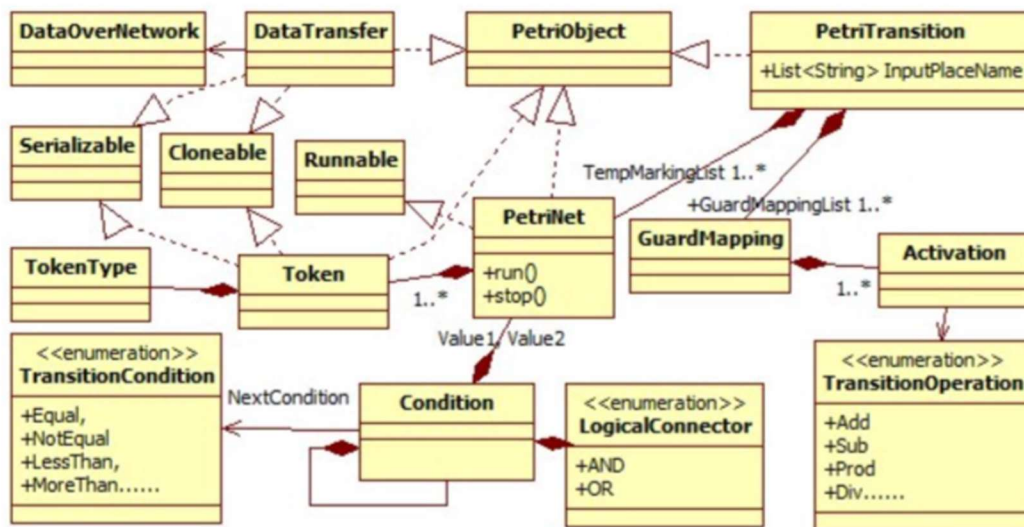


# DCS PROJECT REPORT

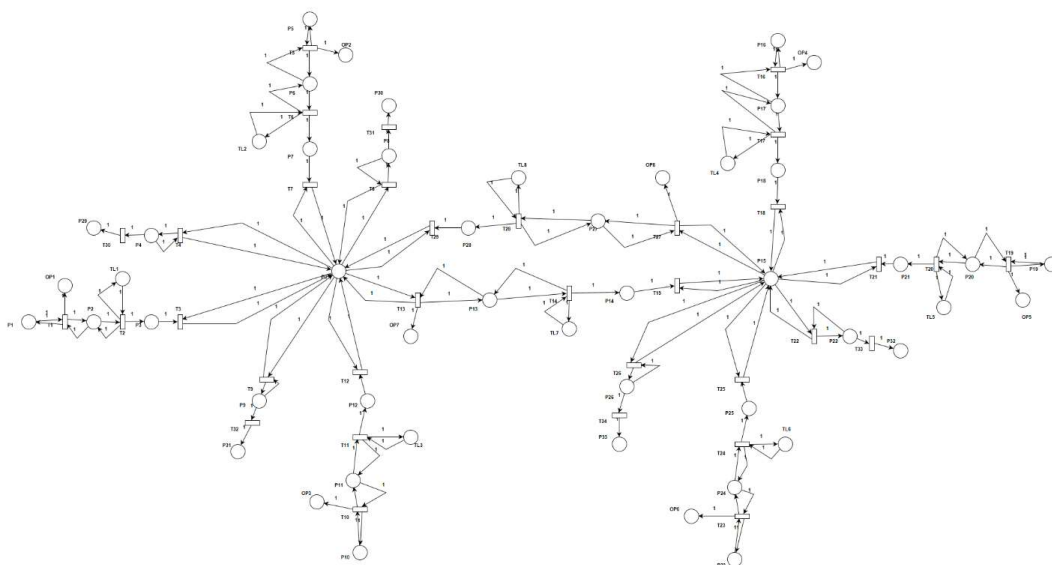
TeamMLT

Mateiu Mihaela (30343), Pițan Timeea (30342), Suci Laura (30342)

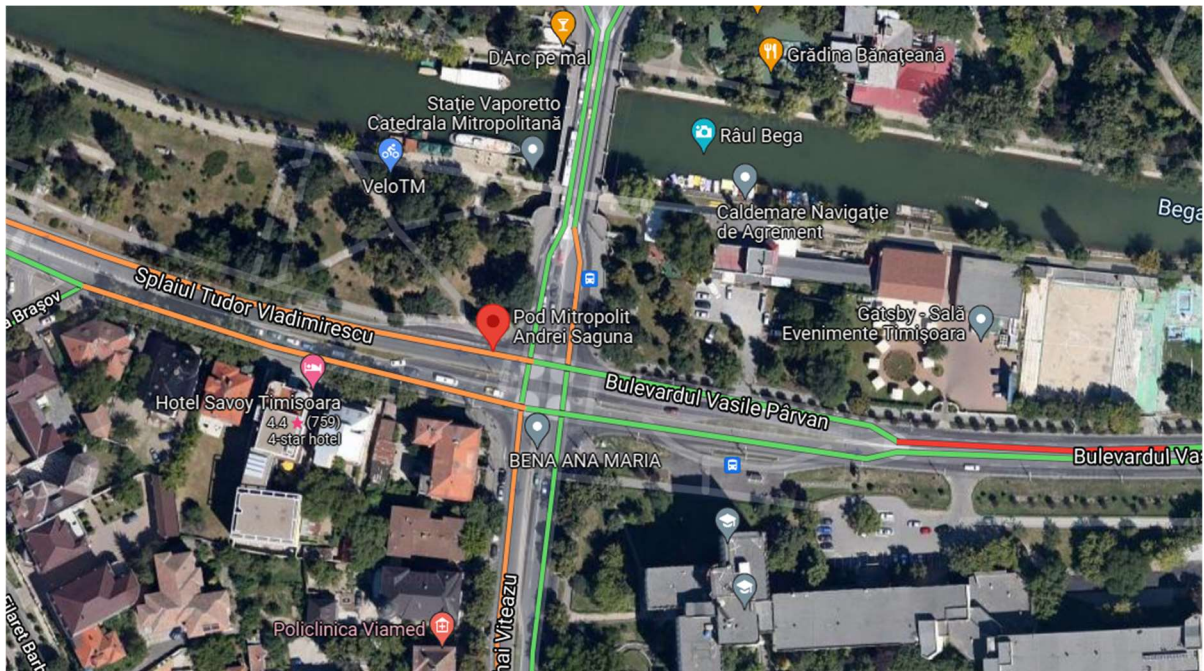
Component diagram for the controllers and the two intersections



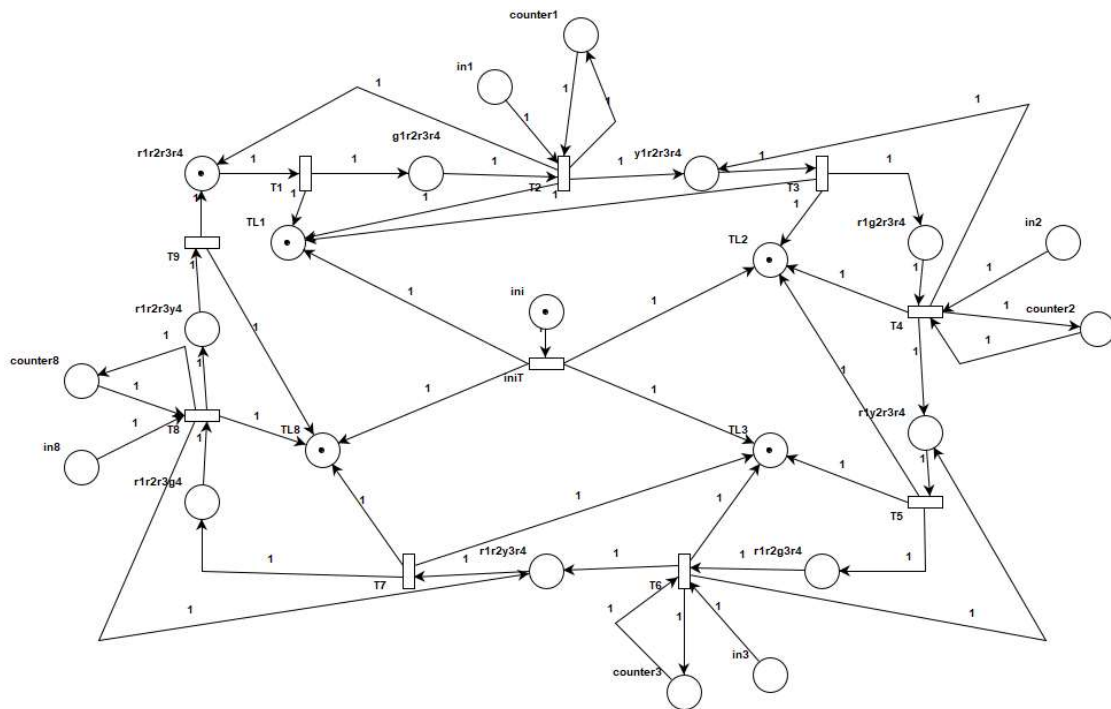
OETPN model for the Lane



First Intersection: <https://goo.gl/maps/PtkgVeWZSktTamR46>



Model for the first intersection

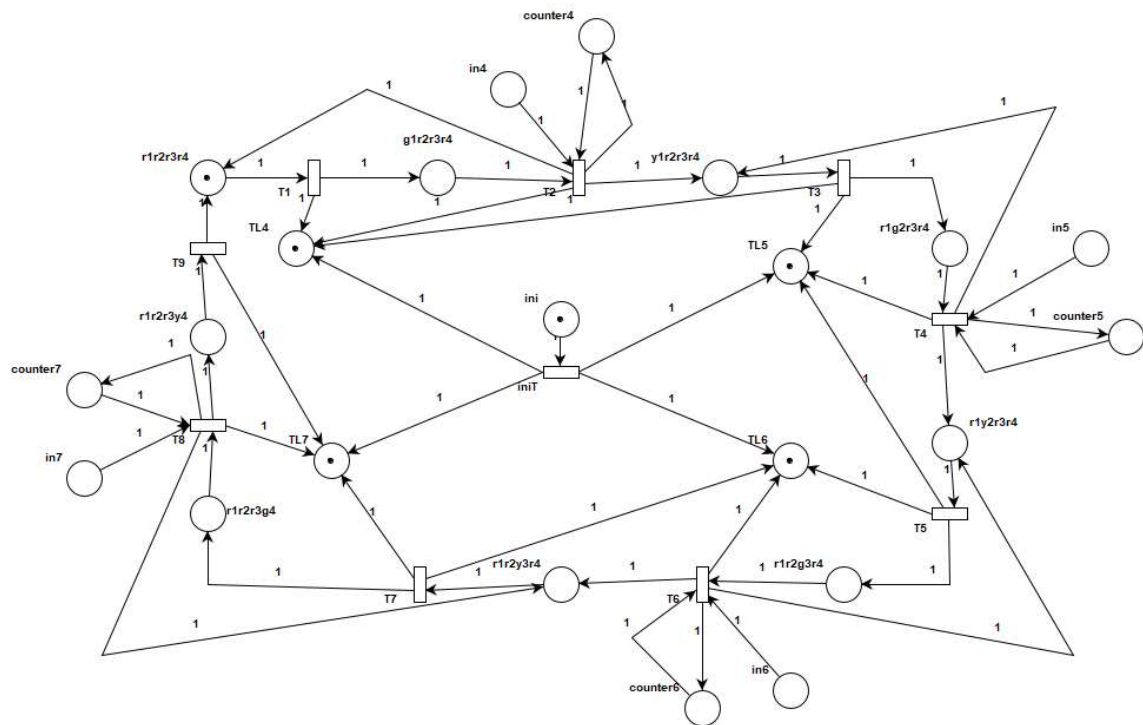




Second Intersection: <https://goo.gl/maps/vkYXGj3SUKJQmxsf6>



Model for the second intersection



## Guard and Mappings

$\text{type}(P1) = \text{type}(P3) = \text{type}(P5) = \text{type}(P7) = \text{type}(P10) = \text{type}(P12) = \text{type}(P14) = \text{type}(P16) = \text{type}(P18) =$   
 $\text{type}(P19) = \text{type}(P21) = \text{type}(P23) = \text{type}(P25) = \text{type}(P28) = \text{type}(29) = \text{type}(30) = \text{type}(P31) = \text{type}(P32)$   
 $= \text{type}(P33) = \text{DataCar}$

$\text{type}(P0) = \text{type}(P2) = \text{type}(P4) = \text{type}(P6) = \text{type}(P8) = \text{type}(P9) = \text{type}(P11) = \text{type}(P13) = \text{type}(P15) =$   
 $\text{type}(P17) = \text{type}(P20) = \text{type}(P22) = \text{type}(P24) = \text{type}(P26) = \text{type}(P27) = \text{DataCarQueue}$

$\text{type}(TL1) = \text{type}(TL2) = \text{type}(TL3) = \text{type}(TL4) = \text{type}(TL5) = \text{type}(TL6) = \text{type}(TL7) = \text{type}(TL8) = \text{DataString}$

$\text{type}(OP1) = \text{type}(OP2) = \text{type}(OP3) = \text{type}(OP4) = \text{type}(OP5) = \text{type}(OP6) = \text{type}(OP7) = \text{type}(OP8) =$   
 $\text{DataTransfer}$

$grd_1^1 = (P1 \text{ NotNull}) \text{ AND } (P2 \text{ CanAddCars})$

$map_1^1 : P1 \text{ Add Element } P2$

$grd_1^2 = (P1 \text{ NotNull}) \text{ AND } (P2 \text{ CanNotAddCars})$

$map_1^2 : OP1 \text{ SendOverNetwork}(\text{full})$

$: P1=P1$

$grd_2 = (TL1 == \text{green}) \text{ AND } (P2 \text{ HaveCar})$

$map_2 : (P2)\text{PopElementWithoutTarget}(P3)$

$: TL1=TL1$

$grd_3 = (P3 \text{ NotNull}) \text{ AND } (P0 \text{ CanAddCars})$

$map_2 : P3 \text{ AddElement } P0$

$grd_4 = (P0 \text{ HaveCarForMe}) \text{ AND } (P4 \text{ CanAddCars})$

$map_4 : P0 \text{ PopElementWithTargetToQueue } P4$

$grd_5^1 = (P5 \text{ NotNull}) \text{ AND } (P6 \text{ CanAddCars})$

$map_5^1 : P5 \text{ AddElement } P6$

$grd_5^2 = (P5 \text{ NotNull}) \text{ AND } (P6 \text{ CanNotAddCars})$

$map_5^2 : OP2 \text{ SendOverNetwork}(\text{full})$

$: P5=P5$

$grd_6 = (TL2 == \text{green}) \text{ AND } (P6 \text{ HaveCar})$

$map_6 : (P6)\text{PopElementWithoutTarget}(P7)$

$: TL2=TL2$

$grd_7 = (P7 \text{ NotNull}) \text{ AND } (P0 \text{ CanAddCars})$

$map_7$  : P7 AddElement P0

$grd_8$  = (P0 HaveCarForMe) AND (P8 CanAddCars)

$map_8$  : P0 PopElementWithTargetToQueue P8

$grd_9$  = (P0 HaveCarForMe) AND (P9 CanAddCars)

$map_9$  : P0 PopElementWithTargetToQueue P9

$grd_{10}^1$  = (P10 NotNull) AND (P11 CanAddCars)

$map_{10}^1$  : P10 Add Element P11

$grd_{10}^2$  = (P10 NotNull) AND (P11 CanNotAddCars)

$map_{10}^2$  : OP3 SendOverNetwork(full)

: P10=P10

$grd_{11}$  = (TL3 == green) AND (P11 HaveCar)

$map_{11}$  : (P11)PopElementWithoutTarget(P12)

: TL3=TL3

$grd_{12}$  = (P12 != null) AND (P0 CanAddCars)

$map_{12}$  : P0+=P12

$grd_{13}^1$  = (P0 HaveCar) AND (P13 CanAddCars)

$map_{13}^1$  : P13=PopElementWithTargetToQueue(P0)

$grd_{13}^2$  = (P0 != null) AND (P13 CanNotAddCars)

$map_{13}^2$  : OP7=SendOverNetwork(full)

: P0=P0

$grd_{14}$  = (TL7 == green) AND (P13 HaveCar)

$map_{14}$  : P14=PopElementWithoutTarget(P13)

: TL7=TL7

$grd_{15}$  = (P14 != null) AND (P15 CanAddCars)

$map_{15}$  : P15+=P14

$grd_{16}^1$  = (P16 != null) AND (P17 CanAddCars)

$map_{16}^1$  : P17+=P16

$grd_{16}^2$  = (P16 != null) AND (P17 CanNotAddCars)

$map_{16}^2$  : OP4=SendOverNetwork(full)

: P16=P16

$grd_{17}$  = (TL4 == green) AND (P17 HaveCar)

$map_{17}$  : P18=PopElementWithoutTarget(P17)

: TL4=TL4

$grd_{18}$  = (P18 != null) AND (P15 CanAddCars)

$map_{18}$  : P15+=P18

$grd_{19}^1$  = (P19 != null) AND (P20 CanAddCars)

$map_{19}^1$  : P20+=P19

$grd_{19}^2$  = (P19 != null) AND (P20 CanNotAddCars)

$map_{19}^2$  : OP5=SendOverNetwork(full)

: P19=P19

$grd_{20}$  = (TL5 == green) AND (P20 HaveCar)

$map_{20}$  : P21=PopElementWithoutTarget(P20)

: TL5=TL5

$grd_{21}$  = (P21 != null) AND (P15 CanAddCars)

$map_{21}$  : P15+=P21

$grd_{22}$  = (P15 HaveCarForMe) AND (P22 CanAddCars)

$map_{22}$  : P22=PopElementWithTargetToQueue(P15)

$grd_{23}^1$  = (P23 != null) AND (P24 CanAddCars)

$map_{23}^1$  : P24+=P23

$grd_{23}^2$  = (P23 != null) AND (P24 CanNotAddCars)

$map_{23}^2$  : OP6=SendOverNetwork(full)

: P23=P23

$grd_{24}$  = (TL6 Equal green) AND (P24 HaveCar)

$map_{24}$  : (P24 PopElementWithoutTarget P25) AND (TL6 Move TL6)

$grd_{25}$  = (P15 CanAddCars) AND (P25 NotNull)

$map_{25}$  : (P25 AddElement P15)

$grd_{26}$  = (P15 HaveCarForMe) AND (P26 CanAddCars)

$map_{26} : (P15 \text{ PopElementWithTargetToQueue } P26)$   
 $grd_{27}^1 = (P15 \text{ HaveCar}) \text{ AND } (P27 \text{ CanAddCars})$   
 $map_{27}^1 : (P15 \text{ PopElementWithTargetToQueue } P27)$   
 $grd_{27}^2 = (P15 \text{ NotNull}) \text{ AND } (P27 \text{ CanNotAddCars})$   
 $map_{27}^2 : (\text{full SendOverNetwork OP8}) \text{ AND } (P15 \text{ Move } P15)$   
 $grd_{28} = (TL7 = \text{green}) \text{ AND } (P27 \text{ HaveCar})$   
 $map_{28} : (P27 \text{ PopElementWithoutTarget } P28) \text{ AND } (TL8 \text{ Move } TL8)$   
 $grd_{29} = (P0 \text{ CanAddCars}) \text{ AND } (P28 \text{ NotNull})$   
 $map_{29} : (P28 \text{ AddElement } P0)$   
 $grd_{30} = (P4 \text{ HaveCar})$   
 $map_{30} : (P4 \text{ PopElementWithoutTarget } P29)$   
 $grd_{31} = (P8 \text{ HaveCar})$   
 $map_{31} : (P8 \text{ PopElementWithoutTarget } P30)$   
 $grd_{32} = (P9 \text{ HaveCar})$   
 $map_{32} : (P9 \text{ PopElementWithoutTarget } P31)$   
 $grd_{33} = (P22 \text{ HaveCar})$   
 $map_{33} : (P22 \text{ PopElementWithoutTarget } P32)$   
 $grd_{34} = (P26 \text{ HaveCar})$   
 $map_{34} : (P26 \text{ PopElementWithoutTarget } P33)$

### **Screenshots while running the experiment**

Tracing a car going through the first intersection to the output lane of the second intersection





