



# Public Transport Priority at Traffic Lights

Laurent BREHERET - SODIT



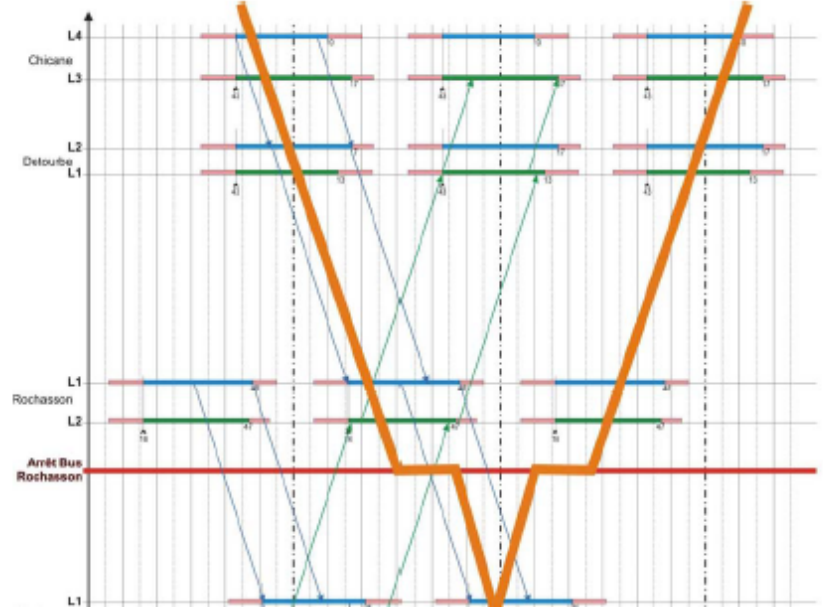
# General concepts for PT priority

- A PT priority system aims at coordinating a set of actions, each of them favoring Public Transport while crossing junctions against all other users
- Two categories of actions have to be undertaken :
  - Static Priority
  - Dynamic Priority



# Static Priority

- Priority Vehicles are considered when traffic signal plan is calculated
- Signal Plan minimise their theoretical waiting time : green wave based on their usual speed
- Where to use it :
  - Routes with high PT frequency
  - Few variations of traffic



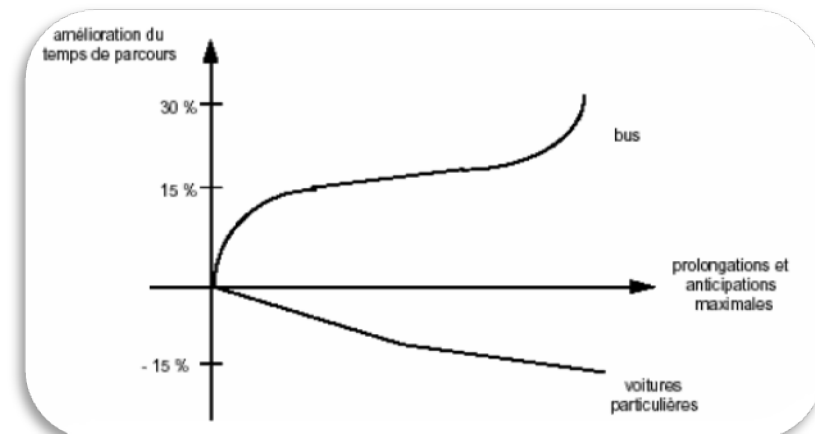


# Dynamic Priority

- On-line adaptation of the signal plan (microregulation) in order to favour PT
- Done by the traffic controller
- Well-suited when traffic conditions are changing rapidly, and when frequency of priority vehicles is low
- Two categories of actions:
  - Earlier or longer compatible green phase
  - Insertion of a green phase dedicated to PT

# Impact of PT Priority on traffic

- PT frequency, traffic volumes and design and capacity of junctions have a great impact on priority efficiency/performance
- Generally, the higher benefits for the PT, the greater degradation for other road users
- The computation of signal plans and determination of activation rules are of the greatest importance



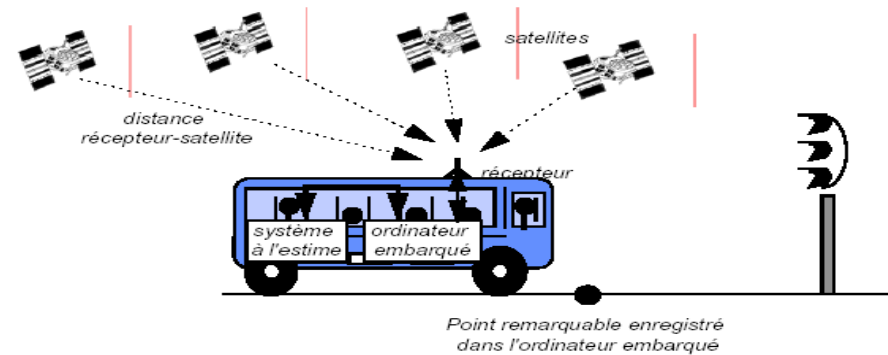


# Efficient approach for PV

- Specific road design can improve the approach of priority vehicles to the junction
  - Reduce absolute value of arrival time
  - Reduce uncertainty on arrival time
- Road installation
  - Reserved lane, full or only near the junction
  - Commercial stop after the junction
  - Separated road

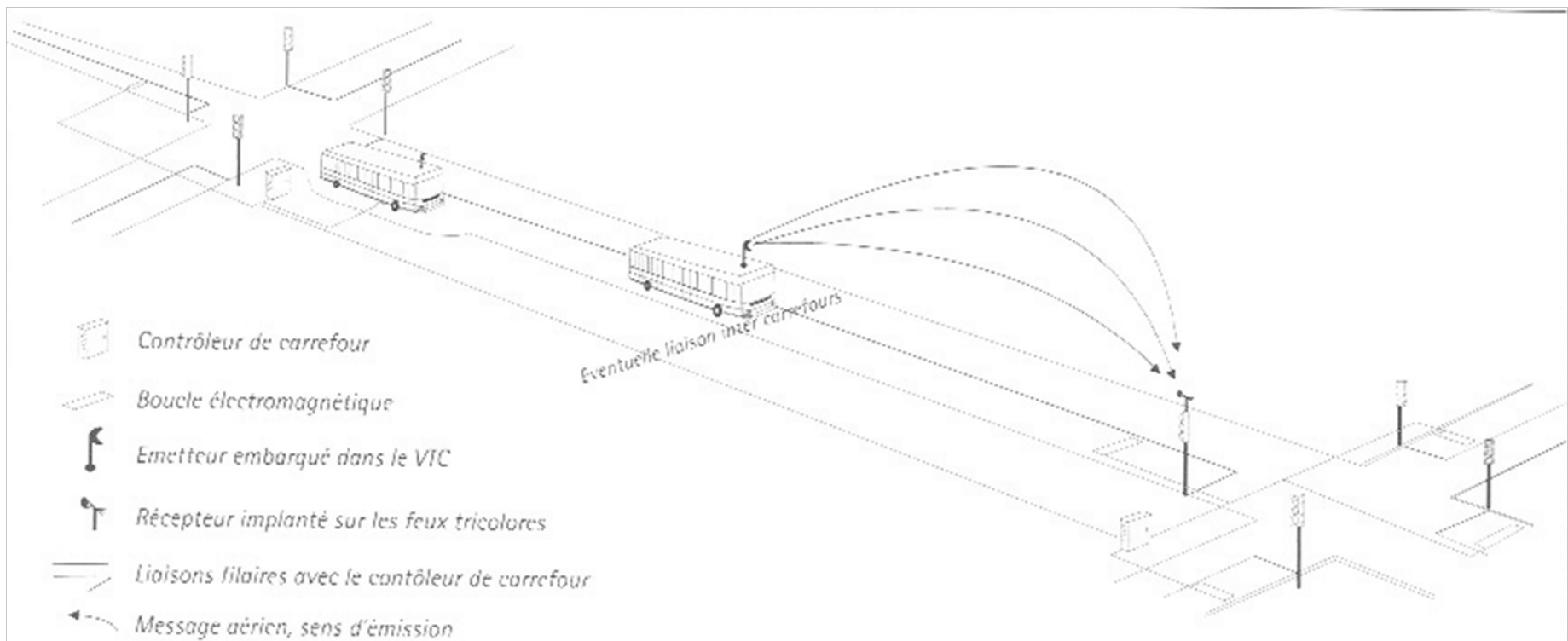
# Components of the priority system

- Detecting the vehicle
  - Local detection
  - On-board localisation
- Transmission of this information to the traffic light controller
- Management of the priority demand
  - Local decision
  - Centralised decision
- → 4 system architectures are possible



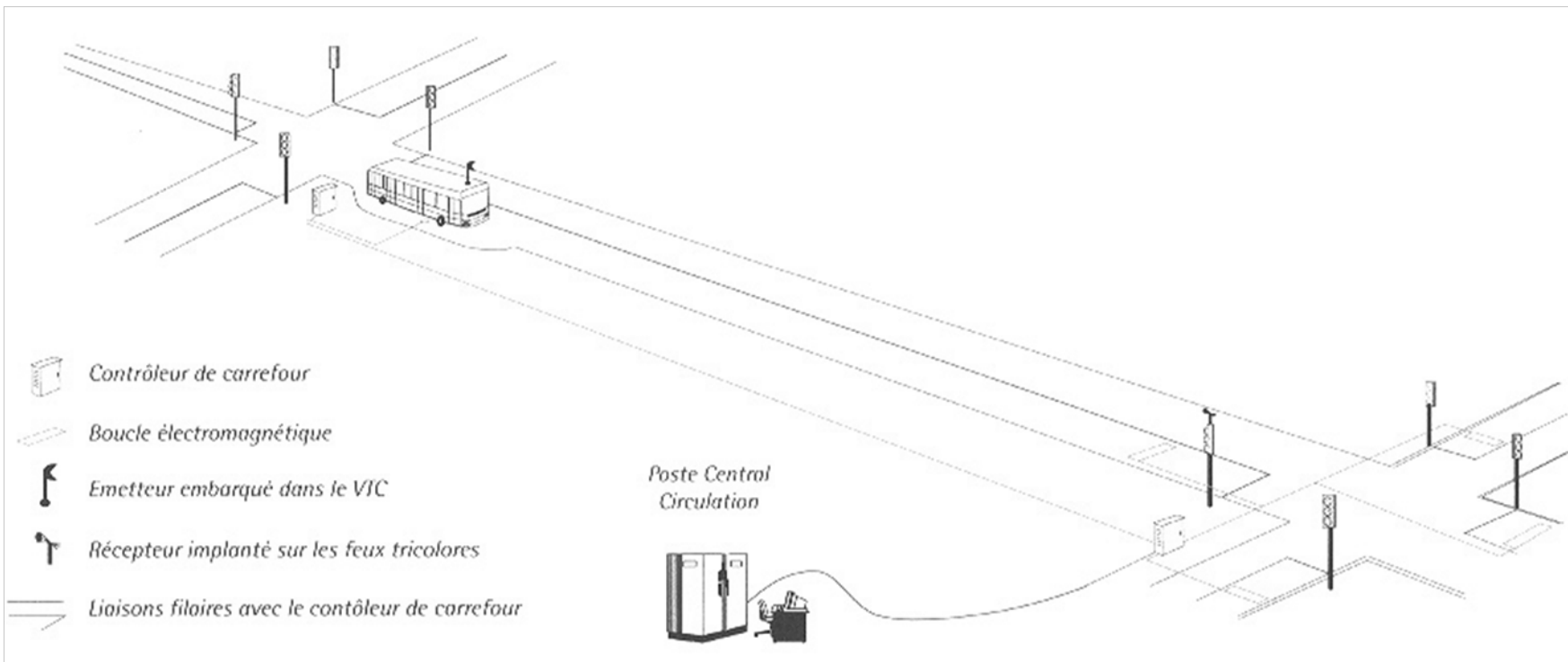
# Local detection / local decision

- Traffic controller receives the approach info
- And compute the new signal plan on its own



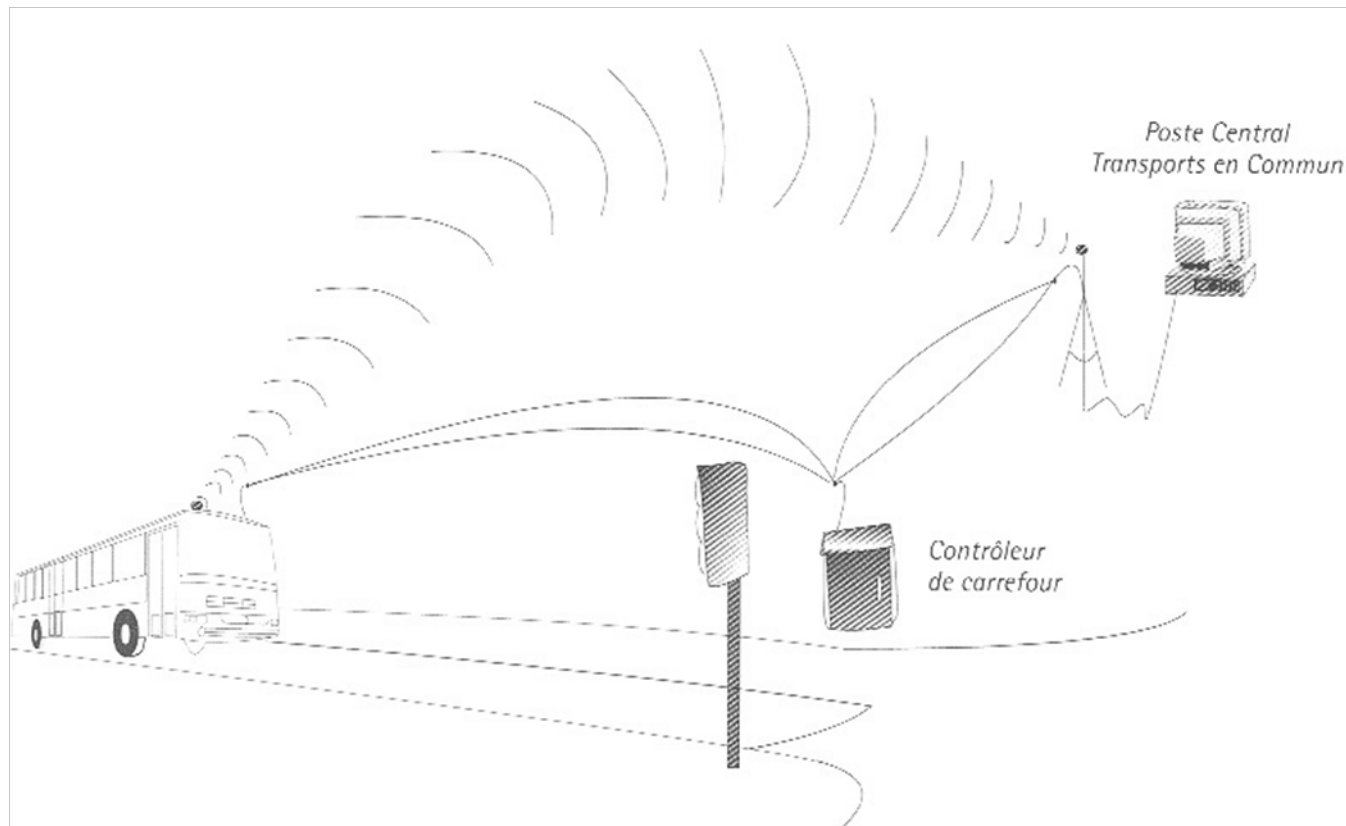
# Local detection / Centralised decision

- PV approach detected by traffic controller
- Adapted signal plan computed by a control centre
- Traffic controller receives new decision from CC



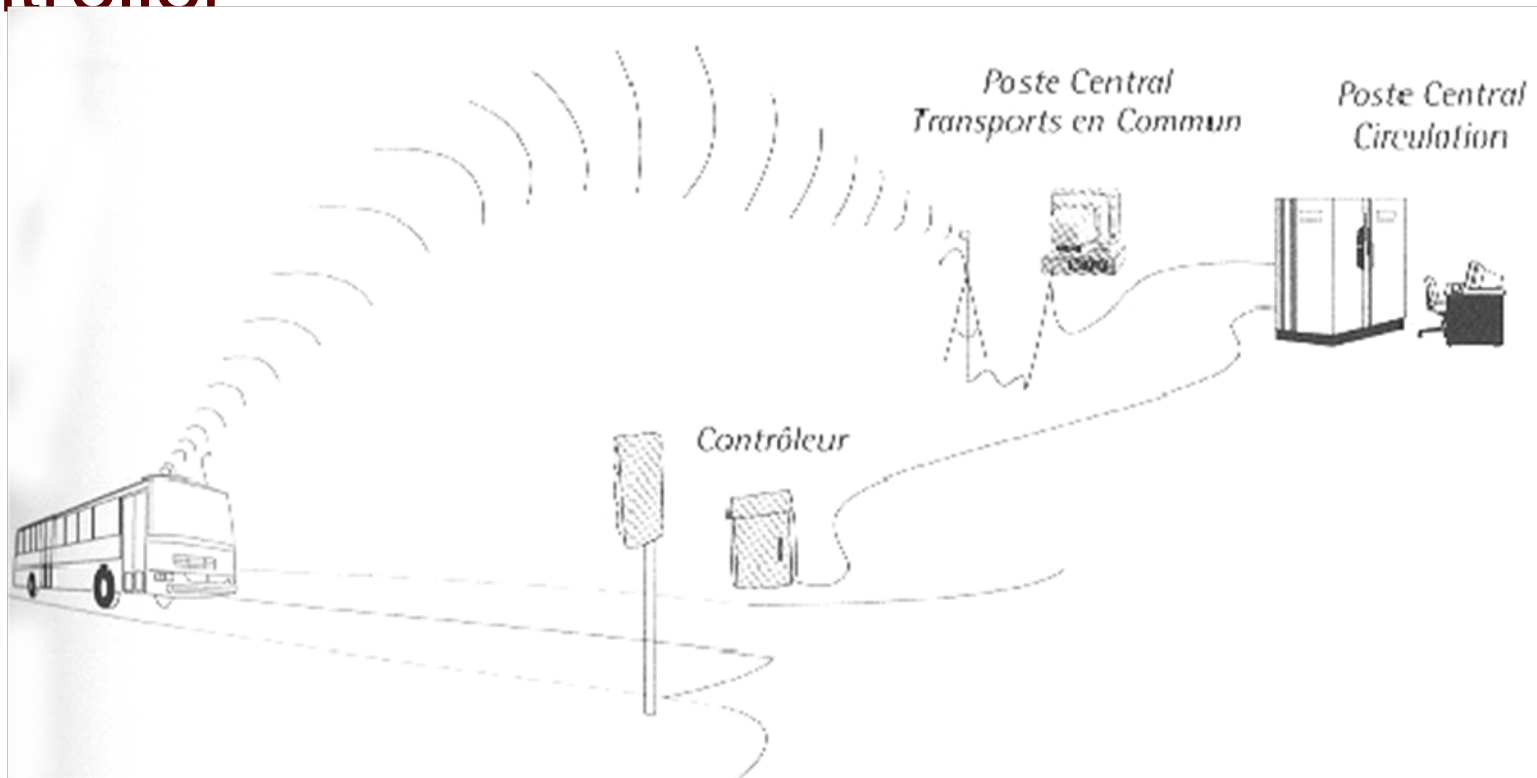
# On-board localisation / Local decision

- The vehicle is localised by a control centre
- The traffic controller manages locally the priority demand



# On-board localisation / Central decision

- The vehicle is localised by a control centre
- Which transmits the info to a Traffic Control Centre
- The TCC sends priority orders to the local controller





# Comparaison des Architectures

## *ACTION LOCALE*

## *ACTION CENTRALISEE*

*Détection Locale*

Connexion à un PC-Trafic pas nécessaire

**Avantages :**

- Robustesse du Système
- Précision de la détection
- Fiabilité de la chaîne d'information

**Inconvénients :**

- Paramétrage du Système
- Système peut évolutif

**Domaines d'emploi privilégiés :**

- TCSP
- Carrefours isolés

Contrôleur de carrefour à feux remonte les informations et obéit aux ordres du PC Circulation

**Avantages :**

- Maîtrise de l'impact de la priorité des TC sur l'écoulement des VP

**Inconvénients :**

- Repose sur l'architecture de communication du PC Circulation
- Repose sur les performances du PC Circulation

**Domaines d'emploi privilégiés :**

- Maîtrise de la priorité des TC par le PC Circulation

*Localisation embarquée*

Dialogue TC ⇔ Contrôleur de carrefour à feux  
Connexion à un PC-Trafic pas nécessaire

**Avantages :**

- Suivi précis de la progression du TC dans la circulation
- Système paramétrable à souhait
- Système évolutif

**Inconvénients :**

- Localisation précise des TC nécessaire
- Fiabilité de la chaîne d'information

**Domaine d'emploi privilégié :**

- Bus évoluant dans la circulation générale

Dialogue PC SAE ⇔ PC Circulation

**Avantages :**

- TC utilisés comme capteurs par le PC circulation

**Inconvénients :**

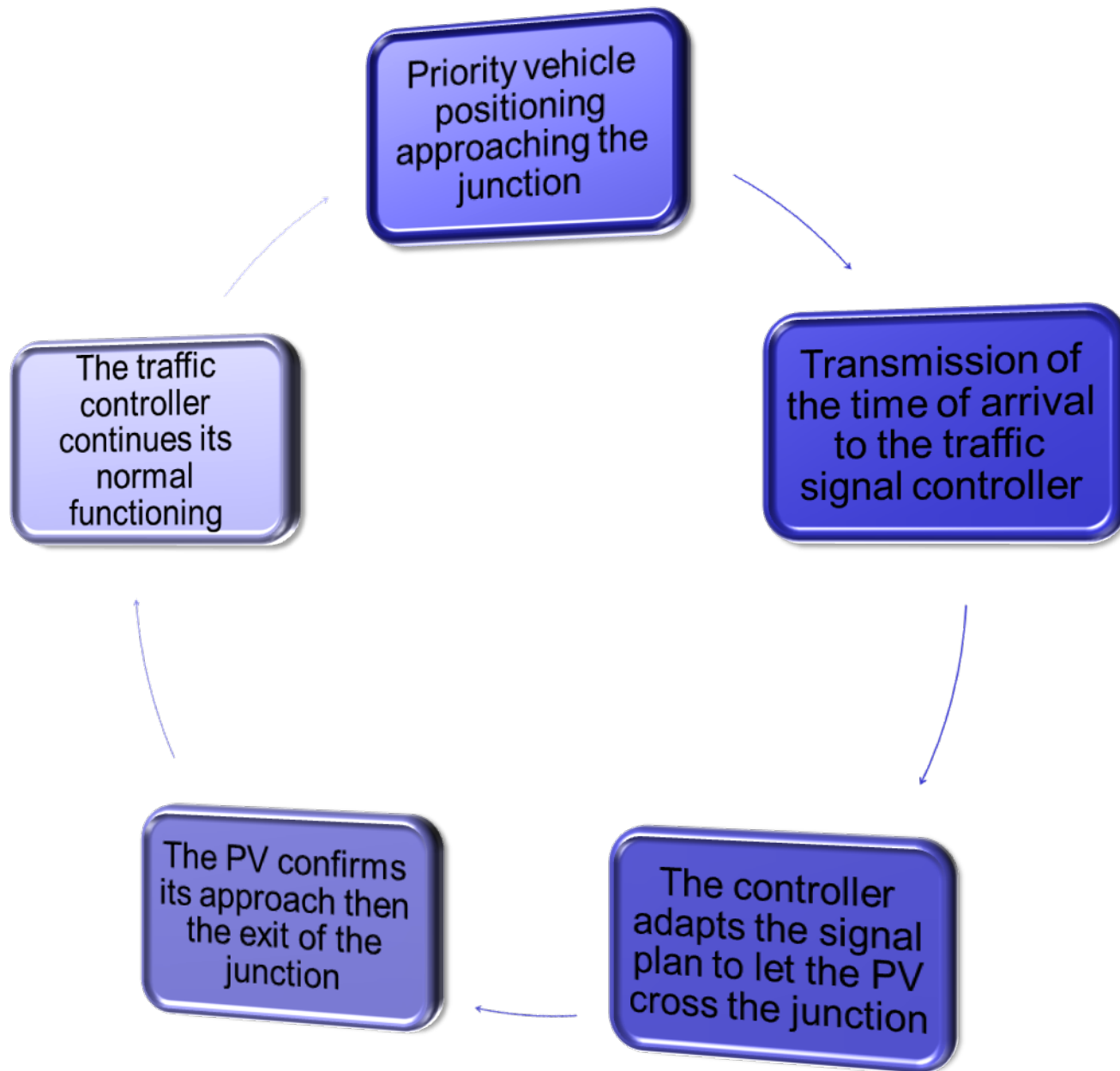
- Repose sur l'architecture de communication du PC SAE ainsi que du PC Circulation
- Repose sur les performances du PC Circulation

**Domaine d'emploi privilégié :**

- Gestion globale des déplacements : information TC utilisé pour la régulation du trafic, réglage des feux adaptés aux modifications d'itinéraires



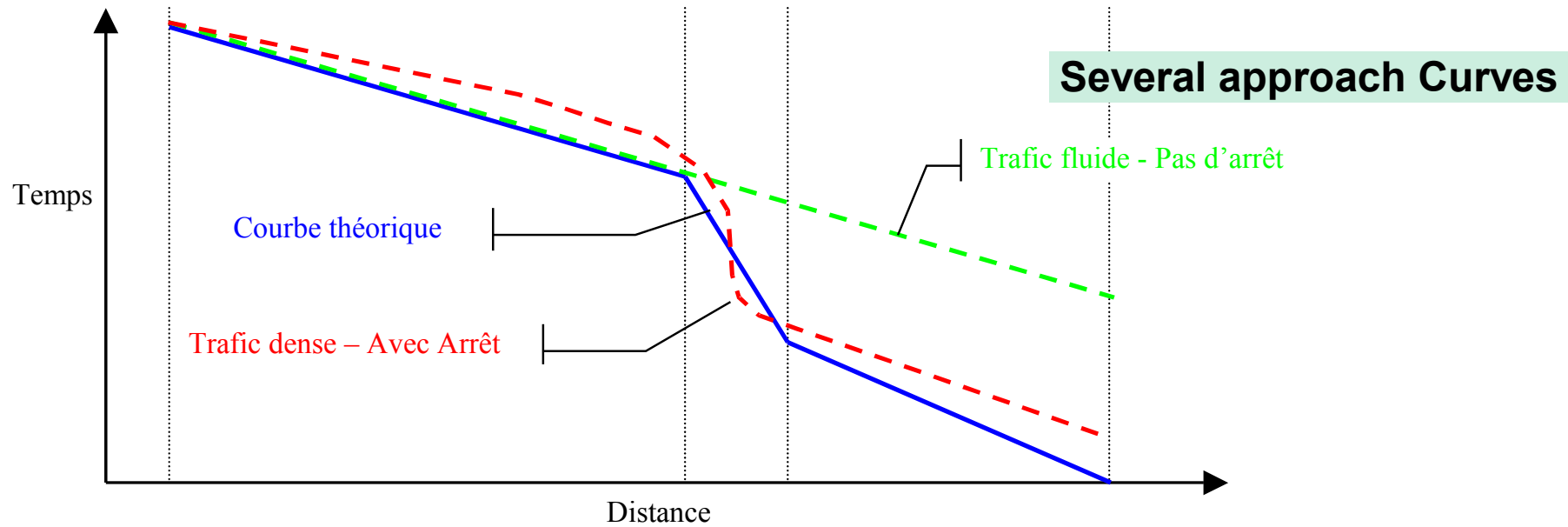
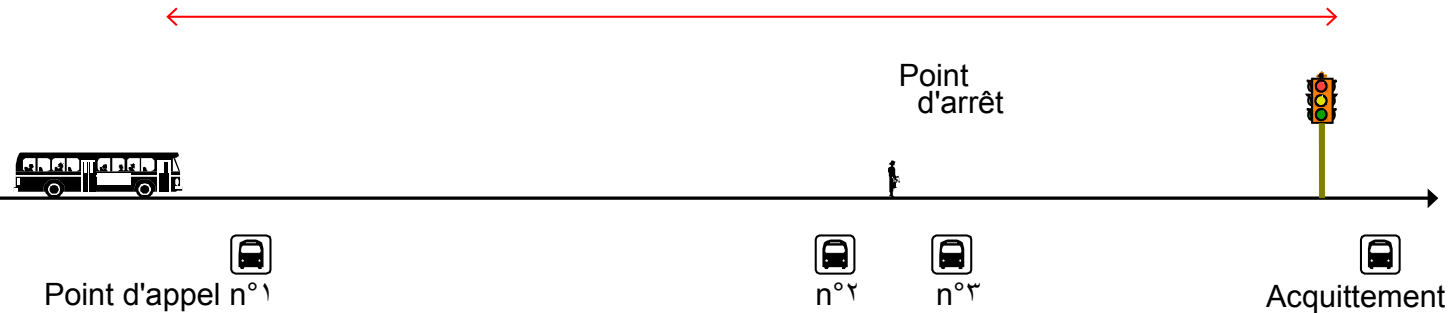
# PT priority in 5 steps



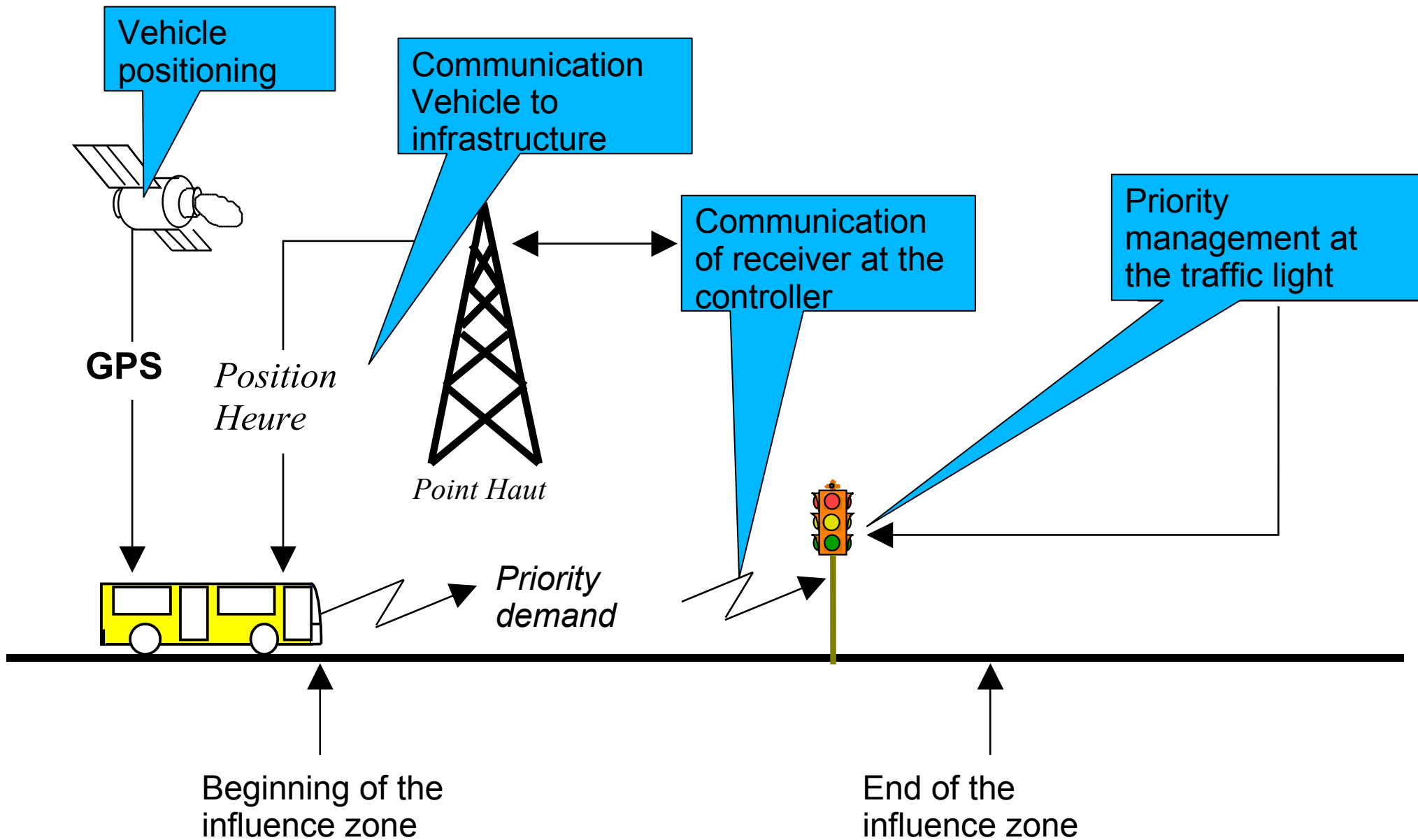
simulation

# Programming of data exchanges

## Influence Zone of the controller



# Basic Equipments





**Thank you for your attention**

Laurent Breheret

SODIT – France

[breheret@sodit.info](mailto:breheret@sodit.info)