

Cost information: Benefiting from the existing experience and tools

LICB

Lasting Infrastructure Costing Benchmark



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UIC



Content

- Background and Objectives
- Methodology
- Benefits and results



Content

- **Background and Objectives**
- Methodology
- Benefits and results

INFRACOST



- project of the UIC (International Union of Railways) start 1996
- analysis of total infrastructure cost
 - investment
 - maintenance
 - renewal
- aims
 - help for infrastructure managers
 - improve the performance of infrastructure
 - enable them to define their individual cost-position
 - develop methods for cost comparison
 - identify cost drivers
 - "toolboxes" for strategies towards cost reduction



INFRACOST

The first's Conclusions (Phase III):

- different cost levels exist; reductions are clearly possible
- reduction covers whole value chain
- Life-cycle-cost = optimal decision basis
- benchmarking shows to participants their relative cost position
- need for action = role of the participants



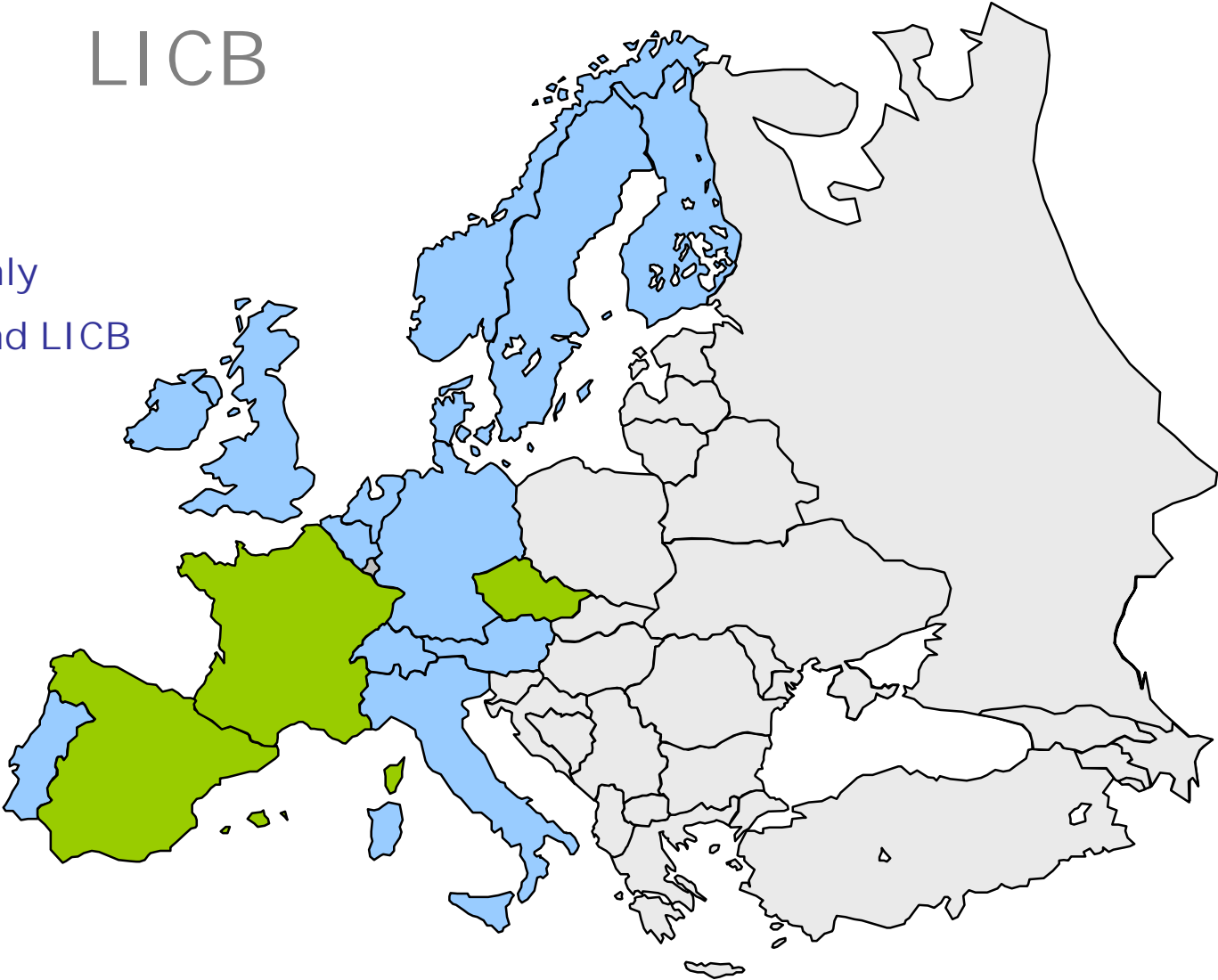
The results of INFRACOST are the input for LICB

- In June 2002 INFRACOST has delivered the final report
- The study has provided considerable insight in cost relations and has given useful advice to infrastructure managers
- In order to preserve this value, a "lasting benchmarking function" has been established to guarantee a platform for a continuous comparison of cost and for tracking of trends

Starting 2003

LICB

- InfraCost only
- InfraCost and LICB



Objectives of LICB



- Annual updates of the existing database (INFRACOST has delivered the final report June 2002)
- Production of defined benchmark charts including a management summary
- Evaluation of trends
- Communication with participants for “good practice” monitoring
- Introduce a UIC staff member to the INFRACOST methodologies and hand over the database

Background and Objectives

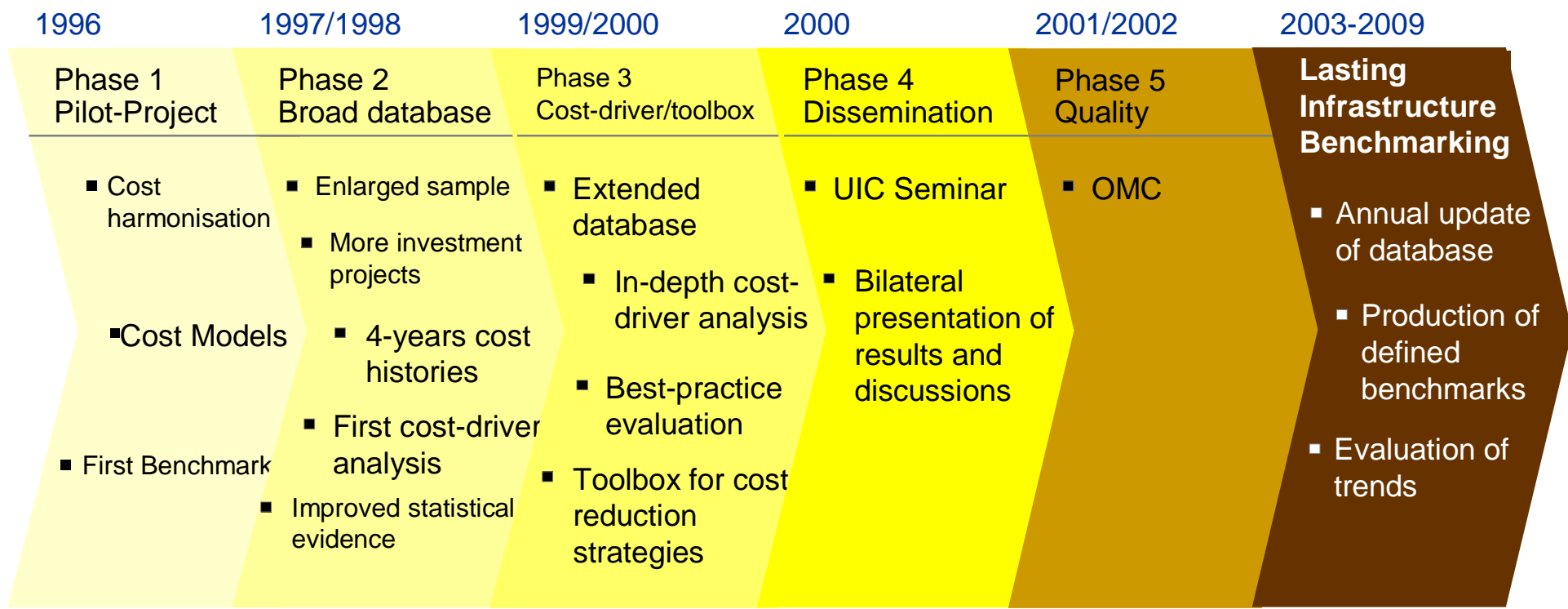




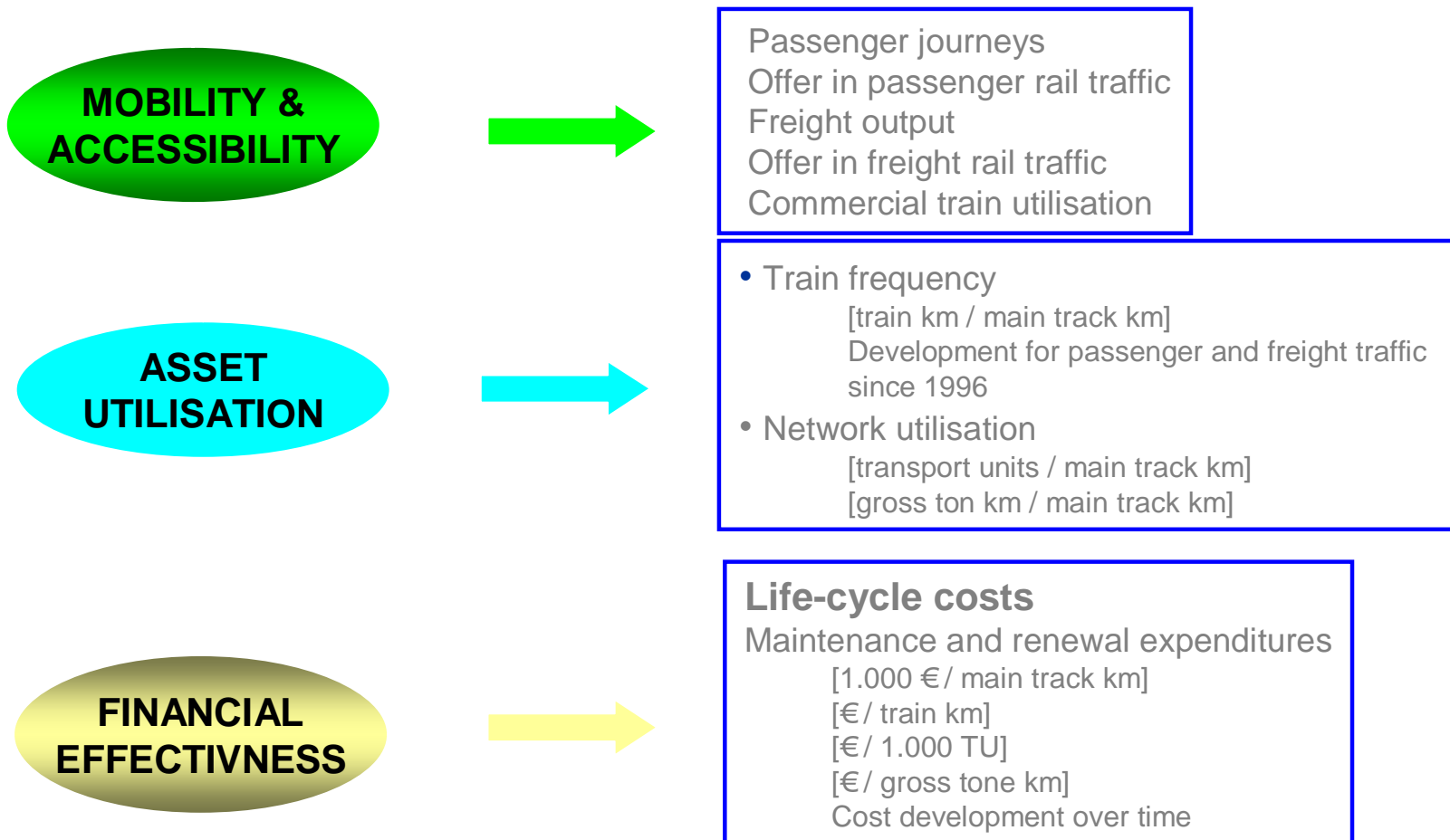
Content

- Background and Objectives
- **Methodology**
- Benefits and results

The UIC project LICB/Infracost has already gained experience over the years



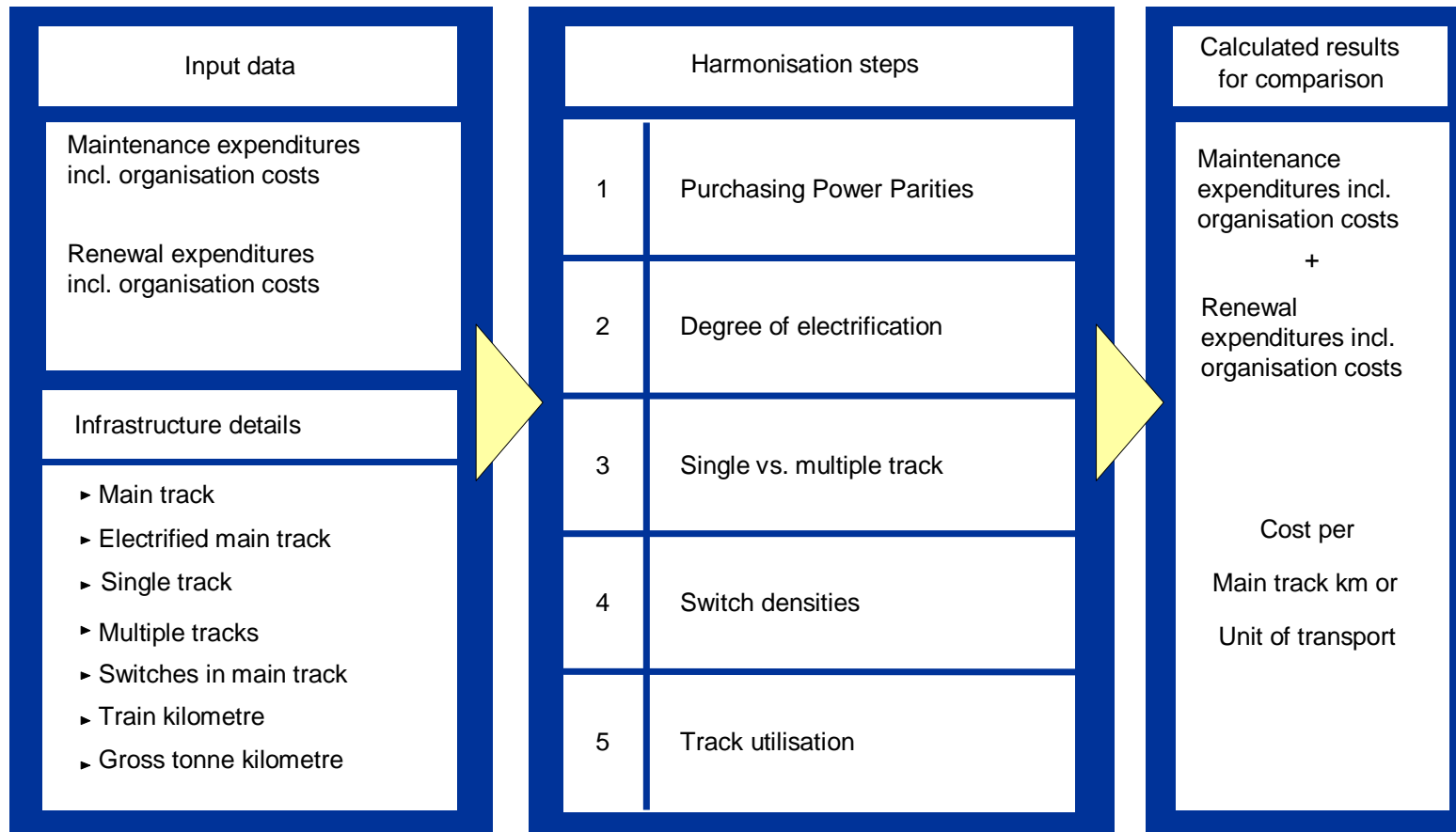
LICB Key Performance Indicators



Key Performance Indicators - detailed

Parameter
Inhabitants (mio inhabitants)
Length of lines, total [linekm]
Length of lines, passenger [linekm]
Length of lines in single track [linekm]
Length of main track [main trackkm]
Length of electrified main track [main trackkm]
Number of passenger stations [passenger stations]
Number of switches in main track [switches]
Passenger transport output [mio passkm]
Passenger transport volume [mio journeys]
Passenger trainkilometers [mio trainkm]
Passenger gross tonkilometers [mio gtkm]
Freight transport output [mio net tonkm]
Freight transport volume [mio net tons]
Freight trainkilometers [mio trainkm]
Freight gross tonkilometers [mio gtkm]

In order to make cost figures comparable a harmonization is necessary



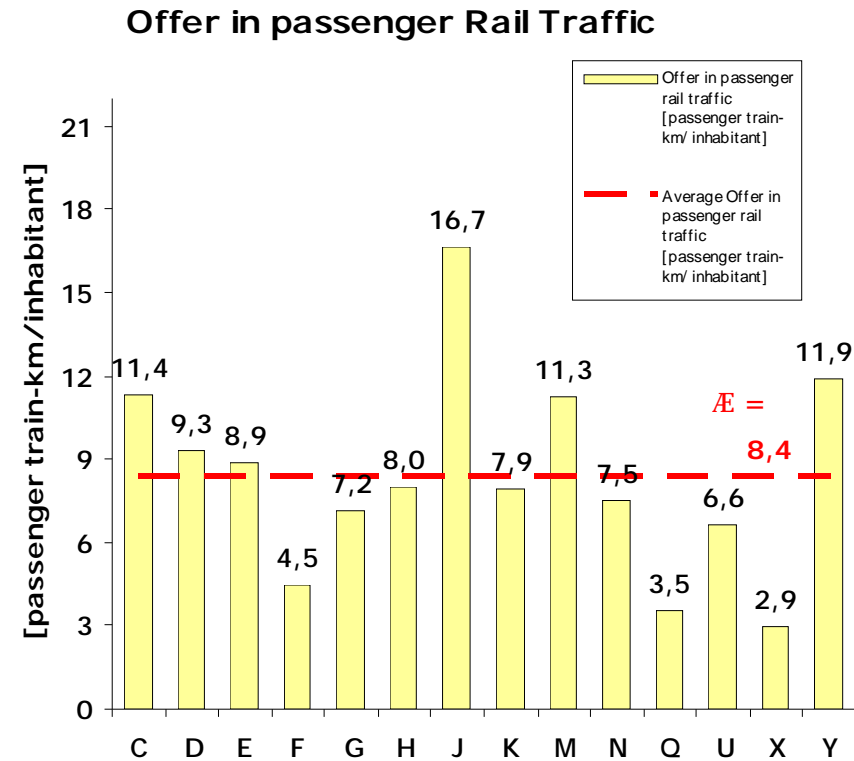
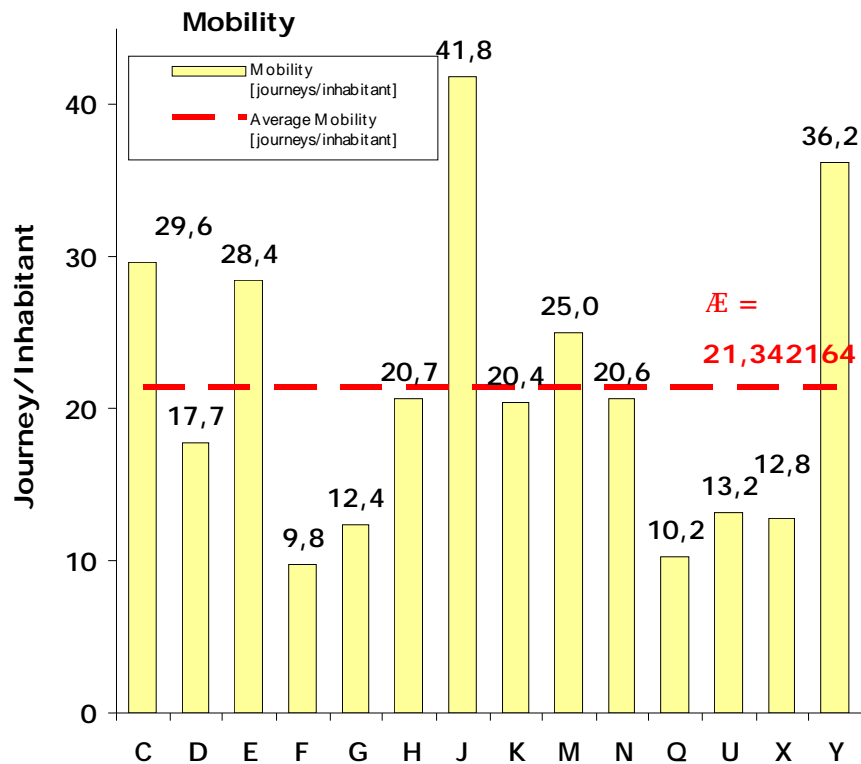


Content

- Background and Objectives
- Methodology
- **Benefits and results**

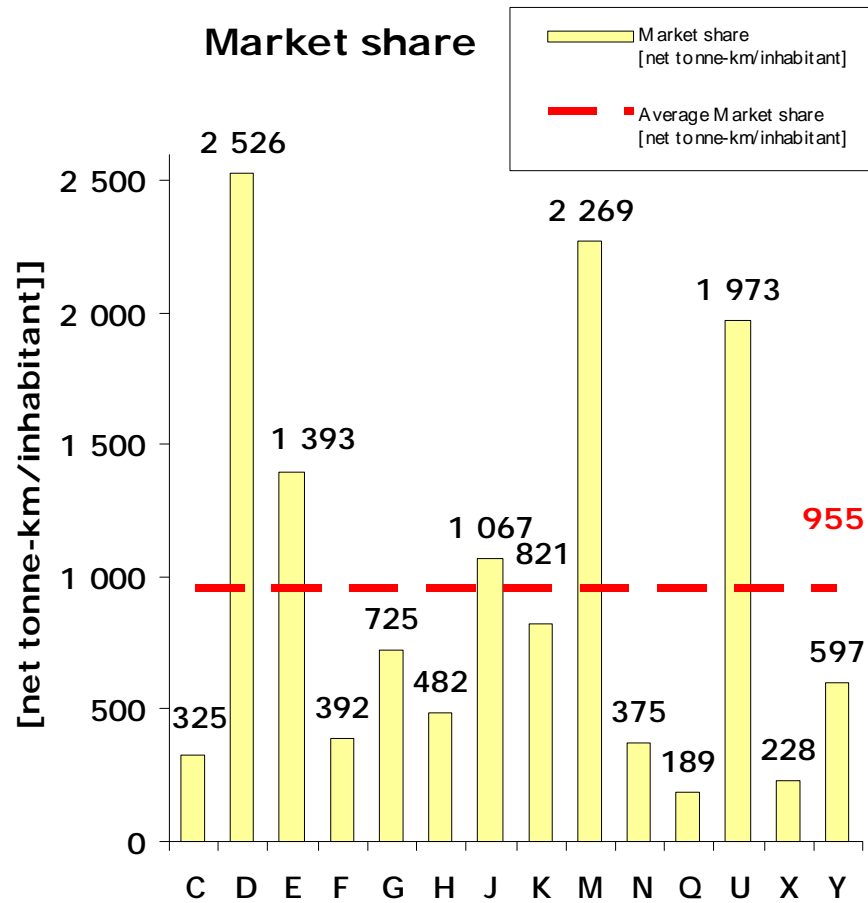
Mobility & Accessibility

- Passenger journeys
- Offer in passenger rail traffic
- Freight output
- Offer in freight rail traffic
- Commercial train utilisation

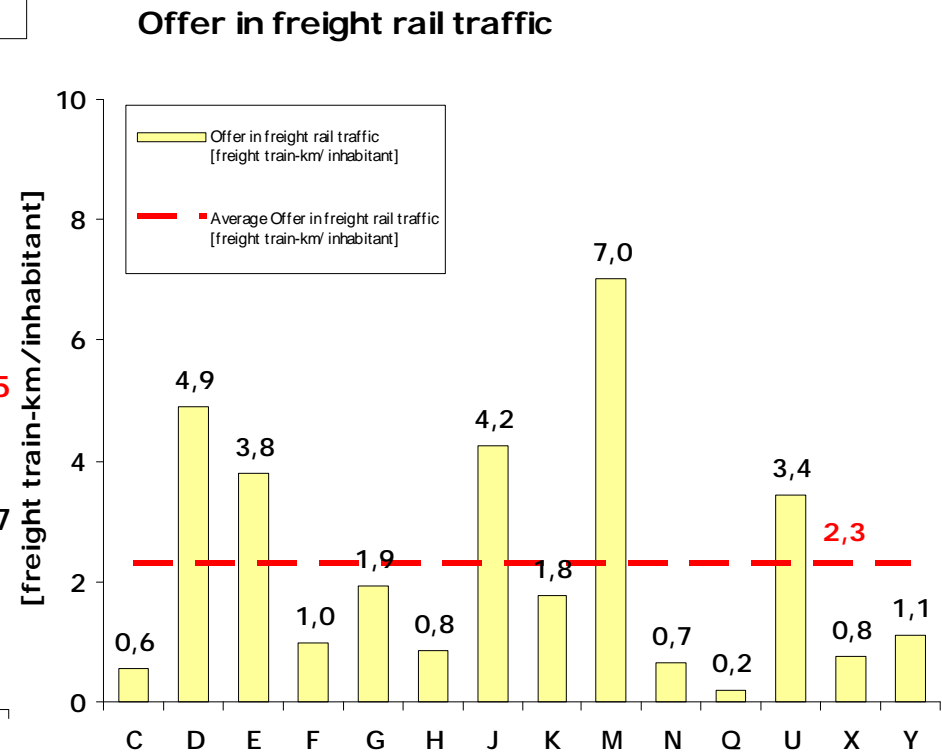




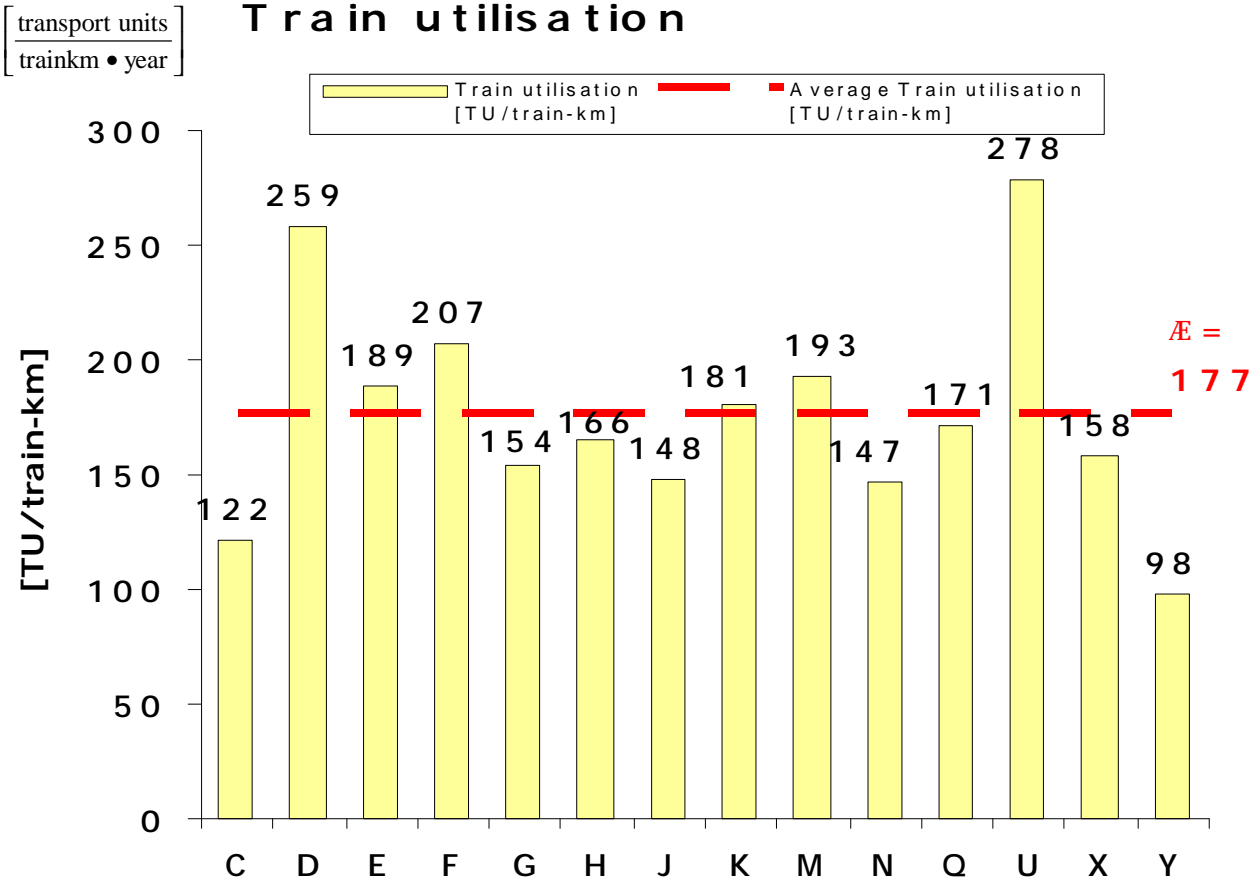
$\left[\frac{\text{net tonne km}}{\text{inhabitant} \cdot \text{year}} \right]$



$\left[\frac{\text{freight train km}}{\text{inhabitant} \cdot \text{year}} \right]$



Commercial train utilisation in terms of passengers and tones of freight



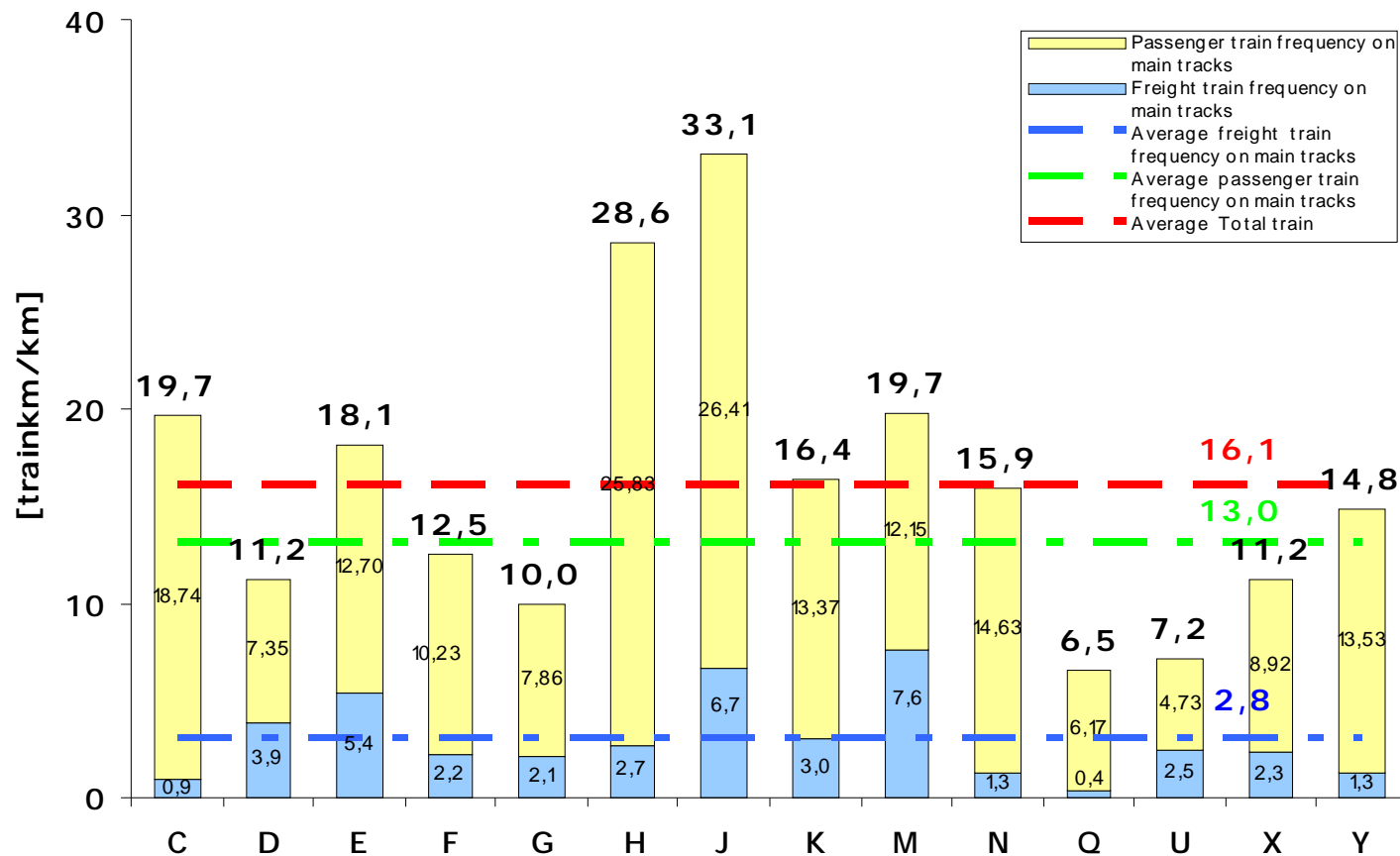


Asset utilisation

- Train frequency
[train km / main track km]
Development for passenger and freight traffic since 1996
- Network utilisation
[transport units / main track km]
[gross tone km / main track km]

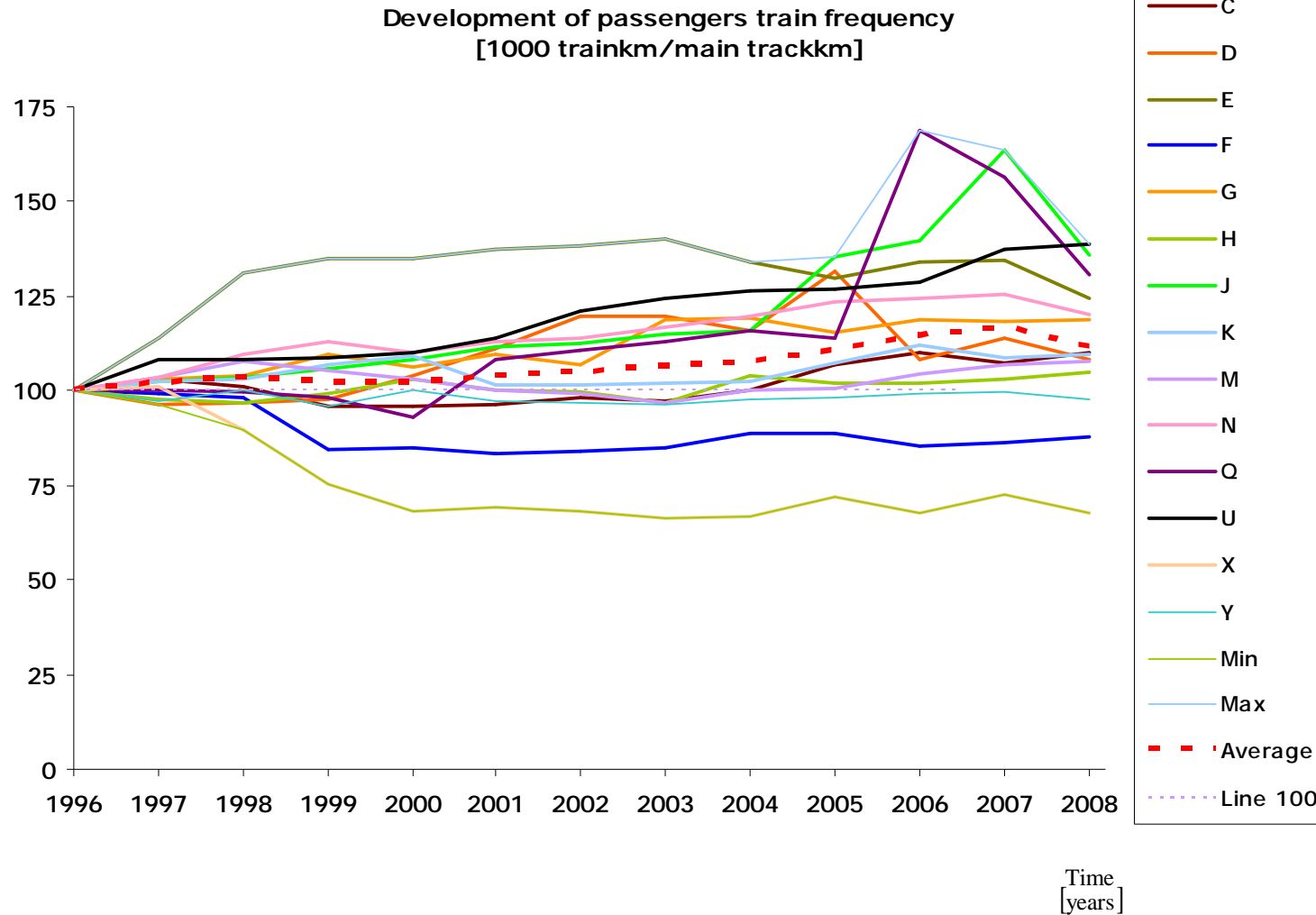
Train frequency for passenger traffic differs much more between the networks than train frequency for freight traffic

Total train frequency on main track



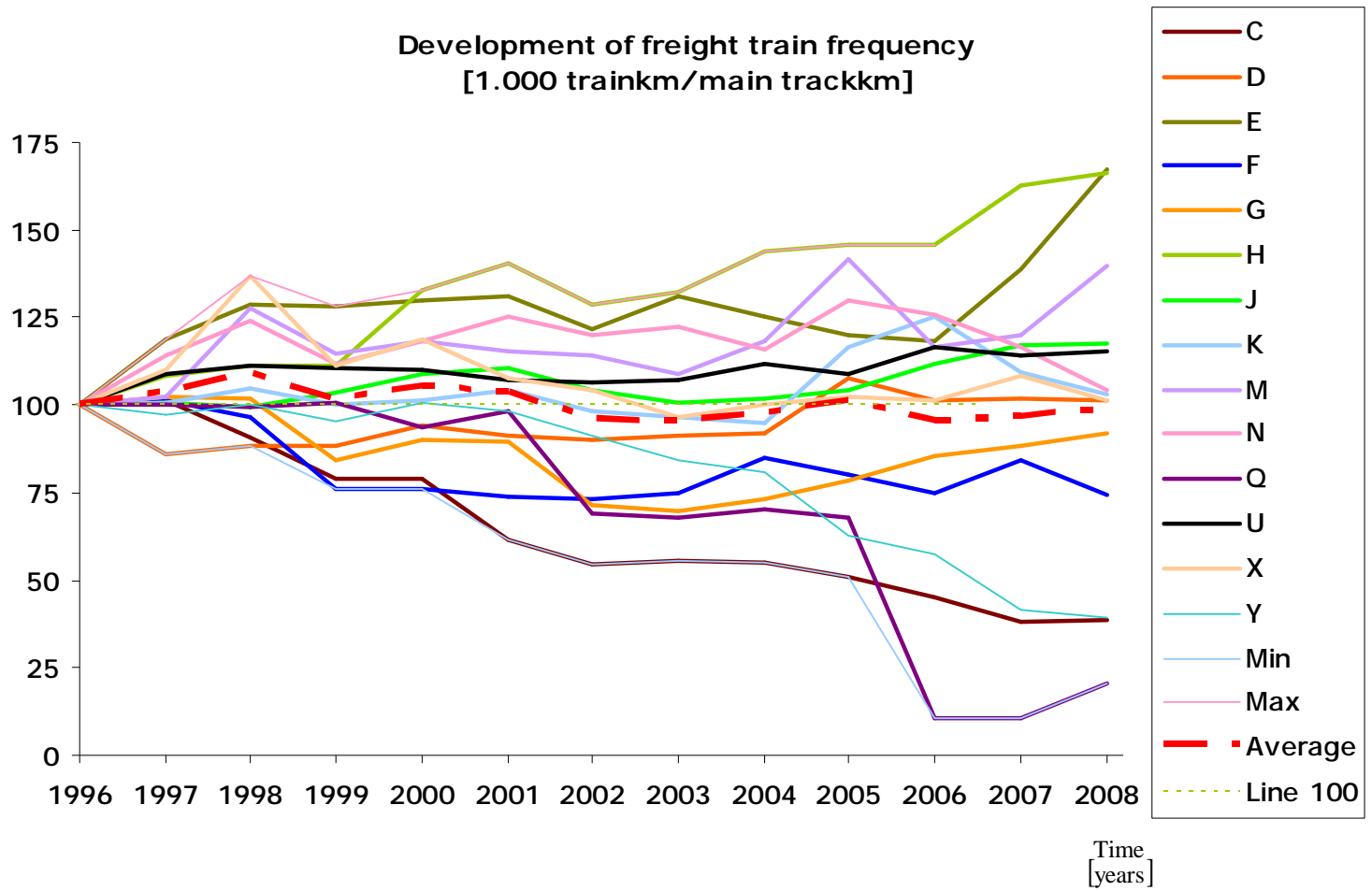
The passenger train frequency increased only slightly by 10 % on average over the last 13 years

Index
[1996=100]

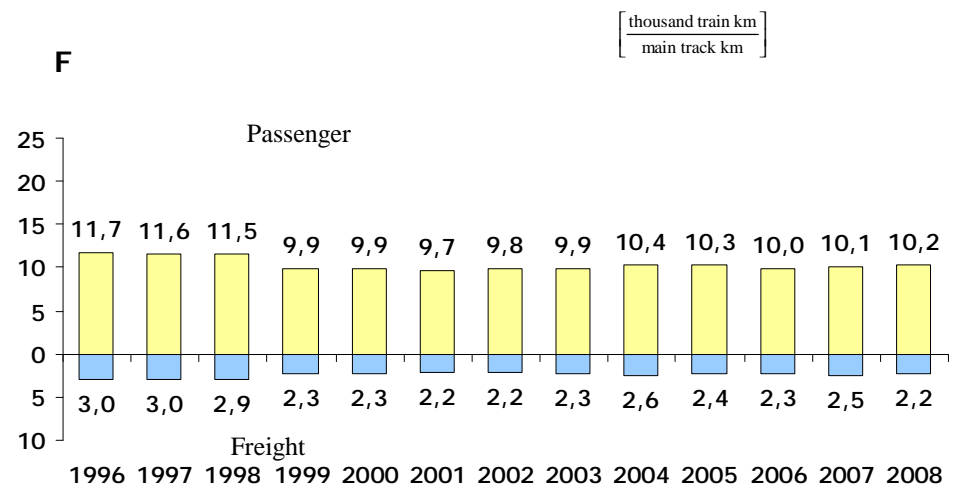
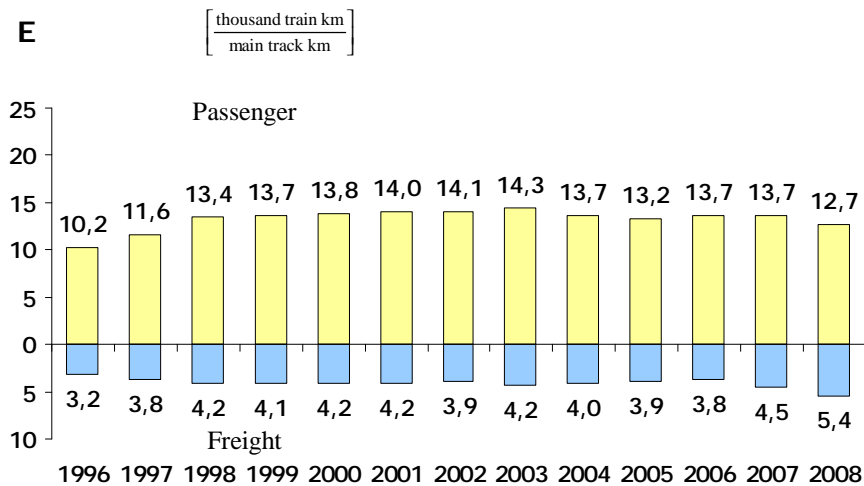
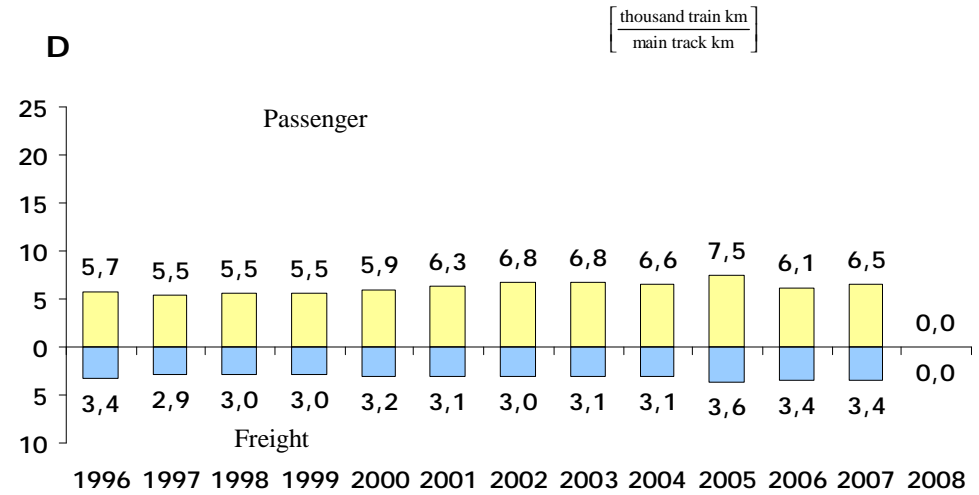
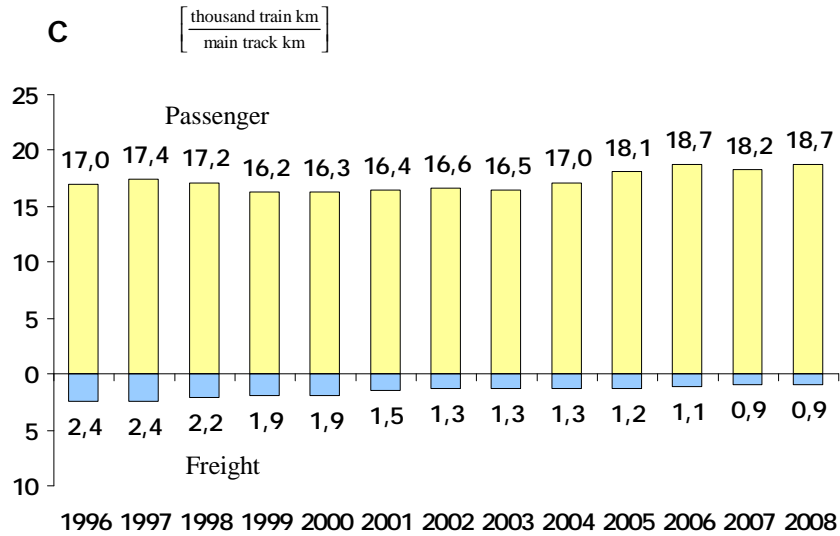


The average freight train frequency remained about the same since 1996

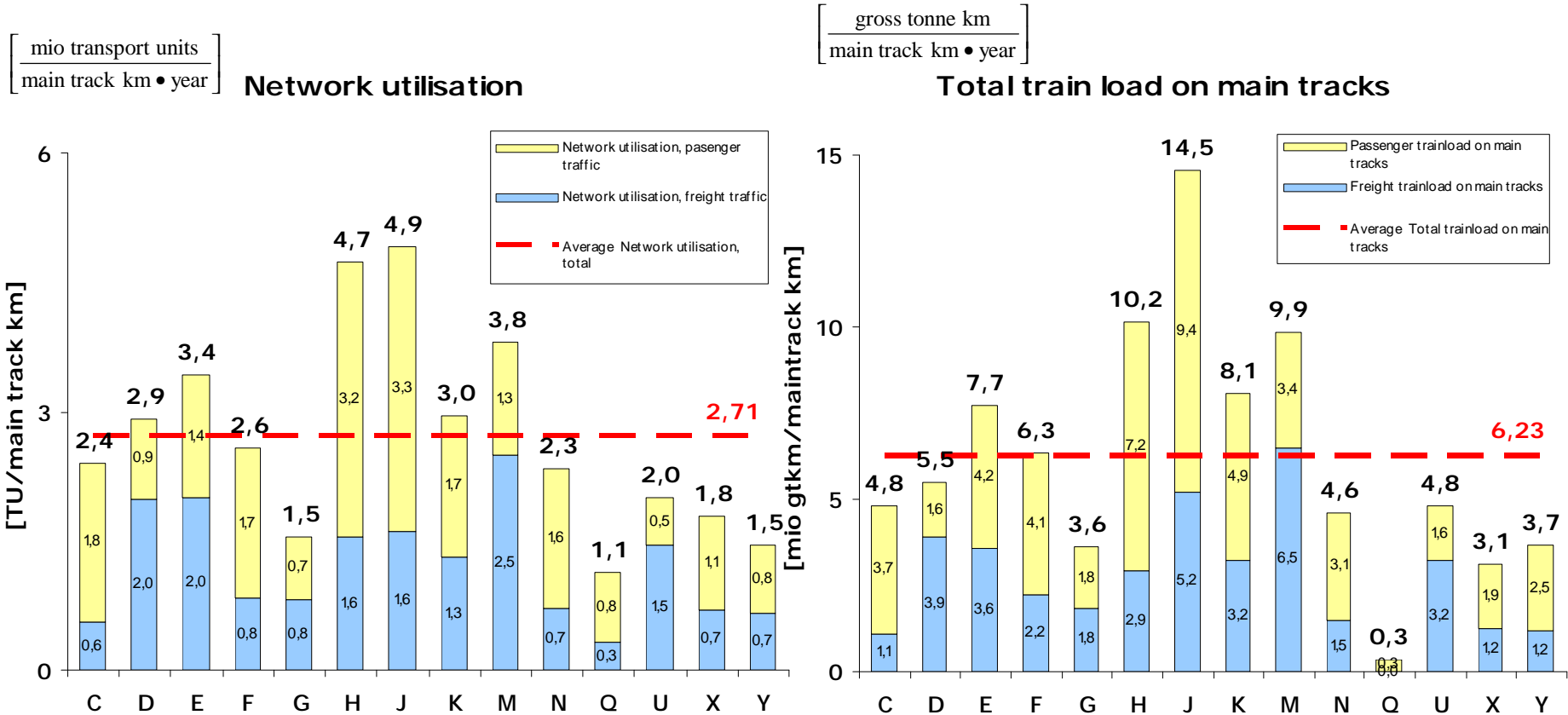
Index
[1996 = 100]



The development of train frequencies for passenger and freight traffic is documented separately for the railways



Freight oriented railways tend to have a higher network utilisation in terms of gross hauled tonne km

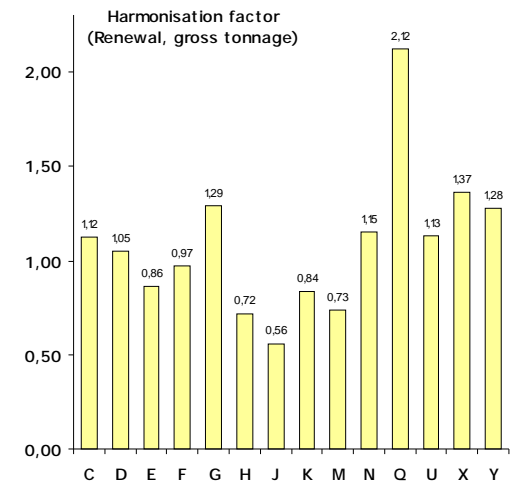
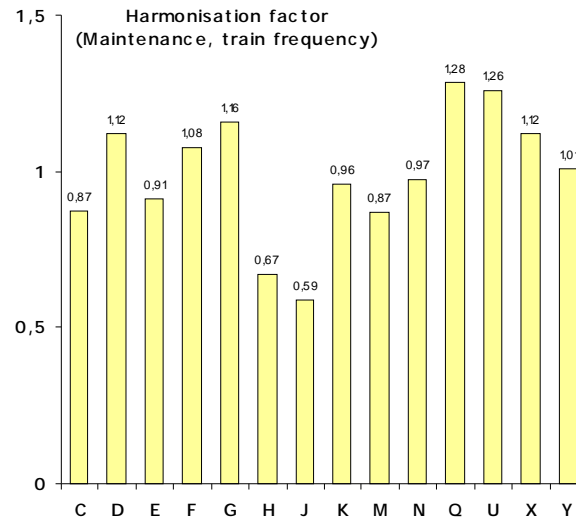
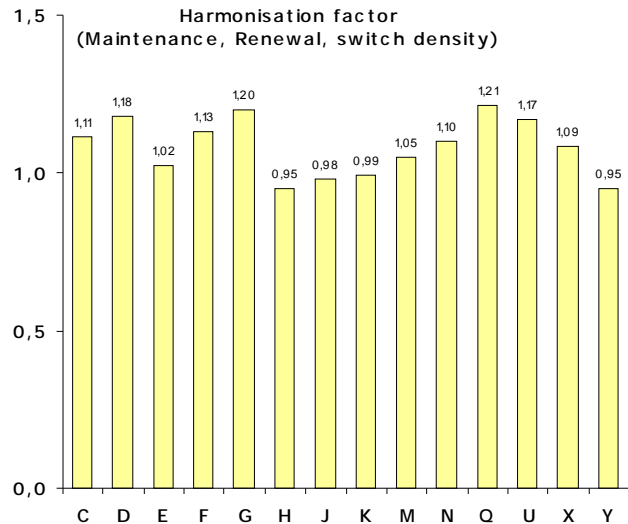
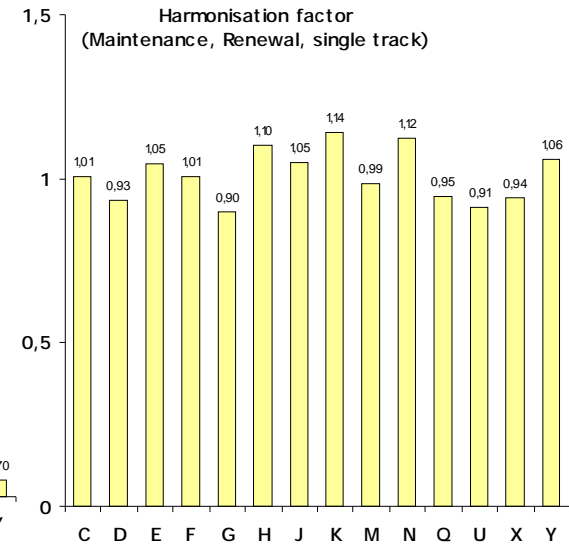
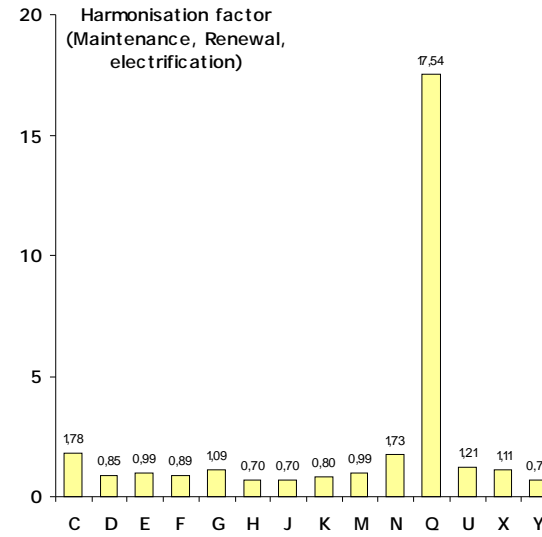
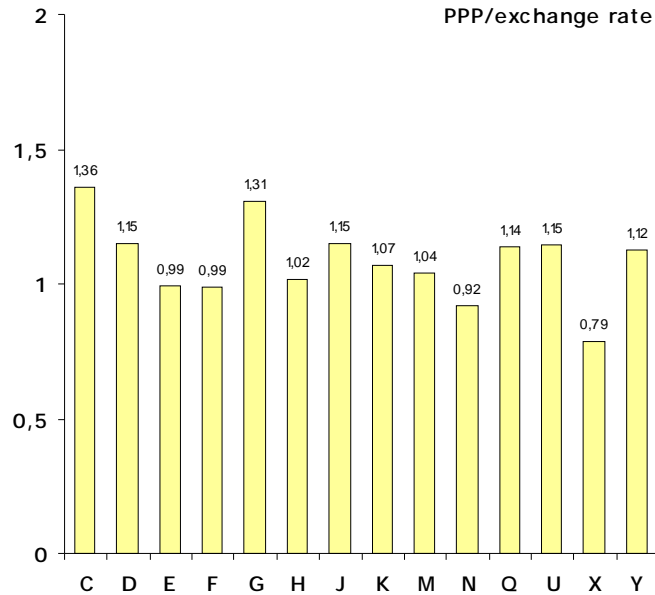




Financial Effectiveness

- Maintenance and renewal expenditures
 - [1.000 € / main track km]
 - [€ / train km]
 - [€ / 1.000 TU]
 - [€ / gross tonne km]
 - Cost development over time

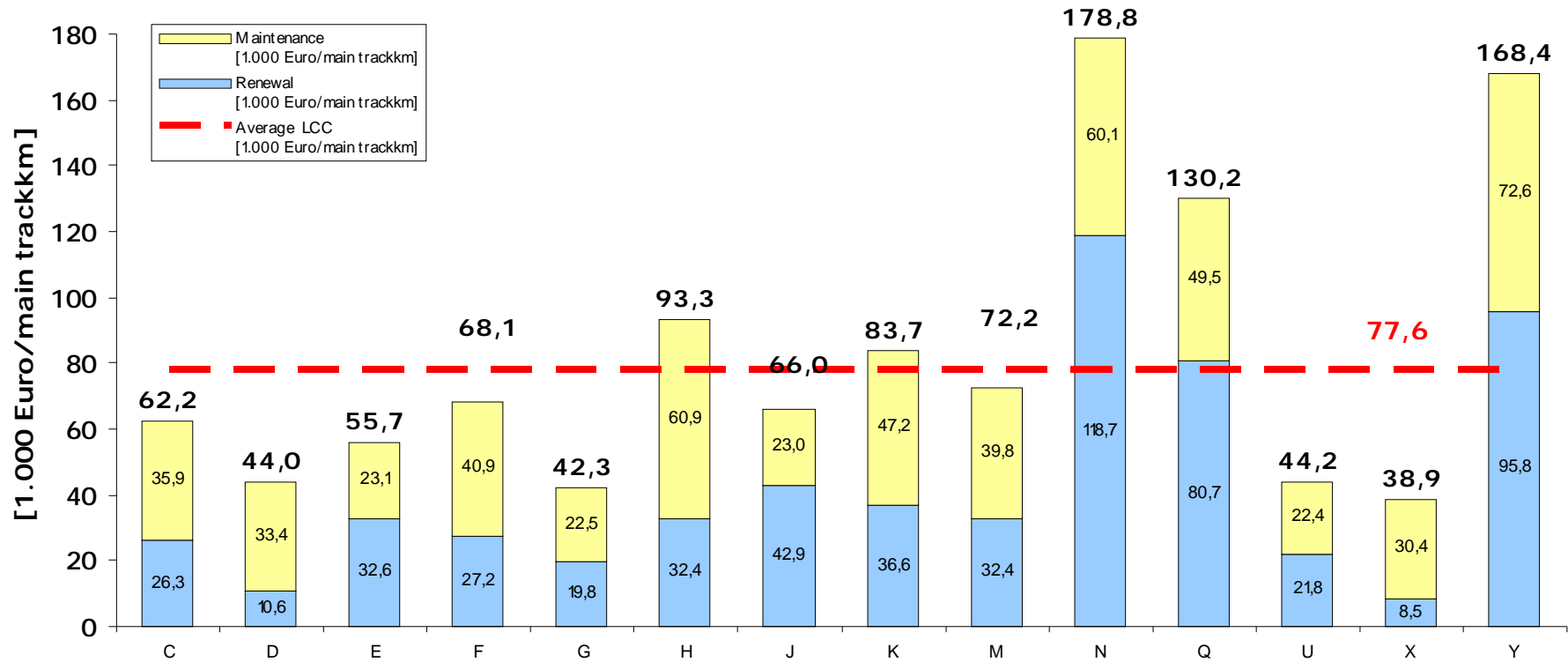
Different harmonization factors have been used to make the costs of the railways comparable



Annual maintenance plus renewal cost are about 77,4 K€ per kilometer of main track

Annual expenditures 2008
(full harmonized)

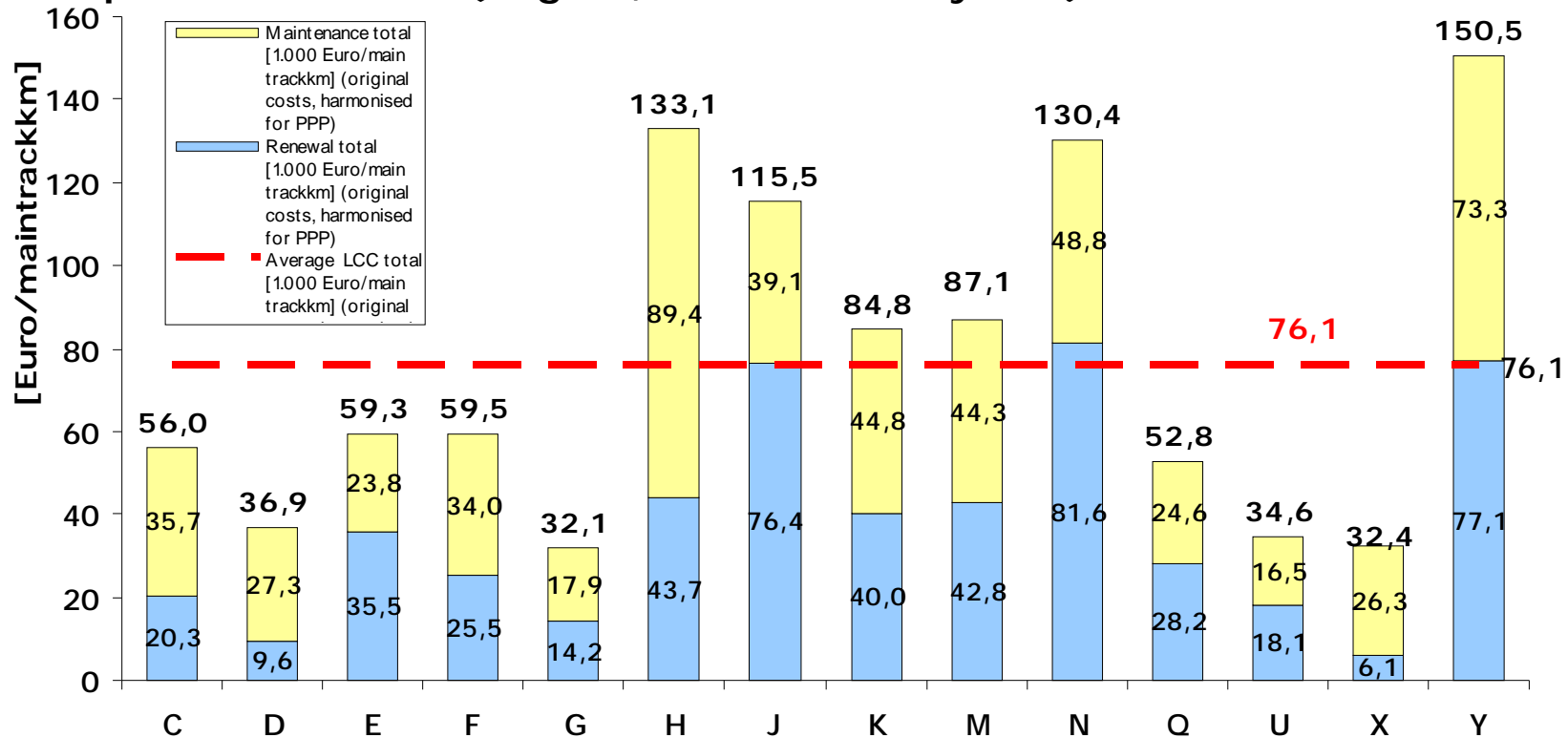
LCC per main trackkm (full Harmonised)



Harmonized life cycle costs are about 76,1 € per kilometer of main track and year

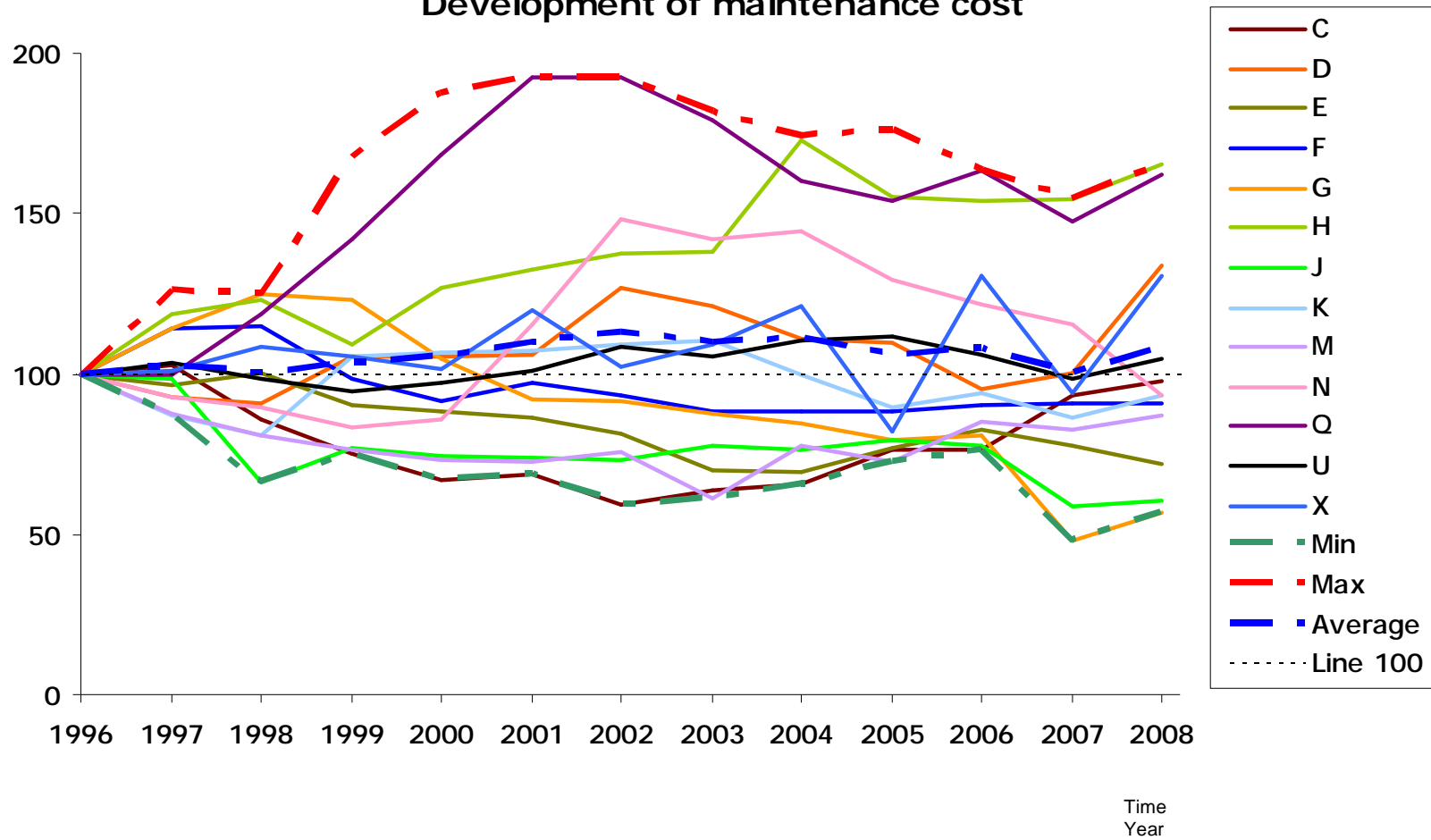
Annual expenditures 2008
(original,harmonized only PPP)

LCC per maintrackkm (original,harmonised only PPP)



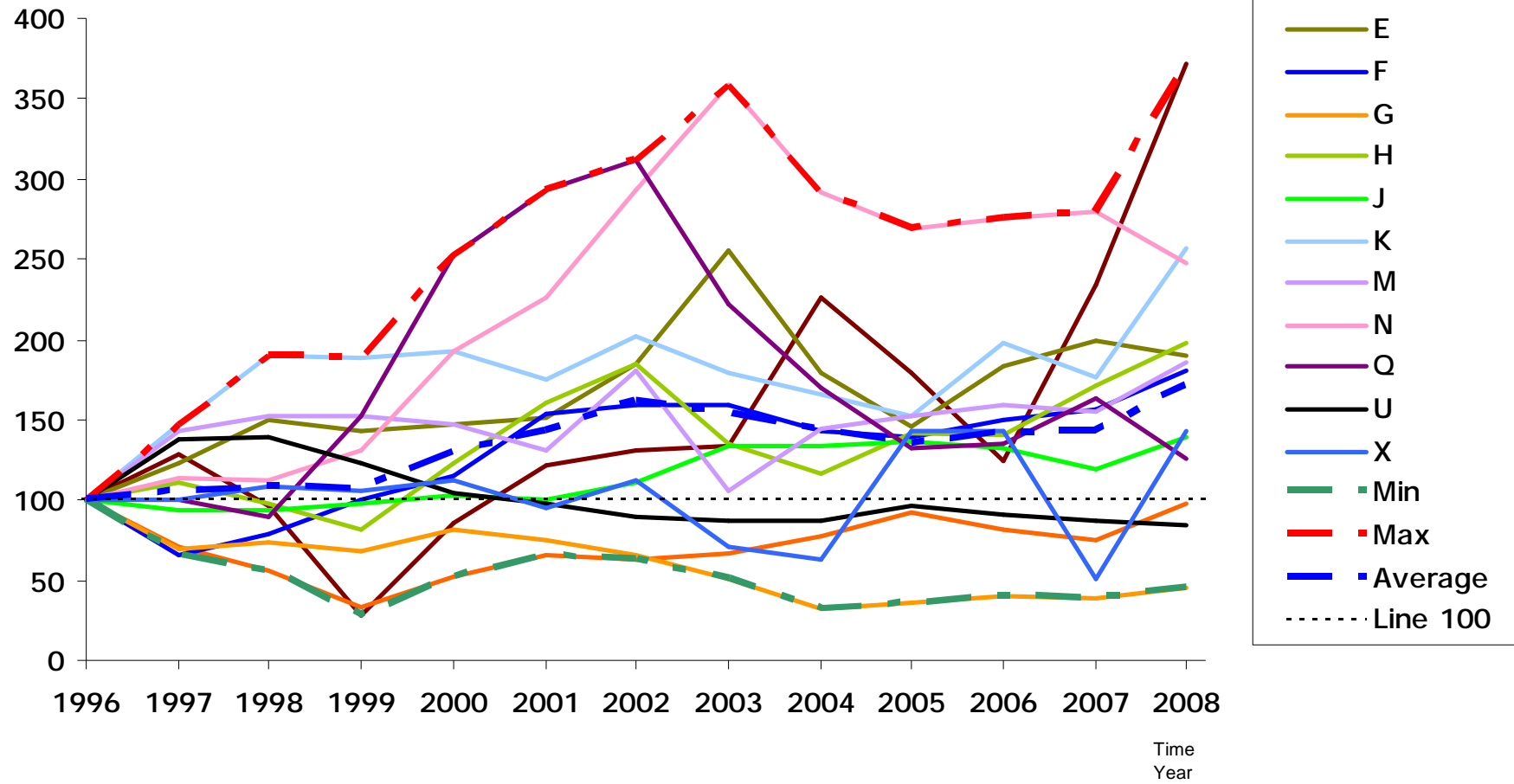
Index 1996=100%

Development of maintenance cost

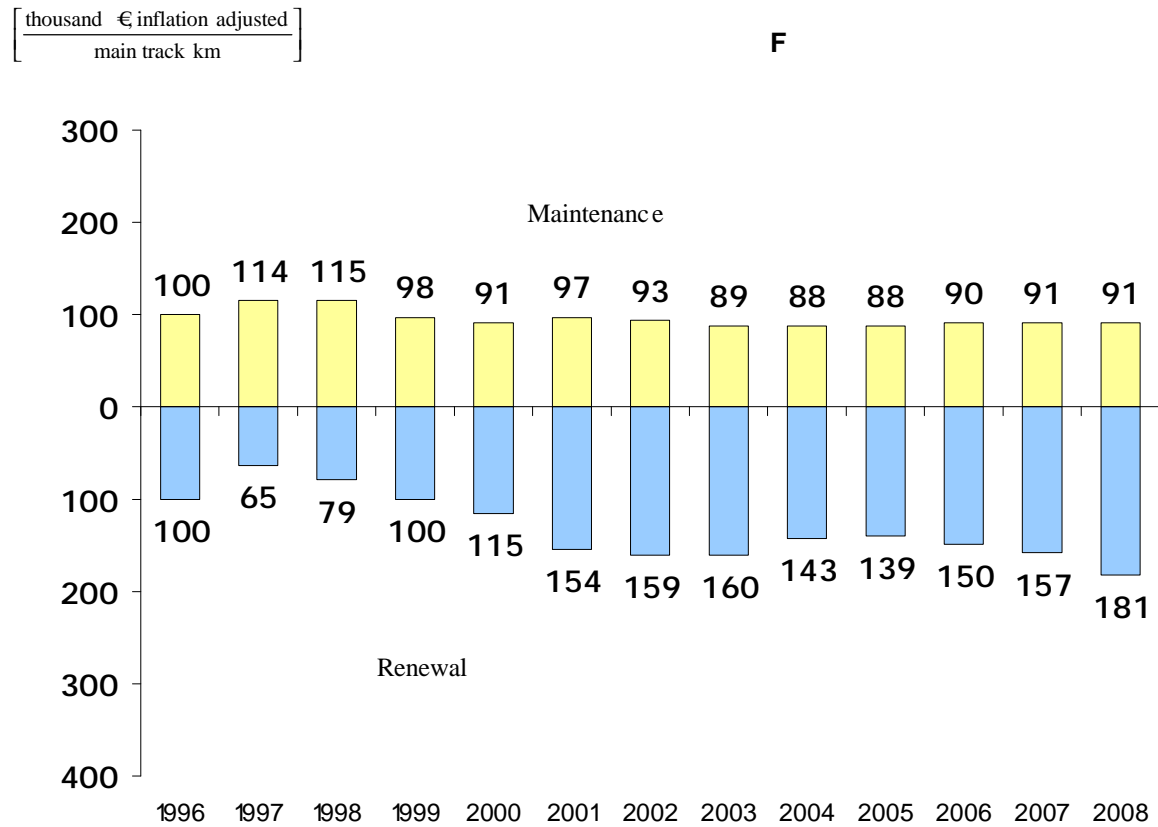


Index 1996=100%

Development of renewal expenditure



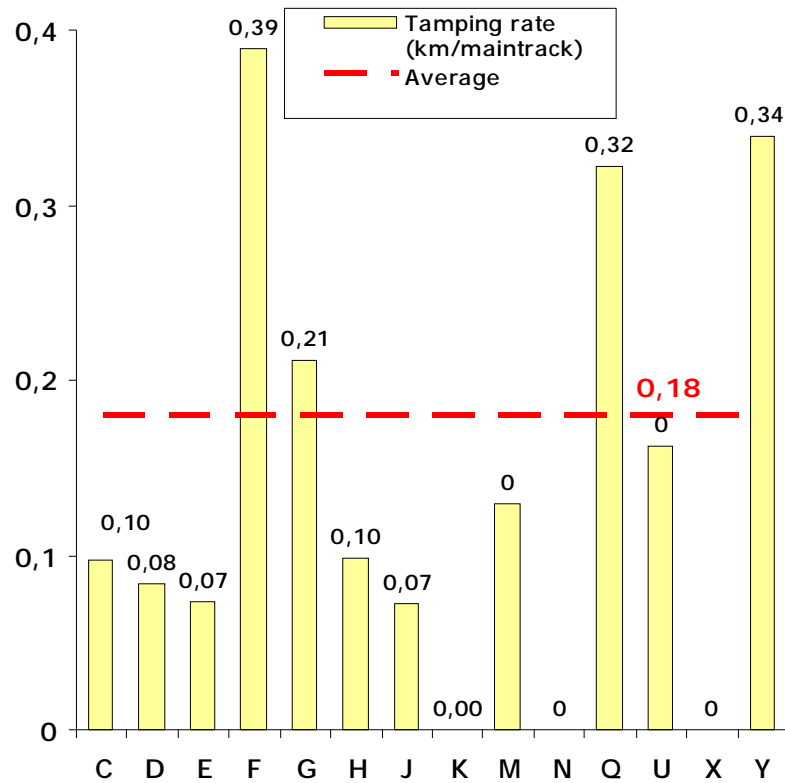
Maintenance and renewal expenditures over time for each railway



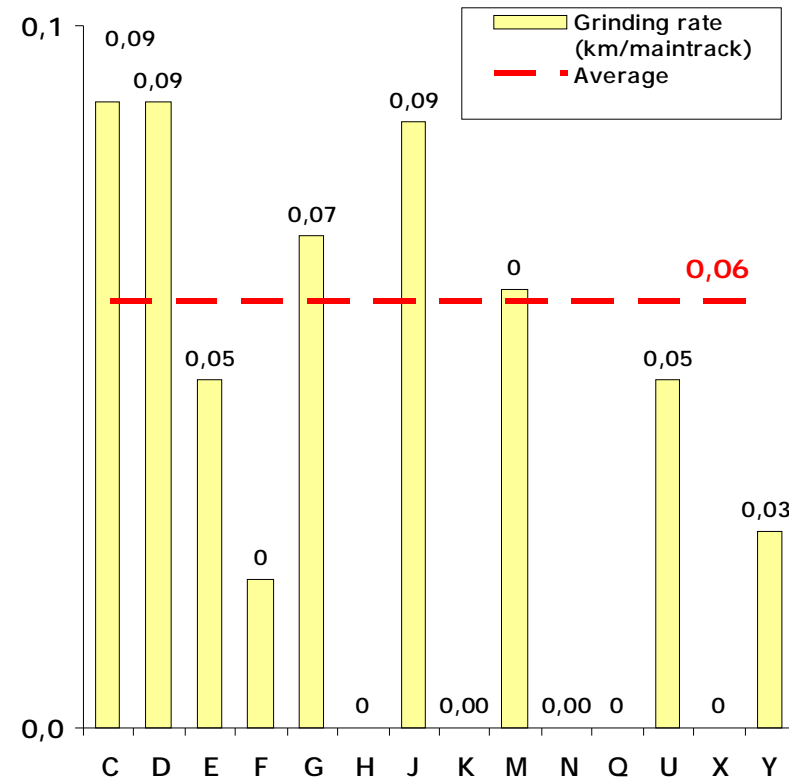
Maintenance & Renewal Rates

- **Tamping rate**
- **Grinding rate**
- **Ballast cleaning rate**
- **Renewal rate of rails**

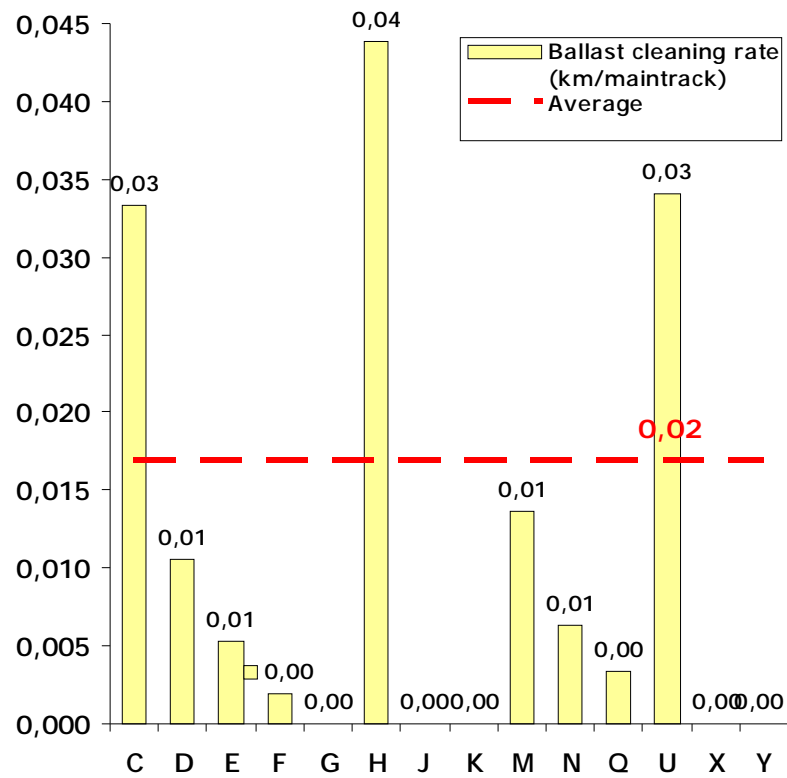
Tamping Rate



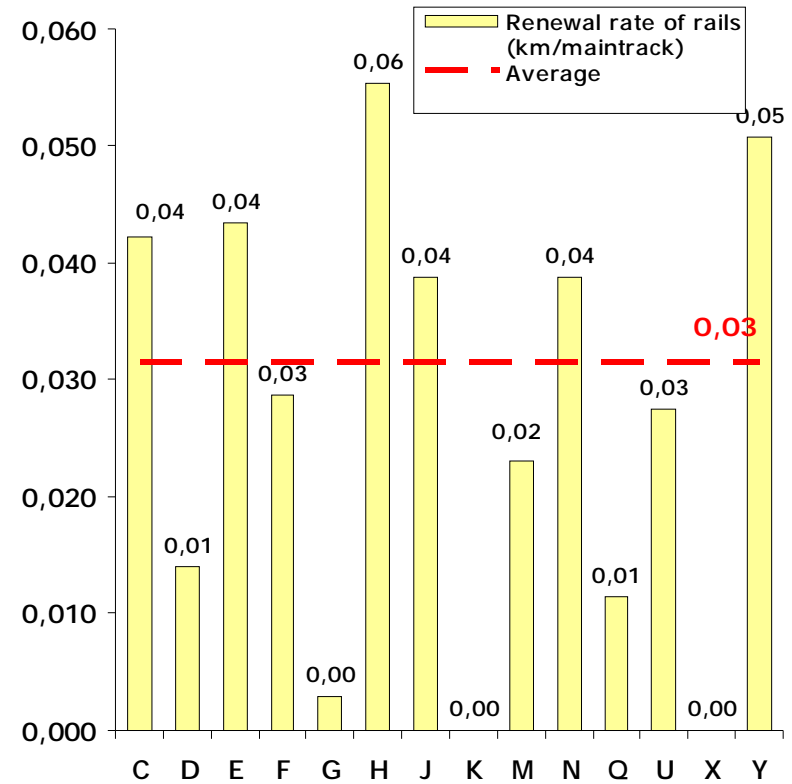
Grinding rate



Ballast cleaning rate



Renewal rate of rails





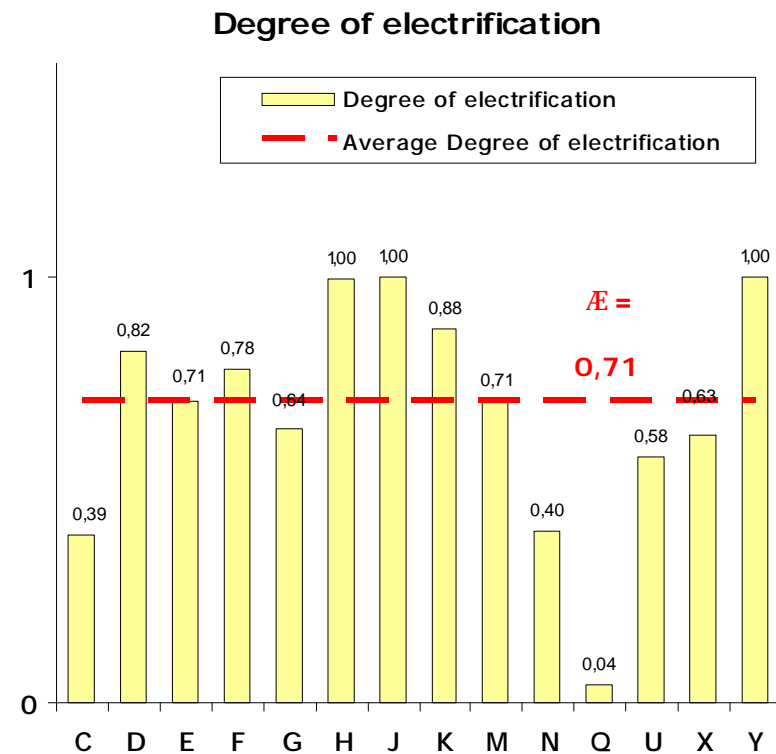
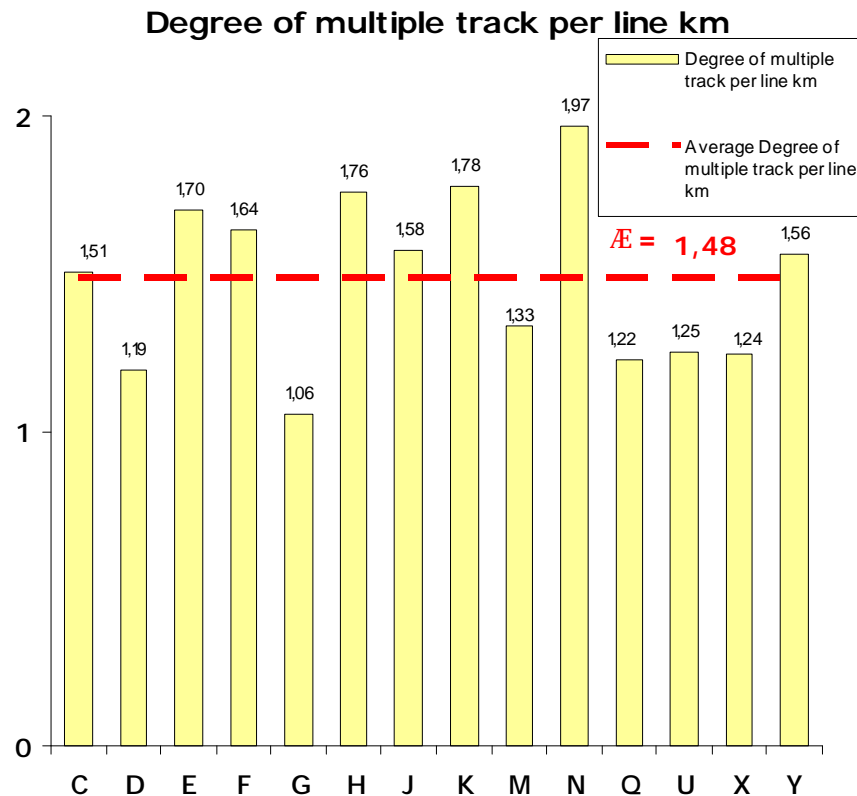
Background indicators

- Degree of multiple track per line km
- Degree of electrification
- Passenger station density
- Density of switch units

A number of parameters are essential for understanding the variability in performance between different railways

$$\left[\frac{\text{main track km}}{\text{line km}} \right]$$

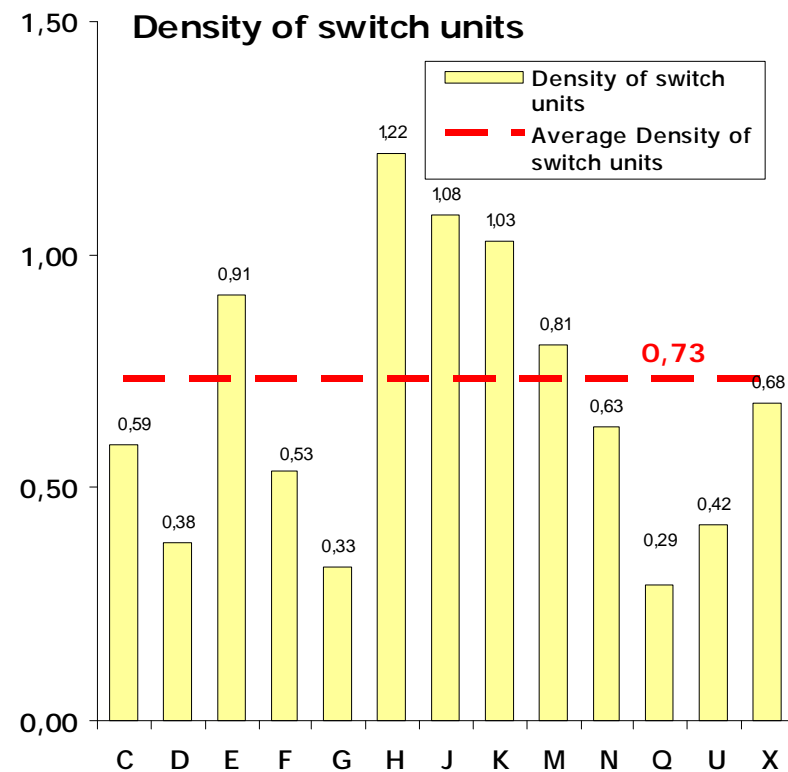
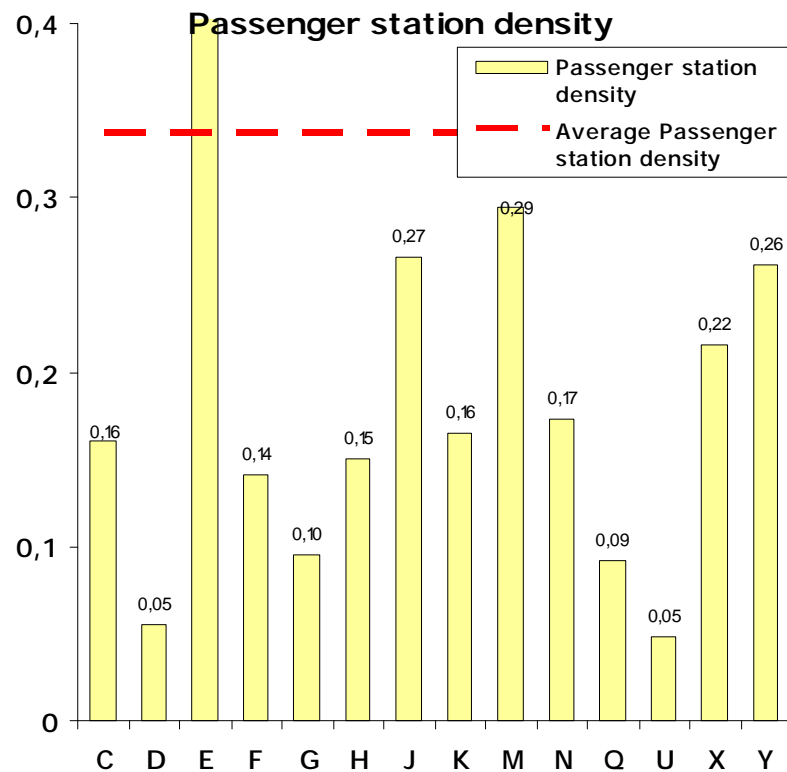
$$\left[\frac{\text{electrified main track km}}{\text{main track km}} \right]$$



Mobility and market share for passengers and freight are widely spread in European countries

$$\left[\frac{\text{passenger station}}{\text{passenger line km}} \right]$$

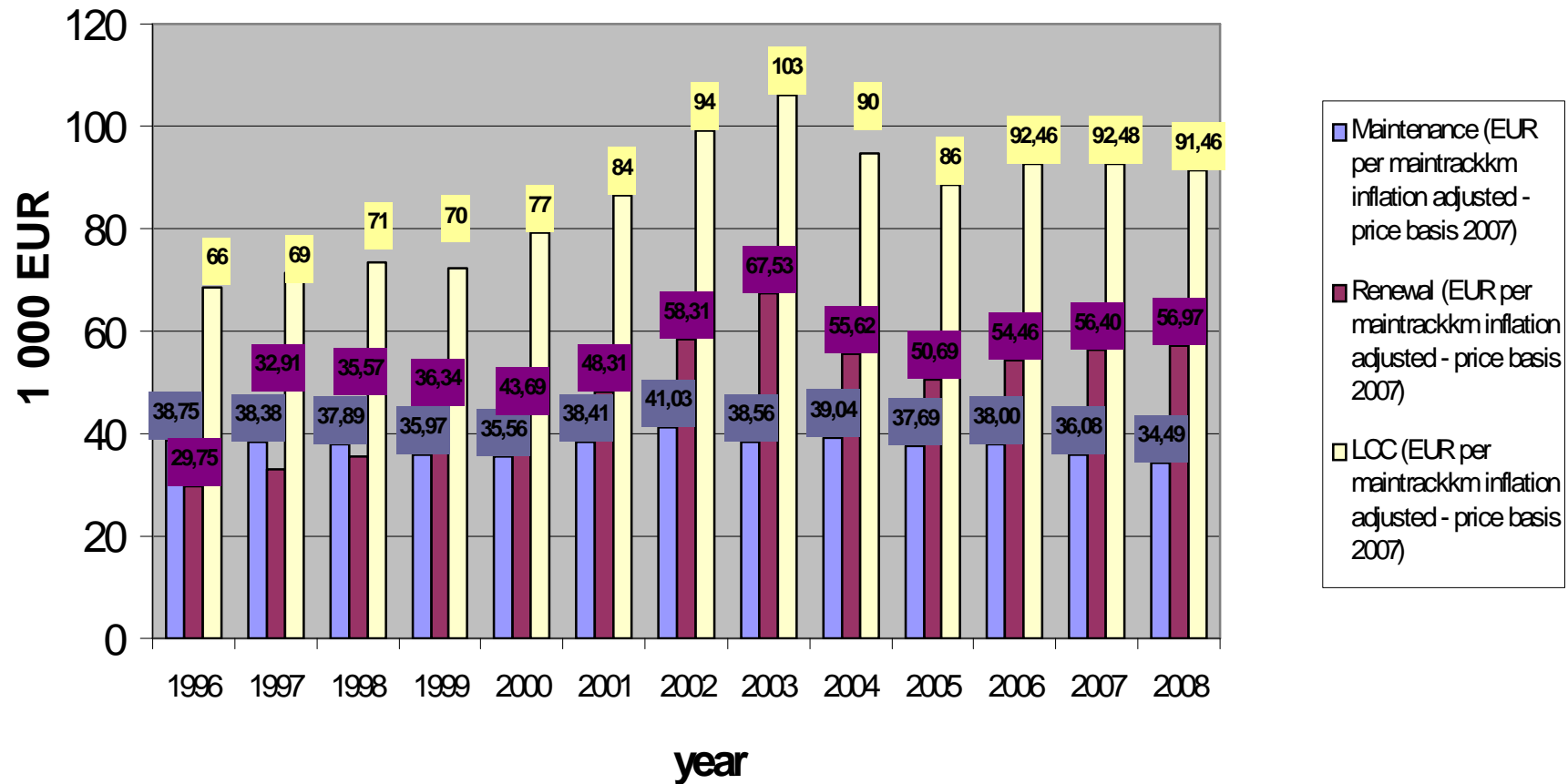
$$\left[\frac{\text{switch units}}{\text{main track km}} \right]$$



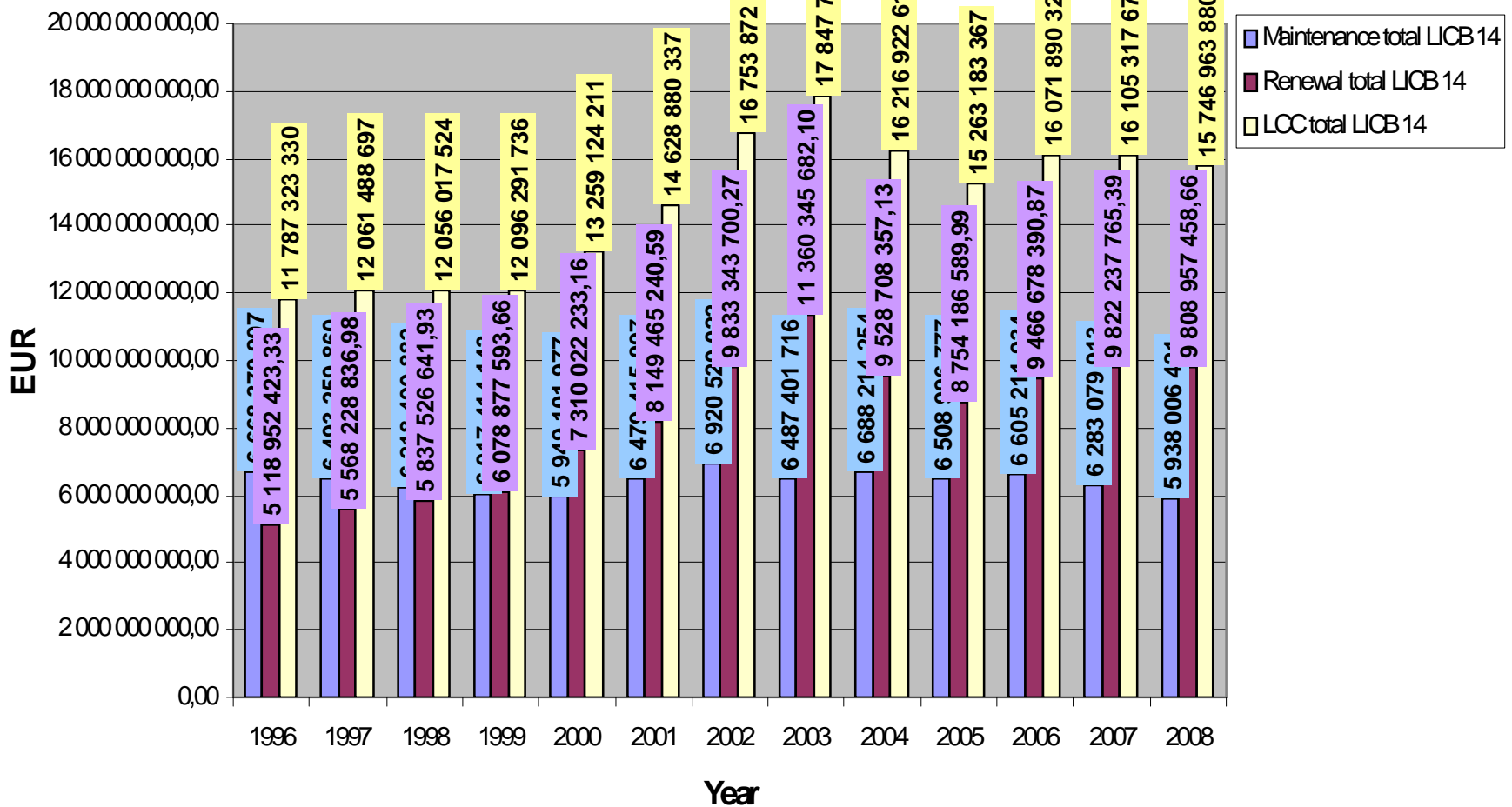


Global expenditures figures

14 LICB Members Average Expenditures Maintenance and Renewal Development (1000 EUR/main trackkm)



Total expenditures LICB 14





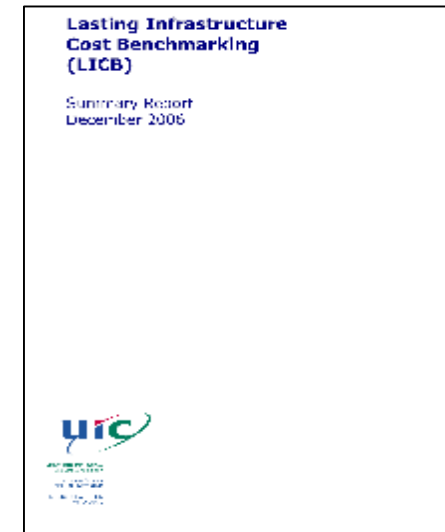
The Benefits of Benchmarking

- improving performance by learning from best practices and understanding the processes by which they are achieved
- better understanding and forecasting of costs and revenues
- setting target cost levels
- There is increasing pressure on railways to demonstrate their costs and performance, in relation to other railway networks achievements and other modes.
- Internally, budgetary constraints demand a business case to support requests for higher levels of investment , to secure long-term benefits.
- Externally, important political issues are feeding a debate on infrastructure provision:
 - Transparency of access charging and accounting
 - State Aid and Multi-Annual Contracts
 - Recognition of external costs
- It is preferable for IMs to prepare the basis for such assessment rather than allow other stakeholders to draw their own conclusions, from perhaps uncorrelated sources.

Deliverables :

- Each year a full report – for the LICB Members
- Each year a summary report for – all UIC Members

In 2007 – 10 years report



LICB new project phase 2009-2010, consists of two work packages

Deliverables



Key deliverables

- Documentation and presentation of the revised methodology including the overall approach to normalisation, cost-functions applied and long term steady state renewal levels ✓
- Documented analyses of status quo, IT concept, development of the new software and launching and testing it ✓
- Survey with potential candidates, workshop to discuss the approach and the benefits, planning of the next project phase to assess and evaluate information
 - *Only first step to find out their interests*



Other related projects on cost benchmarking

In collaboration with HS Committee

UIC High Speed Rail KPI Comparison

- Ø A systematic examination and comparison of existing sets of KPIs for high speed rail is the purpose of the benchmarking study described in this proposal
- Ø It could be the basis for an in-depth analysis and performance benchmarking of most suitable (and internationally comparable) KPIs

UIC High Speed Rail Cost Benchmarking :

- Ø an international comparison of cost considering specific cost drivers in Investment and Renewal & Maintenance

Thank you for your attention

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