

Public Transport Priority at Traffic Lights

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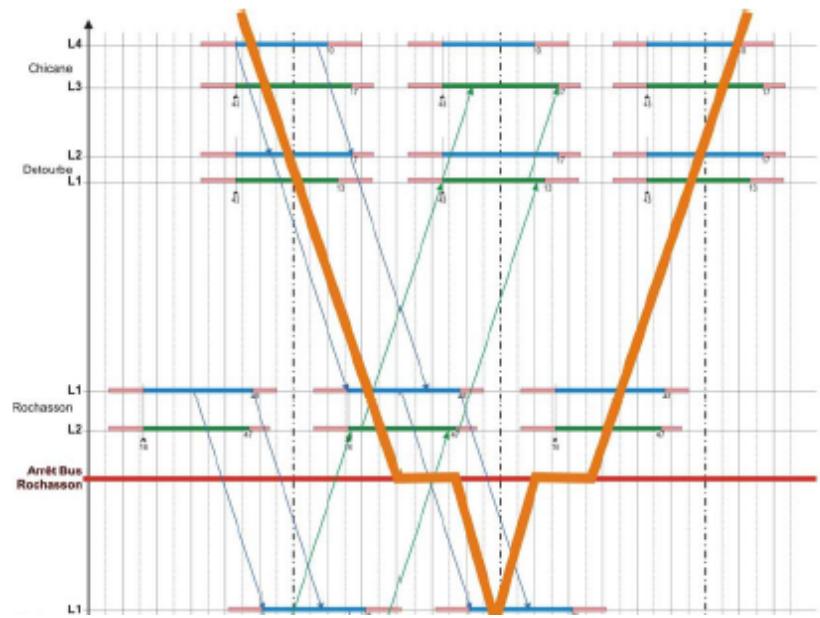
General concepts for PT priority

- 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



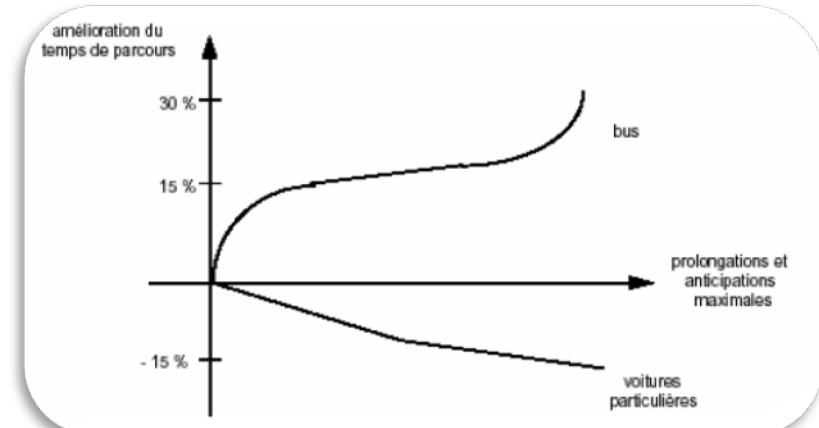


Dynamic Priority

- 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



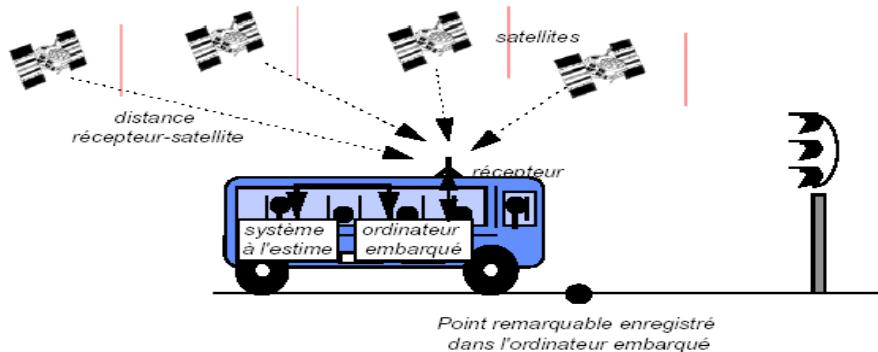


Efficient approach for PV

- 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

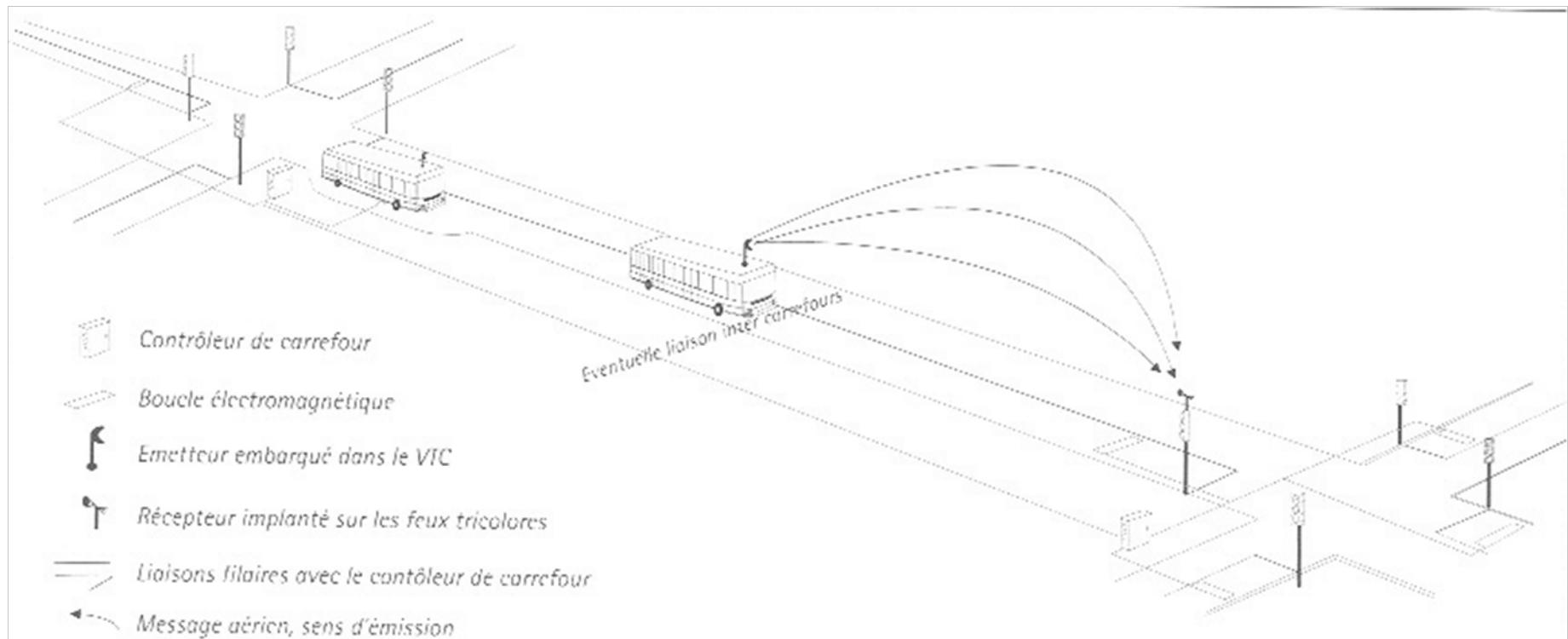
Components of the priority system

- 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



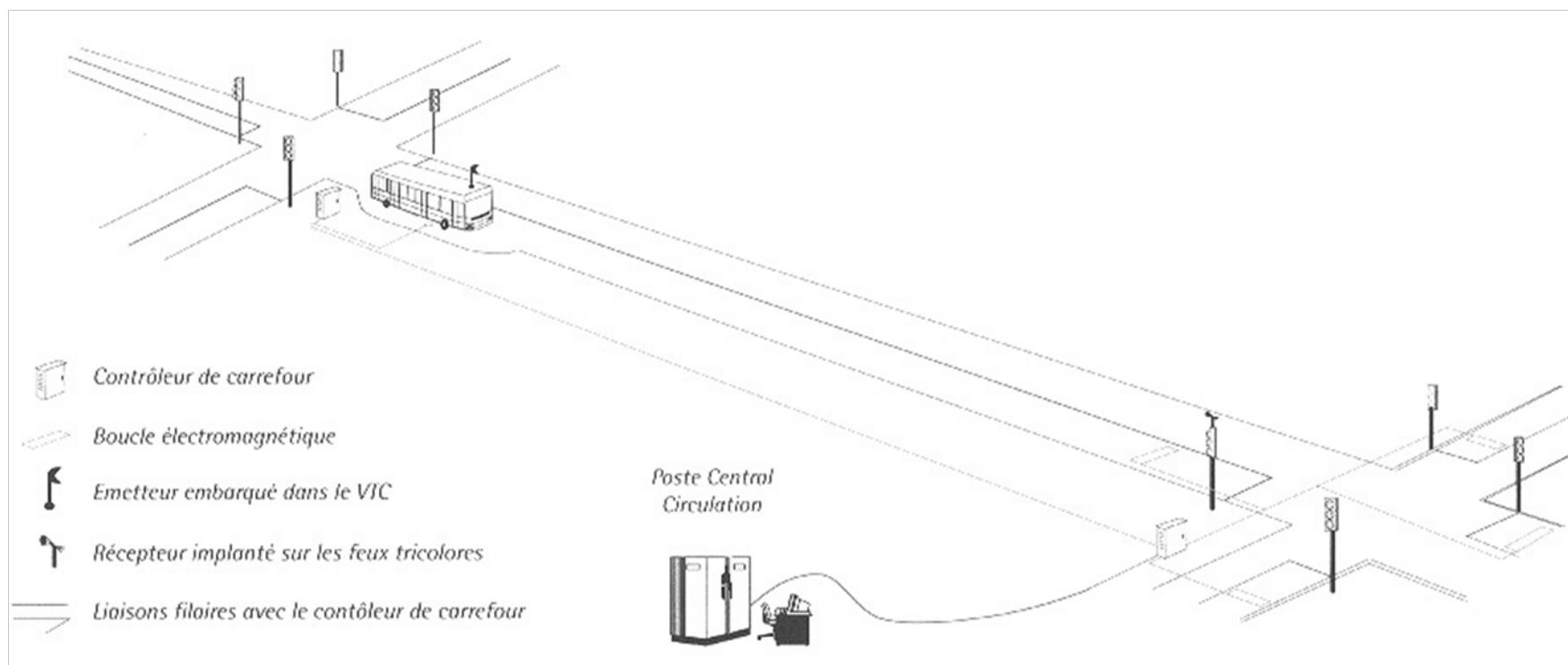
Local detection / local decision

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



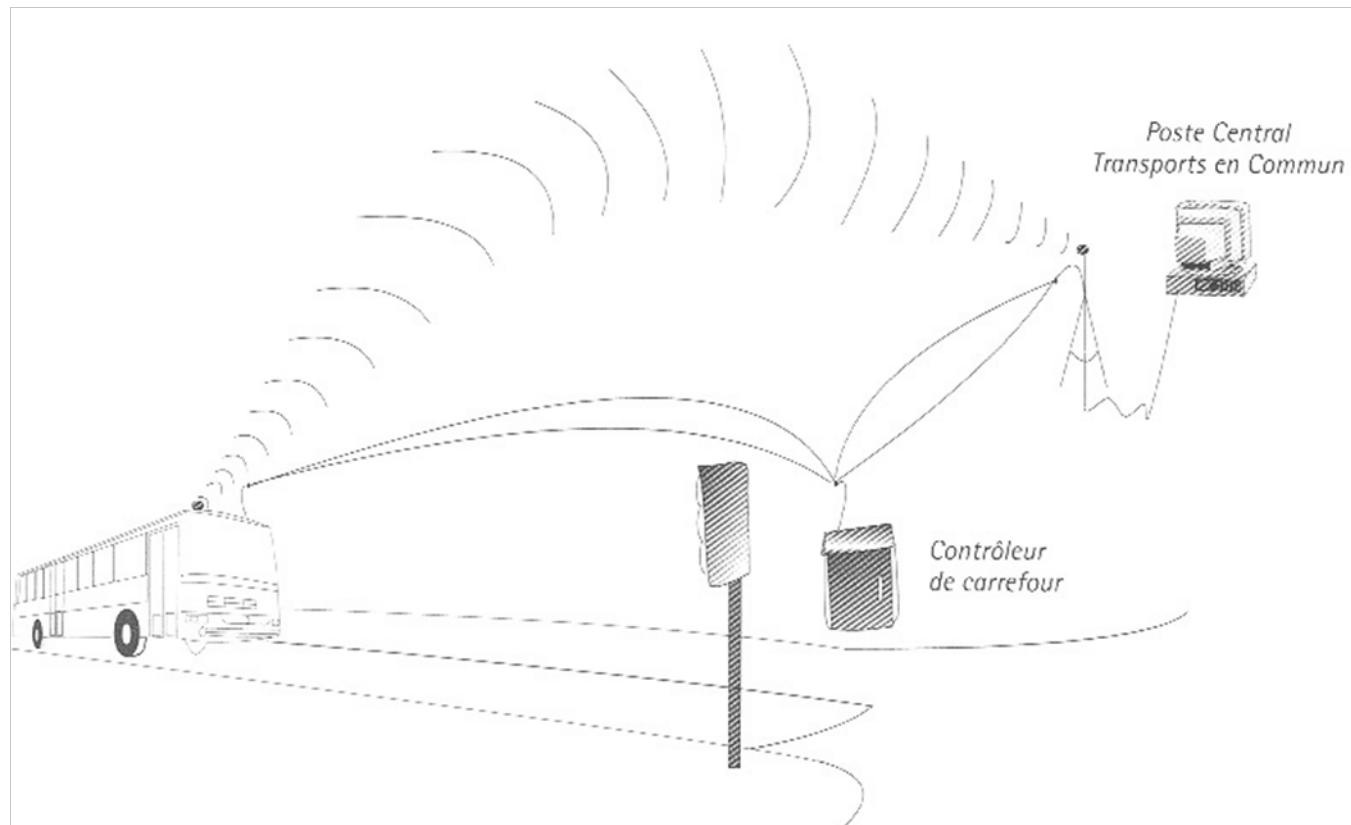
Local detection / Centralised decision

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



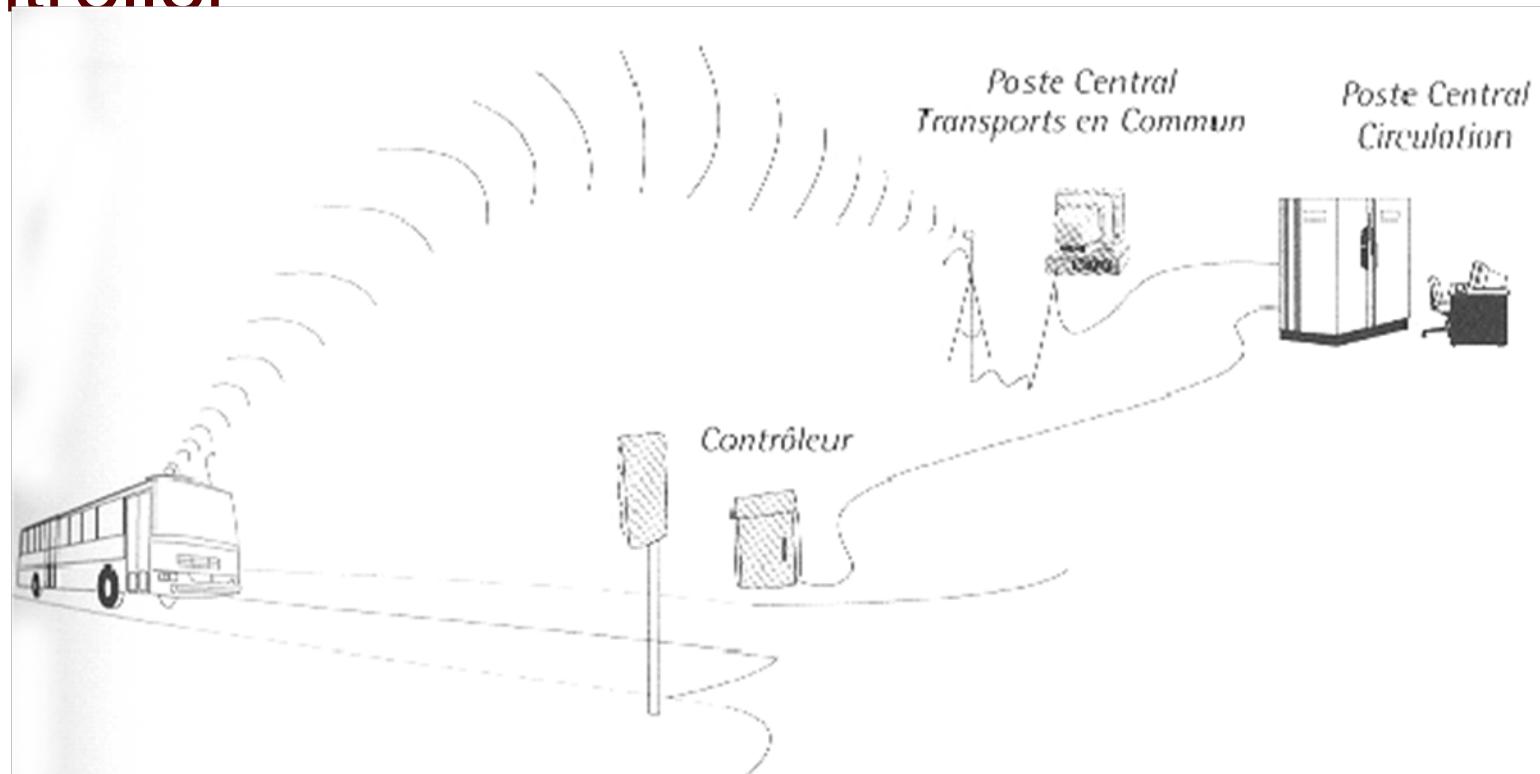
On-board localisation / Local decision

- 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

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

ACTION CENTRALISEE

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

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

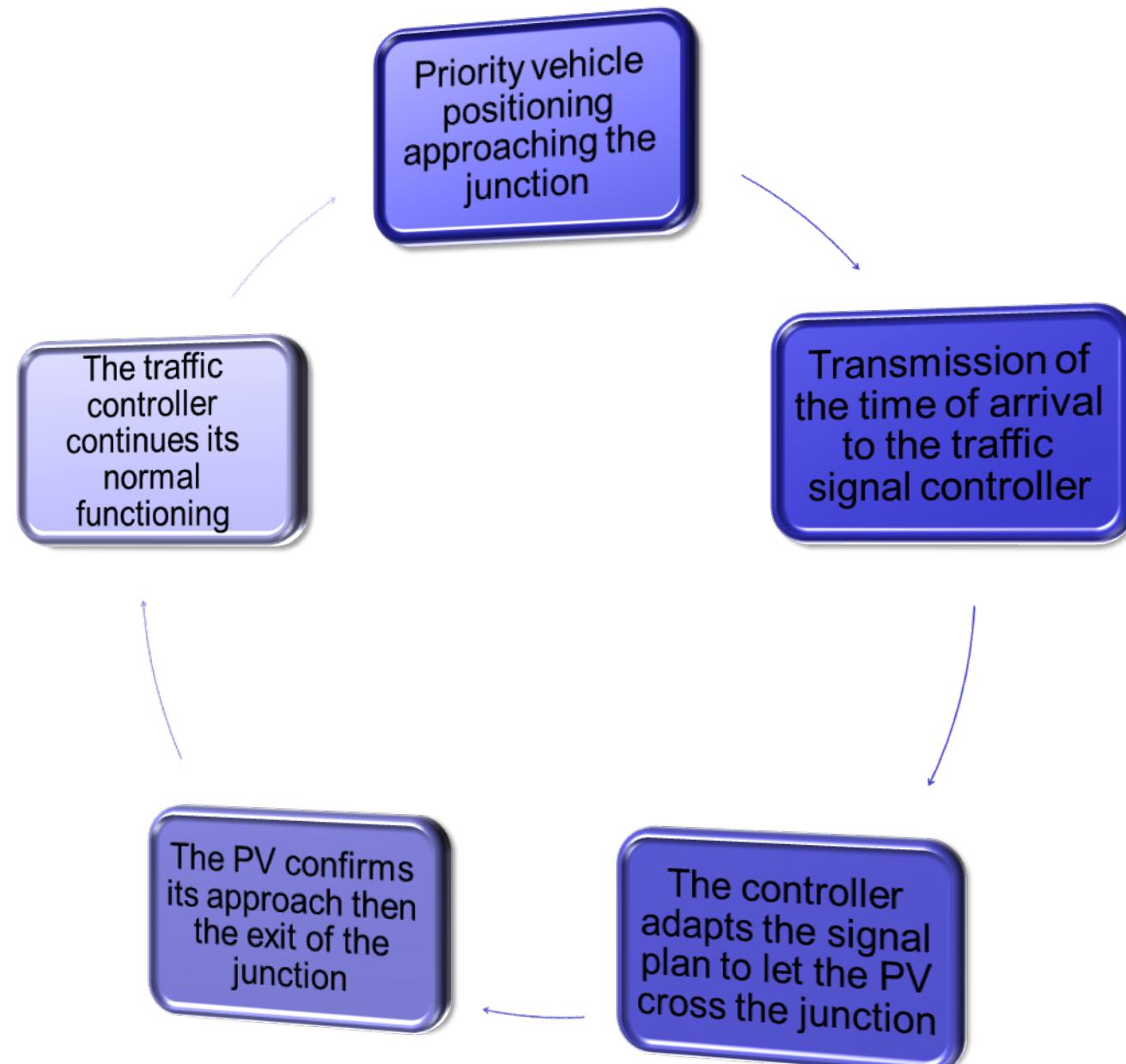
Inconvénients :

- 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 :

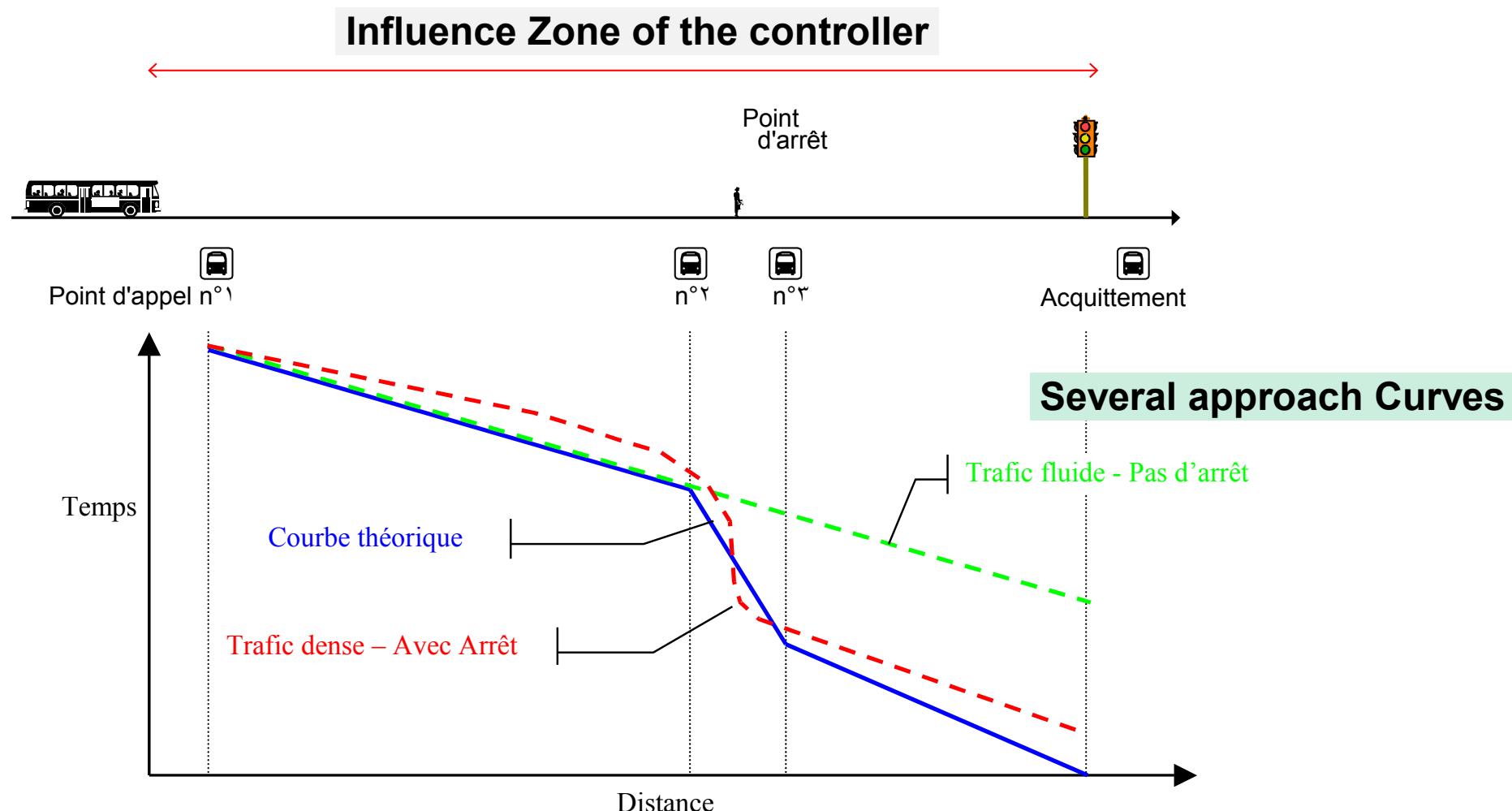
- Gestion globale des déplacements : information TC utilisé pour la régulation du trafic, réglage des feux adaptés au modifications d'itinéraires

PT priority in 5 steps



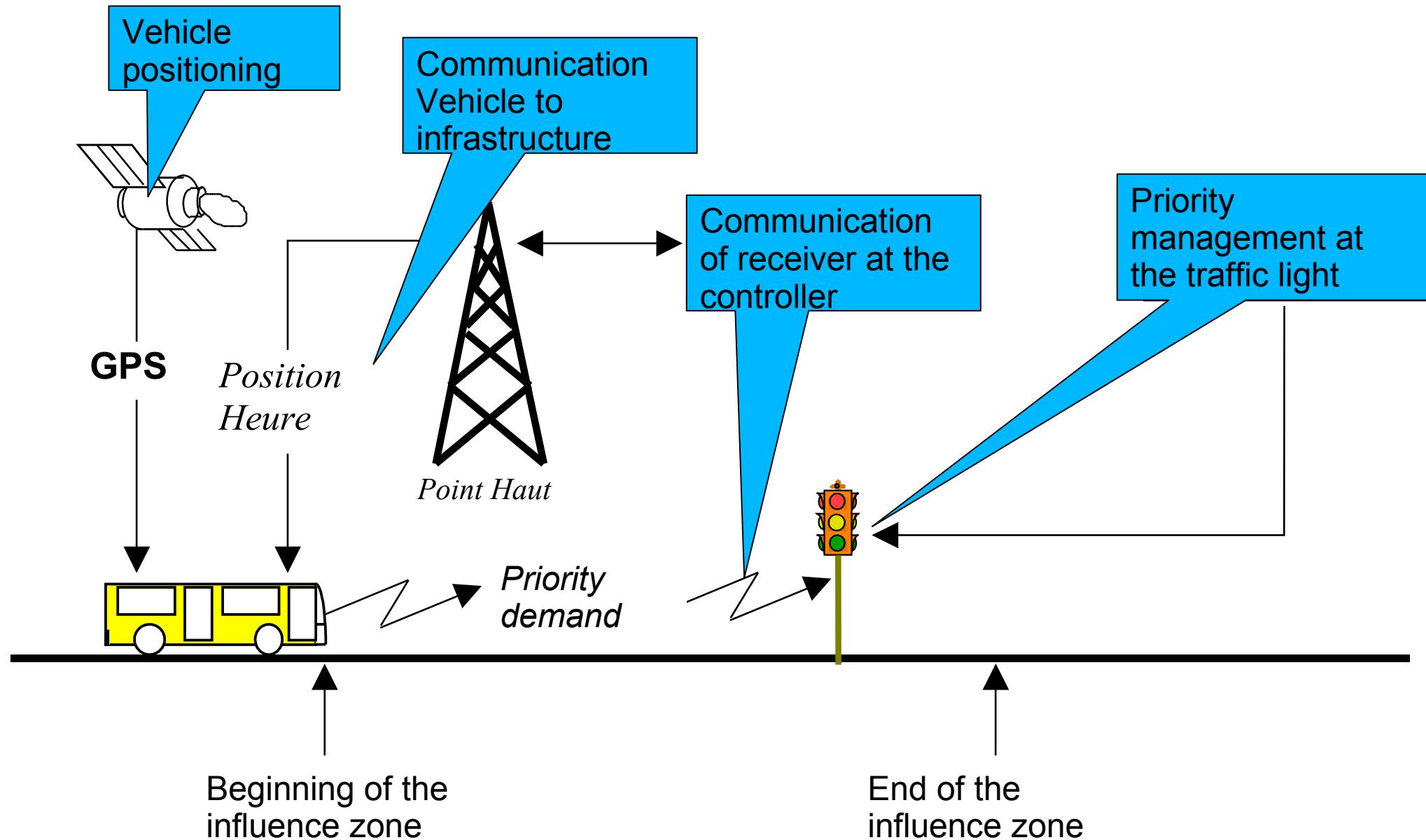
simulation

Programming of data exchanges





Basic Equipments





Thank you for your attention

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