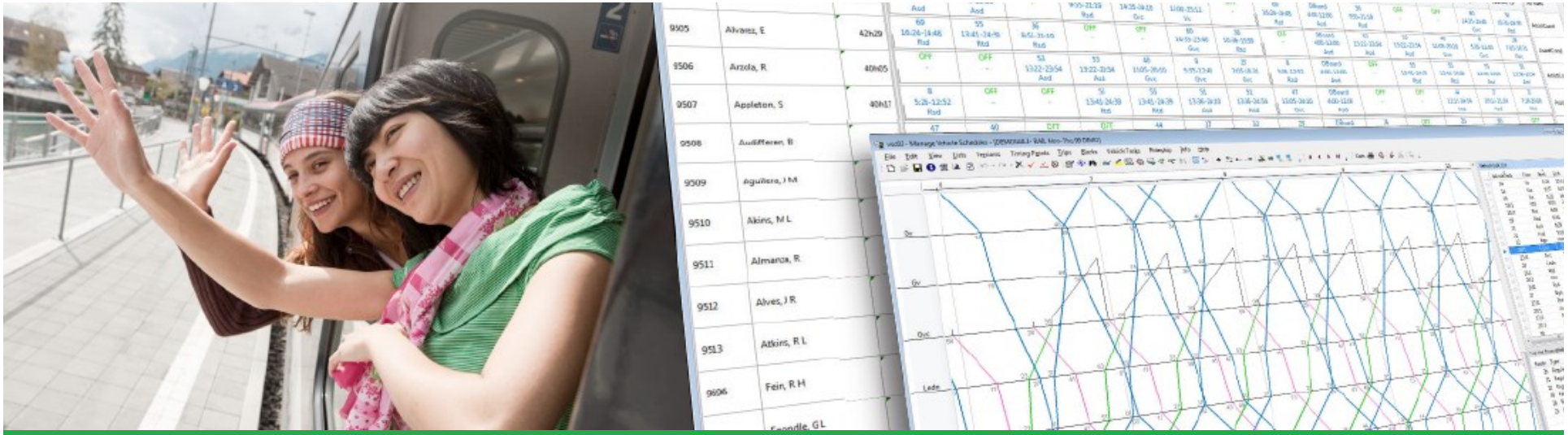


Improving public transport efficiency for over 35 years

By Alexandre Savard, PMP
Senior Account Manager

GIRO: then and now

1979: Public transport in Montréal

First bus line
in 1919

≈ 1 600 buses
(today ≈ 1 700)

Sub-optimised
network
(no interlining)

Source: STM

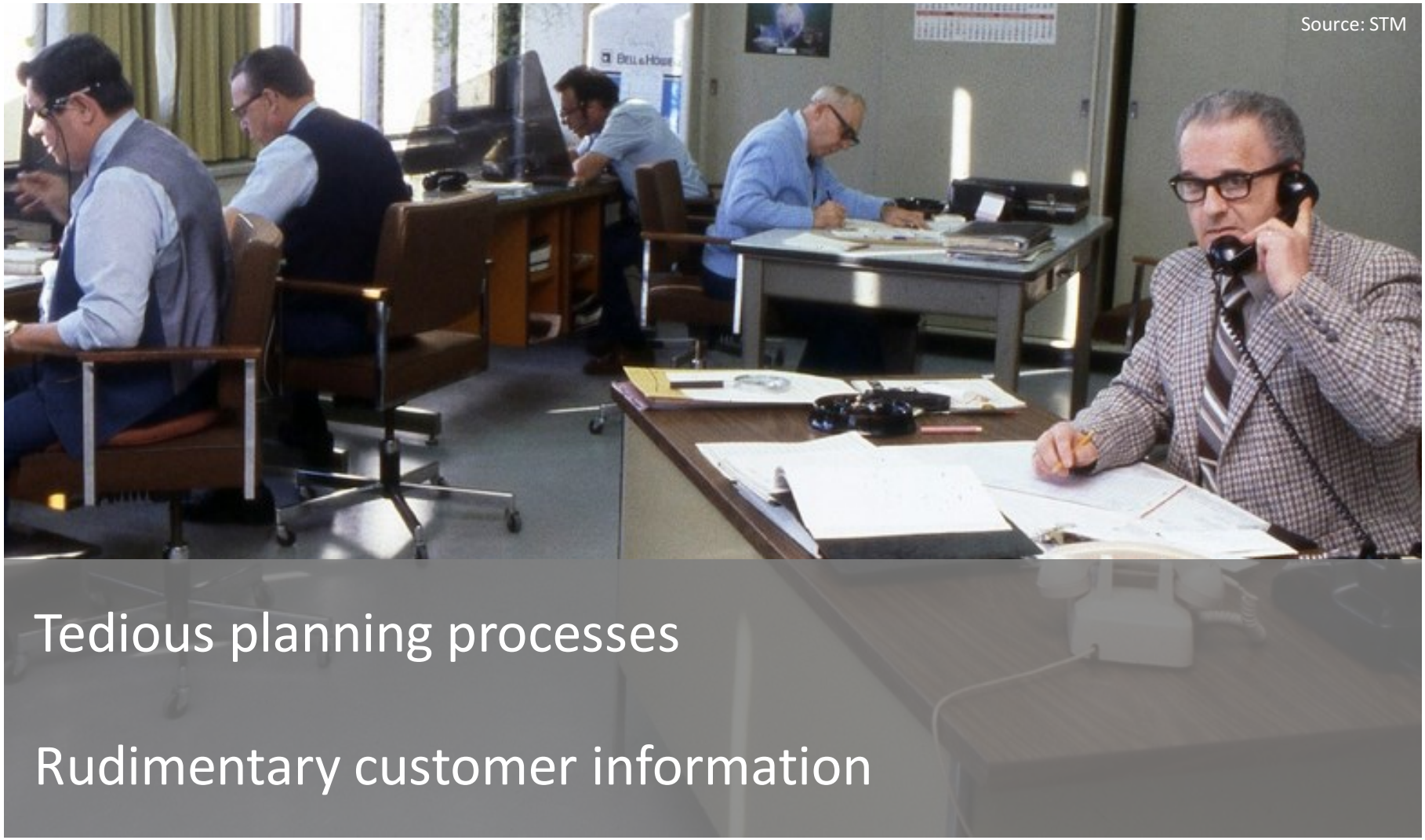
1979: Public transport in Montréal

Metro commissioned in 1966

Extended in 1976 (Olympics), 1986 and 2007

759 railcars (still 759 today)

1979: Public transport in Montréal

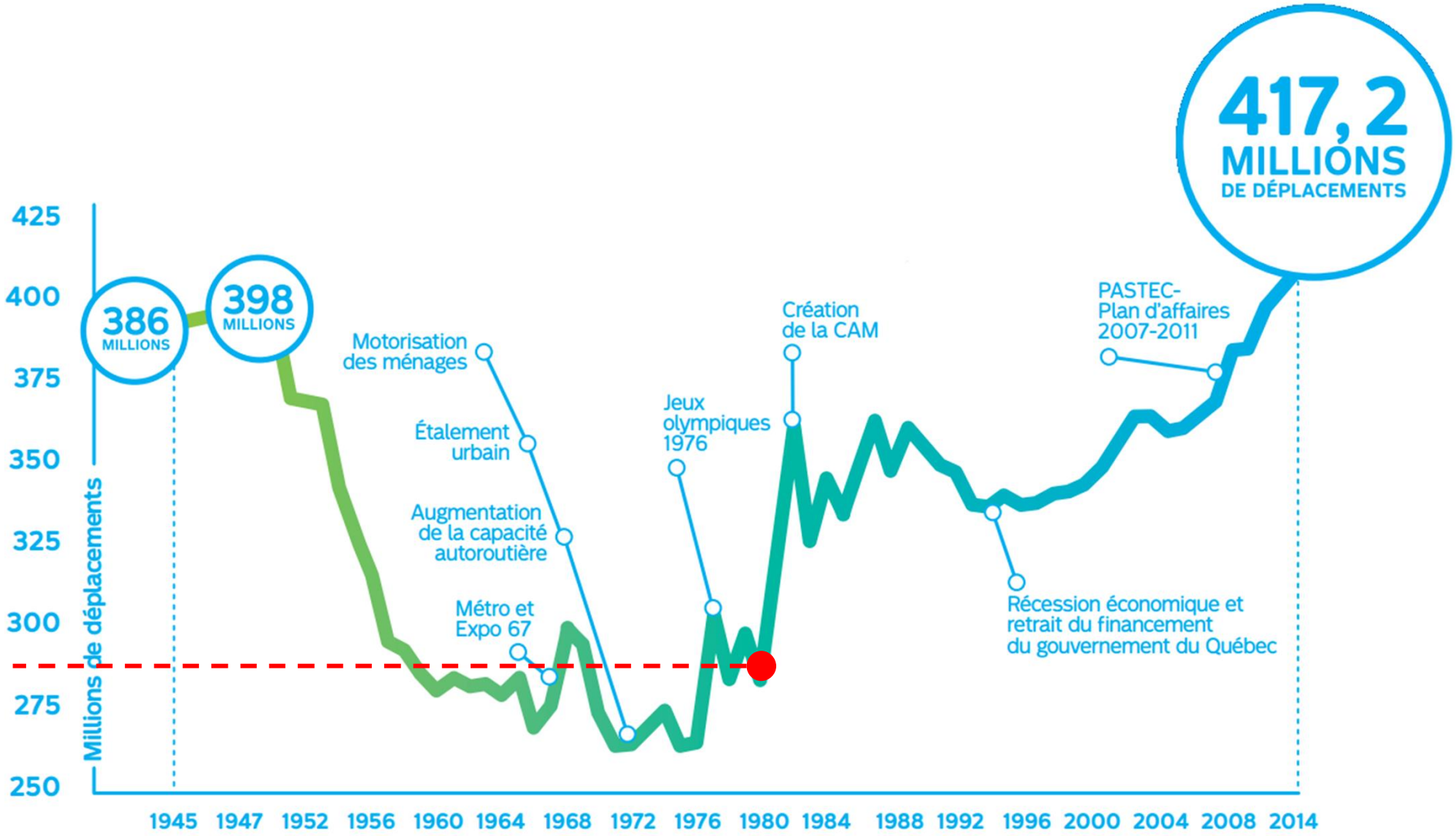


Tedious planning processes

Rudimentary customer information

1979: Ridership is on the rise

Resources are not. How to increase service level?



1979: GIRO is founded

Optimisation algorithms at its core

```
c ----------------------------**********************************************
c                                                                          *
c                      h.a.s.t.u.s                                         *
c            "horaires et assignations d'un systeme de transport           *
c                urbain  structure "                                       *
c                                                                          *
c   ce programme analyse une convention collective de chauffeurs           *
c                d'autobus , il peut etre accouple au programme            *
c                lirmps pour imprimer les resultats                        *
c                                                                          *
c     fonctions:  * lire un dictionnaire pour connaitre les mots a         *
c                   reconnaitre                                            *
c                 * lire une convention collective                        *
c                 * lire des horaires de vehicules                        *
c                 * produire un probleme de programmation lineaire        *
c                 * produire un rapport "lirmps"                          *
c                                                                          *
c     documents: pour utilisation  voir                                    *
c                  document # 93 du centre de recherche sur les            *
c                                transports                                *
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c                                                                          *
c       ---# ce programme a ete developpe par jean-yves blais              *
c            au cours de 1977.                                             *
```

35 years of innovation and expertise

1979

GIRO founded, based on university research project

Launch of ***HASTUS*** software

Montréal: 1st client

1988

Introduction of ***HASTUS*** daily operations modules

1995

HASTUS now available in a Windows® environment

Tablet and Web applications

2006

Development of ***HASTUS-Rail*** applications

2015

Clients' feedback continues to drive innovation

GIRO at a glance

Based in Montréal, Canada

325+ skilled employees

Industry-leading software solutions for planning and managing transport-related operations

Public transport (*HASTUS™)*

Demand responsive (*GIRO/ACCES™*)

Postal service (*GeoRoute™*)

Global presence

300 sites / 26 countries

Rotterdam, Singapore, Los Angeles, Chicago, New York, Stockholm, Sydney, and more

Global and local organisations

Arriva, Keolis, Transdev, and more

More than 130,000 vehicles managed with *HASTUS*

Our values define us

Expertise

Largest dedicated optimisation development team in the industry
Average employee seniority: 10 years

Commitment

100% successful implementations since day 1

Collaboration

100% of our clients serve as references

Long-term vision

30% of our resources allocated annually to R&D

HASTUS suite for public transport

HASTUS suite for public transport

Mass-transit-specific

Across key processes

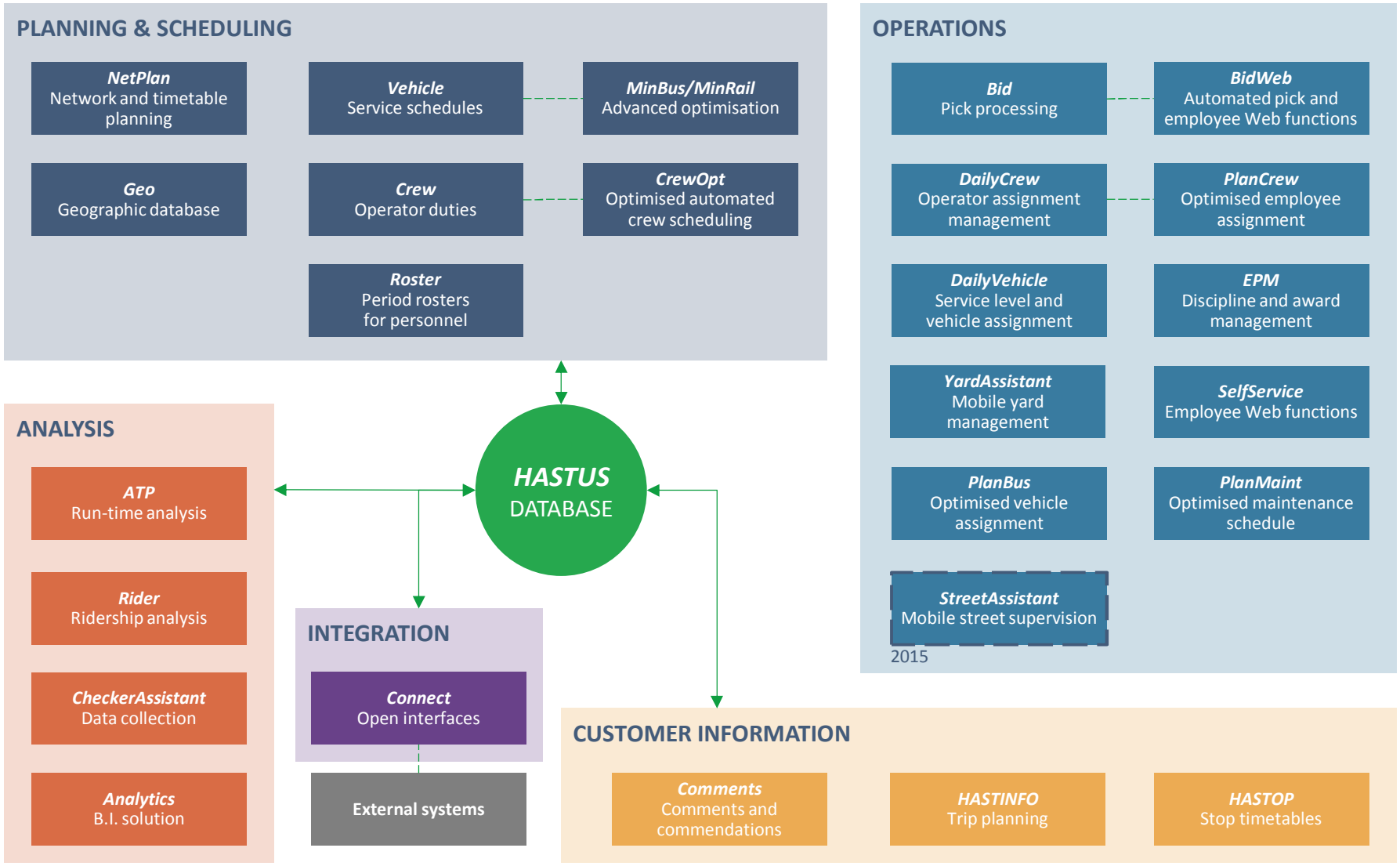
Multimodal

Fully integrated

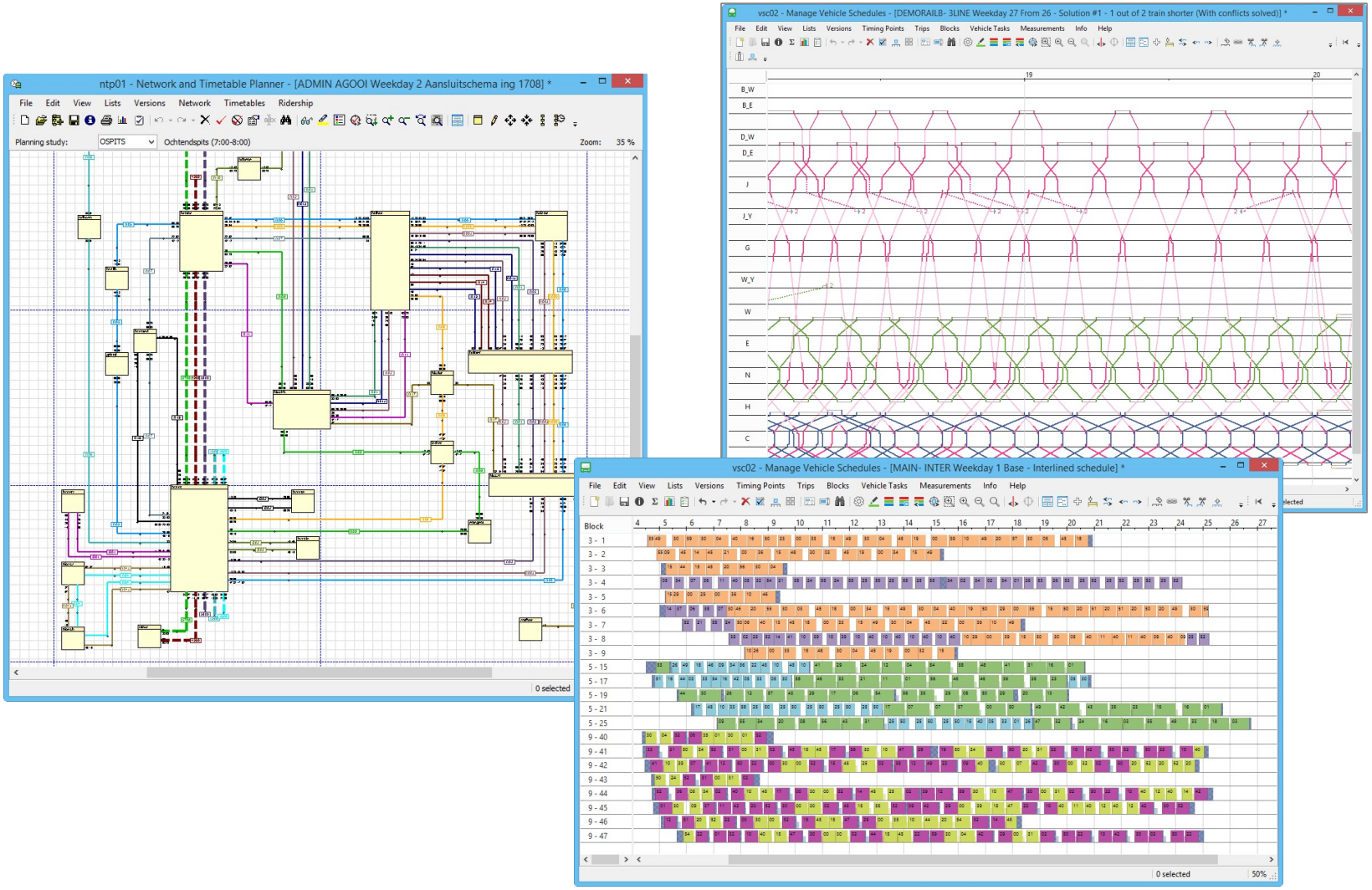
Optimisation-oriented

Updated yearly

HASTUS architecture



Planning & Scheduling



Case study: Trip shifting optimisation

RTC, Québec City, Canada: 450 buses

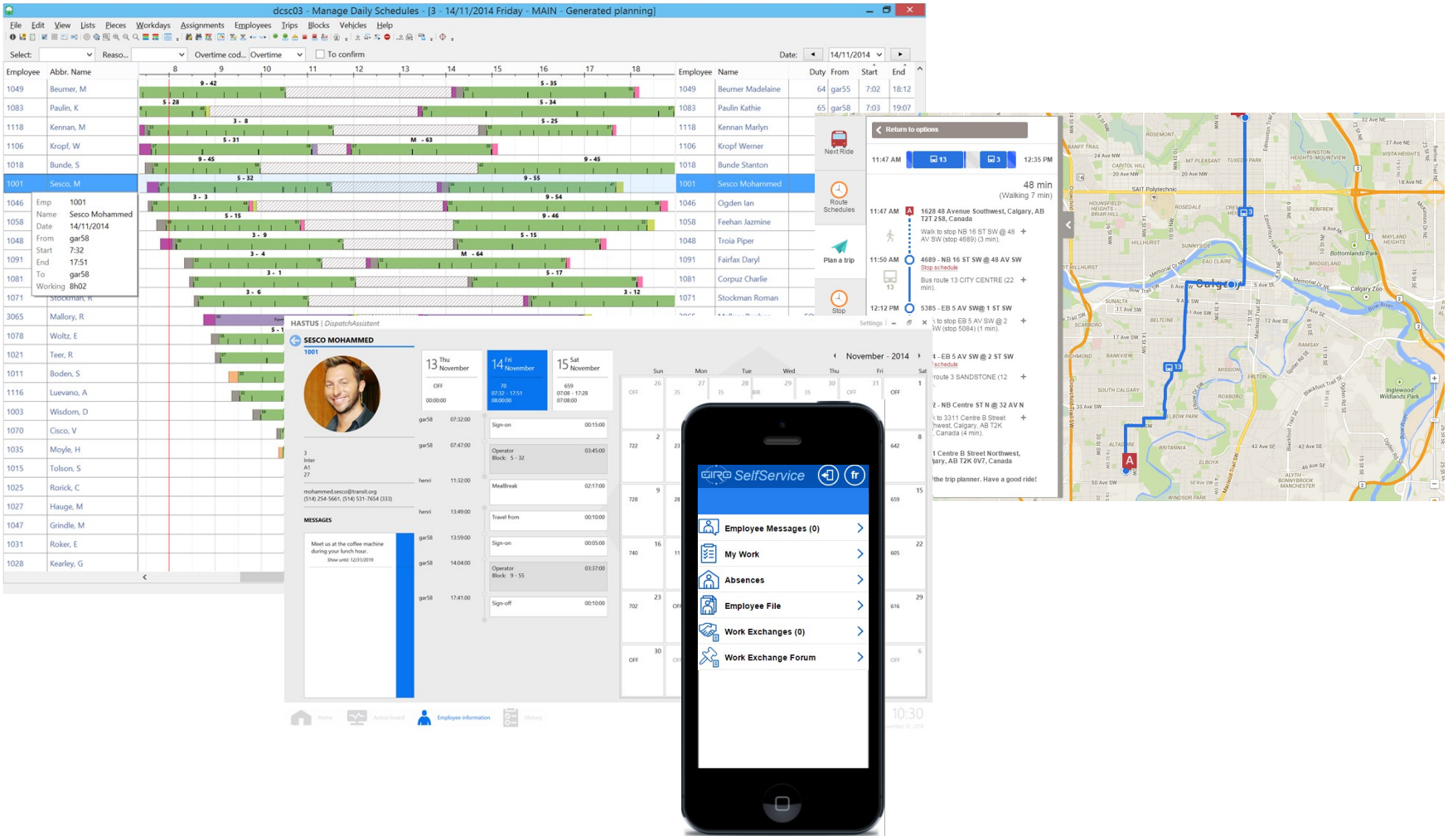
Challenge

- Minimise number of vehicles needed during rush hour, while maintaining same service quality

Benefits

- 5% fewer buses needed during that period (21 buses)
- $430 k in maintenance savings
- $330 k in wage savings

Operations & customer information



Case study: Process streamlining

STIB, Brussels, Belgium: 500 employees

Challenge

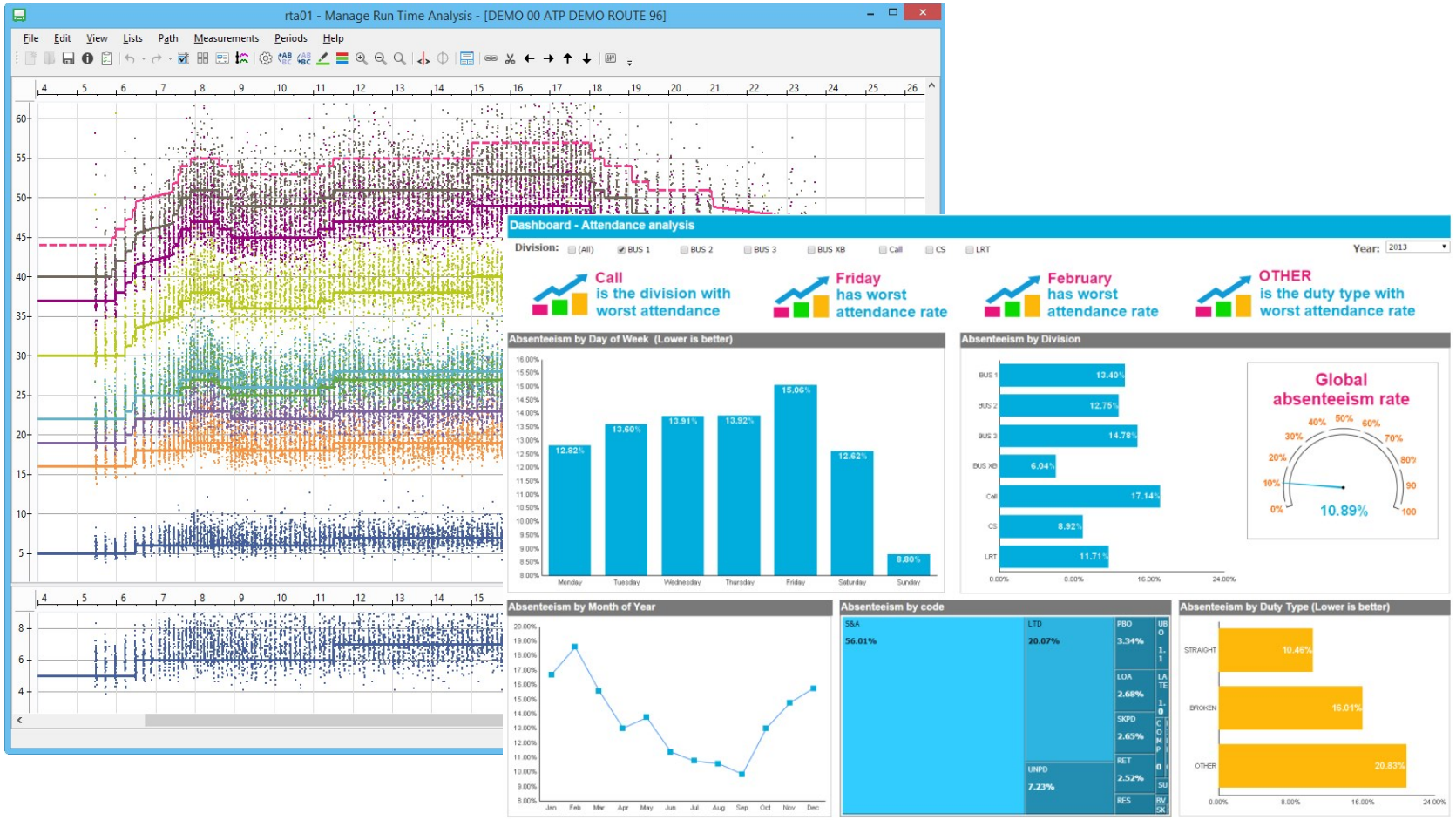
- Streamline work-assignment processes with ***PlanCrew***'s implementation

Benefits

- Optimised driver assignments, meeting quality requirements and considerations of medical and social constraints
- Significant time saved with automated functions

Source: STIB

Analysis & Integration



Case study: Calibration

Transpole, Lille, France: 400 buses

Challenge

- Increase on-time performance by calibrating run times for the season

Benefits

- 3.5% increase in speed
- Improved punctuality on early arrivals
- Reduced number of vehicle-blocks on high-frequency routes

Source: Lille

Recent innovations

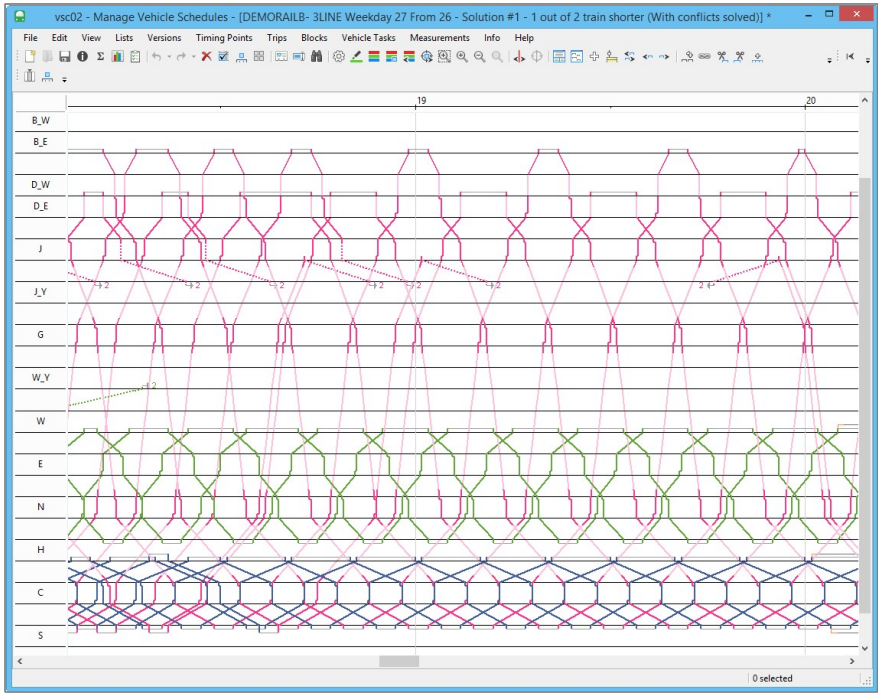
HASTUS-Rail specific features

Network attributes

Disruption management (workforce & rescheduling)

Yard management

Fleet allocation



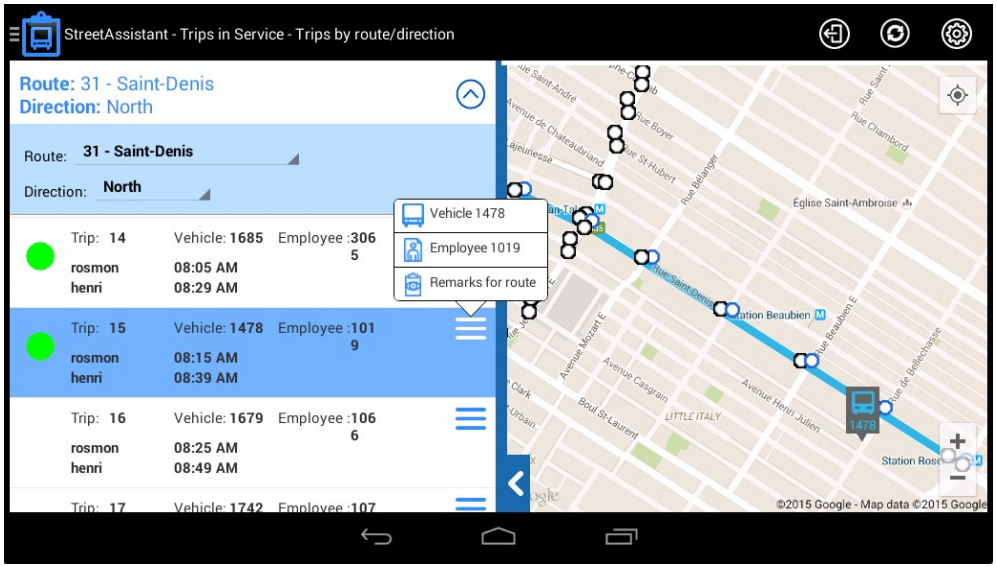
Mobile solutions

Operations supervision

Train-station staff

Yard management

Employees self-service



Fleet & maintenance optimisation

Bus-yard optimisation

Manpower planning

Maintenance activities

Recovery algorithms in daily operations

Some challenges ahead

New vehicle types

How to adapt and optimise public transport networks to account for new vehicle types?

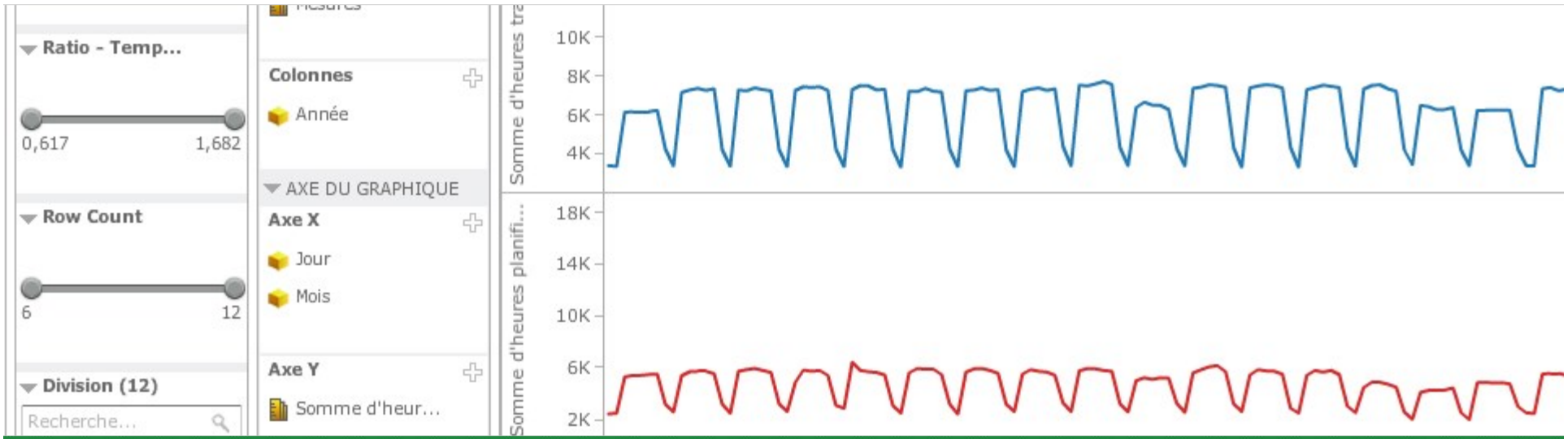
What about autonomous vehicles?

Source: Nova Bus

GIRO

Data valorisation

How to turn massive amounts of data into
real decision-making tools for agencies and riders?



New transportation models

How to facilitate the coexistence of traditional and new models to improve overall mobility?

Source: BIXI

GIRO

"To raise new questions, new possibilities,
to regard old problems from a new angle, requires
creative imagination and marks real advance in science."

- *Albert Einstein*

Thank you

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Improving efficiency at every turn