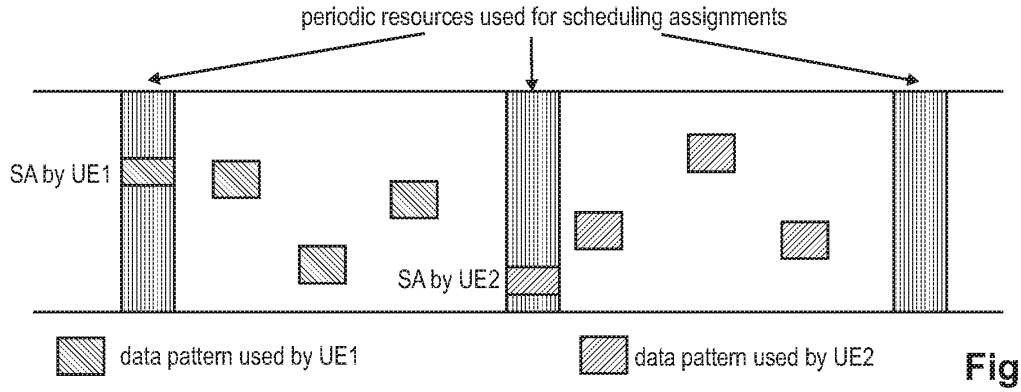

Fig. 5

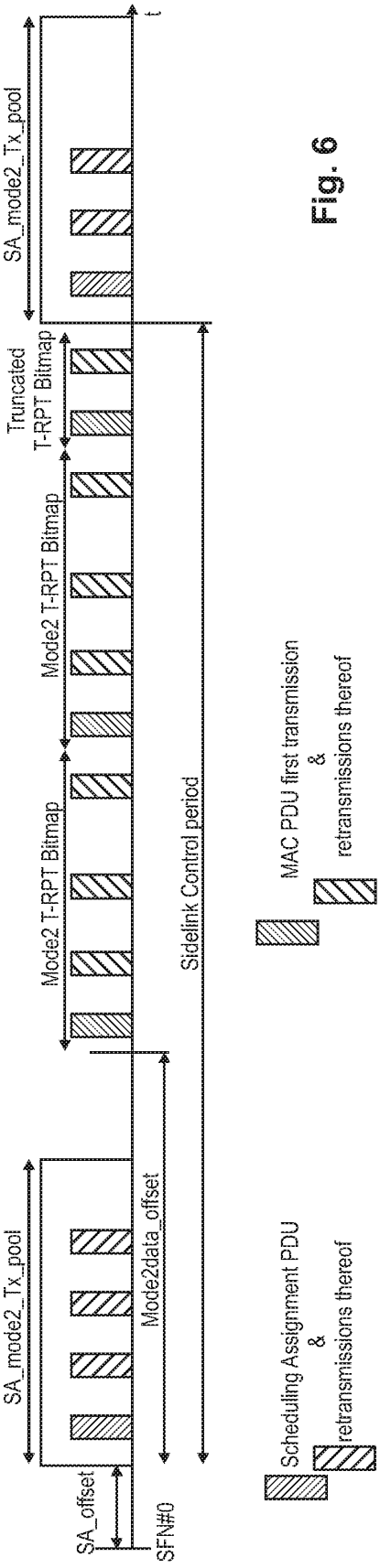
SA_mode2_Tx_pool
SA_offset
SFN#0
Mode2data_offset
Mode2 T-RPT Bitmap
Mode2 T-RPT Bitmap
Truncated
T-RPT Bitmap
SA_mode2_Tx_pool
t
Sidelink Control period
Scheduling Assignment PDU
&
retransmissions thereof
MAC PDU first transmission
&
retransmissions thereof

Fig. 6

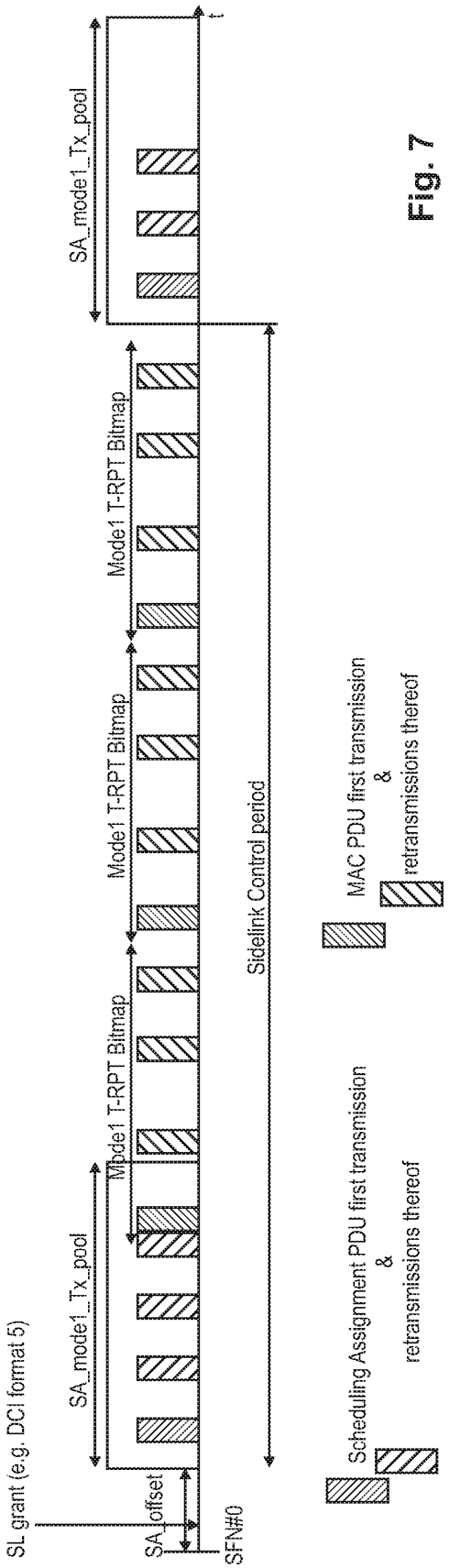
SL grant (e.g. DCI format 5)
SA_mode1_Tx_pool
SA_offset
SFN#0
Mode1 T-RPT Bitmap
Mode1 T-RPT Bitmap
Mode1 T-RPT Bitmap
SA_mode1_Tx_pool
t
Sidelink Control period
Scheduling Assignment PDU first transmission
&
retransmissions thereof
MAC PDU first transmission
&
retransmissions thereof

Fig. 7

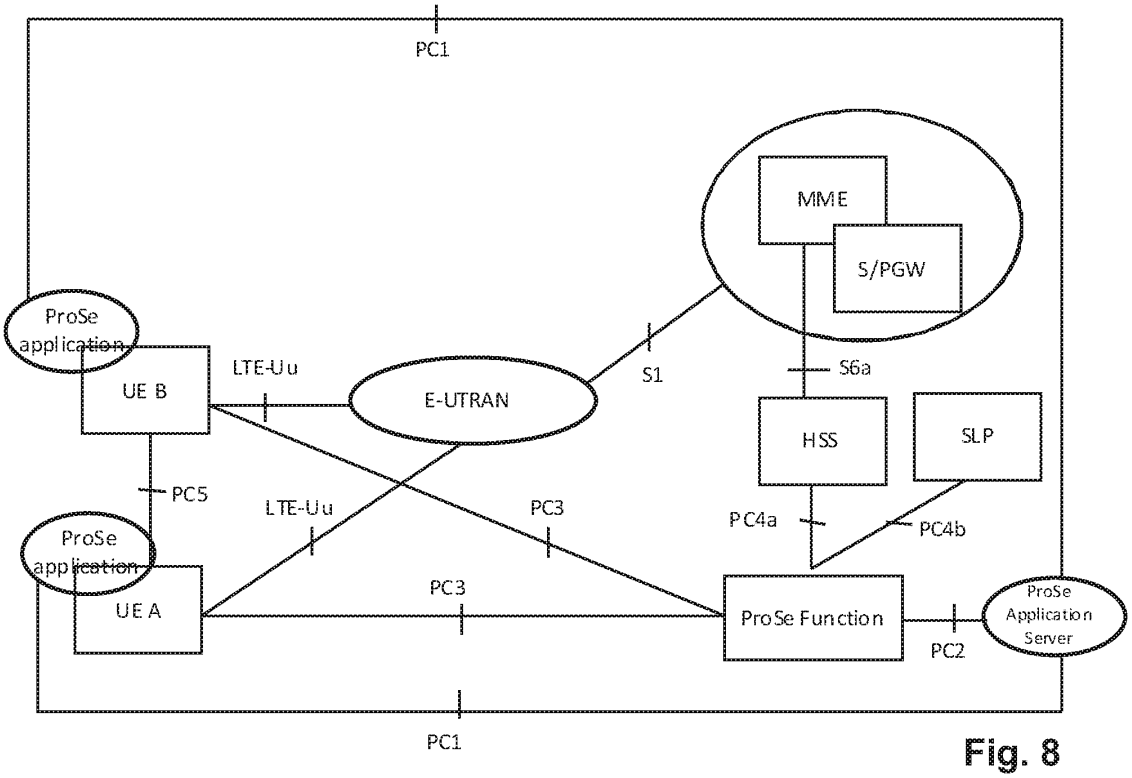
PC1
MME
S/PGW
ProSe application
UE B
LTE-Uu
E-UTRAN
S1
S6a
HSS
SLP
PC5
LTE-Uu
PC3
PC4a
PC4b
ProSe application
UE A
PC3
ProSe Function
ProSe Application Server
PC2
PC1

Fig. 8

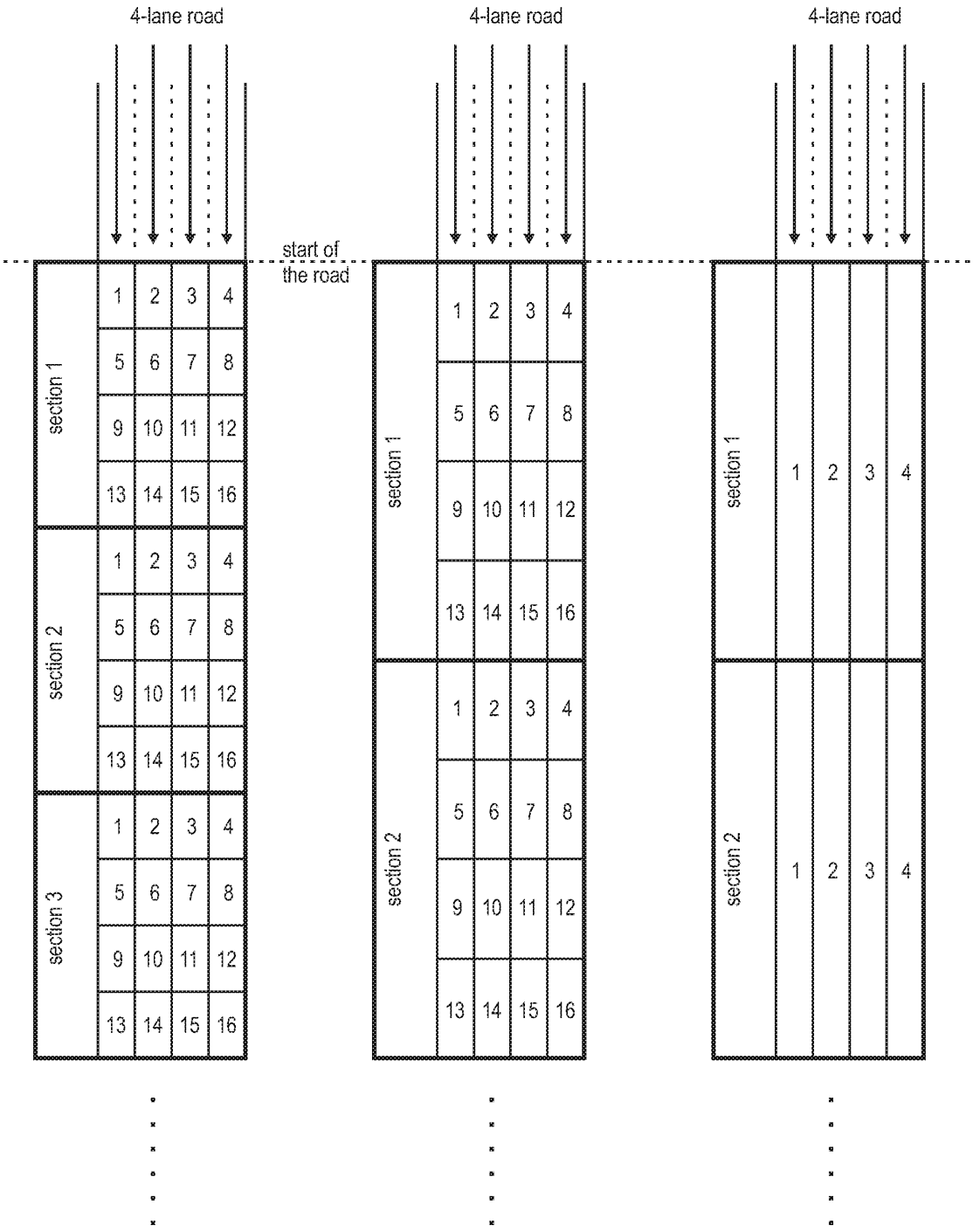

Fig. 9A

Fig. 9B

Fig. 9C

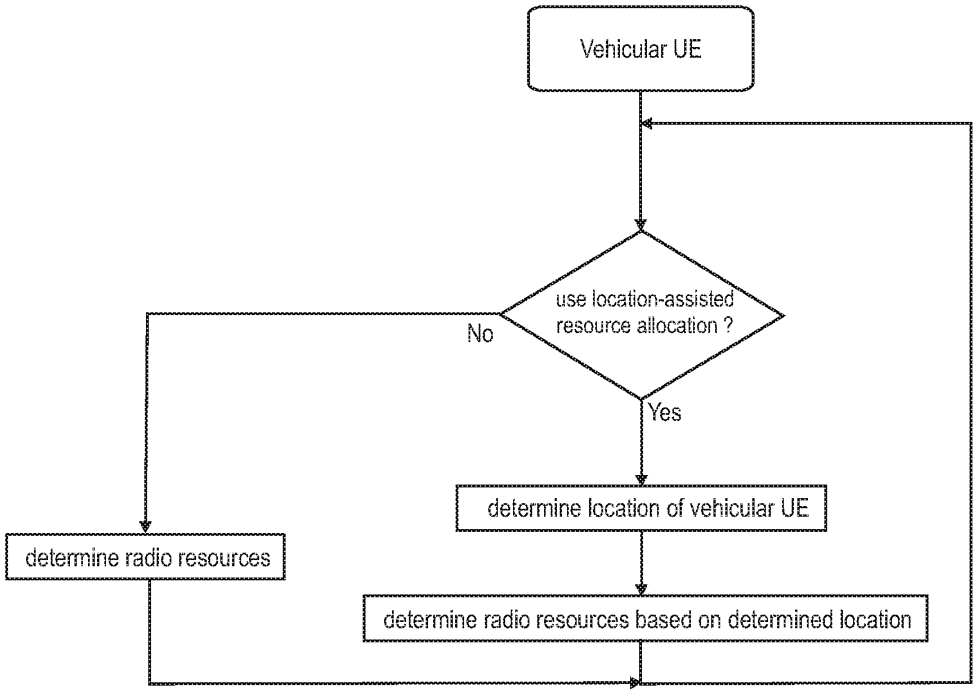
Vehicular UE
use location-assisted resource allocation ?
No
Yes
determine location of vehicular UE
determine radio resources
determine radio resources based on determined location

Fig. 10