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Future@SystemX

Modeling a Bus Line

Case study: Line 9106 Massy-Palaiseau RER – Saclay

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- **Every public transportation system is bus-dependent.**
- **Sometimes bus lines have unexpected behaviors:**
  - Buses often arrive to bus stops in bounches instead of at a regular frequency.
  - This behavior depends on the feeding mode of the line, which may differ in the Morning and in the Afternoon.
- **Factors and solutions?**

Line 91.06 Massy-Palaiseau Gare RER -- Saclay

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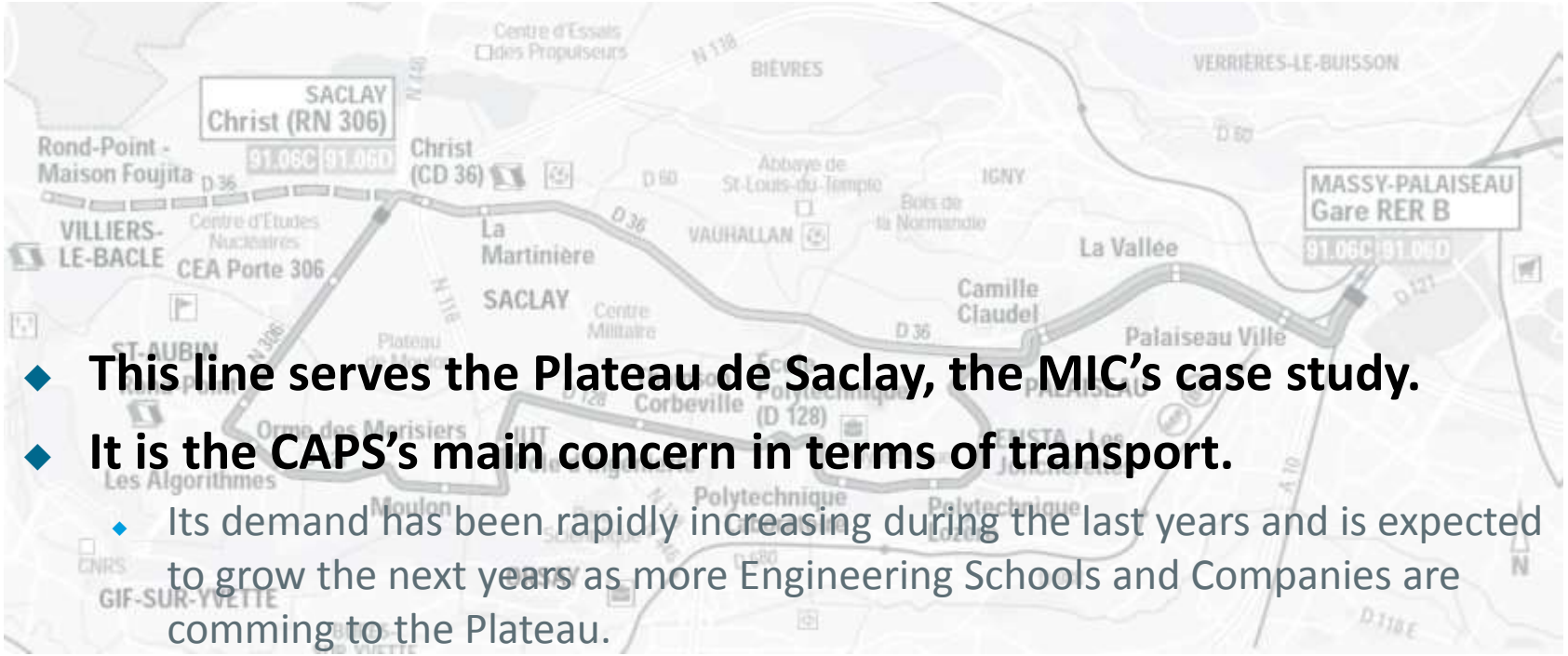

- **This line serves the Plateau de Saclay, the MIC's case study.**
- **It is the CAPS's main concern in terms of transport.**
  - Its demand has been rapidly increasing during the last years and is expected to grow the next years as more Engineering Schools and Companies are comming to the Plateau.

- **Inputs**
  - Between-stops distance
  - Drivers' preferred speed
  - Passenger arrival rates to bus stops
- **Outputs**
  - Between-buses distance
  - Headways
  - Group sizes

- **Buses move at a speed** v_i **.**

$$\Delta x = v_i \Delta t$$

$$\rightarrow$$

$$t \rightarrow t + \Delta t$$

- **Buses stop at bus stations to take *f* passengers and to leave *g* passengers, and thus they stay there for a time *t*.**