



CONDUENT



# Using Big Data to Improve Urban Mobility

23 February 2017 / Frederic Roulland

Xerox Research Centre Europe

# The opportunity

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Leverage transportation operations data to plan and optimize city mobility



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Short term challenges: Operations efficiency

- **Productivity**
- **Quality of Service**

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Long term challenges: Sustainable mobility

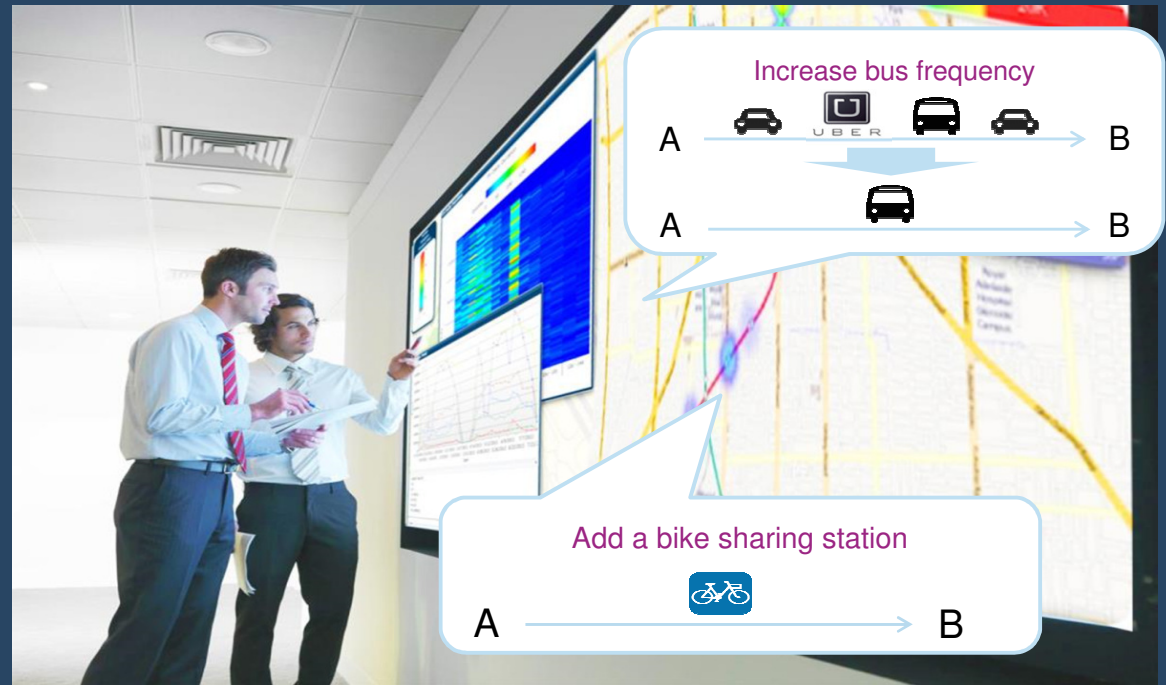
- **Traffic congestion**
- **Energy consumption, pollution**



# Technology innovation: From the traveler to the city planner



**Traveler assistance**



**Planning support**

# Example 1: Smart Parking

The Xerox smart grid helps LA drivers save time and park smarter.

## Problem

LA faced the same challenges affecting every city:

- Congestion and emissions
- Time wasted circling for a space
- Disparate technology
- Manual and burdensome processes



## Solution for LA Express Park™



## Results

Single central system to manage all field technology

Reduced rates at 60% ↓ of parking spaces

Increased rates at 27% ↑ of parking spaces

Demand pricing

Parking congestion decreased 10%

Ensure 10-30% space availability.

Before Smart Grid

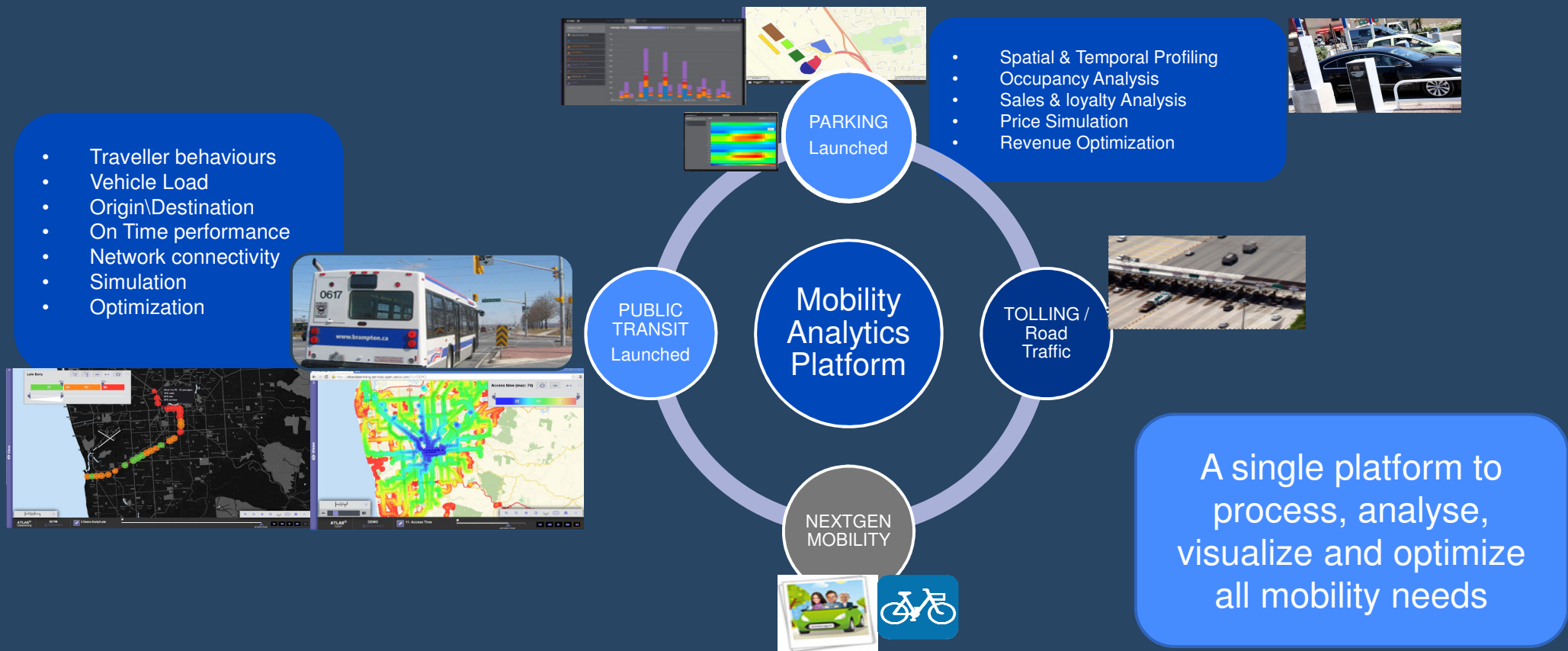
After Smart Grid

Increase in total revenue. 2% ↑

Merge® powers data-driven parking management



# Example 2: Mobility Analytics Platform



# Technical challenges

## Size

Millions of transactions every days  
Millions of vehicle locations traces



## Heterogeneity

Different providers  
Different domains  
Different spatio-temporal granularities  
Different user needs



## Quality

Noisy  
Partial  
Low level

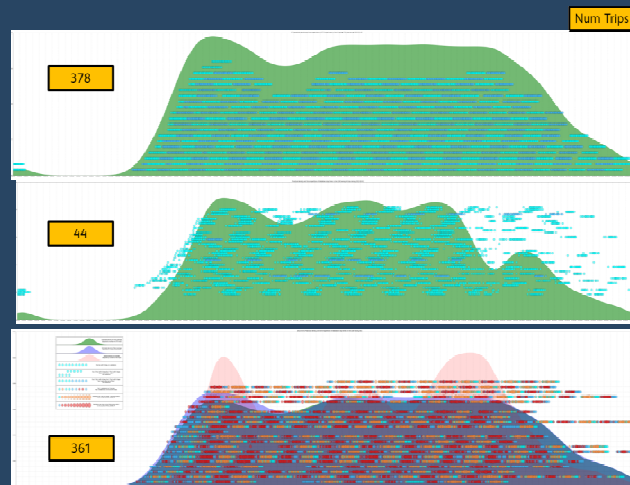


# XRCE approach

## Specific ETL Process



## Using stochastic models for cleaning / reconciliation



## Big data processing framework: so far only experimenting





# Organizational challenges

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**Data is the new oil but ...**



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**The highest values comes when crossing sources**

Usage data are business sensitive  
Privacy issues even bigger in such contexts

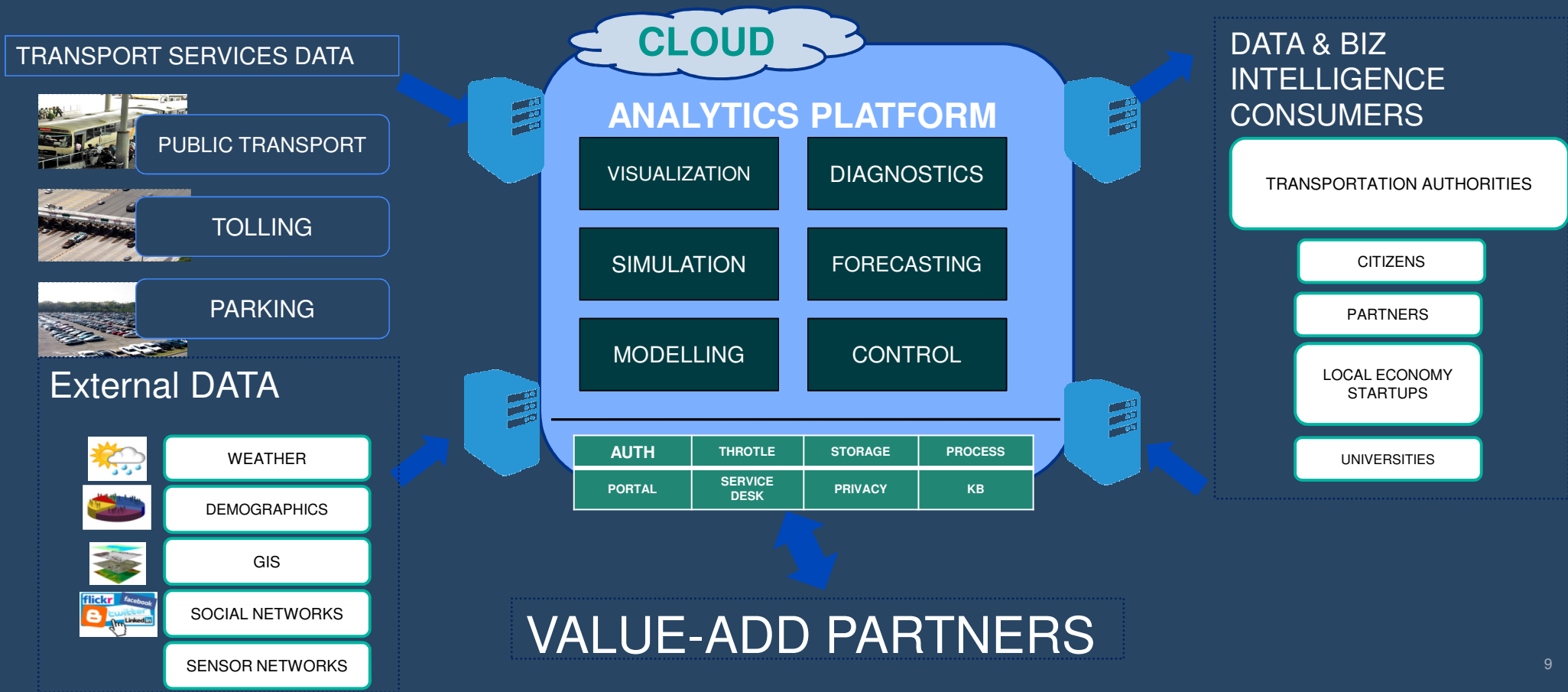
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**Open Data is developing but limited to non sensitive data**

Service descriptions  
Old aggregated usage



# A single and open platform for a global understanding of mobility



# Operational challenges

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**No/Few data scientists at customer site**

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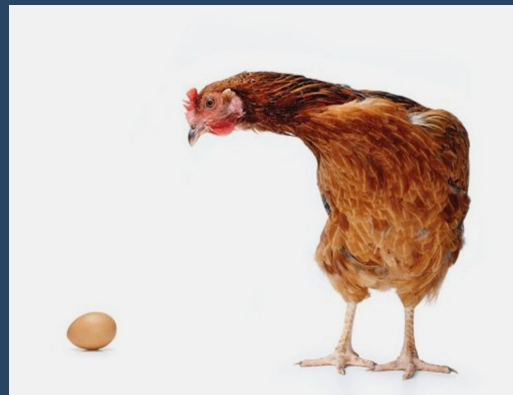
**Data-driven approach disrupts current practices**

Potential resistance from existing technical staff

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**Chicken/egg**

how to give requirements without understanding possibilities



# XRCE approach



## Iterative and interactive innovation process

Dreaming sessions  
Data set exchanges  
Online demos shared on Open Xerox

## Stepped technical development

Visualize: quickly get valuable insights  
Model: Over time test what the system can learn  
Optimization: Long term, use what has been learned to optimize decision making

# Conclusion

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- Transportation domain is not yet fully taking benefits of the potential of big data
- Some recent examples of technologies shows the potential of innovative disruption it can bring
- A full transition relies not only on technical progress but also on organizational and operational changes



