A strategic study at Infrabel
FROM AUDIT TO LONG TERM PLANNING

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Infrabel – Strategy & Enterprise Steering

UIC Asset Management Conference
April 2019
Agenda

1. The challenge

2. The audit mission

3. Looking back & Looking forward
The challenge for Belgium

There are opportunities for improvement

.....and the willingness to change increases

**Network size**
Average; but “big” compared to NL

**Modal split**
- Passenger: low
- Freight: average

**Utilisation**
Relatively low (slightly better than FR)

**Punctuality**

<table>
<thead>
<tr>
<th>Country</th>
<th>Length of lines (km)</th>
<th>Line km per million people</th>
<th>Modal split passengers (% train km)</th>
<th>Modal split freight (% ton km)</th>
<th>Utilisation Tr.Km/Km line</th>
</tr>
</thead>
<tbody>
<tr>
<td>NL</td>
<td>3,058</td>
<td>180,1</td>
<td>10,9%</td>
<td>6,0%</td>
<td>48.053</td>
</tr>
<tr>
<td>BE</td>
<td>3,607</td>
<td>318,9</td>
<td>7,7%</td>
<td>11,6%</td>
<td>26.637</td>
</tr>
<tr>
<td>AT</td>
<td>4,917</td>
<td>565,8</td>
<td>11,4%</td>
<td>31,5%</td>
<td>31.261</td>
</tr>
<tr>
<td>UK</td>
<td>16,253</td>
<td>248,6</td>
<td>8,7%</td>
<td>8,4%</td>
<td>34.642</td>
</tr>
<tr>
<td>FR</td>
<td>28,364</td>
<td>424,9</td>
<td>9,5%</td>
<td>10,9%</td>
<td>15.683</td>
</tr>
<tr>
<td>DE</td>
<td>38,990</td>
<td>474,5</td>
<td>8,5%</td>
<td>18,8%</td>
<td>28.212</td>
</tr>
</tbody>
</table>
The challenge for Infrabel

**Business As Usual**

- Financially driven (60/40)
- Operational improvement programs (I-AM 2020, SMARTER-M, new TMS,..)
- Diligent, “bon père de famille”

**New strategy**

Input for discussion (Board)

New strategy on the long term (Gov.)

Can we go on as before?

Visualise our constraints & opportunities

Phoenix Project
Agenda

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What kind of mission?

Mobility development scenarios

Replacement needs
Maintenance needs
State of the network
Demand evolution
Capacity utilisation
State of the traffic

A strategic multi-scenario analysis: horizon 2040
Why an audit?

The main advantages

• Methodological approach based on operational realities
• Objective & challenging
• International neutral expertise / simulation tools

www.imdm.ch
Infrastructure Management Decision Making

www.sma-partner.com
Railway System Planning
Optimizing the future value of our network

Long term national mobility scenario(s)

Network strategies
Optimized long term vision for the network(segments) and the transport plan (eg homogenous corridors) in line with future technologies and alternative transport systems

Assets strategies
Optimal use of technologies, optimal life-cycle costs (maintenance, renewal & upgrades), risk management

Assets portfolio strategies
Migration, investment and reinvestment strategies, etc.

Strategic operational concept
Type of timetable (cyclic and symmetric, non cyclic)
Asset portfolio complexity reduction (number of tracks, number of S&C in stations)
Generic track possessions design

Planning, operations

Planning, operations

Assets

Service

Line-segmentation is used as driving force to define adequate strategies
The mission’s objectives

**Phase 1. Establish the situation**

- **D1** State of the network maintenance and replacement needs
- Network capacity

**Phase 2. Visualize choices**

- "Assets condition & risks" tool (IMDM - Eqylibr®)
- "Capacity simulation" tool (SMA - Viriato®)

**Phase 3. Define the next steps for strategic improvement**

- TCO, organisation of works
- Business cases (eg: for tertiary lines)
- Financial impact analysis

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**“The reference”**
- Replacement investments
- Recommendations
- Reference scenario 2040

**“Scenario analysis”**
- Simulation-tools
- Scenario building & evaluation

**“Apply the strategy”**
- Decision making to support the strategy

2 audits deliverable until now:
- D1) Evolution of the state of the network
- D2) Evolution of the use of the network

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**The reference**

**Simulation-tools**

**Scenario building & evaluation**

**Decision making to support the strategy**
D1 : Evolution of the state of the network

(Delayed) renewal

Asset inventory

+ 
• Technology & automatization
• Asset base
  • Extensions & suppressions
• Rationalisations

Risk based output
(auditors judgement)
• step by step adjustments
• safety first
• strategic line segmentation

Asset impact
• Safety
• Cost
• Reliability

Scenarios
• Resource constraints
• Budget constraints

Traffic evolutions
• Charge (growth)
D1 : Evolution of the state of the network

Theoretical scenario : renewals based upon aging without constraints

Industrial scenario : renewals based upon aging with industrial constraints
  - As of 2020 additional CAPEX needed to guarantee safe network.
  - 60/40 CAPEX repartition non tenable without structural adjustments

Limited budget scenario : budget remains constant after 2020 (= reference BAU)
  - up to 25% of the fine meshed lines will have exceeded the economical lifetime in 2047
D2: Evolution of the use of the network

- **Reference 2040 - BAU**
  - The network
  - Train paths

- **Selection of preferred measures**
  - Network development
  - Utilisation

- **Scenario development**
  - Network variants
  - Transport plan variants

- **Evaluation (delta BAU)**
  - Financial bilan
  - Quality of service

1. Cost reduction
2. Increase utilisation (asset reduction and/or traffic increase (corridors))
3. Quality of service (safety / punctuality)
D2 : Evolution of the use of the network

2 contrasting scenarios for a first iteration
Indicative results of first iteration

D2 : Evolution of the use of the network

No additional network extensions (except the ongoing)

<table>
<thead>
<tr>
<th></th>
<th>Scenario focus OPEX</th>
<th>Scenario focus CAPEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPEX budget</td>
<td>Reduction by increased productivity (day work windows)</td>
<td>Reduction by elimination of switches</td>
</tr>
<tr>
<td>CAPEX budget</td>
<td>-</td>
<td>reduction by elimination of switches</td>
</tr>
<tr>
<td>Transport plan changes</td>
<td>Same logic as today</td>
<td>Disruptive, important impact in stations</td>
</tr>
<tr>
<td>Volume in peak (increase 2040 vs 2018)</td>
<td>+ 36%</td>
<td>+ 57 %</td>
</tr>
<tr>
<td>Capacity to meet future demand</td>
<td>Not OK</td>
<td>OK (except certain lines to BXL)</td>
</tr>
<tr>
<td>Robustness</td>
<td>No improvement, no deterioration</td>
<td>Slightly better</td>
</tr>
</tbody>
</table>

**Minus**
- Low utilisation
- Single line exploitation
- Low flexibility (corridors)
- Resistance against change in transport plan

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A look back

Main success factor
- Implication of management & experts
- Implication of the board
- The auditors

Achievements
- Awareness!
- Future (budget)scenarios defined by transport choices
- Development of a coherent financial asset model (OPEX & CAPEX). Permitting to calculate budgets by asset needs (risk based) instead of “due diligence”
And a look forward

Next steps
• Further improve simulation capabilities
  • Tools & data
• Act on recommendations
  • Improve decision making (LCC, R&R)
  • Long term exploitation & network vision
    - The future role for public transport & rail
    - Roles & responsibilities – building blocks (cfr. scenario choice)

Our roadmap for Asset Management is taking shape
Implementation of RAIL ASSET MANAGEMENT

- Clear objectives – better decisions.
- Maximise the value of the rail assets.
THE UIC AM FRAMEWORK: INFRABEL WIDE

AM Framework ≠ I-AM

Phoenix Project

(source: UIC Railway Application Guide p. 23)
THE UIC AM FRAMEWORK: TWO STREAMS

OPERATIONAL EXCELLENCE

STRATEGIC CHOICES & DECISION CRITERIA

- Line segmentation
- Long term vision
- Corridors
- Robustness
- Transport plan
- Rationalisation
As yet no formal roadmap

But we continue nurturing our “maturity” growth path

• Understand what’s it about by using it (implicit)
• Prepare the basics (more explicit)

*Maturity is not when we start speaking big things
*it is when we start understanding small things.*
Thank you