Second-hand rolling stock and upgraded infrastructure:

Business cards for sustainable cities?

Equipment and operational aspects

SPUTNIC Final Conference, Brussels, 03 July 2009
Andreas Friedrichsen, TÜV Rheinland Group
Scope of EQ cluster

EQ cluster: “Equipment and operational aspects”

- Rolling stock and fleets
- Diesel bus, trolley bus, tram
- Infrastructure
- Guiding technologies, innovative technologies

- Alternative ways of procurement and implementation:
  Modernisation, Upgrading, Retrofitting, Refurbishment, Second hand
Participants in EQ cluster

- **Experts** from all over Europe

- **4 cluster members**
  - **CERTU**
    Centre d’études sur les réseaux, les transports, l’urbanisme et les constructions publiques (F-Lyon)
  - **IFTEC**
    IFTEC GmbH &Co. KG (D-Leipzig)
  - **MPK**
    Miejskie Przedsiębiorstwo Komunikacyjne SA (PL-Krakow)
  - **TÜV Rheinland Group**
    TÜV Rheinland Consulting (EQ coordination)
    TÜV Rheinland InterTraffic (D-Köln)
State of the art in CEEC

• No general statement
• Only description of significant structural problems
• No prejudice
• Same problems visible in Old MS many times
• EQ experts and members are aware of project highlights located in CEEC …
• … and of enthusiasm of CEEC colleagues
State of the art in CEEC

*In many/most cases:*
Shrinking fare receipts
Shrinking funding
Shrinking budgets
→ Deficit in investments

→ Lack of modernity
→ Lack of attractiveness and comfort
→ Overstaffed workshop facilities
→ Inadequate maintenance
→ Unsatisfying cost effectiveness

Procurement of new equipment not financable

**Alternative solutions?**
State of the art in CEEC

The situations of Public Transport in

• small and medium sized cities and rural areas
  and in
• big cities and capitals

… are **very different**

with respect to quantities and qualities!!!
State of the art: rolling stock

• Outdated rolling stock
  – over-aged
  – inhomogeneous fleets
  – unable to fulfil the desired environmental standards

• Cannibalism
  – the operating part of the fleet becomes ever smaller
State of the art: bus

- Break-even point for modernisation measures cannot be attained for bus vehicles due to the low procurement costs.
- In the field of diesel buses only measures seem to be profitable that upgrades the buses as a whole system and not only the vehicle.

- One of the few alternative fuels, which became generally accepted today, is natural gas.
- Higher initial costs for the vehicle and the dependence on a special supply network.
State of the art: trolley bus

- Initial costs are higher than for diesel buses
- Operational life is longer due to the electrical equipment
- **Upgrading might be justified**

*In the EU-27 the average age of urban buses is 7.6 years.*

*The average age of trolley buses is 11 years.*
State of the art: tram

Modernisation variants – focussing on residual operating times of additional 16 to 34 years – for tram vehicles refer primarily to:

- Bogies
- Car bodies
- Interior
- Electrical equipment
State of the art: tram

**Tatra CKD** is backbone of railbound PT in CEEC

- The operating experience and in particular the achievable energy reduction clearly shows that modernisation is a real alternative.
- The major part of the enterprises assigns the work to external experts.
State of the art: tram

Tatra CKD is backbone of railbound PT in CEEC

Similar to imported second hand DUEWAG vehicles
State of the art: infrastructure

- The **structural condition** of the subgrade of bus and even tram networks is often very insufficient
- **Damages** of the subgrade
- Bad condition of the guide way is often intensified by the low share of **independent subgrades and lanes**
  - this, in turn, leads to further damages
- Low share of **independent lanes and/or prioritisation**
- Low share of **acceptable stops and stations** causes many conflicts with automobile traffic with the consequence of unsafe, uncomfortable and unsatisfactory access
  - especially for disabled people
State of the art: infrastructure

- Non-existence of BRT
Breakdown of key strategies

1. Optimise the number of vehicles required by increasing the commercial speed
   – Upgrade of infrastructure
   – Fleet renewal
2. Optimise the maintenance process and the workshops
3. Reduce the travel time and increase the travelling comfort
4. Additional strategic aspects
Breakdown of key strategies

1. Optimise the number of vehicles required by increasing the **commercial speed**
   - Upgrade of infrastructure
   - Fleet renewal
2. Optimise the maintenance process and the workshops
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4. Additional strategic aspects
Breakdown of key strategies

**Rise of commercial speed**
Principal aim of modernisation measures

**ELEMENTARY IMPORTANCE!**

- **Effectiveness**
  - Number of necessary vehicles is lowered
  - Less funds for operation are needed

- At the same time: **Attractiveness**
  - Higher passenger acceptance
  - Increasing fare receipts
Rise of commercial speed

• The modernisation or upgrading of PT systems always works according to the principle: ‘rolling stock follows infrastructure’

• Integrated concept needed!
Breakdown of key strategies

1. Optimise the number of vehicles required by increasing the commercial speed
   – Upgrade of infrastructure
   – Fleet renewal
2. Optimise the maintenance process and the workshops
3. Reduce the travel time and increase the travelling comfort
4. Additional strategic aspects
Breakdown of key strategies

• Optimise the number of vehicles required by increasing the commercial speed
  – Upgrade of infrastructure
    → Improvement of track quality
    → Optimised use of energy supply
    → Increase of dedicated space and of PT prioritisation
Breakdown of key strategies

1. **Optimise the number of vehicles required by increasing the commercial speed**
   - Upgrade of infrastructure
   - Fleet renewal

2. **Optimise the maintenance process and the workshops**

3. **Reduce the travel time and increase the travelling comfort**

4. **Additional strategic aspects**
Breakdown of key strategies

- Optimise the number of vehicles required by increasing the commercial speed
  - **Fleet renewal**

Experts’ source: B. Hick, MAN Ferrostaal AG
Breakdown of key strategies

• Optimise the number of vehicles required by increasing the commercial speed
  – Fleet renewal

  Modernisation of owned vehicles
    → Short term
    Purchase (and maybe modernisation) of second-hand rolling stock
    → Middle term
    Acquisition of new rolling stock
    → Long term

  → INTEGRATED STRATEGY!
Breakdown of key strategies

• Optimise the number of vehicles required by increasing the commercial speed
  – Fleet renewal

→ Think about second hand rolling stock as an alternative!
→ Rolling stock has to follow infrastructure!
→ Consider spare parts and energy supply when choosing rolling stock!
→ Reduce the energy consumption of the fleet!
Breakdown of key strategies

1. Optimise the number of vehicles required by increasing the commercial speed
   – Upgrade of infrastructure
   – Fleet renewal
2. Optimise the maintenance process and the workshops
3. Reduce the travel time and increase the travelling comfort
4. Additional strategic aspects
Breakdown of key strategies

• **Optimise the maintenance process and the workshops**

  Key measures are:
  → The harmonisation of the fleet
  → The improvement of the reliability of the fleet
  → The choice of fuel and the reduction of energy consumption
  → The use of vehicle monitoring technology
Breakdown of key strategies

1. Optimise the number of vehicles required by increasing the commercial speed
   - Upgrade of infrastructure
   - Fleet renewal
2. Optimise the maintenance process and the workshops
3. Reduce the travel time and increase the travelling comfort
4. Additional strategic aspects
Breakdown of key strategies

• Reduce the travel time and increase the travelling comfort
  Key measures are:
  → Adjustment of timetable
  → Improvement of punctuality
  → Optimisation of interfaces and interchanges as well as interoperability
  → Dedicated measures for handicapped or disabled people
  → Introduction of low floor vehicles or low floor compartments
  → Optimisation of (Dynamic) Passenger Information Systems
  → Improvement of the technical safety of Public Transport
  → Upgrading of infrastructure and fleet
Breakdown of key strategies

Adjustment of timetable

Use modified modes of PT in order to optimise the effort!

For example:
  Flexible solutions like
  Demand Responsible Transport
Breakdown of key strategies

Introduction of low floor vehicles or low floor compartments

• Substantial step forward towards the increase of attractiveness and economy
• In the new MS the conditions *almost provoke* the introduction of the low floor technique
Breakdown of key strategies

1. Optimise the number of vehicles required by increasing the commercial speed
   - Upgrade of infrastructure
   - Fleet renewal
2. Optimise the maintenance process and the workshops
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4. Additional strategic aspects
Breakdown of key strategies

• **Additional strategic aspects**
  → Strengthening of the environment protection
  → Reduction of energy consumption (as a contribution to ecological sustainability)
  → Reduction of emissions
    → Reduction of air pollutant emissions
    → Reduction of noise emission

**SPUTNIC experts appraise:**
In many/most cases environmental aspects

• ... do only have minor effect on attractiveness and demand
• ... raise costs and do not contribute to economic efficiency
• ... can only be part of long term strategies
Final remarks

- Wherever possible, consideration of LCC aspects should be given priority over plain key date valuations.
Final remarks

Pursue adaptation measures in a **step-by-step** (e.g. line-by-line) fashion

- always allowing for the possibility of changes in course
- in order to accommodate any adaptations of strategy.

“**KEEP THE SYSTEM RUNNING!”**
Final remarks

• The rolling stock
  – represents the backbone of PT system
  – and it is dependent on the condition of the infrastructure.

• The economical sustainability of PT depends on appropriate measures for effective and attractive infrastructure and rolling stock.

• The need for a cost effective PT operation is the first priority and much higher than the need for clean vehicles.
Final remarks

The situation in the capitals is not representative of the fleets, infrastructure and PT technology in small and medium sized cities of CEEC.

Therefore for the future there has to be a stronger focus on those regional and local areas due to the European targets for the greening of mobility.
Final remarks

• With respect to the migration of those measures **long term strategies** are needed.
Final remarks

- New MS should pay more attention to **efficient use of available EU funds**.
Final remarks

• Involvement of the local and regional economy of CEEC
  – in outsourcing solutions and
  – in the implementation of any other measures.

• CEEC and new MS have to be supported in finding their own and individual ways to create innovative solutions for PT under integration of their own economies.
Final remarks

- CEEC and new MS have to be supported in finding their own and individual ways to create innovative solutions for PT under integration of their own economies.
- Old MS can use existing capacities and even knowledge.
Sustainability

• Second-hand rolling stock and upgraded infrastructure:

Business cards for **sustainable** cities?
Sustainability

Rolling stock and infrastructure renewal …
+ contribute to better quality of **technical performance**
+ increases **customers’ satisfaction**
+ raises **staff motivation**
+ brings **environmental benefits**

Retrofitting old rolling stock and upgrading of infrastructure …
+ extends its **life cycle**,  
+ provides **employment** in overstaffed PT companies  
+ is a reasonably **priced option**
Sustainability

- Modernisation,
- Upgrading,
- Retrofitting,
- Refurbishment,
- Second hand solutions

**ARE PROFITABLE**

- in nearly all cases for tram/light rail
- in most cases for trolley buses
- in many cases for buses
Sustainability

Macro-economical perspectives
Mid of 2009

• For example: **Ukraine**
  S&P creditibility rating downgraded to CCC+
  Forecast: negative

• “Banking system needs to be rescued by foreign countries” (Financial Times May 2009)
Sustainability

Macro-economical perspectives
Mid of 2009

• For example: Hungary
  S&P creditibility rating downgraded to BBB-
  Forecast: negative

• “Intervention of International Currency Fond avoids state bankrupt”
  (Financial Times May 2009)
Sustainability

Macro-economical perspectives
Mid of 2009

S&P creditibility rating downgrades in 2009 in the geographical Europe

- Ukrainia
- Hungary
- Greece
- Ireland
- Latvia
- Lithunia
- Macedonia
- Portugal
- Spain

http://www.sputnicproject.eu/

EQ Cluster – Andreas Friedrichsen, TÜV Rheinland Group
Macro-economical perspectives
Mid of 2009

Worldbank forecast:

• “In 2010 the €-based economy will shrink by 4.5 percent.” (Spiegel online, June 2009)
Sustainability

- Modernisation,
- Upgrading,
- Retrofitting,
- Refurbishment,
- Second hand solutions

**ARE SUSTAINABLE**
with respect to

- **economical** needs
- **ecological** needs of greening mobility
- **social** needs.
Sustainability

- Performance of PT is most important!
- Development of modal share should be key target!
- Involvement of local and regional economy is of essential necessity!

- UPGRADED INFRASTRUCTURE AND SECOND HAND ROLLING STOCK ARE GOING TO BE BUSINESS CARDS FOR SUSTAINABLE CITIES !!!

SPUTNIC – Strategies for Public Transport in Cities
http://www.sputnicproject.eu/
EQ Cluster – Andreas Friedrichsen, TÜV Rheinland Group
Sustainability

UPGRADED INFRASTRUCTURE AND SECOND HAND ROLLING STOCK ARE GOING TO BE BUSINESS CARDS FOR SUSTAINABLE CITIES !!!

EVERYWHERE !!!