TRANSPORT – THE NEXT 50 YEARS
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« What can we learn from the last 50 years? »

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International Transport Forum

www.internationaltransportforum.org
www.cemt.org
Structure

- Look Back
- Look Forward
- Lessons
Looking Back

Since 1950:

- World population x 2.5
- Urban population x 4
World population 1950-2005 (thousands)

Source: United Nations Population Division
Looking Back

Since 1950:

- World population x 2.5
- Urban population x 4
- World GDP x 8
- GDP / capita x 3
World GDP and GDP/capita

Source: Maddison (2005)
Looking back

Since 1950:

• World population x 2.5
• Urban population x 4
• World GDP x 8
• GDP / capita x 3
• World trade x 20
World trade (billion 2000 US$)

Source: Hummels (2006)
Looking Back

Since 1950:

- World population x 2.5
- Urban population x 4
- World GDP x 8
- GDP / capita x 3
- World trade x 20
- Mobility increased and altered (longer trips, more leisure trips, more by road and air)
Freight transport trends (tonne-kilometres)
Western European countries
1970=100

Source: ECMT
Annual traffic: World airlines
(Number of passengers and million passenger-km)

Source: ICAO
Looking Back

- World population x 2.5
- Urban population x 4
- World GDP x 8
- GDP / capita x 3
- World trade x 20
- Mobility increased and altered (longer trips, more leisure trips, more by road and air)
- Number of cars x 4 since the 1960s
Number of Cars in the World

- 1900: 100,000,000
- 1968: 200,000,000
- 1985: 300,000,000
- 1990: 400,000,000
- 2000: 700,000,000
- 2004: 800,000,000
Major Productivity Increases

• Technology: Cars/Trucks/Aircraft/Ships/Trains
  – Improved reliability, faster speeds, bigger sizes.

• Containers revolutionised freight transport
## Growth in containership size

The table below shows the average and largest ship sizes in TEUs over several years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Average ship size (TEU)</th>
<th>Largest ship in world fleet (TEU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>975</td>
<td>3057</td>
</tr>
<tr>
<td>1990</td>
<td>1355</td>
<td>4409</td>
</tr>
<tr>
<td>2000</td>
<td>1741</td>
<td>7200</td>
</tr>
<tr>
<td>2006</td>
<td>2300</td>
<td>11500</td>
</tr>
</tbody>
</table>

Source: Fremont (2007)

Emma Maersk. August 2006
Efficiency of terminal handling operations
Major Productivity Increases

• Technology: Cars/Trucks/Aircraft/Ships/Trains
  – Improved reliability, faster speeds, bigger sizes.
• Containers revolutionised freight transport.
• Through infrastructure investment.
Inland Transport Infrastructure Investment as a percentage of GDP

Western European Countries
Central & Eastern European Countries

Source: ITF database
Major Productivity Increases

- Technology: Cars/Trucks/Aircraft/Ships/Trains
  - Improved reliability, faster speeds, bigger sizes.
- Containers revolutionised freight transport.
- Through infrastructure investment.
- Costs/ prices declined.
Reduction in costs

• **Sea freight**
  Unit cost on the North Atlantic in 2002:
  – 1200 TEU ship: 550 US$ per unit
  – 6500 TEU ship: 240 US$ per unit

• **Air freight**
  – 1995: 3.9 $ per tonne-km
  – 2004: 0.3 $ per tonne-km

Sources: Fremont (2007); Hummel (2006)
Aircraft operating costs per seat mile

Source: World bank
Major Productivity Increases

- Technology: Cars/Trucks/Aircraft/Ships/Trains
  - Improved reliability, faster speeds, bigger sizes.
- Containers revolutionised freight transport.
- Through infrastructure investment.
- Costs/ prices declined.

AND

Dramatic reductions in crashes and pollution
Summary - looking back

Transport system is now

- Faster
- Cheaper
- Safer
- Cleaner
- More efficient than ever

But, still

- too dirty (3 billion tonnes of CO$_2$)
- too unsafe (over 1 million road deaths)
- too inefficient (protectionism, closed markets)
- Often too expensive
Looking Ahead

- World population grows to 9 billion by 2050 with 7 billion in cities
World population 1950-2005 (thousands)

Source: United Nations Population Division
Looking Ahead

- World population grows to 9 billion by 2050 with 7 billion in cities.

- World GDP and GDP/capita more than doubles by 2030.
GDP growth will continue, developed countries growth will slow

Source: Maddison
Looking Ahead

- World population grows to 9 billion by 2030 with 7 billion in cities
- World GDP and GDP/capita more than doubles by 2030
- Trade growth will continue
- Transport growth also
  - Links between GDP and transport
    - Elasticities might alter
    - But broad links to continue
Ton-km and pass-km will follow GDP growth, oil consumption has remained at the 1970s level.

GDP (constant US$), freight (ton-km), passenger transport (pass-km) and oil consumption (tonnes) in the EU-15 (index 1970=100)

Sources: BP Statistical Reviews of World Energy 2007; ITF database; OECD database
Looking ahead

• World population grows to 9 billion by 2030 with 7 billion in cities
• World GDP and GDP/capita more than doubles by 2030
• Trade growth will continue
• Links between GDP and Transport
  – Elasticities might alter
  – But broad links to continue
• Transport forecasts:
  - often wrong, miss structural change.
In 1970s, forecasts overestimated actual trends

Transport on road (bill. ton-km) in Sweden

Source: SIKA 4/2005
Underestimated in 1990s

Europe: Freight – 15 1993-2010, 1000 bill. ton-km

Sources: Forecast: ECMT (1995); Actual: ITF database
Looking ahead

• World population grows to 9 billion by 2030 with 7 billion in cities
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• Transport forecasts:
  - often wrong, miss structural change
  - Suffer from project optimism and biases
Project optimism

Eurostar passenger numbers and forecasts.

Airline passengers between UK and France

Actual Eurostar passengers

original forecast - 1995

Sources: LCR and CAA
Looking ahead

- World population grows to 9 billion by 2030 with 7 billion in cities
- World GDP and GDP/capita more than doubles by 2030
- Trade growth will continue
- Links between GDP and Transport
  – Elasticities might alter
  – But broad links to continue
- Transport forecasts:
  - Often wrong, miss structural change
  - Suffer from project optimism and biases
  - But useful to build scenarios, to inform and give warning signs for policy.
Looking Ahead

• Transport will consume more energy
  (i.e. growth will be faster than efficiency improvements)
Energy Use in Transport

The 400 transport measures adopted so far should save 700 Mt CO₂ in 2010

IEA projection of transport emissions

Source: ITF & IEA
Looking ahead

- Transport will consume more energy (i.e. growth will be faster than efficiency improvements)
- System will face increasing pressure
- Congestion will grow
  - In developing world cities
  - In suburbs in all cities
  - In airports and in the air
  - In ports and inland connections
Hours spent in congestion on German roads, 2015 forecast

Hours per road section:
- >3000
- >1500 - 3000
- >1000 - 1500
- >750 - 1000
- >500 - 750
- >300 - 500
- <300

Congestion outlook in the Netherlands

Congestion increase +30% by 2020 on Dutch motorways

Source: IWW.

Source: Dutch Ministry of Transport, Public Works and Water Management
Road Congestion, US 2020

Source: USFHWA
Increased congestion in hub airports

Air Passenger Traffic expected to double over the next 20 years

World Air Traffic Outlook

World Air Cargo Traffic Will Triple Over the Next 20 Years

<table>
<thead>
<tr>
<th>RTKs, billions</th>
<th>Forecast</th>
<th>Average annual growth 2005-2025</th>
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<tbody>
<tr>
<td>800</td>
<td>History</td>
<td></td>
</tr>
<tr>
<td>600</td>
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<td></td>
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<td>400</td>
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<td>1995</td>
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<td>2020</td>
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<tr>
<td>2025</td>
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</tbody>
</table>

Sources: Airbus for passengers, Boeing for freight

Air Freight Traffic expected to triple over the next 20 years

Revenue Earning Passenger Kilometres

Sources: Airbus for passengers, Boeing for freight
Lessons

– Policies

– Politics
Policies

- **Most countries have similar policy aims**
  - But few have clear priorities…
  - …or discussion of possible tradeoffs
  - Most underestimate societal and economic forces and trends…
  - …especially those favoring car and truck use
  - Few worry about demand management or climate change
  - Most make limited use of economic instruments.
Policies

- Policies may reverse or halt existing trends
  - But measures are needed outside transport sector (fiscal, land use...)
  - ...need to be sustained over a long period
  - ...are expensive
  - and there are few successes so far.
Advice to policy makers and politicians

• Improve appraisal of projects
  – 90% of investment projects go over budget
  – procedures are more and more lengthy, complex and contested

• Need strategic appraisal and political debate
• Far better communication to public
• Agreement on timetable for procedures
Advice to policy makers and politicians

• Tackle problems directly

Not indirectly as we have done, for example, by dealing with:

– Air quality through modal split policies
– Truck traffic growth through rail investment
– Congestion through public transport support
– Oil use through biofuels
– Or by giving subsidies to everyone

With measures not aspirations.
Advice to policy makers and politicians

• Don’t raise expectations or set unrealistic objectives as we did with promises to
  – eliminate congestion (UK)
  – get traffic off roads and onto rail (France)
  – eliminate accidents (Netherlands & others)
  – have sustainable system (New Zealand)
Advice to policy makers and politicians

• Beware of secondary objectives for transport such as:
  – investing for employment reasons
  – protecting national operators/companies
  – giving priority to suppliers rather than consumers
Conclusions

• Transport’s importance will continue to grow.
• Public expectations will continue to increase.
• Constraints on space, finance, environment will intensify.
• Policies and politics will need to adapt so as to manage demand, and not simply meet it.