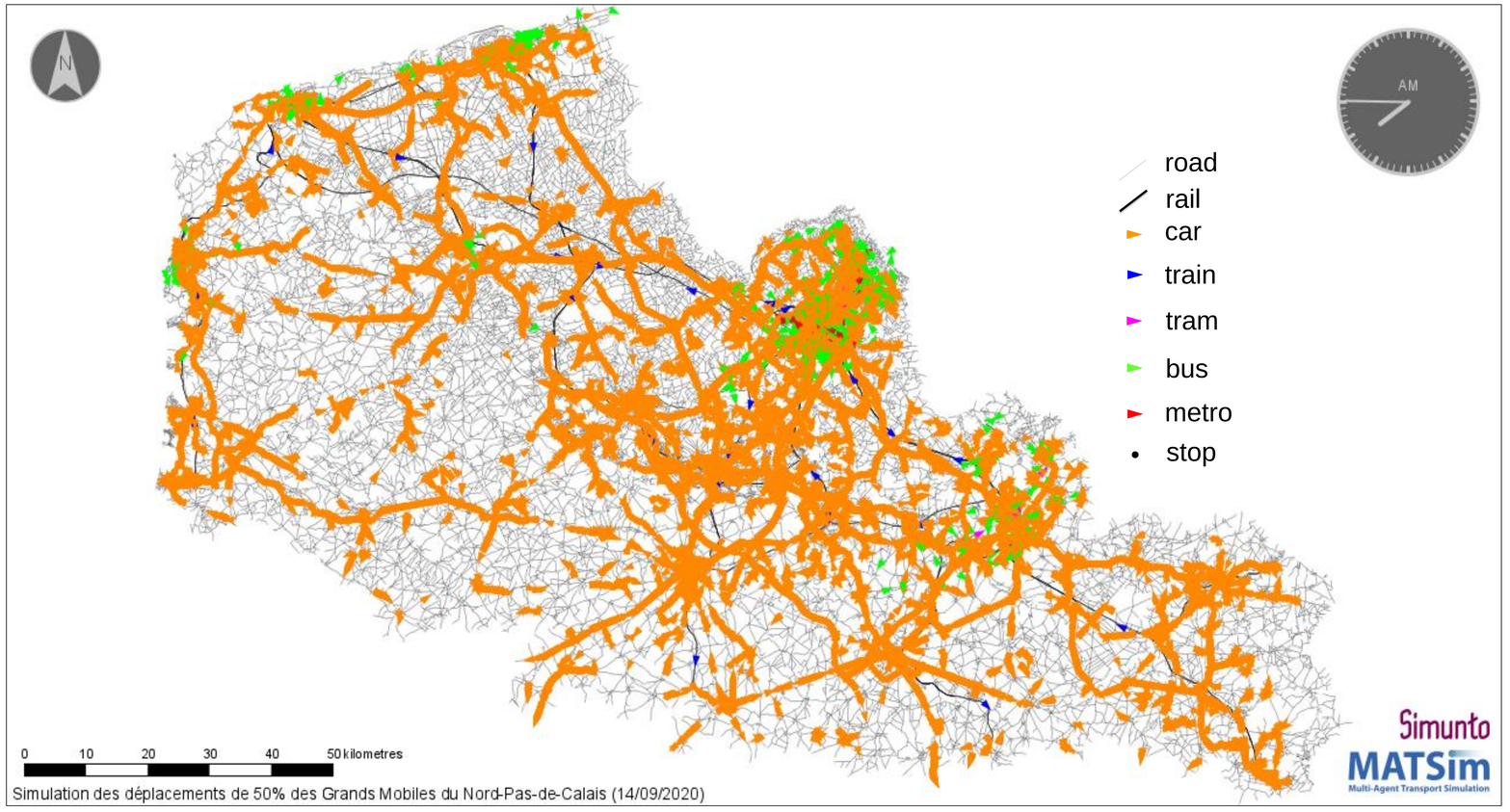
MULTIMODAL MODEL TO EVALUATE REGIONAL TRANSPORT POLICIES

AN APPLICATION FOR NORTH FRANCE

MATSim User Meeting



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March 22, 2021

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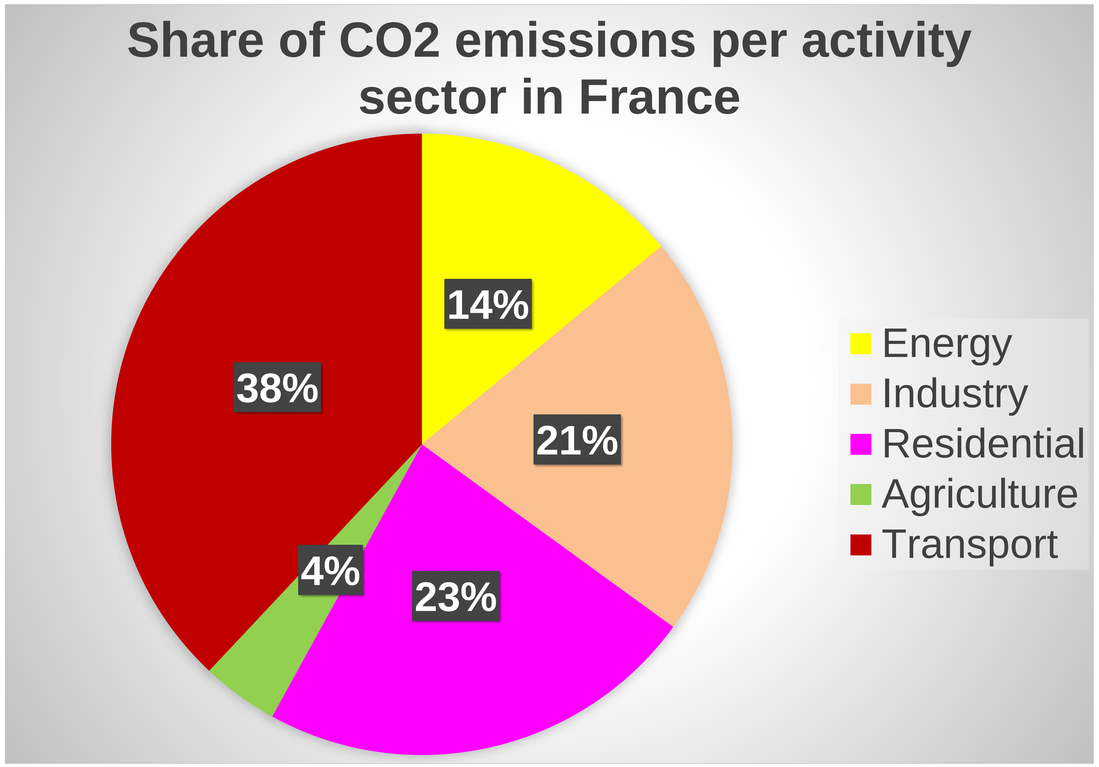
1. Motivation

❑ Environmental issues

Pollution



CITEPA, 2017

- **Transport : 33% (2000) to 38% (2017), while Residential : 22% (2000) to 23% (2017)**
- **Nuclear energy for the other sectors**
- **40% increase in the car fleet**

1. Motivation

❑ Socio-economic issues

- ✓ **Zero fare to promote soft and PT modes**
- ✓ **Application of tolls to limit car use**
- ✓ **congestion**
- ✓ **Parking problems**

1. Motivation

❑ Objectives of mobility policies : Framework Law on Mobility

- ✓ **Increase investment in public transport by 40% by prioritizing the rail system;**
- ✓ **Facilitate and promote access to transport services;**
- ✓ **Initiate the transition to cleaner mobility.**

Simulation as a decision support tool

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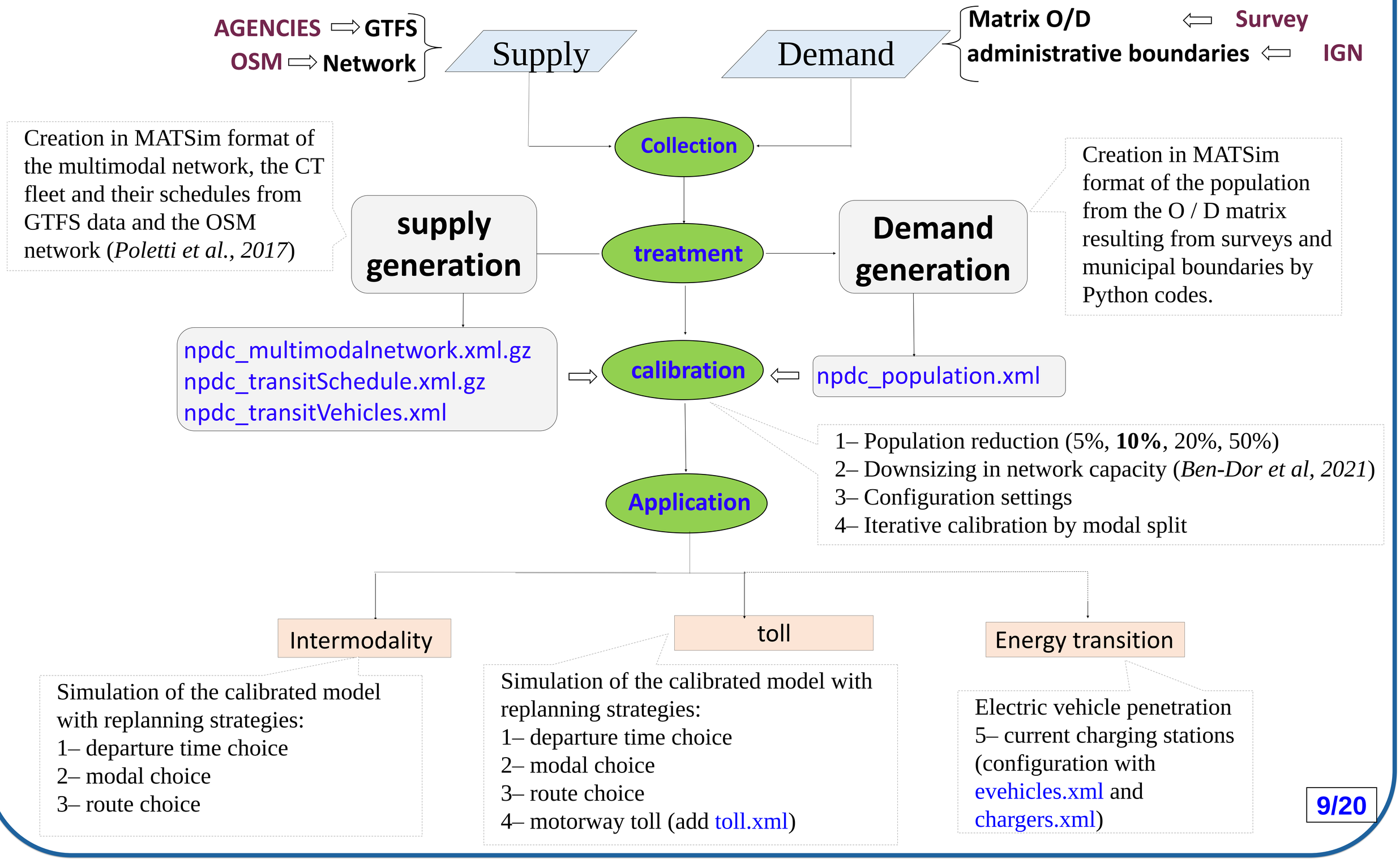
2. Why MATSim

- ✓ **Objective to reproduce individual travel behavior.**
- ✓ **Investigate user interactions according to travel utility parameters related to congestion and travel time**
- ✓ **Simulation on a large scale such as a region**

Simplified methodological approach to setting up our model



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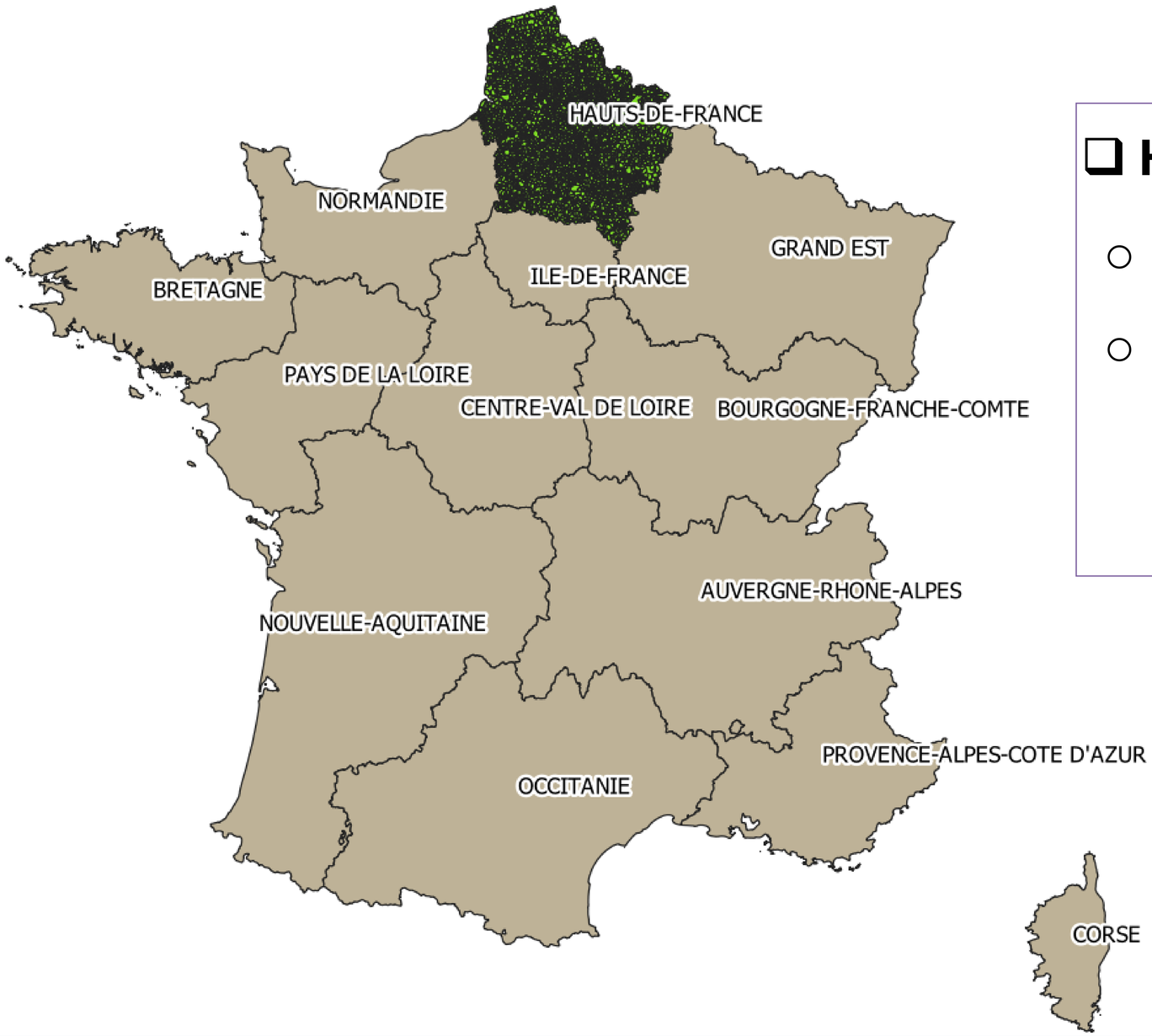
3. Study area

Study area retained …

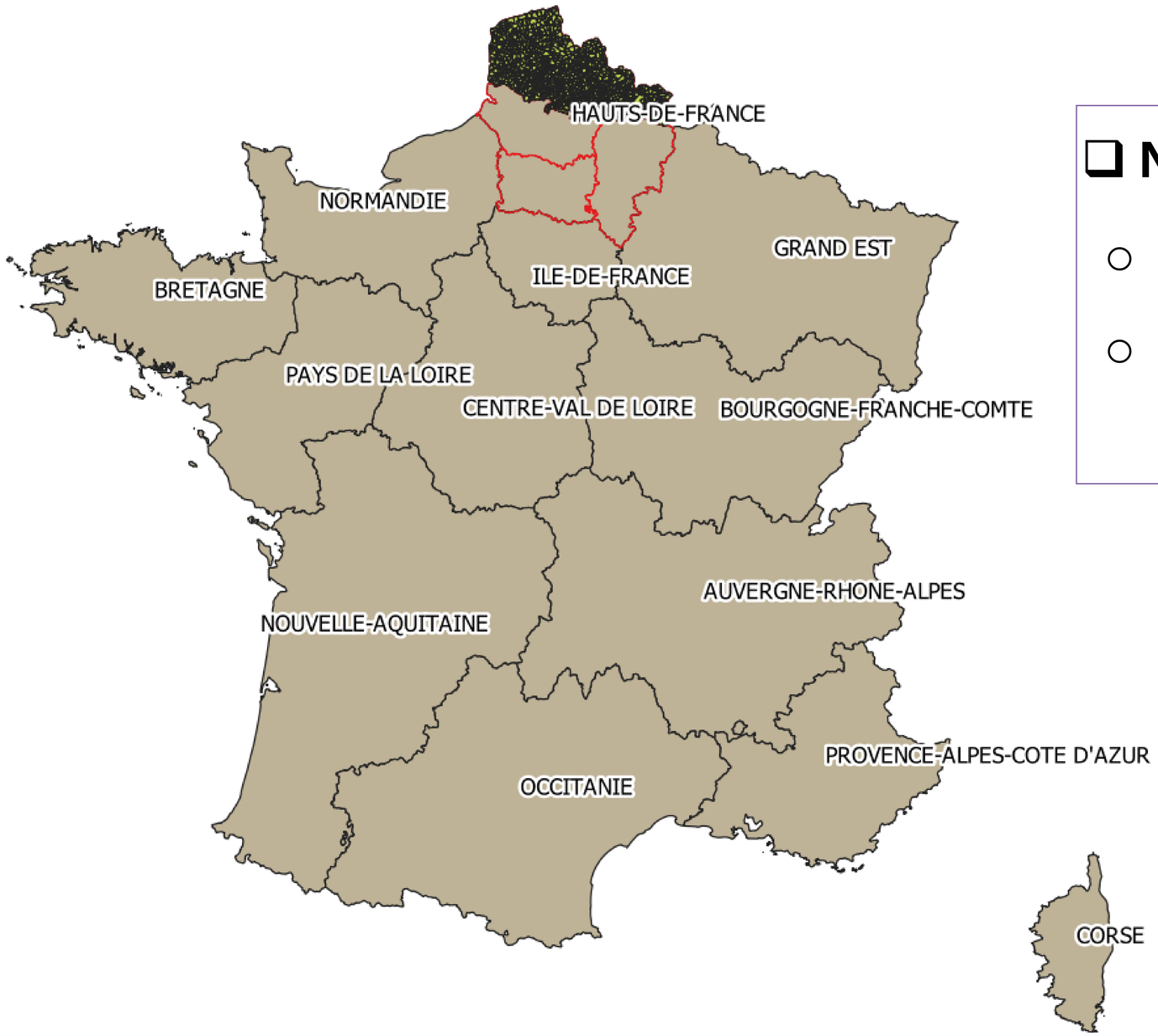


❑ **Hauts-de-France**

- Pop : 6 000 000 hbts
- 2nd most densely populated in France after Île-de-France

3. Study area

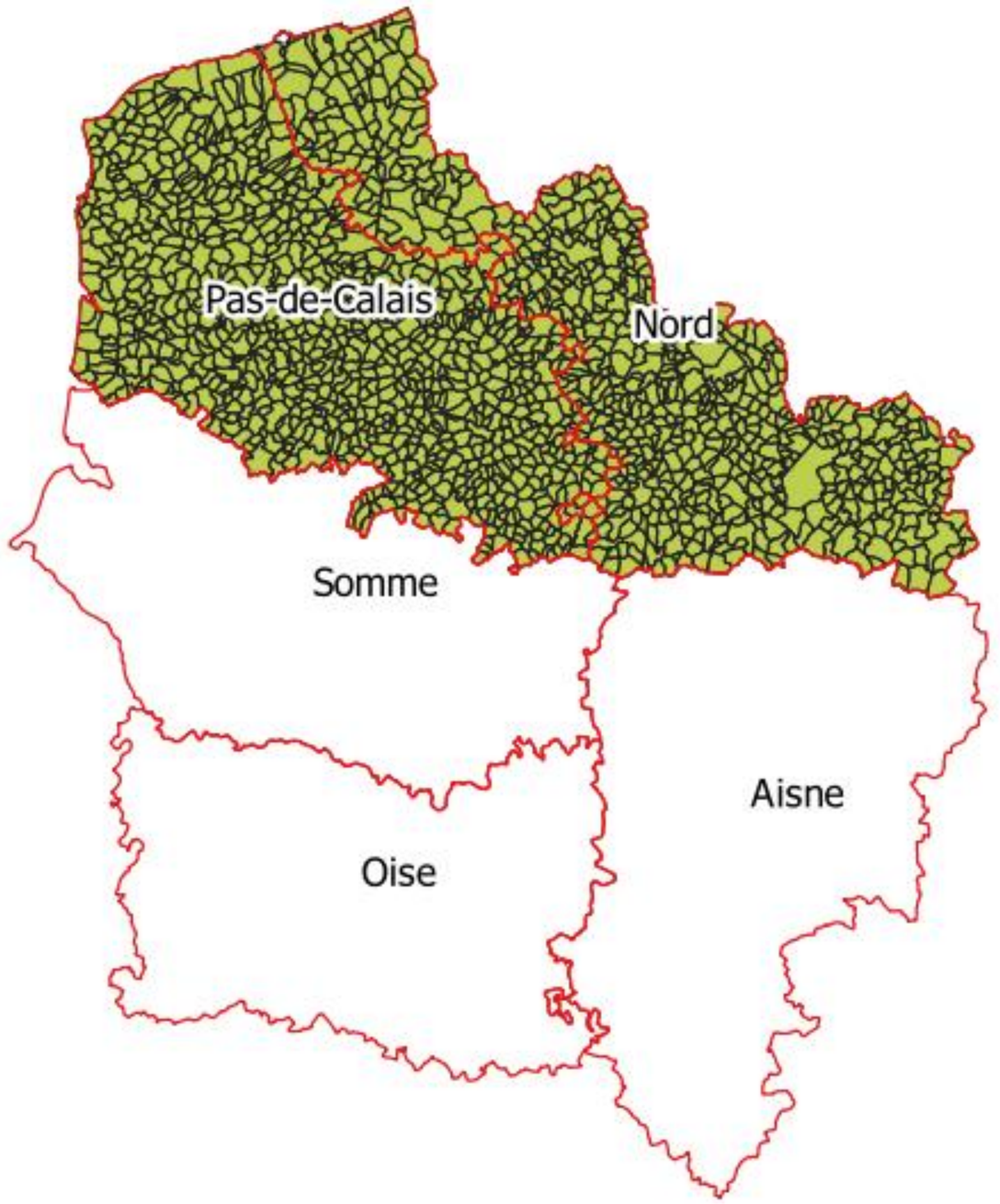
Study area retained …



- **Nord-Pas-de-Calais**
  - Pop : 4 000 000 hbts
  - 68 % of Pop Hauts-de-France

3. Study area

Network study area retained



❑ **Nord-Pas-de-Calais**

- Lille capitalizes most of the flows (A1)
- Logistics zone with Dunkirk port
- Contribution of other areas

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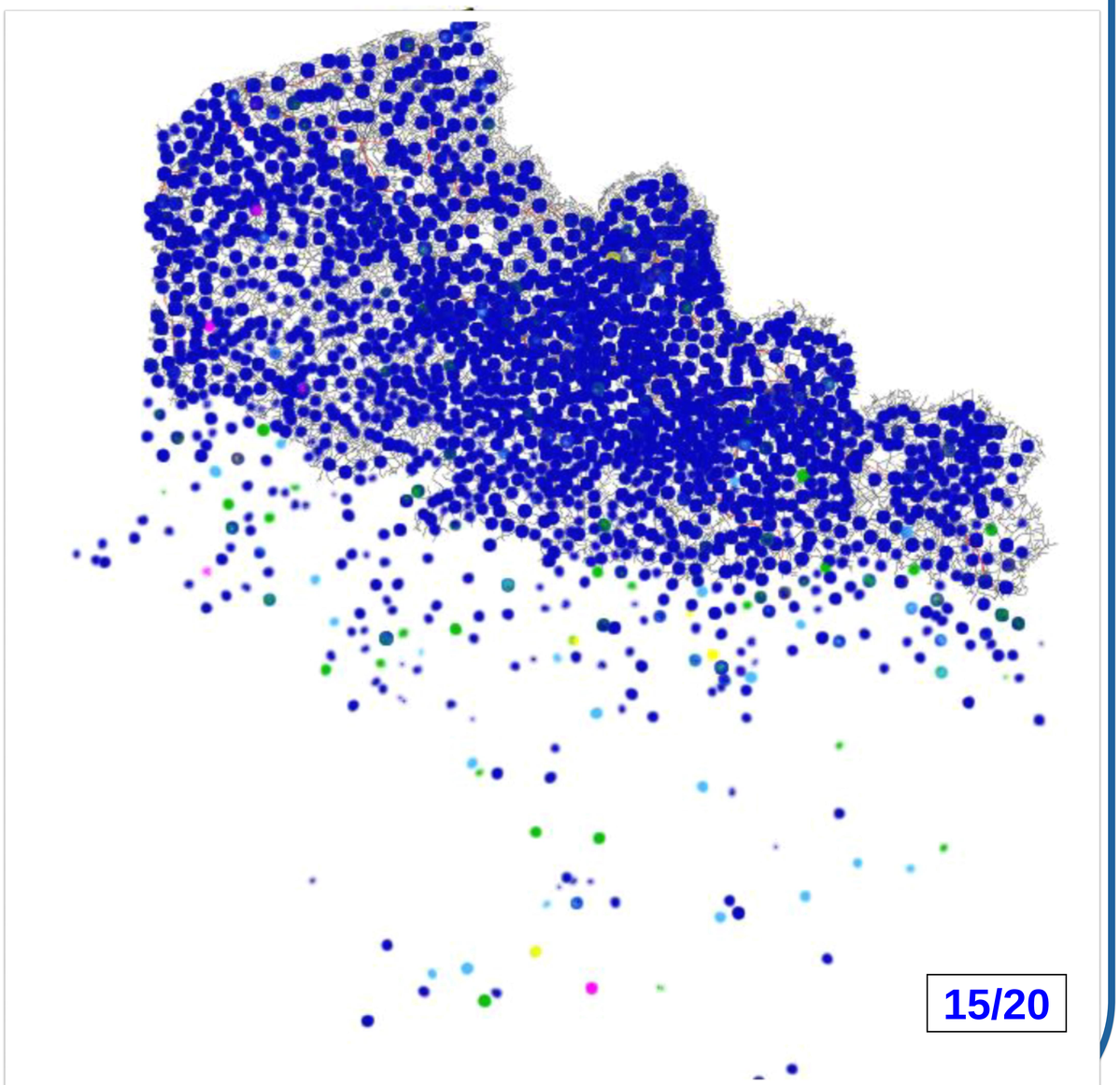
Demand generation

Python Codes :

❑ **Plans**

- From regional survey 2016
- **1 209 213** agents for study of train use
- whose origin or destination relates to our area



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5. Supply generation

Python Codes :

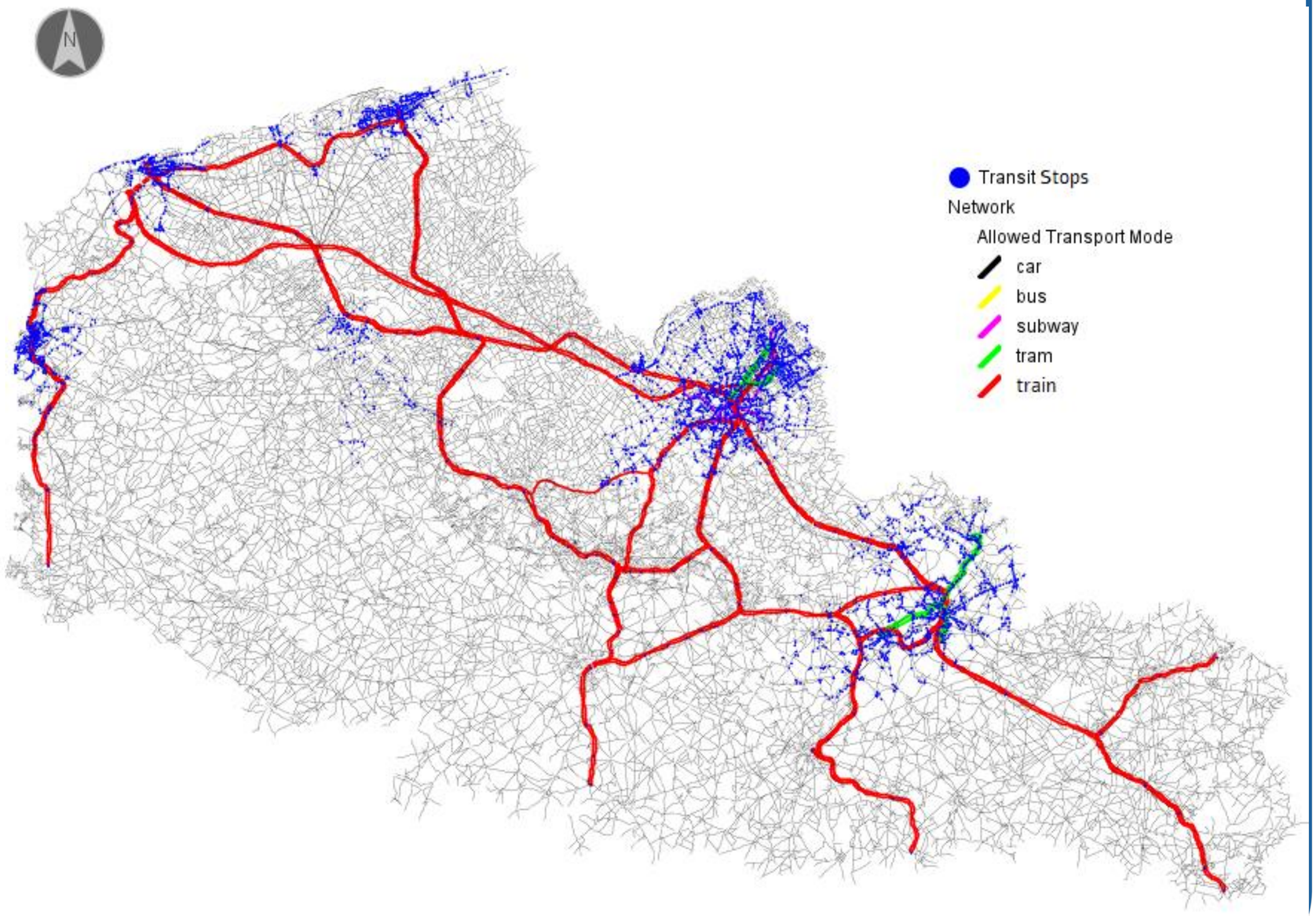
❑ **Pre-treatment**

- GTFS data merging
- data filtering

PT2MATSim :

❑ **Network**

- OSM ---> XML
- Extraction of relevant routes
- Multimodal network
- Stops



5. Supply generation : Extract from PT vehicles

```xml
<?xml version="1.0" encoding="UTF-8"?>

<vehicleDefinitions xmlns="http://www.matsim.org/files/dtd"
    <vehicleType id="Bus">
        <capacity>
            <seats persons="70"/>
            <standingRoom persons="0"/>
        </capacity>
        <length meter="18.0"/>
        <width meter="2.5"/>
        <accessTime secondsPerPerson="0.5"/>
        <egressTime secondsPerPerson="0.5"/>
        <doorOperation mode="serial"/>
        <passengerCarEquivalents pce="2.8"/>
    </vehicleType>
    <vehicleType id="Tram">
        <capacity>
            <seats persons="180"/>
            <standingRoom persons="0"/>
        </capacity>
        <length meter="36.0"/>
        <width meter="2.4"/>
        <accessTime secondsPerPerson="0.25"/>
        <egressTime secondsPerPerson="0.25"/>
        <doorOperation mode="serial"/>
        <passengerCarEquivalents pce="5.2"/>
    </vehicleType>
    <vehicleType id="Subway">
        <capacity>
            <seats persons="300"/>
            <standingRoom persons="0"/>
        </capacity>
        <length meter="30.0"/>
        <width meter="2.45"/>
        <accessTime secondsPerPerson="0.1"/>
        <egressTime secondsPerPerson="0.1"/>
        <doorOperation mode="serial"/>
        <passengerCarEquivalents pce="4.4"/>
    </vehicleType>
```

```xml
    <vehicleType id="Rail">
        <capacity>
            <seats persons="400"/>
            <standingRoom persons="0"/>
        </capacity>
        <length meter="200.0"/>
        <width meter="2.8"/>
        <accessTime secondsPerPerson="0.25"/>
        <egressTime secondsPerPerson="0.25"/>
        <doorOperation mode="serial"/>
        <passengerCarEquivalents pce="27.1"/>
    </vehicleType>
    <vehicle id="veh_0_bus" type="Bus"/>
    <vehicle id="veh_1_bus" type="Bus"/>
    <vehicle id="veh_2_bus" type="Bus"/>
    <vehicle id="veh_3_bus" type="Bus"/>
    <vehicle id="veh_4_bus" type="Bus"/>
    <vehicle id="veh_5_bus" type="Bus"/>
    <vehicle id="veh_6_bus" type="Bus"/>
    <vehicle id="veh_7_bus" type="Bus"/>
    <vehicle id="veh_8_bus" type="Bus"/>
    <vehicle id="veh_9_bus" type="Bus"/>
```

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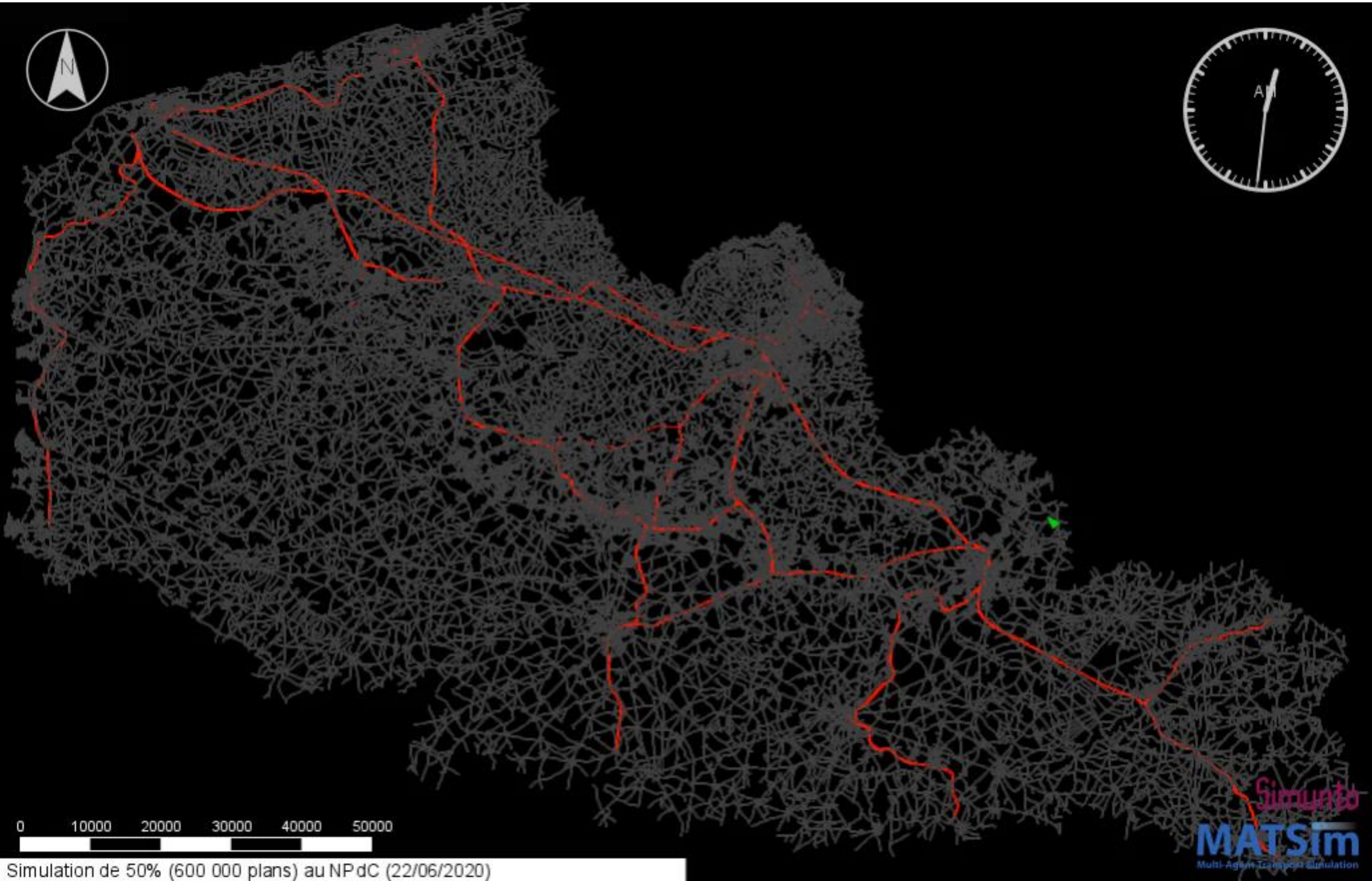
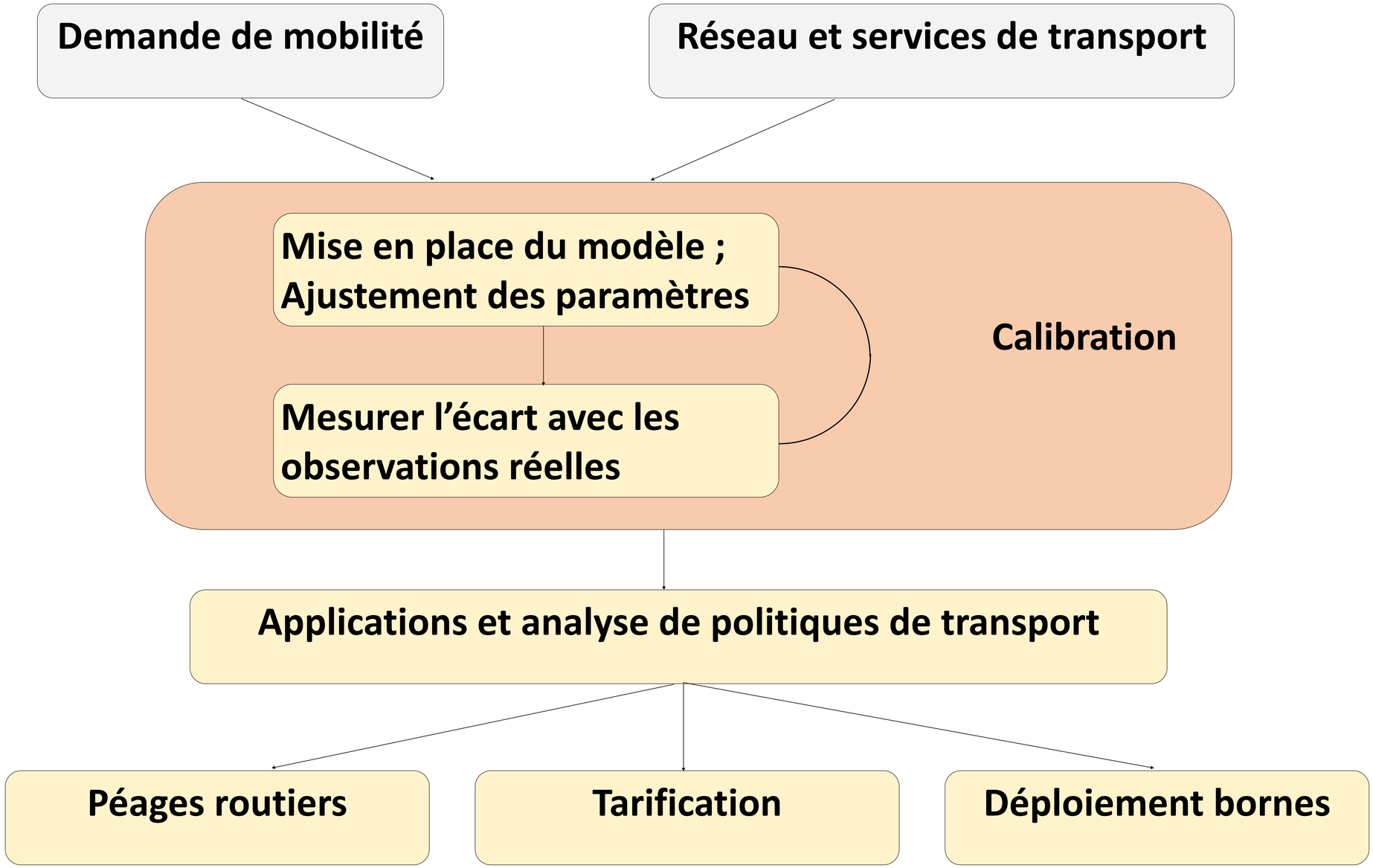
PLAN

1. Motivation
2. Definition of study area
3. Data collection
4. **Demand generation**
5. Supply generation
6. Choice of allocation model
7. Calibration and validation of the model
8. Exploitation of the model

LA MODÉLISATION AU SERVICE DE LA LOGISTIQUE



2.6. Calibration et validation du modèle:



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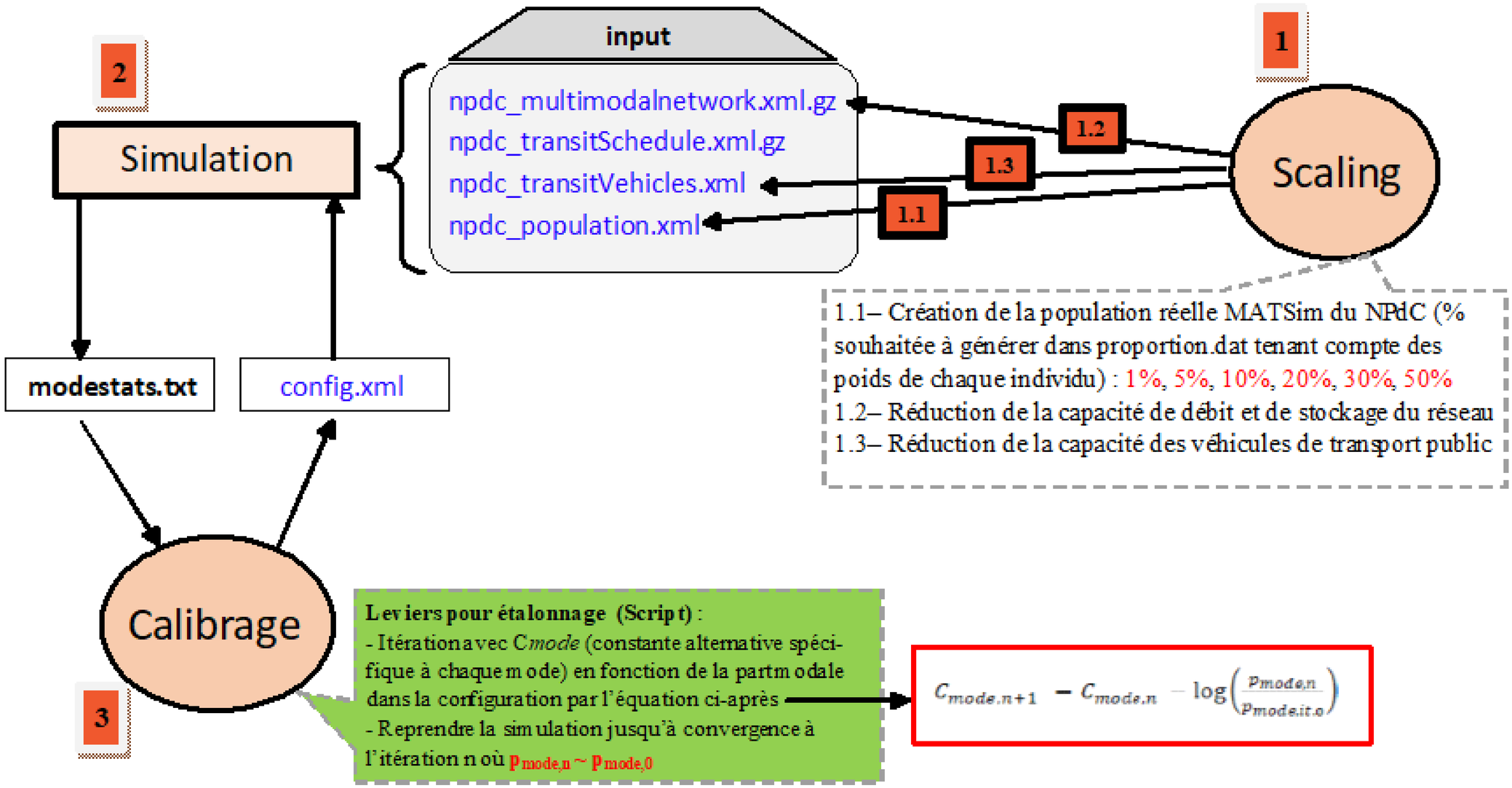
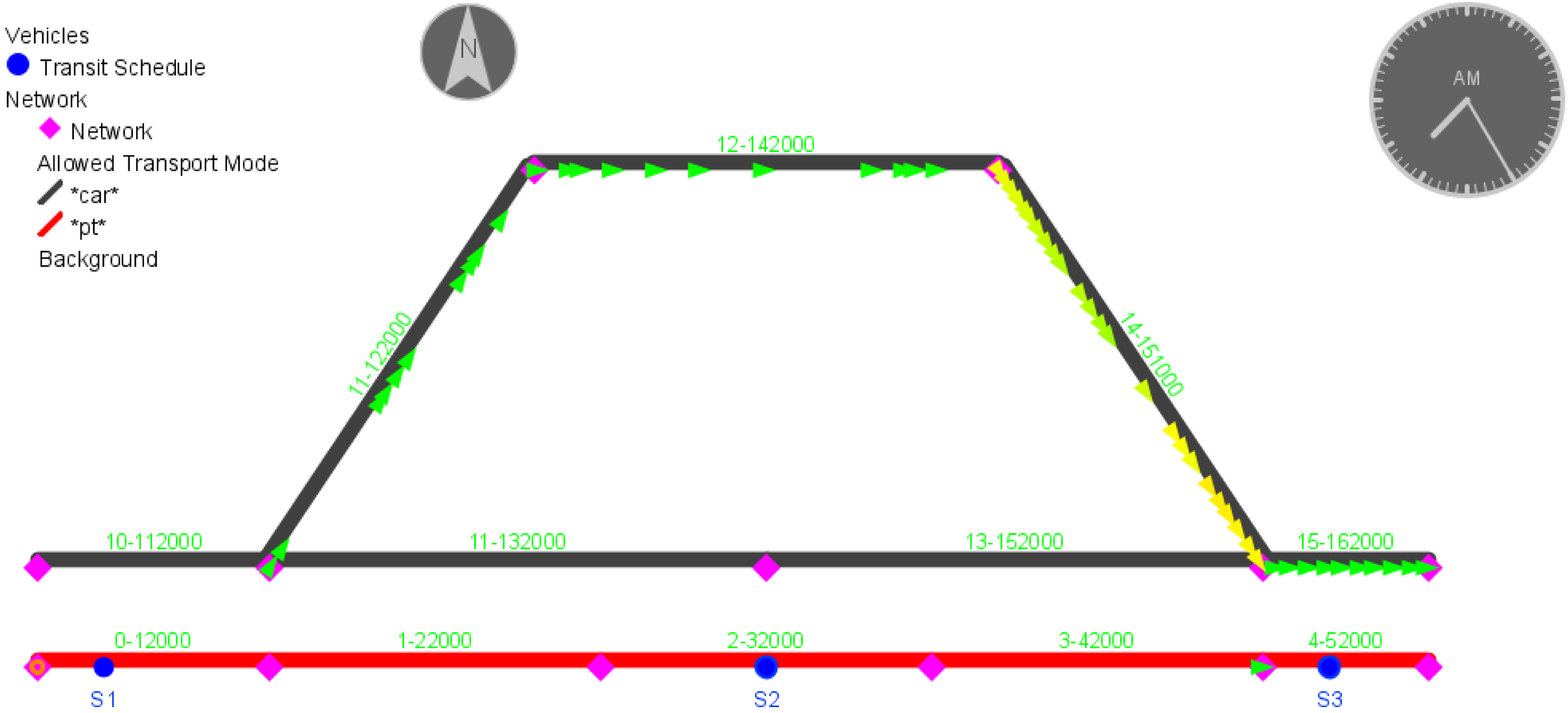
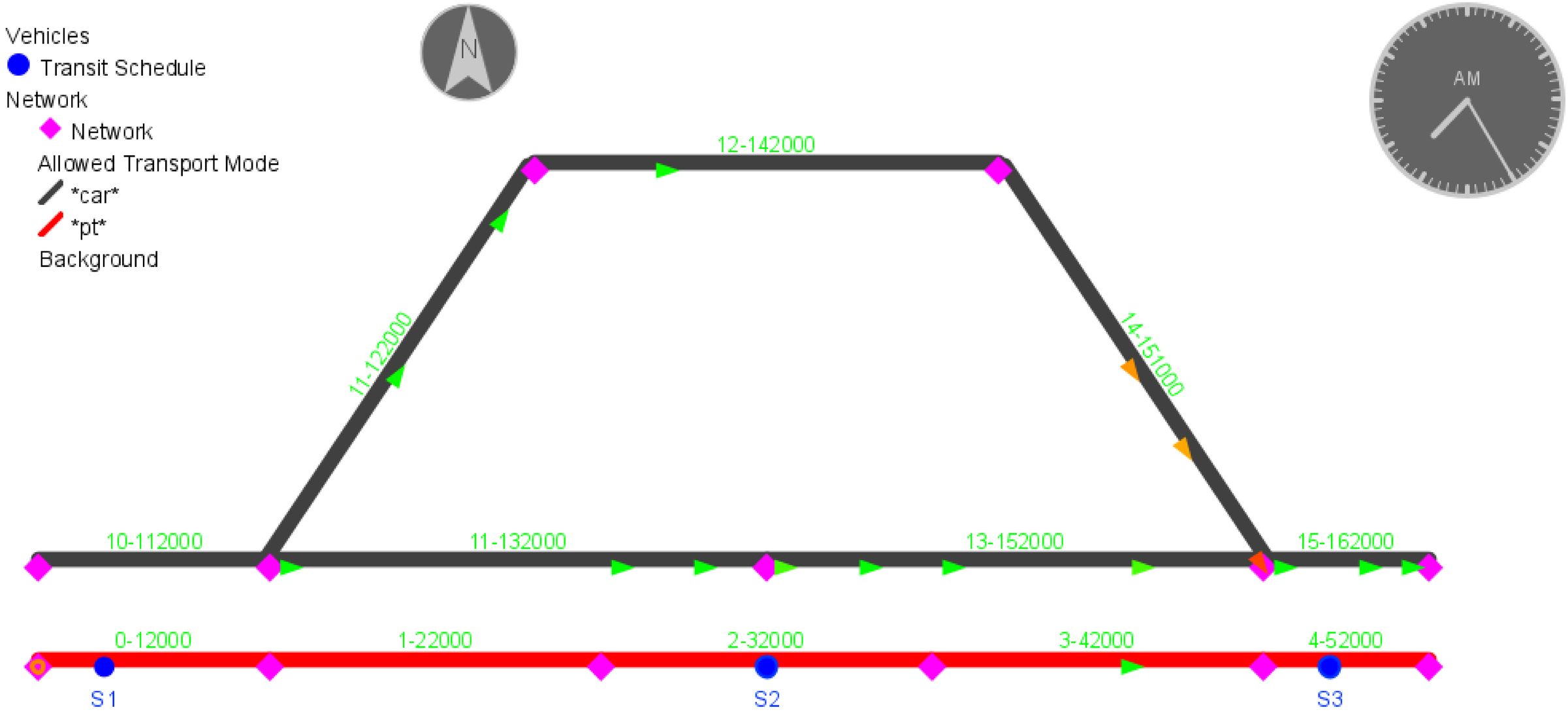
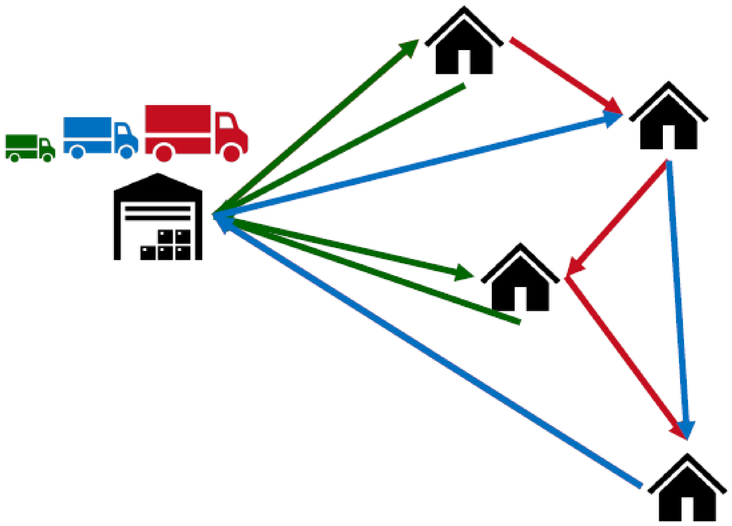


2.7. Exploitation du modèle : Sans péage (à 08h00)



2.7. Exploitation du modèle : Avec péage (à 08h00)





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