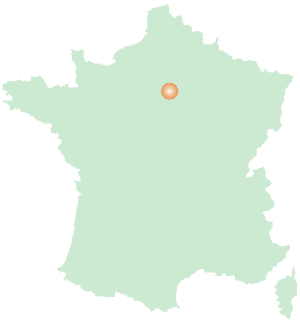
CASE STUDY

MAIRIE DE PARIS

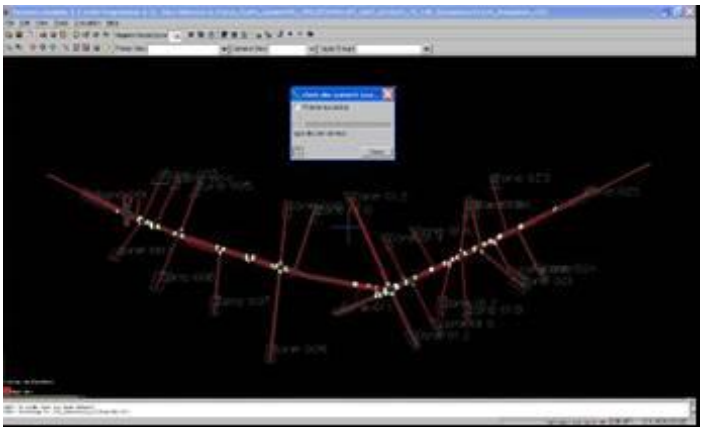


Dynamic simulation of the bus line 91 in Paris

During our mission as main contractor support, our group of companies has had to manage a priority system of the bus line 91. The city of Paris ordered a dynamic simulation of this bus line, to approve the proposal of the setup for priority system.

PROJECT DETAILS AND BACKGROUND

The dynamic simulation, realized with the Paramics software, showed the crossroads functioning of the bus line 91, from Port Royal/Barbusse to Saint Marcel Essai intersections.
Paramics permits the simulation at different scales (e.g. a crossroads or a total study area).



ANALYSIS AND METHODOLOGY

The dynamic simulation has been realized in several steps :

Network modelling :

From topographical plans in DXF or DWG format realized with Paramics, we modelled the streets. The original priority rules have been respected. The programmer unit developed complementary functionalities to respect as much as possible the reality:

- An optimized functioning of the crossroads, which is faithful to the actual controllers programming (phases management, local regulation, uncycling functioning, crossroads coordination, ect.
- The management of the public transport priority, especially for the detection with GPS/odometer systems and radio transmission.

All bus lines crossing the study area have been modelled. Taxis using bus lanes have also been taken into account.

Development of an Origin-Destination matrix :

The traffic has been modelled with an origin-destination matrix, based on counting data. Each vehicule choose its itinerary depending of times and distance criterias. The proportion of users called "regulars" (who have a second itinerary solution) or users called "irregulars" (using principles highways) is precised. This possibility permits to respect as much as possible the reality.

Existing simulation – Model fitting

The existing functioning based on a fixed cycle coordinated to personal vehicles (PV) without priority system, has been simulated to fit the model and to have stuff to compare.

CeRyX TRAFIC SYSTEM

Once the model is done, CeRyX Trafic System realize the simulation several times to have enough elements to elaborate a strong analyse.

Simulation of 3 scenarios

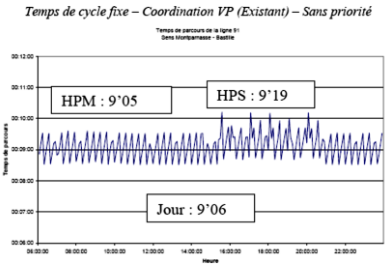
- fixed cycle coordinated to personal vehicles with priority system
- fixed cycle coordinated to bus lines with priority system
- variable cycle with priority system

Simulation results are analysed to extract many indicators (like travel or waiting times, ridding between lanes, effective green light time…) and to find the network's blockers.

SOLUTIONS DELIVERED

Thanks to the compared indicators of the previous scenarios, results have been identified:

- **Travel times of the bus line 91**: the most efficient functioning is variable cycle, followed by a fixed cycle coordinated to personal vehicles.



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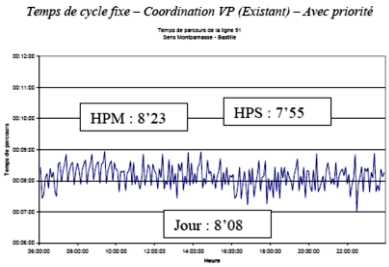

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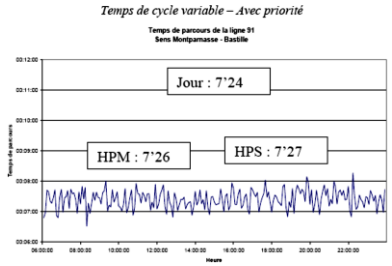

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- **We can't achieve goals fixed for the bus coordination** (the two opposite ways can't be optimized concurrently). Variable cycle is the most adapted functioning to have a regular service.
- **Travel times of personal vehicles**: the most binding functioning is fixed cycle one with bus coordination. The most efficient functioning for PV is a fixed cycle with PV coordination, even if the variable cycle travel time is really similar and really satisfied.
- Waiting time before traffic light: the variable cycle functioning proposes the lower waiting time for PV, closely followed by fixed cycle functioning with PV coordination.
- Ridding between lanes: variable cycle functioning is the most efficient one.

Dynamic simulation results recommend implementing an absolute priority system with variable cycle.