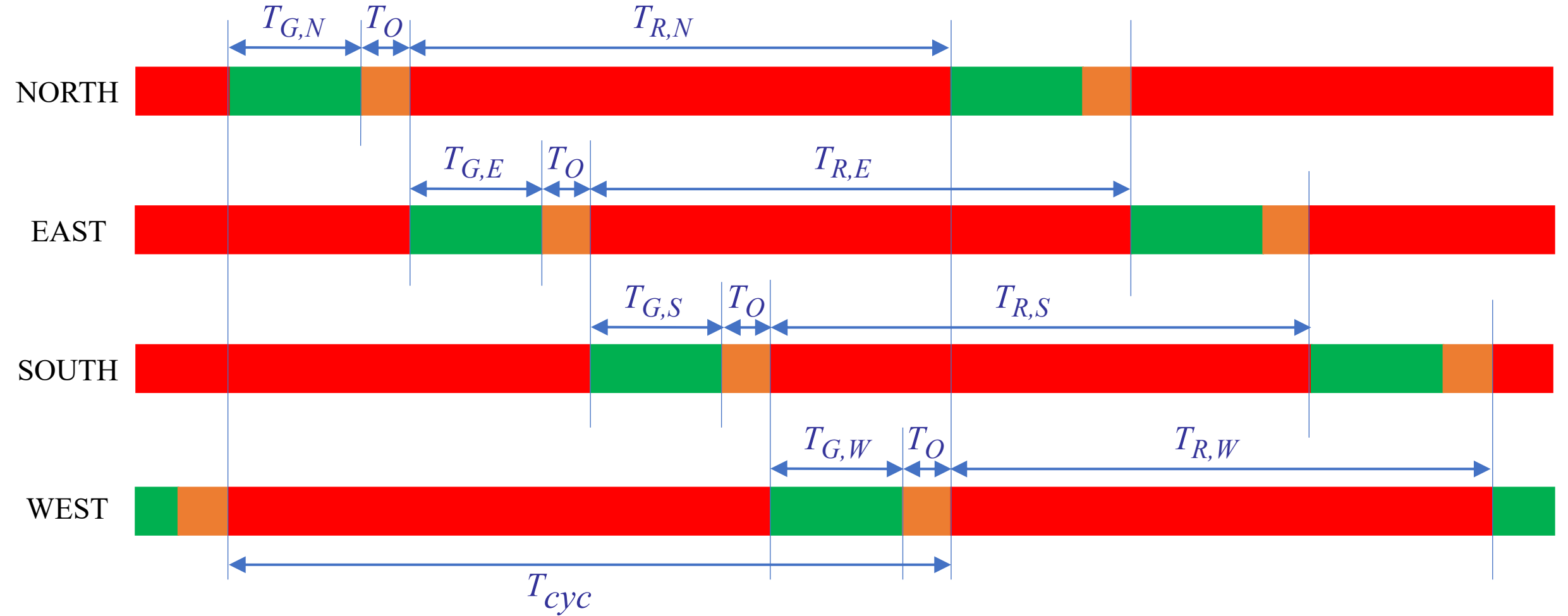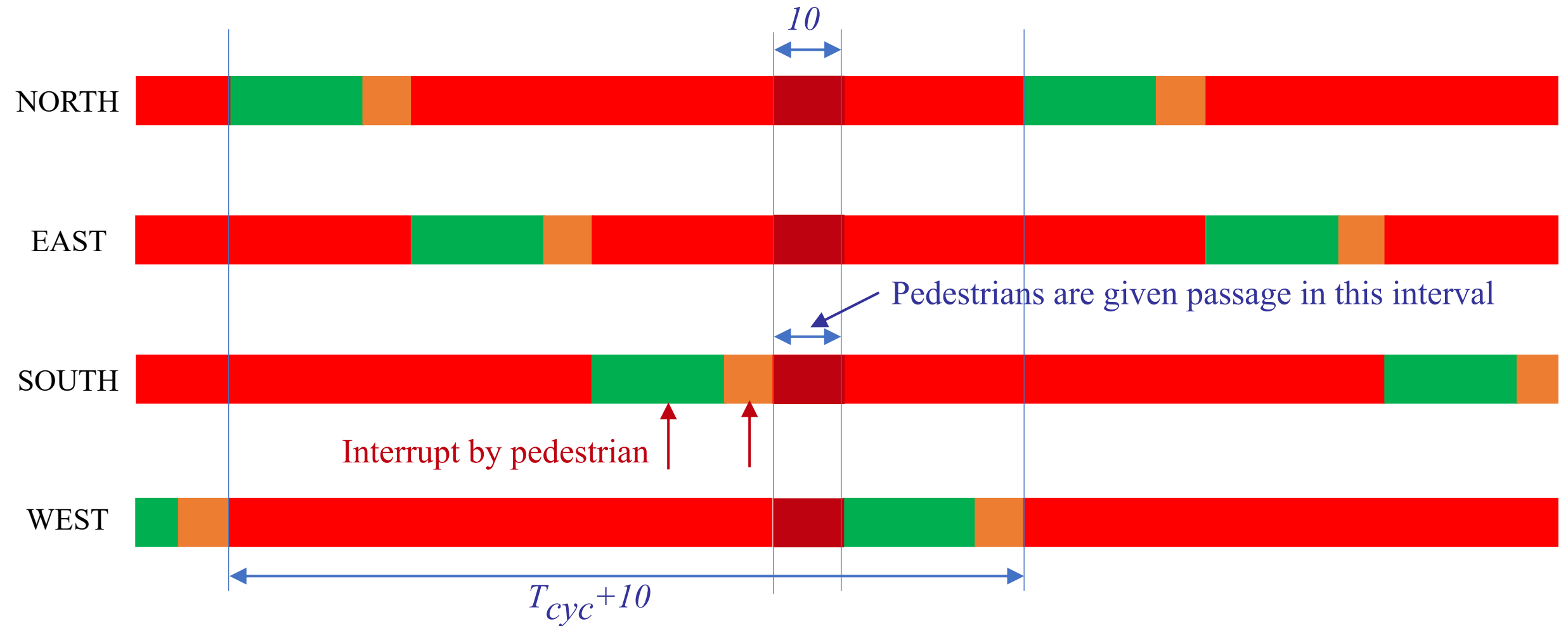# COL719 Lab Assignment 1

Timing diagrams and computation details

Normal timings
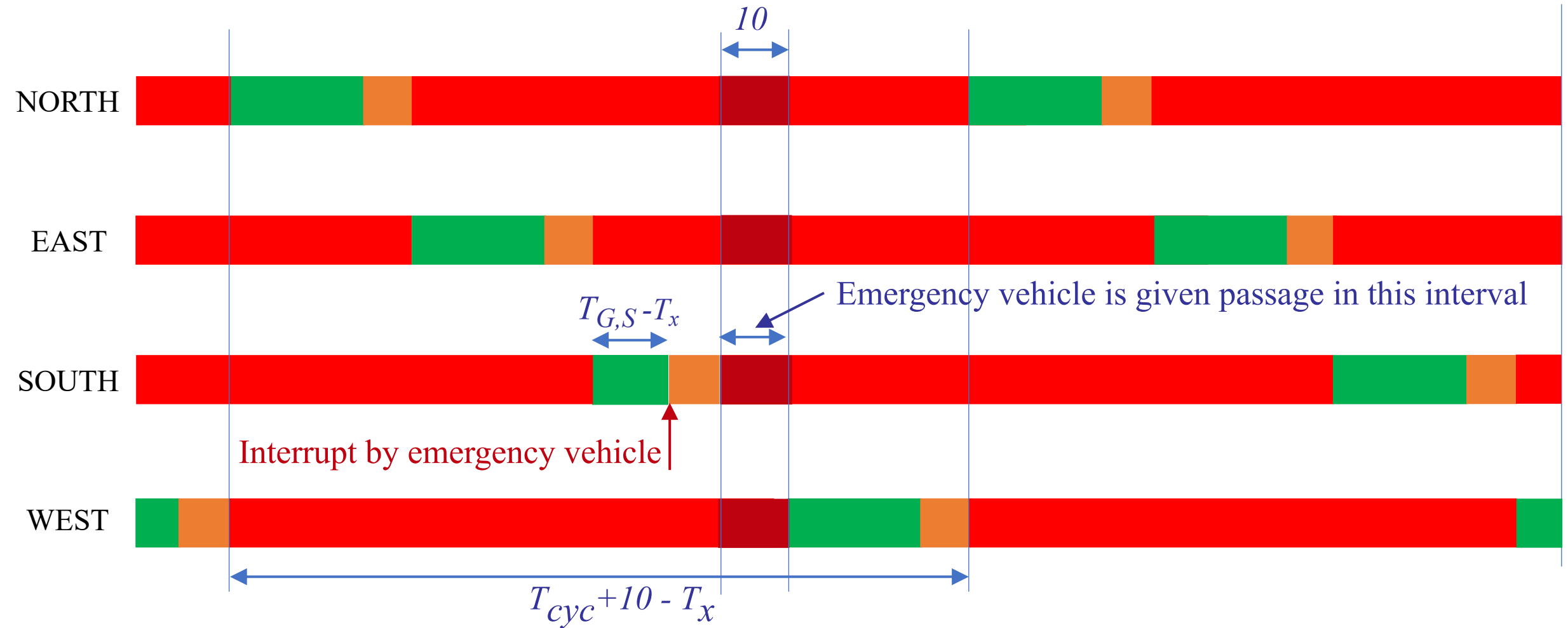

Here N − E − S − W sequence is assumed. Reverse of this is equally valid
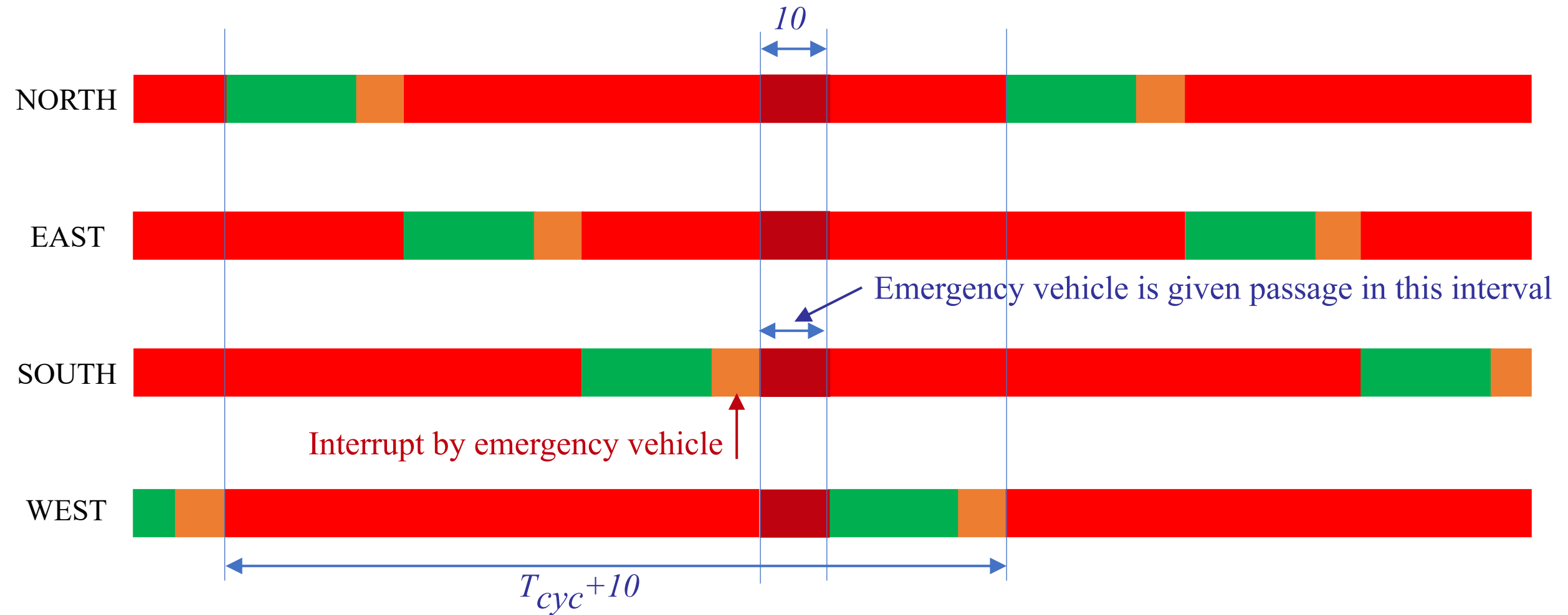
Timings with pedestrian interrupt

A pedestrian makes a request while it is green/orange for SOUTH. Green/orange interval is not reduced.
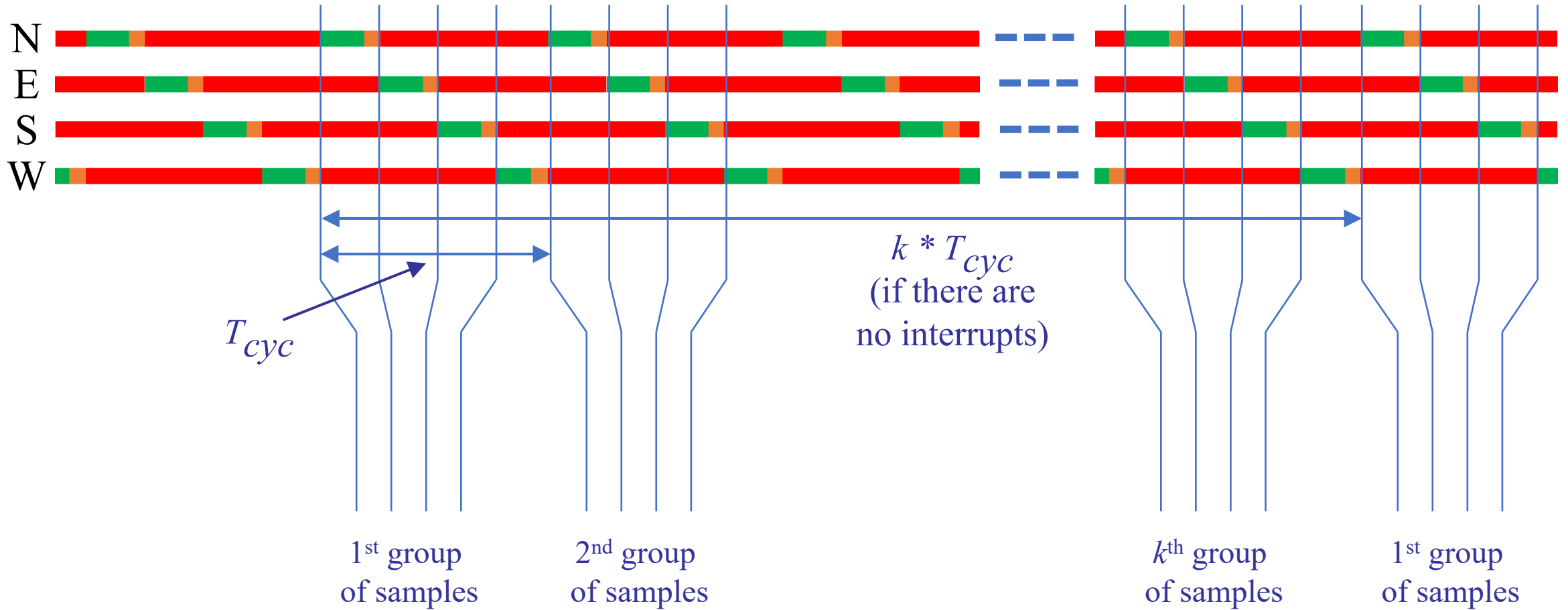
Timings with emergency vehicle interrupt - 1

An emergency vehicle makes a request while it is green for SOUTH. Remaining time for green (let us denote it by T_x) is cut short.

Timings with emergency vehicle interrupt - 2

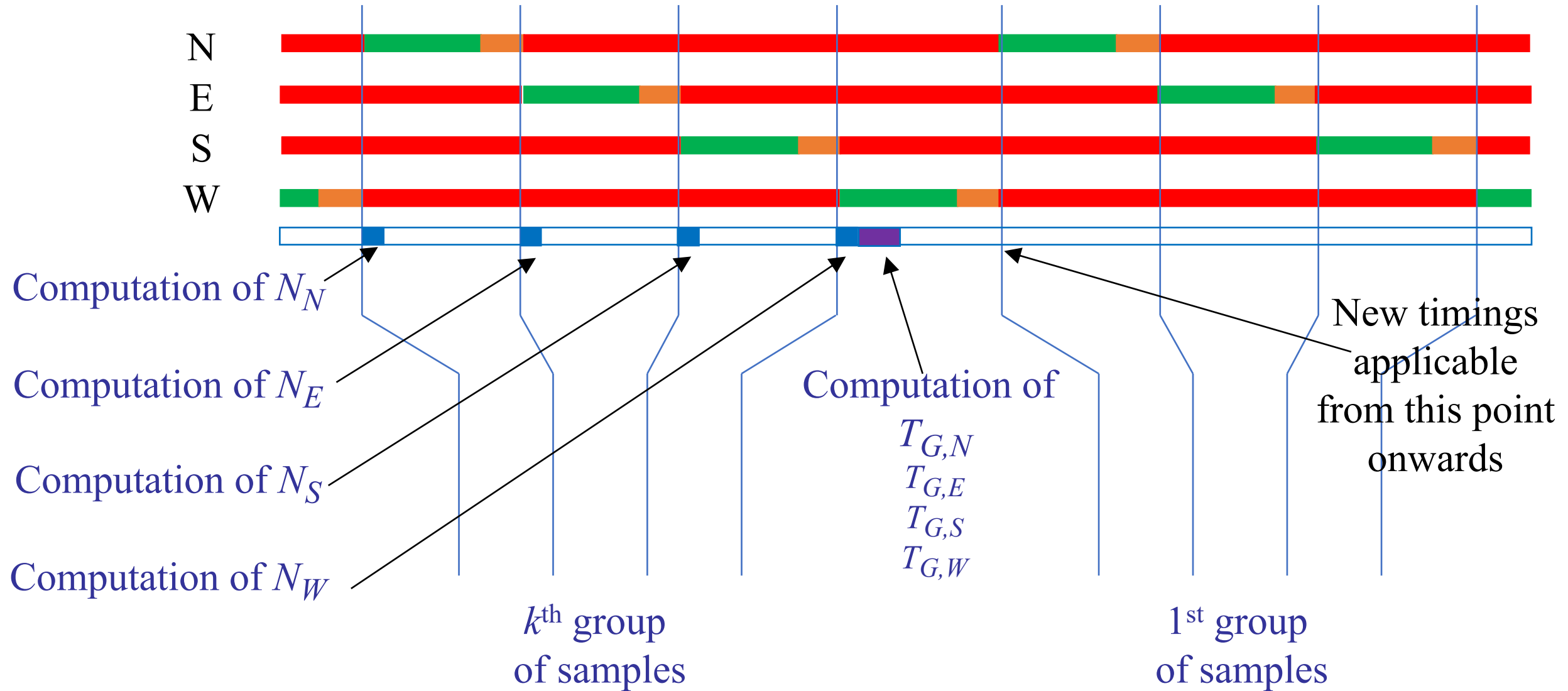
An emergency vehicle makes a request while it is orange for SOUTH.
Orange interval is not reduced.

Timings for sampling number of vehicles waiting

N

E

S

W

T_{cyc}

$k * T_{cyc}$
(if there are
no interrupts)

1st group
of samples

2nd group
of samples

kth group
of samples

1st group
of samples

Timings for computations

N
E
S
W

Computation of N_N

Computation of N_E

Computation of N_S

Computation of N_W

Computation of
$T_{G,N}$
$T_{G,E}$
$T_{G,S}$
$T_{G,W}$

New timings
applicable
from this point
onwards

k^{th} group
of samples

1st group
of samples

Computations to be performed

North sensor unit: $N_N <= (N_{N,1} + N_{N,2} + \ldots + N_{N,k}) / k$
East sensor unit: $\quad N_E <= (N_{E,1} + N_{E,2} + \ldots + N_{E,k}) / k$
South sensor unit: $N_S <= (N_{S,1} + N_{S,2} + \ldots + N_{S,k}) / k$
West sensor unit: $\quad N_W <= (N_{W,1} + N_{W,2} + \ldots + N_{W,k}) / k$
$\qquad$ where $N_{i,p}$ denotes p^{th} sample read by sensor unit on road i.

Adaptation unit:
$N_{avg} <= (N_N + N_E + N_S + N_W) / 4$
$T_{G,N} <= T_{G,N} + \beta * (N_N - N_{avg})$
$T_{G,E} <= T_{G,E} + \beta * (N_E - N_{avg})$
$T_{G,S} <= T_{G,S} + \beta * (N_S - N_{avg})$
$T_{G,W} <= T_{G,W} + \beta * (N_W - N_{avg})$