



OF MINISTERS OF TRANSPORT

MARKET ACCESS, TRADE IN TRANSPORT SERVICES AND TRADE FACILITATION

ROUND TABLE

134

TRANSPORT RESEARCH CENTRE

REPORT OF THE ONE HUNDRED AND THIRTY FOURTH ROUND TABLE ON TRANSPORT ECONOMICS

MARKET ACCESS, TRADE IN TRANSPORT SERVICES AND TRADE FACILITATION





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The ECMT is a forum in which Ministers responsible for transport, and more specifically the inland transport, can co-operate on policy. Within this forum, Ministers can openly discuss current problems and agree upon joint approaches aimed at improving the use and ensuring the rational development of European transport systems.

At present, ECMT has a dual role. On one hand it helps to create an integrated transport system throughout the enlarged Europe that is economically efficient and meets environmental and safety standards. In order to achieve this, ECMT assists in building bridges between the European Union and the rest of the European continent at a political level. On the other hand, ECMT also develops reflections on long-term trends in the transport sector and, more specifically, studies the implications of globalisation on transport.

In January 2004, the ECMT and the Organisation for Economic Co-operation and Development (OECD) brought together their transport research capabilities by establishing the Joint Transport Research Centre. The Centre conducts co-operative research programmes that address all modes of inland transport and their intermodal linkages to support policy-making throughout Member countries.

Ministers at their Dublin Council in May 2006 agreed a major reform of ECMT designed to transform the organisation into a more global body covering all modes of transport. This new international transport Forum will aim to attract greater attention to transport policy issues, and will hold one major annual event involving Ministers and key sectoral actors on themes of strategic importance. 2007 is a transitional year for the setting up of the Forum. The new structure will be fully operational as of 2008.

> Also available in French under the title: Accès au marché, commerce des services de transport et facilitation des échanges

 $Further\ information\ about\ the\ ECMT\ is\ available\ on\ Internet\ at\ the\ following\ address:$

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THE ROLE OF MARKET STRUCTURE IN THE TRANSPORT SECTOR ON THE EFFECTS OF LIBERALISATION: THE CASE OF THE WORLD TRADE ORGANIZATION

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Geneva, April 2005

1. INTRODUCTION

This paper will concentrate on the description of the institutional framework of the World Trade Organization (WTO) and of the rules it has elaborated and implements on land transport, with a geographical focus on Europe and Central Asia. It will deal only with land transport questions, since maritime transport is marginal in the exchanges between the two regions, and since air transport is to a very large extent excluded for the disciplines of the General Agreement on Trade in Services (GATS). It will not deal either with the actual economic effects of this liberalisation, a largely uncharted territory.

The World Trade Organization is an international governmental organisation, dealing with the rules of trade between nations. At its heart are the WTO agreements, negotiated and signed by the bulk of the world's trading nations and ratified in their parliaments. The goal is to help producers of goods and services, exporters and importers conduct their business. The WTO is located in Geneva, Switzerland. It was established on 1 January 1995 as a result of the Uruguay Round of negotiations (1986-94), in virtue of the Marrakech Agreement (1994). It is the successor of another organisation, the General Agreement on Trade and Tariffs (GATT), established in1947.

By lowering trade barriers, the WTO's system also breaks down other barriers between people and nations.

The WTO agreements – known as the multilateral trading system – lay the legal ground-rules for international commerce, guaranteeing member countries important trade rights. They also bind governments to keep their trade policies within agreed limits to everyone's benefit.

This is done by:

- Administering trade agreements;
- Acting as a forum for trade negotiations;
- Settling trade disputes;
- Reviewing national trade policies;
- Assisting developing countries in trade policy issues, through technical assistance and training programmes;
- Co-operating with other international organisations.

2. STRUCTURE OF THE WTO AND DECISION-MAKING

The WTO has more than 140 members, accounting for over 90% of world trade. Over thirty others are negotiating membership, such as Azerbaijan, Belarus, Bosnia-Herzegovina, Kazakhstan, Lebanon, Lithuania, Russian Federation, Ukraine, Uzbekistan, Vietnam and the Federal Republic of Yugoslavia.

In Europe, only Belarus, Bosnia-Herzegovina, Serbia and Montenegro, Ukraine and the Russian Federation are not yet members of the World Trade Organization, but are in an accession process which may take months or years, depending on how difficult will be the negotiation of commitments by those countries in agriculture, goods and services.

In Asia, the geographical coverage of the WTO is more elusive, but there again all countries that are not yet members of the WTO – except North Korea – have requested their accession to the organisation, and negotiations to that effect are ongoing though at various stages of advancement. This is the case of: Saudi Arabia, Yemen, Lebanon, Syria, Iran, Iraq, Afghanistan, Azerbaijan, Kazakhstan, Tajikistan, Uzbekistan, Laos, Vietnam and Bhutan. Therefore, if WTO rules are not yet relevant for those countries they will become so in the coming years.

Decisions are made by the entire membership. This is typically by consensus. A majority vote is also possible but it has never been used in the WTO, and was extremely rare under the WTO's predecessor, GATT.

The WTO's top-level decision-making body is the Ministerial Conference, which meets at least once every two years. Below this are: the General Council, which meets several times a year and the Council for Trade in Goods, the Council for Trade in Services and the Council for Trade-Related Aspects of Intellectual Property Rights, which all operate under the guidance of the General Council.

Numerous specialised committees, working groups and working parties deal with the individual agreements, and other areas such as: the environment; development; membership applications and regional trade agreements; the relationship between trade and investment; the interaction between trade and competition policy and transparency in government procurement; and the area of electronic commerce.

3. WTO RULES

The WTO's rules include in particular:

- -- Multilateral Agreements on Trade in Goods, comprising:
 - General Agreement on Tariffs and Trade (GATT);
 - Several specific agreements (*inter alia* on agriculture, on the application of sanitary and phytosanitary measures, on textiles and clothing, on technical barriers to trade, on traderelated investment measures, on pre-shipment inspection, on rules of origin, on import licensing procedures, on subsidies and countervailing measures, and on safeguards);
- -- General Agreement on Trade in Services (GATS);
- -- Agreement on Trade-Related Aspects of Intellectual Property Rights;
- -- Understanding of Rules and Procedures;
- -- Trade Policy Review Mechanism;
- -- Multiplurilateral Trade Agreements (on government procurement and on civil aircrafts).

Through these agreements, WTO members operate a non-discriminatory trading system that spells out their rights and their obligations. Each country receives guarantees that its trade will be treated fairly and consistently in other countries' markets. Each promises to do the same for imports into its own market. The system also gives developing countries some flexibility in implementing their commitments.

3.1. Trade in goods

It all began with trade in goods. From 1947 to 1994, GATT was the forum for negotiating lower customs duty rates and other trade barriers. The text of the General Agreement spelled out important rules, particularly concerning non-discrimination. The principle of non-discrimination covers NT (National Treatment), which means that foreigners should be treated on an equal footing with own nationals, and MFN (Most Favoured Nation), which means that all foreigners should be treated alike.

Since 1995, the GATT has become the WTO's umbrella agreement for trade in goods. It is also important for transport (see below).

3.2. Trade in services

Banks, insurance firms, telecommunications companies, tour operators, hotel chains and transport companies looking to do business abroad, can now enjoy the same principles of freer and fairer trade which originally only applied in virtue of the GATT.

These principles appear in the new General Agreement on Trade in Services (GATS). WTO members have also made individual commitments under GATS, stating for which of their service sectors they are willing to permanently guarantee a certain degree of openness ("binding") to foreign competition, and defining the degree of that openness: for instance, indefinitely binding the possibility of 51% foreign majority ownership. This also has its importance for the road transport sector (see below).

3.3. Dispute settlement

The WTO's procedure for resolving trade quarrels, under the Dispute Settlement Understanding, is vital for enforcing rules and thus ensuring that trade flows smoothly.

Countries bring disputes to the WTO if they think their rights under the agreements are being infringed. Judgements by specially-appointed independent experts are based on interpretations of the agreements and individual countries' commitments.

The system encourages countries to settle their differences through consultation. Failing that, they can follow a carefully mapped out, stage-by-stage procedure that includes the possibility of a ruling by a panel of experts, and the chance to appeal against the ruling on legal grounds.

Dispute settlement is now binding and States are obliged to comply. This differentiates the WTO system from any other universal international organisation, and makes it comparable to the system of the European Court of Justice, for instance. Sanctions can be and have been taken in cases of non-compliance.

3.4. Policy review

All WTO members must undergo periodic scrutiny, each review comprising reports by the country concerned and the WTO Secretariat.

4. OPPORTUNITIES OFFERED BY GATT FOR LAND TRANSPORT

4.1. Existing provisions of the GATT

The "1994 GATT", integrated into the 1994 Marrakech Protocol, foresees, in its Article V on the importance for transport, that:

"There shall be freedom of transit through the territory of each contracting party, via the routes most convenient for international transit, for traffic in transit to or from the territory of other contracting parties. No distinction shall be made which is based on the flag of vessels, the place of origin, departure, entry, exit or destination, or on any circumstances relating to the ownership of goods, of vessels or other means of transport.

"Any contracting party may require that traffic in transit through its territory be entered at the proper customs house, but, except in cases of failure to comply with applicable customs laws and regulations, such traffic coming from or going to the territory of other contracting parties shall not be subject to any unnecessary delays or restrictions and shall be exempt from customs duties and from all transit duties or other charges imposed in respect of transit, except charges for transportation or those commensurate with administrative expenses entailed by transit or with the cost of services rendered.

"All charges and regulations imposed by contracting parties on traffic in transit to or from the territories of other contracting parties shall be reasonable, having regard to the conditions of the traffic.

"With respect to all charges, regulations and formalities in connection with transit, each contracting party shall accord to traffic in transit to or from the territory of any other contracting party treatment no less favourable than the treatment accorded to traffic in transit to or from any third country."

As mentioned above, the GATT is fully based on the NT and MFN principles, which apply across the board, except for minor exceptions in MFN (Regional Agreements, pre-1947 colonial preferences, etc.).

In this respect, Article 3.1 of the GATT stipulates that:

"... rules, regulations and requirements affecting ... the internal transportation of products ... should not be applied ... so as to afford protection to domestic production." Article III.4 establishes a national treatment principle in this respect, specifying that "(these) provisions shall not prevent the application of differential internal transportation charges which are based exclusively on the economic operation of the means of transport and not on the nationality of the products."

Article 1.1 of the GATT stipulates that:

"... With respect to customs duties and charges of any kind imposed on or in connection with importation or exportation or imposed on the international transfer of payments for imports or exports, and with respect to the method of levying such duties and charges, and with respect to all rules and formalities in connection with importation and exportation, and with respect to all matters referred to in paragraphs 2 and 4 of Article III, any advantage, favour, privilege or immunity granted by any contracting party to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originating in or destined for the territories of all other contracting parties."

Furthermore, there are two other articles of the GATT of relevance for land transport: Article VIII on fees and formalities connected with importation and exportation, and Article X on publication and administration of trade regulation.

Article VIII:

- 1. (a) All fees and charges of whatever character (other than import and export duties and other than taxes within the purview of Article III) imposed by contracting parties on or in connection with importation or exportation shall be limited in amount to the approximate cost of services rendered and shall not represent an indirect protection to domestic products or a taxation of imports or exports for fiscal purposes.
 - (b) The contracting parties recognize the need for reducing the number and diversity of fees and charges referred to in sub-paragraph (a).
 - (c) The contracting parties also recognize the need for minimizing the incidence and complexity of import and export formalities and for decreasing and simplifying import and export documentation requirements.*
- 2. A contracting party shall, upon request by another contracting party or by the CONTRACTING PARTIES, review the operation of its laws and regulations in the light of the provisions of this Article.
- 3. No contracting party shall impose substantial penalties for minor breaches of customs regulations or procedural requirements. In particular, no penalty in respect of any omission or mistake in customs documentation which is easily rectifiable and obviously made without fraudulent intent or gross negligence shall be greater than necessary to serve merely as a warning.
- 4. The provisions of this Article shall extend to fees, charges, formalities and requirements imposed by governmental authorities in connection with importation and exportation, including those relating to:
 - (a) consular transactions, such as consular invoices and certificates;
 - (b) quantitative restrictions;
 - (c) licensing;
 - (*d*) exchange control;
 - (e) statistical services;
 - (f) documents, documentation and certification;
 - (g) analysis and inspection; and
 - (h) quarantine, sanitation and fumigation.

Article X:

- 1. Laws, regulations, judicial decisions and administrative rulings of general application, made effective by any contracting party, pertaining to the classification or the valuation of products for customs purposes, or to rates of duty, taxes or other charges, or to requirements, restrictions or prohibitions on imports or exports or on the transfer of payments therefor, or affecting their sale, distribution, transportation, insurance, warehousing, inspection, exhibition, processing, mixing or other use, shall be published promptly in such a manner as to enable governments and traders to become acquainted with them. Agreements affecting international trade policy which are in force between the government or a governmental agency of any contracting party and the government or governmental agency of any other contracting party to disclose confidential information which would impede law enforcement or otherwise be contrary to the public interest or would prejudice the legitimate commercial interests of particular enterprises, public or private.
- 2. No measure of general application taken by any contracting party effecting an advance in a rate of duty or other charge on imports under an established and uniform practice, or imposing a new or more burdensome requirement, restriction or prohibition on imports, or on the transfer of payments therefor, shall be enforced before such measure has been officially published.
- 3. (a) Each contracting party shall administer in a uniform, impartial and reasonable manner all its laws, regulations, decisions and rulings of the kind described in paragraph 1 of this Article.
 - (b) Each contracting party shall maintain, or institute as soon as practicable, judicial, arbitral or administrative tribunals or procedures for the purpose, inter alia, of the prompt review and correction of administrative action relating to customs matters. Such tribunals or procedures shall be independent of the agencies entrusted with administrative enforcement and their decisions shall be implemented by, and shall govern the practice of, such agencies unless an appeal is lodged with a court or tribunal of superior jurisdiction within the time prescribed for appeals to be lodged by importers; Provided that the central administration of such agency may take steps to obtain a review of the matter in another proceeding if there is good cause to believe that the decision is inconsistent with established principles of law or the actual facts.
 - (c) The provisions of sub-paragraph (b) of this paragraph shall not require the elimination or substitution of procedures in force in the territory of a contracting party on the date of this Agreement which in fact provide for an objective and impartial review of administrative action even though such procedures are not fully or formally independent of the agencies entrusted with administrative enforcement. Any contracting party employing such procedures shall, upon request, furnish the CONTRACTING PARTIES with full information thereon in order that they may determine whether such procedures conform to the requirements of this sub-paragraph.

The provisions of these three articles have been interpreted by several dispute settlement cases. A detailed analysis of this jurisprudence can be found at the following electronic addresses: http://www.wto.org/english/res_e/booksp_e/analytic_index_e/gatt1994_e.htm http://www.wto.org/english/res_e/booksp_e/analytic_index_e/wto_agree_e.htm

4.2. State of play of the trade facilitation negotiations

After years of protracted debates, WTO members agreed on modalities for negotiation on trade facilitation. A Negotiating Group on Trade Facilitation was established in October 2004 which, at its first meeting in November 2004, adopted a work plan and a schedule of meetings. It was agreed for the work plan to cover the following points:

- Clarification and improvement of relevant aspects of Articles V, VIII and X of the GATT 1994; enhancement of technical assistance and support for capacity building; effective co-operation between customs or any other appropriate authorities on trade facilitation and customs compliance issues;
- Special and differential treatment for developing and least-developed countries;
- Least-developed country members;
- Identification of trade facilitation needs and priorities; concerns related to the cost implications of proposed measures;
- Technical assistance and support for capacity building;
- Working with, and work of, relevant international organisations.

So far, the group has held four meetings and concentrated its work on Articles VIII and X. With regard to article X on fees and formalities, discussions included the question of collateral/monetary securities, the possible simplification and reduction of fees and formalities, the use of relevant international standards and the compulsory use of the harmonised system nomenclature.

As far as Article X is concerned, questions discussed included the possible extension of publication and communications requirements to all interested parties, in one or two official WTO languages and on the Internet, the possibility of prior comments for planned new regulations, the publication of statements of policy objectives, the strengthening of due process requirements, transparency provisions, and appeal procedures on customs decisions or on border clearance decisions.

Central Asian countries, such as Pakistan, Nepal and Mongolia, are active in those discussions and have in certain instances formulated or co-sponsored proposals.

It is worth noting, with regard to the future final results of those discussions, that the Doha mandate stipulates that "the extent and the timing of entering into commitments shall be related to the implementation capacities of developing and least-developed members. It is further agreed that those members would not be obliged to undertake investments in infrastructure projects beyond their means."

5. OPPORTUNITIES OFFERED BY GATS FOR LAND TRANSPORT

GATS is comprised of two parts: the short *framework agreement*, which is in many ways similar to the GATT, and the *national schedules of specific commitments* that members have individually undertaken, as well as their individual list of MFN exceptions. One of the main features of the GATS is that governments are free to choose which services they include in their schedules and, even within the committed sectors, to maintain limitations on the degree of market access and national treatment they are prepared to guarantee; and that they can also depart from MFN treatment (= all foreigners to be treated alike) provided they list an exception to that effect, as will be explained in detail below.

5.1. Unconditional obligations

The framework contains five general obligations which apply across the board to all services, regardless of whether they are committed or not ("unconditional obligations"): MFN; transparency; administrative review; disciplines on monopolies and exclusive suppliers; and intergovernmental consultations on restrictive business practices.

5.1.1 MFN treatment

Under Article II of the GATS, members are held to extend, immediately and unconditionally, to services or services suppliers of all other members, "*treatment no less favourable than that accorded to like services and services suppliers of any other country*." This amounts to a prohibition, in principle, of preferential arrangements among groups of members in individual sectors, or of reciprocity provisions which confine access benefits to trading partners granting similar treatment.

Derogations are possible, in the form of so-called Article II Exemptions. Members were allowed to seek such exemptions before the Agreement entered into force. New exemptions can only be granted to new members at the time of accession or, in the case of current members, by way of a waiver under Article IX:3 of the WTO Agreement. All exemptions are subject to review; they should not, in principle, last longer than ten years. Further, the GATS allows groups of members to enter into economic integration agreements or to mutually recognise regulatory standards, certificates and the like if certain conditions are met.

5.1.2 Transparency

GATS Members are required, *inter alia*, to publish all measures of general application, and establish national enquiry points mandated to respond to other members' information requests.

5.1.3 Other generally applicable obligations

Other generally applicable obligations include the establishment of administrative review and appeals procedures, the obligation for members to ensure that monopolies and *exclusive suppliers* do not act in a manner inconsistent with MFN, and intergovernmental consultation procedures on restrictive business practices by services suppliers.

5.2. Conditional obligations

The framework agreement contains a second layer of obligations that are triggered only for committed sectors, i.e. for sectors mentioned in the national schedules of specific commitments. These are *market access, national treatment, freedom of international payments and transfers* as well as supplementary obligations on *transparency* (notification once a year to the WTO of any new, and changes to existing, regulations significantly affecting trade in committed sectors) and on the *behaviour of monopolies* and exclusive services suppliers (which should not act in a manner inconsistent with the commitments, nor, when competing in an area outside its monopoly and covered by commitments, abuse their monopoly position).

5.2.1 Schedule of specific commitments

The market access and national treatment obligations can only be understood in relation with the national *schedules of specific commitments*. A schedule of commitments is basically *a chart with four columns and four rows as follows*.

5.2.2 First column: description of the sector

The first column contains the description of the sector. Members are free to describe and to delineate the sectors as they wish. In practice, however, they have recourse in nearly all instances to a combination of two classifications: W120 and CPC.

For land transport, W120 is composed of the following elements :

11. TRANSPORT SERVICES

В.	3. Internal Waterways Transport		
	a.	Passenger transportation	7221
	b.	Freight transportation	7222
	c.	Rental of vessels with crew	7223
	d.	Maintenance and repair of vessels	8868**
	e.	Pushing and towing services	7224
	f.	Supporting services for internal waterway transport	745**
Е.	Rail	Transport Services	
	a.	Passenger transportation	7111
	b.	Freight transportation	7112
	c.	Pushing and towing services	7113
	d.	Maintenance and repair of rail transport equipment	8868**
	e.	Supporting services for rail transport services	743
	а. e.	Supporting services for rail transport services	8868 743

F.	Road transport services	
	a. Passenger transportation	7121+7122
	b. Freight transportation	7123
	c. Rental of commercial vehicles with operator	7124
	d. Maintenance and repair of road transport equipment	6112+8867
	e. Supporting services for road transport services	744
G.	Pipeline transport	
	a. Transportation of fuels	7131
	b. Transportation of other goods	7139
Н.	Services auxiliary to all modes of transport	
	a. Cargo-handling services	741
	b. Storage and warehouse services	742
	c. Freight transport agency services	748
	d. Other	749

W120 contains correspondences with a more disaggregated classification, the CPC. For the complete text of the CPC items on road transport, see annex at the end of this WTO section.

5.2.3 Second column: market access limitations

The second column of the schedule contains the limitations that a member wants to maintain concerning the principle of market access. By undertaking a market access commitment, a WTO member grants a "*treatment no less favourable than that provided under the terms, limitations and conditions agreed and specified in its schedule*" to services and services suppliers of any other WTO member.

These conditions and limitations can either be discriminatory (i.e. only applying to foreigners) or non-discriminatory (i.e. also applying to nationals but having a quantitative "ceiling" effect on the service).

Conditions and limitations for market access

These are of six types:

- *Limitations on the number of services suppliers*: e.g. a limited number of licences for all truckers including nationals or only for foreign truckers, expressed in absolute numbers, as a percentage or through an "economic needs test", that is to say, a case by case authorisation procedure, subject to more or less specified criteria;
- *Limitations on the total value of services transactions or assets:* e.g. a market share in value or a limited number of trucks;
- Limitations on the total number of services operations or total quantity of services output: e.g. a cargo-sharing provision, expressed in volumes or number of trips;
- Limitations on the total number of persons that can be employed by the services supplier: e.g. number of drivers;

- *Limitations on the type of legal entity*: i.e. prohibition or imposition of certain legal forms, such as subsidiaries, branches, representative offices or joint ventures;
- *Limitations to the participation of foreign capital*: e.g. foreign participation in trucking companies limited to 49%.

Market access options

Faced with a given limitation, a WTO member has basically five options before him:

- *Option 1. Full liberalisation*: If a member inscribes "none" (of these limitations) in its schedule, it is said to have granted full market access and this means that it can never introduce or reintroduce such limitations, and that if any exist in its legislation they are, *ipso facto*, immediately abolished.
- *Option 2. No commitments:* At the other extreme, the Member may list "unbound", which means that it keeps a complete regulatory freedom; if it has no restriction it may introduce some; if it has restrictions it may aggravate them or lighten them, or go back and forth as it wishes.
- *Option 3. Status quo:* An intermediary possibility is to list an existing restriction as is (e.g. a 49% foreign ownership limitation).
- *Option 4. Partial rollback:* A fourth possibility is to use the opportunity of GATS negotiation to liberalise partially while keeping a restriction (e.g. stating 51% of foreign ownership limitation, which will push the ceiling of the legislation up by 2%, thus allowing majority ownership).
- *Option 5. Margin:* A last possibility is to keep a certain margin in terms of action and negotiation for the future (e.g. to bind 30% while practicing 49%, which leaves the country the possibility of tightening its legislation up to a ceiling of 30% and provides, by the same token, a margin of 20% for future GATS negotiations before envisaging a real liberalisation, therefore buying time. In practice, most members have simply listed their existing restrictions ("*status quo*" strategy).

5.2.4 Third column: national treatment (NT)

The third column is devoted to national treatment restrictions. In a GATS context, National Treatment means that in any sector included in its Schedule of Specific Commitments, a Member is obliged to grant foreign services and service suppliers treatment no less favourable than that extended to its own similar services and service suppliers. The key requirement is to abstain from *measures which are liable to modify, in law or in fact, the conditions of competition in favour of a Member's own service industry*. Members are entitled to make the extension of national treatment in any particular sector subject to conditions and qualifications. Those conditions and qualifications are listed following the same principles as the market access restrictions.

Unlike market access, there is *no exhaustive list* of national treatment limitations. Every measure has to be tested to see if it affects the conditions of competition in favour of nationals. If the measure fulfils the test, then it is a national treatment restriction, and should be scheduled if the member wants to maintain it. The practice has enabled the identification of *typical national treatment restrictions*,

nationality requirement, effective residency requirement, land ownership restrictions, and subsidies reserved to nationals (for a more extensive list of national treatment restrictions, see Annex 1 of Document S/L/92 in section 6.8).

Where a measure is at the same time a market access limitation and a national treatment restriction, such a discriminatory limitation on the number of suppliers (e.g. only five foreign banks allowed) has to be scheduled under the market access column.

The sectoral part of the schedule (here, the road transport section) does not necessarily list all the restrictions applicable to the sector. In order to avoid repetitions, members have agreed that restrictions common to all sectors committed (typically, legislation on the movement of persons, subsidy legislation and investment legislation) should be put ahead of the schedule in the *horizontal section*. Therefore, in practice, a commitment must always be read in the light of the horizontal commitments section.

5.2.5 The four rows: modes of supply

Finally, a schedule of commitment has four rows. Each row is meant to cover a mode of delivery, i.e. a different way to deliver services. A key feature of the Agreement is that it covers every means by which services can be traded and supplied, that is to say:

- *Cross-border supply (mode 1)*, i.e. normal cross-border transport, as with the GATT;
- *Consumption abroad (mode 2)*, which, in the context of the road transport industry, means the freedom of shippers of country A to use road transport services within country B for their merchandise, or for a German to use the right to consume hotel services in Morocco;
- *Commercial presence (mode 3)*, which means the right to set up any type of business to supply the service abroad (e.g. setting up a transport company in another country);
- *The presence of natural persons (mode 4),* i.e. the temporary movement abroad of individuals to provide a service (e.g. a transport consultant or trainer rendering services abroad, visas).

5.2.6 Explaining the schedule of commitments: the case of Croatia

Among the many possible examples, the schedule of commitments of Croatia for land transport constitutes a good example of how GATS commitments are undertaken and scheduled.

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	Sector or subsector	Limitations on market access	Limitations on national treatment Ad col	Additional commitments
11.	TRANSPORT SERVICES E. Rail transport service			
(p	Maintenance and repair of rail transport equipment (CPC 8868)	 Unbound* Unbound* None None Unbound, except as indicated in the horizontal section 	 Unbound* Unbound* None None Unbound, except as indicated in the horizontal section 	
()	Supporting services for railway transport (CPC 7430)	 Unbound[*] None None Unbound, except as indicated in the horizontal section 	 Unbound Unbound None None Unbound, except as indicated in the horizontal section 	
Mc	odes of supply: (1) Cross-border supl	dy (2) Consumption abroad (3) Co	ommercial presence (4) Presence of nat	atural persons

Unbound, due to a lack of technical feasibility.

*

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Sect	or or subsector		Limitations on market access	Limitations on national treatment	Additional commitments
F. Road	transport services				
a) & b) Pa tra (C	ssenger and freight nsportation PC 7121 + 7122)	(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,	Unbound None None Unbound, except as indicated in the horizontal section	 Unbound None None Unbound, except as indicated in the horizontal section 	
c) Maint road 1 (CPC	tenance and repair of transport equipment 8867 and 6112)	(1) (3) (3) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	Unbound* None None Unbound, except as indicated in the horizontal section	 Unbound* None None Unbound, except as indicated in the horizontal section 	
d) Supp. road 1	orting services for transport (CPC 744)	(7, 1)	None, except for cabotage and subject to permit. None None Unbound, except as indicated in the horizontal section	 None, except for cabotage and subject to permit None None Unbound, except as indicated in the horizontal section 	
Modes of 5	supply: (1) Cro	ss-bo	order supply (2) Consumption abroad	(3) Commercial presence	(4) Presence of natural persons

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Unbound, due to lack of technical feasibility.

*

Sector or subsecto)r	Limitations on market access	Limitations on national treatment	Additional commitments
G. Pipeline transport serv (CPC 713)	ices 1) 2)	None None	1) None 2) None	
~	3)	None	3) None	
	(4)	Unbound, except as indicated in the	4) Unbound, except as indicated in the	
		horizontal section	horizontal section	
H. Services auxiliary to modes of transport	all			
a) Cargo handling servic	es 1)	Unbound*	1) Unbound [*]	
(CPC 741)	2)	None	2) None	
	3)	None, except for maritime services where a	3) None	
		foreign legal person is required to establish a		
		company in Croatia which should be granted a concession by the port authority.		
		following a public tendering procedure. The		
		number of service suppliers may be limited,		
	:	reflecting limitations in port capacity.		
	4)	Unbound, except as indicated in the	4) Unbound, except as indicated in the	
		horizontal section	horizontal section	
Modes of supply:	(1) Cross-boi	rder supply (2) Consumption abroad	(3) Commercial presence (4) Pres	sence of natural persons

Unbound, due to lack of technical feasibility.

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Additional commitments			Presence of natural persons
Limitations on national treatment	 Unbound[*] None None Unbound, except as indicated in the horizontal section 	 None None None Unbound, except as indicated in the horizontal section 	oad (3) Commercial presence (4)
Limitations on market access	 Unbound* Unbound* None None, except for maritime services where a foreign legal person is required to establish a company in Croatia which should be granted a concession by the port authority , following a public tendering procedure. The number of service suppliers may be limited, reflecting limitations in port capacity. Unbound, except as indicated in the horizontal section 	 None None None, except for maritime services where a foreign legal person is required to establish a company in Croatia which should be granted a concession by the port authority, following a public tendering procedure. The number of service suppliers may be limited, reflecting limitations in port capacity. Unbound, except as indicated in the horizontal section 	ross-border supply (2) Consumption abr
Sector or subsector	b) Storage and warehousing services (CPC 742)	c) Freight transport agency services (CPC 748)	Modes of supply: (1) C

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Unbound, due to lack of technical feasibility.

*

Sector or subsecto	r		Limitations on r	market access	Limitations on national treatment	Additional commitments
 d) Other supporting an auxiliary transport st (CPC 749) 	rvices	(1) (2) (3) (3) (4)	Unbound, except for the preparation services None None, except for marit foreign legal person is company in Croatia w a concession by the pc a public tendering pro- service suppliers may limitations in port capa Unbound, except as in	ransportation document time services where a required to establish a hich should be granted ort authority , following cedure. The number of be limited reflecting acity.	 Unbound, except for transportation document preparation services. None None Unbound, except as indicated in the horizontal section. 	
	_		horizontal section.			
Modes of supply:	(1) Cr(q-ssc	order supply (2	2) Consumption abroad	(3) Commercial presence (4) Pre	ssence of natural persons

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5.2.7 The specificity of the WTO commitments: bottom-up approach

The GATS has a bottom-up structure, i.e. a Member makes commitments only in the sectors they wish, which may be very few (less than 20 of 160 for most developing countries, largely over 60 for most developed countries). This is different from a top-down approach, such as with the EU or NAFTA, where everything is liberalised, in principle, with some specifically listed exceptions. This top-down nature is viewed by the developing countries as an essential provision, ensuring flexibility.

5.2.8 Commitments in land transport in Europe and Asia

Consequently, there is a very striking disparity between service sectors in terms of the number of countries which have made commitments so far. By these standards, land transport does rather badly. The following charts also show ample disparities between the modes of transport – pipelines, inland waterways and rail being the least committed sectors. It is worth noting in this context that the European Communities are counted as one for their 12 Member States at the entry into force of the commitments in 1995, since there is not yet a multilaterally agreed single schedule for the EC with 15 Member States. This chart simply gives a rough idea of the commitments undertaken, since a more precise analysis would entail an examination of the commitments in the 24 numerous subcategories of land transport in the CPC, and would have exceeded the size assigned to this presentation (for such a detailed analysis, see the web link section).

Countries	11.B.a.	11.B.b.	11.B.c.	11.B.d.	11.B.e.	11.B.f.	Total
China		Х					1
Czech Republic	Х	Х	Х	Х	Х	Х	6
European							
Community			Х				1
Hungary				Х			1
Japan					Х	Х	2
Latvia	Х	Х	Х	Х	Х	Х	6
Lithuania			Х				1
Moldova	Х	Х	Х	Х	Х	Х	6
Myanmar	Х						1
Slovak Republic	Х	Х	Х	Х	Х	Х	6
Switzerland	Х	Х	Х	Х	Х	Х	6
Total	6	6	7	6	6	6	37

Summary of Specific Commitments: Inland waterways transport

Legend:

- 11.B.a. Passenger transportation
- 11.B.b. Freight transportation
- 11.B.c. Rental of vessels with crew
- 11.B.d. Maintenance and repair of vessels
- 11.B.e. Pushing and towing services
- 11.B.f. Supporting services for internal waterway transport

Countries	11.E.a.	11.E.b.	11.E.c.	11.E.d.	11.E.e.	Total
Armenia				Х		1
Bulgaria				Х		1
China		Х				1
Chinese Taipei	X	Х		Х		3
Croatia				Х	Х	2
Czech Republic				Х		1
Estonia				Х		1
European						
Community				X		1
Finland				Х		1
FYR Macedonia				X		1
Georgia	X	Х	Х	Х		4
Hungary	X	Х		Х		3
Japan				Х		1
Kyrgyz Republic	X	Х	Х	Х	X	5
Lithuania				Х		1
Moldova	X	Х	Х	Х	X	5
Norway			X	X	X	3
Philippines	X	Х		Х		3
Slovak Republic				Х		1
Slovenia				X		1
Sweden				Х		1
Switzerland	X	Х	Х	Х		4
Thailand				Х	X	2
Turkey	X	Х				2
Total	8	9	5	22	5	49

Summary of Specific Commitments: Rail transport

Legend:

11.E.a. Passenger transportation

11.E.b. Freight transportation

11.E.c. Pushing and towing services

11.E.d. Maintenance and repair of rail transport equipment

11.E.e. Supporting services for rail transport services

Countries	11.F.a.	11.F.b.	11.F.c.	11.F.d.	11.F.e.	Total
Albania	X	X	X	Х	X	5
Armenia	X	X		Х		3
Austria				Х		1
Bulgaria				Х		1
Cambodia	X	X	Х	Х	Х	5
China		X		Х		2
Chinese Taipei	X	X		Х		3
Croatia	X	X	X	Х		4
Czech Republic				Х		1
Estonia		Х				1
European						
Community	X	X	Х	Х		4
Finland	X	X	Х	Х		4
FYR Macedonia	X	X	Х	Х		4
Georgia		X		X		2
Hungary				Х		1
Iceland	X	X	Х	Х	X	5
Japan		X		Х		2
Korea RP		Х				1
Kyrgyz Republic	X	X	Х	Х	X	5
Latvia	X	X		X	X	4
Liechtenstein	X		Х	Х		3
Lithuania	X	X				2
Moldova	X	X	Х	Х	X	5
Myanmar	X					1
Norway	X	X			X	3
Philippines	X	X		X		3
Romania	X	X				2
Slovak Republic				X		1
Slovenia				X		1
Sweden	X	X		X		3
Switzerland	X		X	X		3
Thailand		X	X			2
Turkey	X	X				2
Total	21	24	12	25	7	89

Summary of Specific Commitments: Road transport

Legend:

11.F.a. Passenger transportation

11.F.b. Freight transportation

11.F.c. Rental of commercial vehicles with operator

11.F.d. Maintenance and repair of road transport equipment

11.F.e. Supporting services for road transport services

Countries	11.G.a.	11.G.b.	Total
Cambodia	Х	Х	2
Croatia	Х	Х	2
FYR Macedonia	Х	Х	2
Hungary	Х	Х	2
Japan		Х	1
Kyrgyz Republic	Х	Х	2
Lithuania	Х	Х	2
Moldova	Х	Х	2
Nepal	Х	Х	2
Total	8	9	17

Summary of Specific Commitments: Pipelines

Legend:

11.G.a. Transportation of fuels

11.G.b. Transportation of other goods

Countries	11.H.a.	11.H.b.	11.H.c.	11.H.d.	Total
Albania	Х	Х	Х	Х	4
Armenia	X	Х	Х		3
Austria		Х	Х		2
Bulgaria		Х	Х	Х	3
China	X	Х	Х	Х	4
Chinese Taipei	X	Х	Х	Х	4
Croatia	X	Х	Х	Х	4
Estonia	X	Х	Х		3
European					
Community		Х	Х	Х	3
Finland		Х	Х	Х	3
FYR Macedonia		Х	Х		2
Georgia	Х	Х	Х	Х	4
Hong Kong	X	Х	Х		3
Hungary		Х			1
Iceland	Х	Х	Х	Х	4
Japan		Х	Х		2
Jordan		Х	Х	Х	3
Korea RP	Х	Х	Х	Х	4
Kyrgyz Republic	Х	Х	Х	Х	4
Latvia	Х	Х	Х	Х	4
Liechtenstein	Х	Х	Х	Х	4
Lithuania	X	Х	Х	Х	4
Malaysia			Х		1
Moldova	Х	Х	Х	Х	4
Nepal		Х			1
Norway	Х	Х	Х	Х	4
Oman	Х	Х	Х	Х	4
Philippines	X	Х	Х		3
Singapore			Х		1
Slovenia		Х	Х	Х	3
Switzerland	X	X	X	X	4
Thailand		X	X		2
Total	19	30	30	20	99

Summary of Specific Commitments: Auxiliary services

Legends

11.H.a. Cargo-handling services

11.H.b. Storage and warehouse services

11.H.c. Freight transport agency services

11.H.d. Other

5.2.9 Combination of commitments and MFN principle

An important point is the combination of commitments and the MFN principle. This relatively complex combination can be summed up by the following chart.

	"MFN plus" treatment	"MFN minus" treatment
Absence of commitments	A preferential departure from MFN is possible provided that an MFN exemption has been taken in 1993 or at the time of accession. Example: 100% ownership allowed by country A for truckers of country B, while the legislation provides for 49% for the rest of the world. (Note: This 49% legislation is "unbound" in GATS terms, meaning that it can still go back and forth between 0% and 100%.)	An "MFN minus" treatment is possible, provided that an MFN exemption has been taken in 1993 or at the time of accession. <i>Example 1:</i> the benefit of fiscal exemption – say on VAT – can be submitted to a reciprocity requirement. This reciprocity requirement has the effect of treating certain countries (those not giving reciprocal treatment) in a less favourable manner compared to others. This is still legal if this reciprocity requirement is spelled out in an MFN exemption. <i>Example 2:</i> a bilateral cargo-sharing agreement, 50-50 between A and B, has automatically an "MFN minus" effect (all other foreigners are excluded and therefore less well treated than B). It can be maintained so long as there is an MFN exemption to cover it in the schedule of A, to the benefit of B.
Presence of commitments	A preferential departure from MFN is possible, provided that an MFN exemption has been taken in 1993 or at the time of accession. E.g. the 49% bound legislation is the minimum applicable to all WTO Members but B enjoys an "MFN +" treatment –100% – through an MFN exemption given by A.	A departure from MFN is impossible: the treatment given in the schedule is available to all WTO Members without exceptions. <i>Example 1:</i> A reciprocity requirement for establishment is incompatible with a "none" in mode 3a in market access and national treatment, because the "none" gives the right of establishment to all WTO Members . <i>Example 2:</i> A 50-50 cargo-sharing agreement cannot be maintained if there is a full commitment ("none") in mode 1 freight transport, as the cargo sharing is a limitation of the number of suppliers, of the volume and the value of transactions ("zero" quota for foreigners other than B in all three instances).

5.2.10 MFN exemptions: the case of the European Union

The list of MFN exemptions in the European Community gives a good example of the various types of exemptions.
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MFN exemptions: the case of the European Union

Sector or Sub- sector	Description of measure indicating its inconsistency with Article II	Countries to which the measure applies	Intended duration	Conditions creating the need for the exemption
Road transport – Passenger and Freight	Provisions in existing or future agreements on international road haulage (including combined transport – road/rail) and passenger transport, concluded between the EC or their Member States and third countries, which: – reserve or limit the provision of a transport service between the contracting parties or across the territory of the contracting parties to vehicles registered in each contracting party;	Switzerland, States in Central, Eastern and South-Eastern Europe and all Members of the Commonwealth of Independent States, Albania, Turkey, Lebanon, Israel, Syria, Jordan, Egypt, Tunisia, Algeria, Morocco, Cyprus, Malta, Iran, Afghanistan, Iraq, Kuwait.	Indefinite	The need for exemption is linked to the regional characteristics of the cross-border provision of road transport services.
Road transport services – Freight (CPC 7123)	 provide for tax exemption for such vehicles. Authorisation for the establishment of a commercial presence in Spain may be refused to service suppliers whose country of origin does not accord effective market access to Spanish service suppliers. 	All countries	Indefinite	Need to ensure effective market access and equivalent treatment for Spanish service suppliers.

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Sector or subsector	Description of measure indicating its inconsistency with Article II	Countries to which the measure applies	Intended duration	Conditions creating the need for the exemption
Internal waterways transport	Measures based upon existing or future agreements on access to inland waterways (incl. agreements following the Rhine-Main-Danube link), which reserve traffic rights for operators based in the countries concerned and meeting nationality criteria regarding ownership.	Switzerland, States in Central, Eastern and South-Eastern Europe and all Members of the Commonwealth of Independent States.	Indefinite. Exemption needed, for certain countries, only until an economic integration agreement is concluded or completed.	To regulate transport capacity on inland waterways taking into account geographic specificity.
Internal waterways transport	Regulations implementing the Mannheim Convention on Rhine Shipping.	Switzerland	Indefinite	To regulate transport capacity on inland waterways taking into account geographic specificity.
Rental/leasing services without operators, relating to ships (CPC 83103). Rental of vessels with crew (CPC 7213, 7223).	Chartering in of foreign ships by consumers resident in Germany may be subject to condition of reciprocity.	All countries	Indefinite	Need to ensure effective market access and equivalent treatment for German service suppliers.

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5.2.11 Negotiations on services and their likely impact on land transport

There are two aspects to these services negotiations.

Negotiations on general rules

The first aspect is the negotiations of general rules on safeguards, subsidies, government procurement and domestic regulation. While those future rules may have a direct bearing on road transport, it is far too early to comment on them since they are at an early stage of development or even, in certain instances, still at the stage of the information gathering process.

Negotiations on commitments

The *second aspect* of these negotiations is the *negotiation of new or improved commitments*. This classical "market access" negotiation has itself had two successive phases: the negotiating proposals and the requests-offers process.

In the *first phase* of the negotiations – roughly between their commencement on 1st January 2000 and the WTO Ministerial in Doha in 2002 – a number of members tabled *general proposals*, outlining their interests in the services negotiations (so-called "negotiating proposals"). In total, over 110 proposals on eleven sectors (all except health) were tabled by members, but only two concerning road transport, nominated respectively by the EU and Japan (for their complete text, see the web links section). There were also proposals tabled on logistics, which is roughly the equivalent of services auxiliary to all modes of transport. There was no proposal tabled for rail transport, pipelines and inland waterways. The following charts sum up the main features of the proposals in these two areas.

Summary of the proposals

PROPOSALS	EC	JAPAN
	(S/CSS/W/41)	(S/CSS/W/42)
Objectives	"Reduce unnecessary, distortive trade barriers."	"Liberalisation on land transport services is an important issue, not only for such services providers as transport and distribution services but also for manufacturers who extend their activities abroad. Liberalisation on the land transportation of cargo is badly needed."
Sectoral coverage	 "Passenger transportation Freight transportation Rental of commercial vehicles with operator Maintenance and repair of road transport equipment Supporting services for road transport services." 	
Classification and scheduling issues	"The coverage of this proposal is without prejudice to EC's final positions on classification issues and to EC's classification of their existing commitments."	
Barriers	"International passenger and freight transport, and rental of commercial vehicles with operator: for modes 2 and 3, members should consider commitments or justify why any restrictions could be relevant. Maintenance and repair of road transport equipment, supporting services for transport services: for modes 1, 2 and 3, members should consider commitments or justify why any restrictions could be relevant. Exceptions and/or restrictions may need to be taken into account on a case by case basis in mode 3 for transport of passengers and freight."	 "Restrictions on the participation of foreign capital. Restrictions on the types of legal entity. Numerical restrictions. Measures that favour the providers of road transportation services of certain members."

Negotiating proposals on road transport

PROPOSALS	EC (S/CSS/W/41)	JAPAN (S/CSS/W/42)
Regulatory issues		
MFN exemptions	"Exceptions and/or restrictions may need to be taken into account on a case by case basis in mode 3 for transport of passengers and freight."	
Other policy issues	"Quality of the service, public safety, and the rule of law."	
Organisational issues	"The Council for Trade in Services in Special Session should initiate a debate, whether in the Council or in a subsidiary body established for the purpose, on broad aims for negotiations in land transport services sectors."	

Negotiating proposals on road transport (continued)

PROPOSALS	EC (S/CSS/W/41)	HONG KONG, CHINA (S/CSS/W/68)
Objectives	"Reduce unnecessary trade distortive barriers"	"It is opportune for the services negotiations to accord priority in liberalising the logistics and related services." "the achievement of commercially meaningful liberalisation measures for the logistics services sector."
Sectoral coverage	"Internal Waterways Services auxiliary to all modes of transport. Other transport services."	See classification issues below.
Classification and scheduling issues	"The coverage of this proposal is without prejudice to EC's final positions on classification issues and to EC's classification of their existing commitments."	 "It would be useful to build a consolidated list of logistics and related services. A preliminary list could be as follows: freight transportation services; cargo-handling services; storage and warehousing services; customs clearance services; transport agency services; container station and depot services; order processing services; production planning services; production control services. Coverage/definition for items (a) to (f) could be considered on the basis of the existing classification on the "Transport Services" sector in W/120 or the model schedule on maritime transport services, as appropriate. Items (g) to (j) appear to fall under the category of "Management Consulting Services", under "Other Business Services" sector in W/120. In this regard, Hong Kong, China would suggest that members might wish to review the appropriateness of the very important and wide-ranging services mentioned in paragraph 6 (g) to (j), being scheduled under "Management Consulting Services". This seems an inappropriate location, given their broad scope. We would also welcome initiatives from members to expand this list by suggesting other relevant sectors."

Negotiating proposals on auxiliary services

PROPOSALS	EC (S/CSS/W/41)	HONG KONG, CHINA (S/CSS/W/68)
Barriers	"Auxiliary services: Mode 1, 2 and 3: Substantive commitments should be considered by all members, giving consideration to if and how restrictions could be justified in certain areas. Mode 4: The EC schedule includes, <i>inter</i> <i>alia</i> , temporary movement of intra- corporate transferees as well as contractual service suppliers (i.e. the service is supplied, on the basis of a contract, by an employee of a company not established in the Member's territory). The EC propose that, on this basis, further discussions are held on how to improve and facilitate the temporary movement of natural persons for the provision of specific services. Internal waterways proposals can develop as a multimodal extension of maritime negotiations. The area is mainly of commercial interest for countries where sea–river transport is an important feature of the transport economy. Limitations may sometimes have to be accepted."	"substantial and meaningful Market Access and National Treatment commitments in as many services sectors [mentioned in the consolidated list of logistics and related service below] as possible."
Regulatory issues		
MFN exemptions		
Other policy issues	"Preserving the quality of the service, public safety, and the rule of law."	
Organisational issues	"The Council for Trade in Services in Special Session should initiate a debate, whether in the Council or in a subsidiary body established for the purpose, on broad aims for negotiations in these other transport modes and supporting services."	

Negotiating proposals on auxiliary services (continued)

The debates on the various negotiating proposals has not led to any specific procedural outcome, but it has helped negotiators to focus on the sectors and contributed to a better preparation of the requests and offers process.

Making requests/offers

The *second phase* of those negotiations is the *requests-offers* process. The following box describes this process, which is still ongoing at the date of issuance of the present booklet. Since those negotiations are of a secret nature, it is impossible to give a state of play and to indicate which members have offered new or improved commitments in road transport or to what extent. However, the websites of individual ministries of trade may contain information in that regard. In addition, when the Doha Development Agenda negotiations are concluded, their result for services will become public, in the same manner as the actual commitments resulting from the Uruguay Round became public at the end of 1993.

What are request and offer negotiations?

Requests

Under request-offer negotiations, each WTO submits requests to its trading partners. These requests can be made to other members individually or to groups of members. While some countries tailor their requests to specific trading partners, others have submitted nearly identical, general requests to a number of countries.

Requests can take the form of:

- a request for the trading partner to make commitments in a new sector (i.e. a sector not already included in its schedule);
- a request to remove an existing restriction or to reduce its level of restrictiveness (e.g. if a country has a foreign equity limitation of 49% in a given sector, another WTO Member may request that limit to be removed altogether i.e. that 100% equity be allowed or that it be raised to 75%);
- a request to remove an existing MFN exemption;
- a request to make an additional commitment in its schedule, covering particular regulatory practices aimed at making sure that liberalisation is effective. For example, additional commitments were used in the negotiations on telecommunications for countries to commit to providing an independent regulator for the sector.

The exchange of requests as a process has traditionally been purely bilateral, with countries communicating directly with one another. The WTO Secretariat does not normally have a role to play.

Offers

In the next stage, WTO Members submit offers in response to all the requests they have received. Countries usually prepare a single offer in response to all requests received. Countries may choose not to offer anything in response to some requests, or not to satisfy all points in some requests, and they are free to do so. The choice of what to offer is a decision of each WTO Member. Some countries have already indicated that they will not be making requests or offers on particular sectors (notably, health and education) in the current round of negotiations.

For the sake of clarity, WTO Members have submitted their initial offers in the form of a revision to their existing schedule of commitments, with changes indicated in strike-out and bold.

While requests are addressed bilaterally to negotiating partners, offers are traditionally circulated multilaterally (i.e. to all WTO Members). This is because, under the MFN rule, access offered to one WTO Member is automatically offered to all WTO Members. Given this, the offer is shown to all WTO Members, and even members which did not initially make any requests can consult and negotiate with a country that has submitted an offer. Equally, some countries may choose not to submit their own requests, judging that their interests are covered by others' requests, and knowing that whatever those other countries manage to negotiate in terms of access will automatically be extended to them under MFN (e.g. some countries may not use scarce administrative resources in preparing a services request of the US if Brazil or the EC are going to request the same thing).

The submission of offers can also trigger further requests, including by countries which had not yet submitted requests, and then the process continues and becomes a succession of requests and offers. As with most types of negotiations (e.g. pay negotiations), initial requests can be ambitious, and initial offers more minimal, with a compromise emerging in the process of negotiation.

The starting date for submitting initial offers was 30^{th} June 2002 and the starting date for submitting offers was 31^{st} March. While the number of requests remain unknown, there were 54 offers on the table, representing over 80.5% of world trade in services at 1^{st} December 2003. Members agreed in July 2004 (so-called "July package") to table revised offers as of May 2005 in the perspective of the Hong Kong ministerial conference scheduled for November 2005.

5.3. Useful Internet addresses for additional information and further reading on the above-mentioned topics

- WTO home page: <u>http://www.wto.org</u>
- General information about the WTO: <u>http://www.wto.org/english/thewto_e/thewto_e.htm</u>
- WTO agreements: <u>http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm0_e.htm</u>
- WTO mechanism for settling disputes: <u>http://www.wto.org/english/thewto_e/whatis_e/tif_e/disp0_e.htm</u>
- The organisation of WTO: <u>http://www.wto.org/english/thewto_e/whatis_e/tif_e/org0_e.htm</u>
- WTO official documents (explanatory): <u>http://www.wto.org/english/docs_e/docs_e.htm</u>
- WTO documents on-line (search and browse facilities): <u>http://docsonline.wto.org/gen_home.asp?language=1&_=1</u>
- Publications and information: <u>http://www.wto.org/english/res_e/booksp_e/booksp_e.htm</u>
- Text of the GATS: <u>http://www.wto.org/english/docs_e/legal_e/26-gats_01_e.htm</u>
- Guidelines for the scheduling of GATS commitments: <u>http://docsonline.wto.org/gen_search.asp?searchmode=simple_select_S/L/92</u>
- All about GATS and road transport: <u>http://docsonline.wto.org/gen_search.asp?searchmode=simple_select_S/C/W/60</u>
- Negotiating guidelines for services: <u>http://docsonline.wto.org/gen_search.asp?searchmode=simple_select_S/L/93</u>

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14	egotiating proposal on road transport by the European Communities: http://docsonline.wto.org/gen_search.asp?searchmode=simple_select S/CSS/W/41
N	egotiating proposal on road transport by Japan:
	http://docsonline.wto.org/gen_search.asp?searchmode=simple_select S/CSS/W/42
A	ccess to the complete text of road transport and of horizontal commitments:
	http://tsdb.wto.org/wto/WTOHomepublic.htm (select "full text search in pre-defined reports"
	and enter "road transport" or "horizontal")
4	ccess to the complete text of MFN exemptions:
	http://tsdb.wto.org/wto/public.nsf/FSetReportPredifinedAffich?OpenFrameSet&Frame=F_Pr
	edefinedReport&Src=_e5trn8rpfe1qm4r39ccn6ssr65so2uc9h70r36eb565i66p316ks3gpj364p3
	adj16coj0c1kchhjap1k7t2m8qbk8hnm6tbdcln780
3	rief information on Trade Facilitation:
	http://www.wto.org/english/tratop_e/tradfa_e/tradfa_e.htm
D	verview of Trade Facilitation Work in the WTO:
	http://www.wto.org/english/tratop e/tradfa e/tradfa overview e.htm
F	he Doha Trade Facilitation Mandate:
	http://www.wto.org/english/thewto e/minist e/min01 e/mindecl e.htm#tradefacilitation
T	he Cancun Ministerial Conference:

TRANSPORT'S ROLE IN REGIONAL INTEGRATION PROCESSES

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Boston, March 2005

1. INTRODUCTION AND OVERVIEW

Transportation's role in facilitating regional integration is twofold:

First, investments in transport *physical infrastructure* improvements lead to efficiency gains and to a variety of economic effects that ripple through the economy and lead to interregional integration. Transport improvements reduce congestion, thereby lowering travel times. Travellers gain directly from travel time savings and lowered vehicle-operating costs. Companies enjoy direct efficiency gains from cheaper and more reliable freight services and reduced assembly and delivery costs. Cheaper and better transportation services provide incentives for firms to reorganise and reduce their inventories to low, even to just-in-time levels. The advantages of scale economies occur as firms consolidate production and distribution sites and increase outputs.

While such assessments of short-term effects typically focus on responses to infrastructure improvements by transport-*providing* firms, responses to improvements by transport-*using* firms can generate *economy-wide* adjustments and redistributions over the long run. Cheaper and better transportation promotes interregional and international specialisation and trade; in turn, gains from trade permeate into the far corners of the economy.

As transport improvements lower costs and increase accessibility among various market actors (input suppliers, labour and customers), market expansion, regional specialisation and integration follow. Opportunities increase for exporting and importing goods; and new channels open for product, land and labour markets. Export expansion leads to higher levels of output, with higher sales covering operating costs as well as increasing profits. Imports put competitive pressure on local prices, thereby weakening local monopolies and improving efficiency. The economy is constantly being restructured as firms enter and leave, making for leaner production processes, lower production costs and higher productivity. Over time, lowered transport costs and increased accessibility enlarge markets for labour and other inputs. Firms are able to draw labour from broader areas and with wider ranges of attributes, improving labour supply and lowering its costs. Similar effects occur when transport improvements open up new land for economic activities, as when the US Interstate Highway System accelerated suburbanisation and when air transportation helped fill ski, beach and golf resorts. As other firms concentrate at the same location, agglomeration economies - i.e. efficiencies resulting from ease of access among related neighbouring firms - are enhanced by diversification of skilled labour supply, business services and enlarged markets. Cumulative processes reinforce the clustering, and regional specialisation develops. Further, in such activity clusters (cities) made possible by transport improvements, there appear the "economies of diversity" (Jacobs, 1967), which stimulate innovations, mutually reinforcing endogenous growth and a rise in productivity.

The second role of transport in facilitating interregional or international integration derives from recent improvements in the *non-physical infrastucture of transport or transport institutions*. Transport institutions embody knowledge and competencies about how to transport and communicate in specific legal, economic, financial and governance frameworks in various parts of the world, and how such frameworks may be changed (under rapidly evolving technical and economic conditions) to facilitate improved transport and trade.

Such institutional and organisational capabilities applied to cross-border goods traffic embrace:

- a) the economic institutions governing transport (economic regulation, privatisation of transport assets, etc.);
- b) rules governing cross-border physical flows (customs and other border inspections, rules for size and weight of vehicles, etc.);
- c) mechanisms for financial co-ordination across economies scattered over the globe, and
- d) business logistical practices (Lakshmanan, Subramaniyan, Anderson and Lautier, 2001).

The aim of this paper is to identify and describe the various processes underlying the role that physical and non-physical transport infrastructures (and the transport services they make possible) play in facilitating trade and regional integration. Part 2 describes the causal mechanisms that are unleashed by physical transport infrastructure investments and that lead over time to market expansion, gains in trade, regional specialisation, integration of product and factor markets and total factor productivity gains. An example of such pervasive regional economic integration — the integration of the eastern Midwest states into the Northeast US and the world economy by railroad investments in the middle of the 19th century — is presented. Part 3 characterises the non-physical transport infrastructure or the cross-border transport institutions, and the on-going process of reform and reinvention of transport institutions evolving in support of international trade expansion. Such organisational and institutional reforms that have appeared in the last two decades, particularly in NAFTA and the EU to facilitate integration of these large regions, are briefly sketched. Part 4 concludes the paper.

2. PHYSICAL TRANSPORT INFRASTRUCTURE AND REGIONAL INTEGRATION

Over the years, the economic consequences of physical transport infrastructure investments have been varied: some efficiency gains and modest growth effects in some cases; activity declines and perverse negative economic effects in others; and at yet other times, sharp increases in access and market expansion, interregional economic integration and far-reaching economic changes. Since transport infrastructure investments are large and lumpy and typically made in the public sector, there has been a consequent demand for their careful economic assessment and explanations for these variations.

Such economic assessments appear in two forms: *one*, a microeconomic analysis of transport projects, which identifies the link between specific infrastructure projects and the productivity of specific production units. The traditional approach in this perspective is the *ex ante* tool of cost benefit analysis (CBA), which tries to predict the economic benefits to both households and firms — time and cost savings, as well as further gains from logistical improvements and facilities consolidation — and contrast them with project, operational, external and other costs.

The *second form* of assessment is through macroeconomic models that offer *ex post* econometric analyses of the contributions that transport infrastructure investment programmes offer an economy, in

terms of cost reductions and output expansion — effects typically captured by cost functions and production functions (Mera, 1973; Wigren, 1984; Elhance and Lakshmanan, 1988; Aschauer, 1989; Canning and Bennathan, 2001, Nadiri and Mamuneas, 1996). The externalities to investments in transport infrastructure, which are not captured in microeconomic CBA studies, are incorporated in the macroeconomic models that allow them potentially to identify social rates of return to transport infrastructure. While neoclassical growth theory describes the mechanisms for the positive effects of labour and private capital on output, the mechanisms linking transport public capital to output are, however, unclear.

Recent theoretical advances in the "New Economic Geography" and Endogenous Growth Theory, however, shed light on the mechanisms by which transport infrastructure and services set in motion a variety of interacting economic processes that course through the economy and yield many sectoral, spatial and regional effects which augment productivity (Fujita, Krugman and Venables, 1999; Romer, 1990; Lucas, 1988). As transport infrastructure and service improvements lower costs and increase accessibility to various market actors — input suppliers, labour and customers — market expansion, increased integration and mutually sustaining growth will ensue. It is useful to organise the underlying mechanisms into:

- a) gains from trade;
- b) technology diffusion;
- c) co-ordination device and the "Big Push"; and
- d) induced technical change.

Further, as sustained improvements in transport infrastructure make possible agglomerations or large spatial clusters of firms and individuals (e.g. cities), a variety of agglomeration economies and endogenous growth effects follow, thereby augmenting the economic effects of physical transport infrastructure (Lakshmanan and Anderson, 2002).

2.1. Gains from trade

The lowering of travel time and costs, and the service improvements induced by transport infrastructure expand the markets for individual transport-using firms. As such market expansion links the economies of different localities and regions, there is a major consequence in terms of a shift from local and regional autarky to increasing specialisation and trade and the consequent upsurge in productivity. This is as true for interregional trade between highly differentiated regional economies in continental regions, such as the United States or the European Union, as for cross-border international trade in Free Trade Areas (FTAs). The US Interstate Highway System, the Trans-European Network programme and the emergence of super-efficient ocean ports all contribute to "Smithian" growth -- growth arising due to specialisation and trade.

Such efficiency gains from specialisation and trade derive from two mechanisms:

• Each region has a different endowment of natural resources, labour (availability and skills), capital goods, and institutions that make it highly efficient in some categories of production and less efficient in others. Specialisation and trade allows regional resources to be concentrated in those forms of production for which they are best suited. This is basically David Ricardo's theory of *comparative advantage*, whose theoretical extensions are explored in the Heckscher–Ohlin–Samuelson framework (Findlay, 1995).

• Even if regions have similar endowments of resources, there is still a benefit to interregional trade *via* scale economies that are realised as producers target broader markets. Furthermore, production and trade across a national (as opposed to regional) market make it possible to provide consumers with a broader variety of goods (Krugman, 1979, 1991). This is the explanation of gains from trade provided in the "New Economic Geography" (Fujita, Krugman and Venables, 1999; Venables and Gusiorek, 1999).

A recent study has estimated the economic gains from the increase in variety of traded goods for the US (Broda and Weinstein, 2004). Analysing the most disaggregated US import data during 1972-2001, Broda and Weinstein find that:

- a) consumers have low elasticities of substitution across similar goods produced in different countries indicating support for the assumption of Dixit-Stiglitz (1977) that consumers value variety;
- b) the four-fold increase in available global varieties occurring in the last thirty years is shown to reduce the observed price, relative to the conventionally measured import price index in the US over this entire period, by 28.1 per cent; and
- c) increases in imported varieties have led to a large welfare gain, raising US real income by about 3 per cent.

Specialisation and trade will only occur if the efficiency gains from trade are greater than the transportation costs required. For example, Limao and Venables (2001) found that inadequate transportation infrastructure is a major impediment to the export performance of developing countries, especially in Africa. This type of productivity effect is difficult to capture in cost-benefit analyses, however, and may therefore be missed in policy analyses.

As opportunities for exporting and importing goods are enhanced, several channels of economic effects open, both in product markets and in factor markets. First, as noted above, export expansion will lead to higher levels of output, which allow higher sales to cover fixed costs of operation, yielding efficiencies. Second, increasing imports puts competitive pressures on local prices. Such pressures lead not only to the removal of monopoly rents but also to improved efficiency. Schumpeterian dynamics come into play — firm entry, exit, expansion and contraction. As firms promote leaner production processes, which lower costs of production and raise productivity, further restructuring of the economy occurs. Third, lower transport costs and increased accessibility enlarge the markets for labour and other factor inputs. Firms will likely draw labour from a broader area, with a greater range of attributes improving labour supply, and with lower costs. Similar effects in land and other factor markets are likely as transport improvements open up new land for economic activities, as when the US Interstate highway system accelerated suburbanisation and air transport improvements helped fill ski, beach and golf resorts.

The contributions of transportation infrastructure to productivity need not be a slow process. Kelly (1997) has shown that transportation networks may have critical density levels below which markets are largely isolated and above which they become integrated, expanding the market for the most efficient producers in all regions. Kelly relates this theoretical argument to the rapid commercialisation of the Chinese economy that occurred after completion of interregional waterways in the 12th centuryⁱ.

2.2. Co-ordination failure and the Big Push

Rosenstein-Rodan (1943) and Hirschman (1958) described a problem of development in traditional economies whereby investment in increasing-returns-to-scale technologies (i.e. industrialisation) in a single production sector is not profitable, but simultaneous investment in such technologies by several sectors is profitable. This can occur for several reasons. Most notably, when there are linkages between sectors by means of intermediate goods, expanding one sector expands the market of other sectors. Thus if all sectors industrialise at once, there are mutually supportive intermediate demands that allow them all to achieve scale economies. This is the justification for a "big push" industrialisation policy as a means to address the co-ordination failure that prevents such simultaneous industrialisation from occurring without intervention.

Another reason for co-ordination failure is the fact that no single sector can support the transportation or other infrastructure necessary for its industrialisation. If all sectors industrialise at once, they can jointly support this infrastructure. In light of this, investment in public infrastructure may be viewed as a policy to overcome co-ordination failure, for two reasons. First, it may be sufficient to make it profitable for all sectors to industrialise independently. Second, even if it is not sufficient to create independent profitability, it may provide a signal to firms in all sectors to anticipate widespread industrialisation.

2.3. Technological shifts

Associated with the growth of interregional and cross-country trade, there has been an upsurge in intra-industry trade and the exchange of intermediate goods. There are opportunities here for adopting new technical knowledge associated with imports. There is potential for knowledge and technology growth in the process of *learning by doing and by using*. The newly industrialised countries of East Asia provide successful examples of such technology adoption and learning that facilitate technological shifts and productivity upsurge.

There have been times in history when expanded freight services have made possible radical changes in the structure of production. For example, the development first of canals and later of railroads made it possible for huge areas of the central lowlands of the US to be developed for specialised agriculture serving a national market. To a degree, this fits into the standard comparative advantage argument described above, except that, rather than a shift from autarky to specialisation, it involved the creation of new economic regions, whose growth was primarily driven from an early stage by export commodities. Furthermore, it involved a fundamental transformation of production. It can be argued that a host of improvements in agricultural technology were induced, at least in part, by the expanded market opportunities made possible by freight improvements.

Another example is the industrial revolution in textile production that occurred on a global scale in the 19th century. In this case, improved freight made it possible to develop a production system that required the movement of cotton from production region (southern US, Egypt, India) to production centres in England and New England. Thus, unlike the example above, where freight made it possible for a specialised production region to reach broader markets, in this case freight made it possible for widely separated but complementary regions to be integrated into a specialised production system. Again, this story has elements of comparative advantage, but it involves a fundamental shift in technology, made possible by improved freight (Lakshmanan and Anderson, 2002).

2.4. Gains from agglomerations supported by transport

To the degree that transport improvements make possible the transport-using activity patterns of large numbers of individuals and the input and output logistics of a great many production firms located in large spatial clusters, transport infrastructure supports agglomerations. Many analysts have noted the productivity benefits from such concentrations of economic activity or cities made possible by transport infrastructure (Mera, 1975; Ciccone and Hall, 1996). These economic gains from agglomerations derive from two sources.

- A. The traditional *agglomeration economies:* two types of agglomeration economies are recognised:
 - 1. *Pure agglomeration:* Firms benefit directly from the existence of an agglomeration their relationships with other firms are essentially transient and the only price they pay for membership is the higher land rent.
 - 2. *Industrial complex:* Firms are interlinked by exchanges of goods and services and therefore have longer-term interests in each others' locations. Thus, there are high entry and exit costs. Such complexes are local, but not necessarily urban. Transportation infrastructure plays different roles in different types of agglomeration. In the case of pure agglomeration, transportation infrastructure is important to allow intra-metropolitan commuting and permit diverse markets to be served from a central location. For the industrial complex, intra-regional freight movement is critical and infrastructure requirements may be more specialised, depending upon the industrial sectors involved. The outcomes are *intra-industry* knowledge transfers, as promoted by Marshall-Arrow-Romer (AMR) formulation.
- B. The *innovative activities* resulting from the "innovation infrastructure", developing in many agglomerations in the contemporary knowledge economy, yielding endogenous growth. Two mechanisms underlie this innovation infrastructure:
 - 1. In the context of rapidly evolving knowledge-intensive products and services, firms and other economic agents in these agglomerations develop flexible and interdependent relationships with suppliers and competitors and increasingly depend on intangibles, like know-how, synergies and untraced knowledge (Von Hipper, 1988; Stopper, 1992; Aces, 2002; Lakshmanan and Chatterjee, 2004). In this context, the innovative firm's environment comprises *social networks*, which are intermediate between markets and firm hierarchies and which are more flexible in seizing new opportunities by rapidly decomposing and recombining innovation assets. In these social networks, firms are interrelated by means of a culture of mutual trust. The absence of opportunism reduces transaction costs and promotes risk-taking and joint ventures. McCann and Shefer (2004) argue that the social network model depends on social rather than physical infrastructure, although infrastructure for personal transportation clearly plays a role here. Physical agglomeration is not absolutely necessary but spatial proximity helps to promote such an environment.
 - 2. The second mechanism underlying the innovation infrastructure of agglomerations operates via the need in knowledge-intensive activities for face-to-face communication among economic agents. As knowledge-intensive industries process increasingly complex information, not easily amenable to other channels, face-to-face interactions among a broad variety of participants become more important. Firms that engage in

exchanges of complex knowledge, either in their product or process development, in the management of their supply chains or in financial and risk management, need and use face-to-face interactions more than mature industries. Such innovative industries benefit from the clustering of a variety of activities in agglomerations or cities. An additional dimension of the innovation infrastructure is the creative potential of the interactions between the wide variety of economic agents in a large agglomeration. The formal and informal interactions among the diversity of urban agents — economic, social, cultural, etc. — in large urban areas engenders creativity and innovative outcomes. Jane Jacobs (1969) has written at length about how the juxtaposition and interaction among diverse viewpoints promotes creative outcomes. These "economies of diversity" and *interindustrial* knowledge spillovers associated with agglomerations, made possible by transport infrastructure, have paved the way today and in the past to innovations and the consequent endogenous growth (Rosenberg and Birdzill, 1986; Florida, 2003).

While the discussion has so far noted the positive impact of transport infrastructure's role in inter-regional integration, there are some likely feedback effects associated with expanded production, which may dampen the initial strong positive impacts of transport improvements noted above. Since production growth deriving from market expansion will raise the demand for labour and land, wages and rents will rise, thus offsetting part of the initial lowering of costs and gains in competitiveness. The wage rises, if persistent, will have consequences for migration. Finally, higher production may induce congestion in the networks and a rise in transport costs.

2.5. The railroad's role in the integration of the US Midwest into the Northeastern US and world economies

Railroad technology, introduced into the US in 1830, had improved by 1850 to a level where uniform methods of construction, bridging and grading and the use of the iron T-rail had become common, and the locomotive had acquired a modern aspect. The complementary communications technology of the telegraph provided almost instantaneous communication across vast spaces and aided railroad managers and operators with safe and efficient train operations. In the next decade, the rail network experienced a huge expansion, of about 400 per cent, yielding an articulated national network of some 30 000 miles. Rail routes linked New York to Chicago or Dubuque, Iowa; Baltimore to St. Louis; and hogs from the plains of Illinois to the slaughterhouses in Boston. The East Coast and the Midwest ("the old Northwest") were joined by four great East-West trunk lines, and rapid rail expansion soon linked the East Coast with the Midwestern states of Ohio, Indiana, Illinois, Michigan, Iowa and Wisconsin (Chandler, 1965).

The direct effects of this railroad expansion arrived in the form of sharply lowered costs and time of travel from the East Coast to the Midwest. A railroad rate of 3 cents a ton-mile (an 80 per cent drop from the prevalent overland rate of 15 cents per ton-mile) and shorter travel times released resources for increased settlement, expanded agricultural use of land, and greatly enhanced agricultural output (Fishlow, 1965). The increased accessibility opened the area to settlers, making possible the development of interior, landlocked areas. Before the development of railroads, only areas adjacent to navigable rivers and canals could produce farm products for outside markets. The cheap and quick access that the railroad provided for the eastern US and European markets, allowed the expansion of agriculture into counties without water access (Figure 1). The concentration of wheat and corn production in the Midwest states with water access was reduced after the arrival of the railroad (Table 1).



Figure 1. Acres of improved land in the Midwest, 1810-60

Table 1. Changing geography of agricultural output induced by railroads in Indiana, Illinois,Wisconsin and Iowa, 1848-59

Geographic situation	Area	Output	of wheat	Output	of corn
	(thou. sq.		(Thousands	of bushels)	
	miles)	1849	1859	1849	1859
Counties with water access	71	9 424	26 451	48 602	87 882
Counties without water access	134	12 021	38 352	72 655	148 810
Total	205	21 445	64 803	121 257	236 692

Source: Fishlow, 1965, p. 209.

The expansion of agricultural land and outputs, induced by the lower costs of rail use, was aided by other mechanisms (Fishlow, 1965). The Midwest soils, requiring lower capital costs for preparation, and being more productive than eastern land, allowed greater output per unit of labour and capital, and lower unit costs of production, thereby extending the limits of potential production. The cost per bushel of grain (exclusive of interest costs on land) dropped East to West — from 48 cents in Seneca County in New York to 35 cents in Michigan for wheat, and from 29 cents in Pennsylvania to 10 cents in Ohio and 7 cents in Peoria, Illinois for corn (COP, 1854). Other influences, such as technical improvements (improved ploughs and better drainage) and larger market forces, which increased the relative prices of agricultural output in the 1850s, greatly increased agricultural income. Between 1850 and 1860, there was not only a major expansion of the agricultural sector but also a *regional shift*. The Midwestern states outpaced the East (New England and the Mid-Atlantic states) during 1850-60 in growth rates of agricultural output (51 per cent to 20 per cent), with an 1860 output of \$235 million (1860 prices) — 37 per cent higher than that of the East. In this period, the national average number of man-hours required for a bushel of corn dropped from 3.17 to 3.01, suggesting a productivity effect. From an output point of view, this westward shift and increasing regional specialisation in the Midwest resulted in an actual corn crop in 1860 about 5 per cent larger than it would otherwise have been (Fishlow, 1965).

This railroad-induced interregional trade, by influencing the production decisions of farmers and manufacturers, yielded economic gains. The chance to ship shoes and boots cheaply from Boston to Iowa and Iowa corn to Boston meant greater effective demand and income for Boston manufacturers and Iowan farmers, leading to regional specialisation, and economic expansion and transformation. Real product per capita rose at a rate greater than the long-term trend between 1844-54 (Gallman, 1965). Between 1839 and 1859, the share of agriculture in commodity output dropped from 72 per cent to 56 per cent, while the share of manufacturing rose sharply, from 17 per cent to 32 per cent (Fishlow, 1965).

Another dynamic sequence in the railroad-induced evolution derived from the forward linkage of agriculture to processing industries, such as flour milling, distilling, meat packing, etc. Since these activities are weight-losing, a pronounced westward shift of these industries occurred, with an accompanying shift of their raw materials. Flour milling, meat packing and slaughtering saw a shift from East to West, broadening the industrial base of the Midwest (Figure 2)ⁱⁱ.



Figure 2. Value of manufactured products in the Midwest: 1840-60

The lowering of transport costs by railroads also reduced the final costs of manufactured goods in a variety of industries, increasing the demand for their products. The expansion of several industries at the same time, with mutually supportive intermediate demands, promoted the attainment of scale economies and sustaining growth, $\dot{a} \, la$ Hirschman (1958) "big push" economic scenarioⁱⁱⁱ.

Railroads offered not only lower costs but a variety of other transport services. These rail service attributes pertain to the regularity, predictability, speed, and the large volume of flow in goods transport, never before possible. These characteristics of certainty, speed and volume in turn had profound effects on the American farmer, industrialist and merchant. This assured regularity allowed the Post Office to introduce the use of postage stamps in 1847 and to drop postage rates in 1851 from 5c for 3000 miles.

The new rail service attributes had two other broad economic effects – one technological and another organisational – on the US East and Midwest. First, the continuous and relatively steady and fast flow of raw materials into, and finished products out of US factories, made possible by the railroad and the complementary telegraph, in turn allowed the adoption of mass production methods in the consumer durable industries (Chandler, 1965). While mass production techniques – volume production of goods with interchangeable parts – had developed in New England since 1800 in the arms industry, their application elsewhere was handicapped by the slowness and unreliability of goods flows, and winter restrictions on canal and coastal water movements. As the railroads opened new markets and assured steady supplies of inputs and outputs during the 1850s, the old "putting out" system waned, and the new techniques of volume production with interchangeable parts were adopted in the East and Midwest to mass-produce clothing, shoes, clocks, watches, sewing machines, harvesters and other agricultural implements. Initial benefits came from firm reorganisation and further increases in productivity ensued from the adoption of new production methods.

Second, the certainty and speed of goods movement made possible by the railroad, in turn, engineered a logistical transformation and the rise of new economic specialisations. Previously, the manufacturers carried large inventories, either in their own or in the commission agents' warehouses. The rapid and reliable flow of goods by rail led to the rise in the country of wholesalers and middlemen, who maintained smaller inventories which could easily be replenished, by telegraph request, in a few days by rail. The manufacturer benefited from lower inventory costs and the drop in overall logistics costs benefited the larger economy.

As the railroads expanded after the Civil War, physically integrating the entire country, transport costs fell further – from 39 cents a bushel of wheat from Chicago to New York in 1858 to 14 cents in 1890 – and the freight volume rose rapidly, from 3 billion ton-miles in 1859 to 142 billion ton-miles in 1900 (Fishlow, 1965). Industrialisation and urbanisation were in full force in this period. In the larger urban agglomerations, made possible by rail and other transport infrastructure, the agglomeration economies and industrial complex effects came into play, leading to sustained expansion of the urban and regional economies in the US (Pred, 1966).

Thus, there is a considerable body of evidence that the development of railroads accelerated the settlement and agricultural expansion of the Midwest and initiated dynamic sequences that integrated the New England and Mid-Atlantic regions with the Midwest. Manufacturing activities spread from the Northeast to the East North Central Region, to form the "Manufacturing Belt" of the US (Kim and Margo, 2003). Indeed, this role of the railroad in regional integration has driven some scholars to rhetorical heights – Walter Rostow claiming that "this period of American takeoff centered on the building of the rail net reaching out to the Middle West" (quoted in Fishlow, 1965; p.13); Max Weber terming the railroad "as the greatest innovation in history" (Weber, 1927); and Schumpeter suggesting

that the economic history of the US in the second half of the 19th century can be cast solely "in terms of railroad construction and its effects" (Schumpeter, 1939).

3. NON-PHYSICAL TRANSPORT INFRASTRUCTURE AND REGIONAL INTEGRATION

While the liberalisation of international trade regimes and transport technology improvements in the last quarter century have greatly removed institutional and physical barriers to free trade, a variety of non-tariff barriers remain. A major class of such non-tariff barriers to trade derives from *the non-physical transport infrastructure or the institutions governing transport*, which embody a variety of incentives, appropriate to an earlier era of restricted cross-border trade and regulated transport services. As trading regimes have become progressively more open in recent decades, the traditional transport institutions governing international goods flows are being reinvented, in order to change the economic incentives towards minimising the costs of cross-border goods flow and to better serve the emerging global economy.

3.1. The components of an advanced transport governance system

An advanced transport governance system oriented to trade facilitation (see Table 2) reduces the barriers to transport and cross-border transit of goods, through the use of *knowledge and competencies applied* to the transport vehicles and infrastructure. Such knowledge and organisations incorporate knowledge about how to transport and communicate in specific legal, economic, financial and governance frameworks, which are operative in different countries. Further, these institutions and organisations and organisations are learning systems that develop adaptive knowledge, relating to how such frameworks may be changed over time to facilitate continual improvements of transport and trade (Lakshmanan, *et al.*, 2001).

Transport Institutions (Knowledge and competencies in transport and trade facilitation)
1. Overall governance of transport and trade facilitation
2. Systems of governance of physical flows
Market organisations
1. Business logistical systems
2. Financial co-ordination systems

Table 2. Com	ponents of a t	transport :	governance s	system	facilitating	trade

- 1. Overall governance of transport and trade facilitation. This defines the economic, institutional, legal and administrative frameworks within which cross-border transport activities are carried out. Examples of recent reform of these frameworks in order to promote trade include: deregulation of transport services in North America, Europe and elsewhere; Progressive removal of cabotage restrictions and other residual economic regulations; privatisation of transport infrastructures, etc.
- 2. *Governance of physical flows.* Goods moving from one side of a national border to the other are normally subject to processes and rules pertaining to the size and weight of vehicles permitted in freight across borders, customs inspections and other border inspection relating to agricultural products, drugs, etc. To promote seamless trade across borders, reinvention of such practices is crucial.
- 3. *Business logistical systems.* Business capabilities are enhanced by new logistical systems that offer fast, reliable and low-cost service. Logistical systems represent an integrated analysis and active management of a global corporation's overall supply chain, from the spatially far-flung sources of inputs to delivery of finished products. These systems also can provide competitive advantage by slashing costs (minimum inventory), quickening market feedback and expanding market reach.
- 4. *Financial co-ordination system.* Since money is exchanged for the transfer of property rights to the goods at the time of goods delivery, financial co-ordination across different economies in a vast global economy is crucial. Financial instruments help pool and diversify risk. Financial co-ordination is improved by trade-friendly banking practices and new payment systems. Risk-reduction innovations can reduce the costs of linking the shipper and the customer. Organisational innovations can create efficient entities for marketing and distribution in the rapidly evolving marketplace.

This paper concentrates on two components of the transport and trade facilitation which require *considerable institutional reform* by public sector agents, namely, *overall governance of transport and trade facilitation, and governance of physical flows.*

3.2. Reform of overall governance of transport systems: North America and the EU

The reform of the elaborate and divergent economic regulations that have governed transport in the past in the different countries that make up a Free Trade Area (FTA) is often a prerequisite for the promotion of a seamless cross-border freight flow among those countries. Since transportation carriers, which are integrated with fixed facilities and vehicles and enjoy network economies, were able to engage in monopoly pricing, market segmentation pricing and similar actions that seriously disadvantaged shippers and communities, economic regulation arrived in the US railroads in 1887 and later for other transport modes. Indeed, the transport sector was regulated to varying degrees during much of the 20th century in affluent countries. The adverse effects of intrusive economic regulation, which became very evident by the 1970s in the poor financial performance of US railroads and high truck rates in the LTL (less than truckload) sector, hindered technical change and productivity growth and caused declining service quality^{iv}.

The resulting drive for deregulation led, in short order, to the regulatory reform of airlines (1978), railroads (1980) and motor carriers (1980), first in the US and later in other countries. Entry conditions were eased; freedom to price was promoted; and reliance on the market and competition were

encouraged. Canada, European countries, Mexico and many others followed suit (Lakshmanan and Anderson, 1999).

In North America, processes of transport deregulation and privatisation have played complementary roles with trade liberalisation to promote interregional transport integration. After all the economic regulatory reform that has occurred in Canada, Mexico and the US, there is still a remnant of economic regulation in the form of cabotage rules that hinder efficient transborder operations. As noted below, Europe has witnessed more recently similar deregulation and privatisation processes.

The North American experience

Major changes occurred in the US in the conduct, performance and structure of airlines, trucking and railroads after deregulation – more competition among all modal carriers, lower prices, wider set of service offerings, and new entry into most geographic and product markets (Figures 3 and 4). Carriers have been able to rationalise their networks, improve the efficiency of their operations, and set rates in line with competitive market conditions. There was a significant change in the cost structure of the railroad industry following deregulation, with productivity growing at well over 2 per cent a year (Bereskin, 1996).

Several studies have shown that average airfares (in constant dollars) have fallen since 1978, and competition stays rigorous on most city-pair routes, though concentration has gone up in the industry (US GAO, 1990; NRC, 1991). US domestic airfares adjusted for distance have been consistently lower in the last two decades than in Europe, Asia or the world.

Shippers, confronting technological change and globalisation, have begun to co-ordinate their production activities more effectively with their transportation services – with consequent productivity gains. The experience in Canada since 1987 has been broadly similar, with competitive pressures lowering rates in international air traffic, railroads and trucking. Trucking deregulation in Mexico in 1989 increased competition and lowered rates – 29 per cent lower a few years later (Strah, 1995). It also promoted expansion of intercity routes and the vehicle fleet.

Cabotage, referring to the ability of foreign vehicles and labour to transport goods within a country, is still regulated and forms a trade barrier. The cabotage rules involve the use of labour and equipment of one country in the other except for domestic movements that are incidental to international movements. The existence of these cabotage-rule barriers increases the cost of transborder transport. Railroads are less affected by cabotage restrictions, though they too incur additional costs because of the need to change crews at the border^v.

The rapid growth in international air freight services reflects the emergence of global systems of producing and distributing goods and the associated "just-in-time" inventory and supply chain management systems. Such services are handicapped, however, by the bilateral international aviation agreements that specify traffic rights – the routes, the number of flights on each route and the number of airlines that can fly them. Such restrictions on trans-border airline traffic have been recently relaxed by the US negotiations on "open skies" agreements with Canada and many European and Asian countries such as Germany, the Netherlands and Singapore.



Figure 3. Operating costs for truckload and less than truckload shipping

Figure 4. Railroad operating cost per revenue ton-mile (1995 dollars)



Source: Morrison and Winston, 1997.

The overall message is that inconsistencies in transport regulations between countries will generate economic inefficiencies, hamper trade and delay interregional integration. As both production and transportation firms in all three countries comprising the NAFTA region rationalise their operations, the transport non-tariff barriers noted in this section cause inefficiencies and generate the political demand for their relaxation. The direct effect of these barriers – as the carriers are required to operate around these restrictions – would be higher costs; the longer-term indirect effect would be less competitive and efficient activities in the logistics industry and the consequent loss of productivity in the NAFTA region.

The European Union experience

The goal of creating a common transportation policy was stated explicitly in the Treaty of Rome. It was clear at that time that as tariffs were removed and product standards were harmonised, lack of co-ordination among national transportation systems would constitute a major impediment to trade.

Creating an integrated transportation system in Europe would require progress on three fronts: interoperability, free market access and interconnection. Interoperability refers to harmonisation of technical standards, ranging from rail gauge to air traffic control protocols, as well as rules applying to service providers, such as truck size and weight restrictions.

Free market access refers to the freedom of transportation service providers to operate outside their own home countries - i.e. rules permitting cabotage. Interconnection refers to the need to forge links between transportation networks that had been developed with national needs and goals in mind in order to create a common network.

Despite good intentions, integration of transportation governance has been seen in the past as one of the EU's conspicuous failures (Button, 1993; McCormick, 1999; European Commission, 1999). As late as the 1990s, very little integration had actually taken place and national, rather than EU, regulations dominated. Problems included highly restrictive rules of airline access that kept intra-EU fares inordinately high, various restrictions that slowed and increased the cost of truck movement across borders, and poor progress toward network integration.

Reasons for slow progress in the integration of transportation governance are varied, but most relate to the traditional mandate of national governments in transportation and their unwillingness to transfer authority to the EU. For example, nearly all national governments were owners of major transportation service providers, including railways and airlines, and therefore had interests in preserving their domestic monopoly powers. Furthermore, transportation policy is frequently used as a means of pursuing national economic goals. The role of subnational governments in transportation policy (a greater role than in, say, agricultural policy) further complicated the task of policy integration.

Pressure to move on transportation policy was brought to bear by private sector groups, representing major consumers of transportation services, who successfully sued the Commission before the European Court of Justice on the grounds that it had failed to uphold requirements in the Treaty of Rome. The suits referred specifically to cabotage and airline access restrictions, but they led to a broad re-examination of transportation policy and consequently to substantial reforms.

3.3. Reform of governance system for physical flows

The NAFTA Experience

Interregional goods flow is subject to a host of technical regulations and standards, such as: the size and weight regulations for trucks; size, weight and other technical standards for locomotives and other railroad stock; age, language, licensing and health regulations for vehicle operators; conventions for road signs and traffic signals; procedures for ensuring vehicle safety; and procedures for transportation of hazardous goods.

In all of these cases, somewhat different regulations, standards and procedures have evolved over many years in the three NAFTA partners, thereby increasing the cost of moving goods across borders. Inconsistencies in truck size and weight regulations – imposed in order to reduce hazards in mixed traffic streams, and to avoid accelerated wear and damage to road infrastructure from over-sized vehicles – are a good example.

Unfortunately, there are some significant inconsistencies between these regulations in the three NAFTA partners. Even on the most basic dimension – gross truck weight – there is no consistency. As Table 3 indicates, the United States limits all trucks to a gross weight of 36 288 kg (80 000 lbs.). Both Mexico and Canada allow higher weights for all categories of trucks, and increase the weight limit for trucks with more than the standard five axles. This inconsistency is due mainly to conservative assumptions by US officials about the maximum weight that can be supported by bridges.

Truck Type	US	Canada*	Mexico
Tractor – Semitrailer (5 axles)	36 288	39 500 - 41 500	44 000
Tractor – Semitrailer (6 axles)	36 288	46 500 - 53 000	48 500
Double Trailer (6 axles)	36 288	47 600 – 43 500	47 500

Table 3. Maximum gross vehicle weights in the NAFTA countries (in kg)

* range of provincial regulations

Source: North American Free Trade Agreement Land Transportation Standards Subcommittee, October 1997.

Other inconsistencies, such as the need for some Canadian trucking firms to maintain separate fleets of trucks for shipments into the US and for domestic shipments: a) have the potential to add significantly to the cost of cross-border transportation; and b) imply more border inspections, which add to the delays and costs of border operations.

NAFTA established the Land Transportation Standards Subcommittee, with responsibility for harmonisation in all of the categories of technical regulation listed above. To date, significant progress has been made in the regulation of vehicle operators and in harmonisation of road signs and signals. Canada and the US have traded large volumes of goods for a number of decades and, in the process, both governments have worked co-operatively to develop relatively efficient border crossing routines. However, the border crossings along the US-Mexican frontier are plagued by long delays and many Mexican trucks must be sent back due to violations of various US regulations.

There is considerable potential and some progress toward new information and communication technologies to speed border crossings by eliminating much of the need for paper handling, remotely reading truck identification and cargo information, and conducting certain basic checks on weight, length, height and width while the truck is in motion. Also, electronic databases can be used to identify trucks and drivers with previous violation histories, so that inspection efforts can be concentrated on them.

The European experience

Between 1987 and 1992 major new legislation was enacted regarding air, marine, road, rail and inland waterway transportation. This legislation dealt mostly with issues of market access and interoperability, as well as common work rules for transportation employees. In the 1990s, however, the Commission began to focus more on issues of interconnection. For example, a 1993 White Paper on growth, competitiveness and employment emphasized the transformations in production systems, methods of organising work, and consumption patterns that were already being adopted in North America and Asia. Economic fragmentation and adherence to traditional practices made it difficult for European businesses to manage complex value chains and spawn small innovative firms, placing the EU in a weak competitive position *vis-à-vis* other major production regions.

Repeating a goal that had already been enshrined in the 1992 Treaty on European Union, the White Paper called for the development of integrated and complementary information, transportation and energy, Trans-European Networks (TENs). This led to the announcement in 1994 of a major infrastructure programme specifically geared to filling gaps in the existing European transportation networks.

As part of its Trans-European Networks (TEN) initiative, the EU embarked in the 1990s on a programme to encourage transportation infrastructure projects that fill the gaps in existing Europe-wide networks. The total cost of filling the gaps in transportation and energy networks was estimated to be in excess of 400 billion ECUs over 15 years, only a small proportion of which could be provided from EU funds. A programme was set up to assess proposed projects on the basis of their contribution to the objectives of the TEN initiative, and selected a limited number to which EU support would be provided up to a limit of 10 per cent of total project costs. [This is in contrast to earlier practice where limited funds were distributed at the discretion of the DG Transport across a large number of infrastructure projects proposed by Member States (Kinnock, 1995).] The funds are in the form of co-financing for feasibility studies, fees for loan guarantees, interest rate subsidies and, in limited circumstances, direct investment grants. The remaining 90 per cent of funds must come from Member States and the private sector under public/private partnerships.

The experience of the EU as it tries to develop an integrated transport system provides some valuable lessons for other trading blocks. The EU has achieved some things – such as the elimination of border checks and full cabotage in some service categories – that NAFTA may not achieve for decades. Still, the process has been painful and is very much incomplete after almost 50 years. One important lesson is that Member States have strong incentives to cling to the *status quo* of fragmented transportation infrastructure and regulation. Also, transportation policy is an instrument for pursuing national economic goals that member governments will not relinquish easily.

A second, and related, lesson is that achieving major integration goals may require strong, supranational institutions. The European Court of Justice has played a critical role in breaking down traditional national prerogatives that stood in the way of a Common Transport Policy for thirty years. In most world regions – including North America – there is no judicial institution with comparable power.

Today, the European Union has succeeded in a major reduction in transportation costs, partly due to improved physical infrastructure but probably more due to institutional change (non-physical infrastructure). Due in part to this cost reduction, congestion and pollution are becoming increasing problems within the 15 member area. An approach that involves pricing of infrastructure (especially road) and revitalisation of underutilised infrastructure (especially rail) has been adopted (European Commission, 2001). At the same time, the challenge of integrating the transportation networks of newly entering states points to the need for continued transportation improvement and reform in the coming decades.

4. CONCLUDING COMMENTS

Looking over the past one hundred years or more, one is inclined to feel both optimistic and pessimistic about the potential for transportation infrastructure and policy to promote regional economic integration and growth. On the one hand, transportation infrastructure has proven to have a transformational impact over broad regional economies far beyond simple reductions in cost. Gains from trade, agglomeration, co-ordination and innovation can all be attributed (in varying degrees) to improved mobility of freight and people. On the other hand, the institutional transformations – both in terms of the creation of new institutions and the disposal of old ones – that are needed to reap the full potential of improved mobility and connectivity, pose daunting tasks to national and supranational governments. As the cases of the US and the European Union suggest, it may be easier to develop institutions from scratch than to reform existing ones. This is especially true when international economic integration is needed, as is increasingly the case in a globalising world. Greater integration of transportation systems in regions such as Eastern Europe, The Middle East, Africa, South Asia and Central Asia will require levels of intergovernmental co-operation and institutional flexibility that have seldom been achieved in the past.

NOTES

- 1. By 1075 A.D., manufacturing enterprises in mining, metallurgy and shipbuilding operated on a large scale, employing hundreds and often thousands of workers serving large geographic markets via a national waterway network. Key innovations were: use of coal in iron smelting, a Bessemer process for steel production, a water-powered spinning wheel, printing and gunpowder; the universal use of money, negotiable instruments facilitating large transactions over large distances. There was also a complex set of articulated markets, from periodic village markets to large urban markets (Kelly, 1997).
- 2. For instance, the share of the Atlantic coast states in the value of national flour output dropped from 57% in 1850 to 39% in 1860.
- 3. One example of such mutually supportive expansion came from the large market created in the iron and related coal industries from rail building. Railroads were absorbing half the iron rolled in the US, and as late as the 1880s, 75% of the steel produced in the country went into rails. The railroad generated the first demand large enough to permit the adoption of mass production methods, enhancing productivity (Chandler, 1965, p. 22).
- 4. Economic analyses have shown that the price and entry regulations introduce inefficiency by creating a vicious cycle of artificially high prices, high service quality competition and the resultant losses due to raised costs (Douglas and Miller, 1974). Three sets of such regulatory distortions have proved costly. First, in both road and rail, rates were set above marginal costs costing the economy \$1 billion annually (Winston, 1985). Second, the entry and exit regulations cost the carriers dearly the prohibition on railroads on exiting from poorly performing lines, leading to annual production cost inefficiencies of \$2.5 billion (Winston, 1985). Third, restrictions such as disallowing backhauls, designation of routes, etc., led to X-inefficiency costs of several billion dollars (Winston *et al.*, 1990) besides hindering productivity growth, technical change and service quality.
- 5. Another major remaining cabotage barrier is formed by the existing US restrictions on trade in domestic water transportation. In the large, multi-coastal US economy, foreign participation in its inter-coastal trade is restricted by the 1920 Jones Act. The Jones Act justified by the necessity to secure a sufficient merchant marine capacity for US defence needs reserves the shipping cabotage traffic to US-built and registered ships that are predominantly owned and crewed by US nationals. The US maritime carriers and other stakeholders have excluded these provisions from the GATT and NAFTA. The Jones Act permits domestic shippers to levy rates substantially above comparable world prices, effecting thereby a massive transfer from US water transport users to US maritime carriers a welfare cost of around \$3 billion in 1989 according to a recent analysis of the Jones Act (Francois *et al.*, 1996).

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MARKET STRUCTURE IN THE TRANSPORT SECTOR AND THE EFFECTS OF LIBERALISATION

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Glasgow, March 2005

1. INTRODUCTION

In this report we analyse how the structure of the transport sector interacts with international trade. We then consider the implications of market liberalisation in the transport sector, as well as the interaction between trade liberalisation and the structure of the transport sector. Our analysis is supported by some empirical evidence on competition in different transport modes within the OECD.

While the paper is concerned with trade in international transport services, the basic analytics also apply to the full chain of services required to complete the transactions that turn exports into imports at the frontier. The paper itself is divided into two parts. The first contains an analytical model that illustrates some of the basic issues at stake with liberalisation of transport services trade. This involves not only the implications for the profits of the particular transport industry, but also the implications for levels of trade in goods and national gains from trade. Secondly, we supplement the analytics with some empirical evidence as to the level of competition (or the lack of it) across various modes of transport in several countries. The numerics serve the function of providing an indicator as to where problems with imperfectly competitive transport regimes may have the greatest impact.

2. A THEORETICAL MODEL

We start with an analytical model of trade with transport costs. This is intentionally very simple, in order to illustrate the mechanisms that are at work when international trade requires the services of an intermediary industry, such as road haulage, airlines or the railways. The transport industry in question may or may not be perfectly competitive. The more imperfect is the competition, the greater is the impact of the industry on producers and consumers.

The framework we develop has interesting policy implications. For example, we show that it is possible to use transport cartels as a second-best instrument for manipulating the terms of trade. An imperfectly competitive transport sector, particularly one where there is evidence of collusion, could partially recapture the market-access concessions made under multilateral tariff reductions. The rents would be split between the transport cartels and the importing country. If the cartels are themselves national firms, the recapture is complete.

The message about competition actually covers the whole logistics chain. Any choke point, in terms of competition, in the chain of services that facilitates trade can lead to the type of result developed here. If not resulting from the shipping operations themselves, it may arise due to corrupt port management or a monopoly on handling and loading.

2.1. The basic model

Much of the literature on trade and transportation has been focused on general equilibrium patterns of trade and on the uniqueness of equilibrium (see, for example, Wegge, 1993). As we are concerned instead with market structure, we gain a great deal of analytical simplicity by working with a simplified, partial-equilibrium structure. The formal model that emerges provides a framework for our analytical discussion of equilibrium, given market power in the transport sector.

In order to illustrate the mechanisms at work, we adopt a simple model of international trade in a commodity². The role of transport costs has become increasingly important in international trade research, especially in the analysis of the location of economic activity associated with the "new economic geography". However, the treatment of transport is generally simplistic, often taking the form of "iceberg" trade costs³. Such an approach implicitly assumes a perfectly competitive transport sector and is not useful for the task at hand. Instead, we need to specify an intermediation sector ("transport" or "shipping"), where the price of shipping is determined endogenously and may differ from the actual costs incurred by the transport sector⁴. This will permit us to examine how the market structure affects the volume of trade and gives a role for policymakers to intervene in the market for these intermediation services.

Within this framework, we emphasize the trade in a commodity that is produced in a given export market and then shipped, at some real cost, to the import market where it is sold. Let the quantity of the export commodity traded be q. In order to keep our focus on the intermediary transport sector, producers of the good are assumed to be small, perfectly competitive firms located in one or several countries. The industry supply curve for exports is assumed linear in producer prices p_p^{5} :

$$p_p = a + bq \tag{1}$$

The shipping industry provides the service of transforming exports into imports at the dock. This service is provided at a price σ (the shipping margin, essentially the difference between the fob and cif prices) that depends on competitive conditions in the transport industry⁶. We assume that the transport industry is imperfectly competitive, with *n* identical, profit-maximising firms in competition with one another. The shippers have large fleets of vehicles and an extensive route network. From this stock, they choose to allocate a certain quantity to service this particular trade. Thus the shipping firms compete in quantities.

Consumers in the foreign market have a linear inverse-demand function for imports, relating the price they are charged p_c to the quantity traded q as follows:

$$p_c = x - yq \tag{2}$$

We assume that the good faces an import barrier in the form of an *ad valorem* tariff of t^{7} . The price paid by consumers in the destination consequently exceeds the price received by producers, as a result of both the shipping margin and the tariff $p_{c} = (1+t)(p_{p} + \sigma)$. Rewriting this as an expression for the shipping margin, we get:

$$\sigma = p_c / (1+t) - p_p \tag{3}$$

The total revenue of a representative firm *i* producing quantity q_i is σq_i . We assume that the shipping firms are identical and behave as Cournot competitors. Substituting (1), (2) and (3) into total revenue yields an expression for the perceived marginal revenue of a firm:

$$MR_{i} = \frac{x}{1+t} - a - \frac{(1+s)\left[(1+t)b + y\right]}{s(1+t)}q_{i}$$
(4)

where $s \equiv 1/n$ is the market share enjoyed by each of the shipping firms. If we assume that the real costs of shipping (insurance and freight) are constant, the marginal cost of transport is⁸:

MC = c (5)

Solving (4) and (5) provides the equilibrium quantity of the good supplied:

$$q = \frac{x - (a + c)(1 + t)}{\left[b(1 + t) + y\right](1 + s)}$$
(6)

while the equilibrium shipping margin is⁹:

$$\sigma = \frac{xs + (1+t)(c-as)}{(1+t)(1+s)}$$
(7)

The associated prices of the good for consumers and producers, respectively, are:

$$p_{c} = \frac{x \Big[b(1+t)(1+s) + ys \Big] + y(a+c)(1+t)}{\Big[b(1+t) + y \Big](1+s)}$$

$$p_{p} = \frac{b \Big[(as-c)(1+t) + x \Big] + ay(1+s)}{\Big[b(1+t) + y \Big](1+s)}$$
(8)

If s = 1, the shipping industry is a monopoly. As *s* becomes smaller, the firms' perceived demand for the good becomes more elastic and they lose market power. With *s* close to zero, each firm has a tiny share of the market and its behaviour is almost perfectly competitive.

There are two elements to the market power of a firm. Firstly, they charge consumers a price that exceeds the shippers' marginal costs. Thus the transport sector exercises its market power with respect to consumers, who are forced to pay higher prices for their imports despite the original supply of the good being perfectly competitive. In addition, the shippers exploit their monopsony power with producers. The upwards-sloping industry supply curve represents increasing marginal costs in the provision of the good. Consequently, the shippers restrict the quantity that they transport, lowering the price that they have to pay for the good. Thus the transport sector operates on both sides of the market, driving up their profits, i.e. the shipping margin.

2.2. Effects of increased competition

We simulate the effects of increasing the level of competition through a change in n, the number of firms in the transport industry. (Such increased competition may follow from GATS-related liberalisation of the route itself, or from related liberalisation somewhere else in the logistics chain.) If n rises, the market share s of each incumbent firm declines. They will perceive their market demand to be more elastic and will consequently behave more competitively. If, however, the number of firms were to fall, the industry will become more concentrated and the remaining firms will exercise the increased power from a growing market share.

Of course, there need not actually be a change in the number of firms. Rather, s can instead be viewed as an indicator of the degree of competitiveness in the shipping market. In this interpretation, a fall in s reflects a more competitive environment (as n becomes larger, market shares decline and the shippers' margin gets closer to marginal cost). This could occur if the transport industry's ability to maintain high rates were to decline or if its activities became subject to antitrust rules. An increase in s would indicate that the industry was exerting greater influence in the market, resulting in more collusion.

Figure 1 shows the effects of changing s on prices, quantities and profits. As the transport industry shifts from behaving as perfect competitors to acting as a cartel or monopolist, the consumers pay an increasing price and the volume shipped declines. Given that less of the product is being demanded, the price received by the producers falls. The (shaded) growing gap between the producer and consumer price is σ , the margin captured by the shippers, and this rises monotonically from zero as the industry becomes increasingly concentrated. Thus, when the industry behaves competitively, the shipping margin equals c, the marginal cost of shipping. The margin reaches its highest level when there is complete collusion and the transporters fully exploit their monopoly power with both producers and consumers.





2.3. Benefits of trade liberalisation

How does the tariff affect the trading situation? With a competitive transport industry, the beneficiaries of trade liberalisation would be the consumers in the importing country and the exporting producers. With a less than perfectly competitive shipping industry, the benefits of the more liberal trade regime are partially captured by the shipping firms. Figure 2 illustrates the equilibria that arise with a duopolised transport industry for various levels of tariff¹⁰.



Figure 2. Effects of Trade Liberalisation



As the tariff is reduced, the quantity traded rises, as the consumer price has declined. This rise in demand results in a higher price being received by the producers. However, the benefits of the trade liberalisation are not fully passed through to producers and consumers. The transport industry is able to take advantage of the more liberal trade regime, replacing part of the trade-tax wedge (between consumer and producer price) by one of their own – a greater monopolistic markup. As the tariff continues to fall, the transport firms receive a larger margin over their marginal costs, resulting in increasingly high profits.

The relationship between the concentration of the shipping industry, the tariff barrier and the optimal shipping margin is illustrated in a contour plot in Figure 3. The more concentrated the industry (or the stronger the cartel) and the lower the tariff barrier, the greater is the shipping margin. This means that, the more liberal the trade regime, the more serious the lack of competition in the transport sector becomes. In other words, the market-access benefits of tariff reductions in export markets are inversely related to the degree of market power exercised by the international trade sector and the domestic trade and distribution sector serving the export market. Further, the benefits of past market access concessions can be offset by future increases in the degree of market power exercised by these sectors. Increased concentration, if accompanied by greater market power, may nullify and impair past market access concessions in goods.



Figure 3: Shipping Margin

mereasing concentration

3. A FACTOR ANALYSIS OF REGULATORY STRUCTURES

In this chapter, we work with the OECD's regulation database to examine the structure of competition and regulation in the transport sector across the OECD. The goal is to make a comparison of the regulatory status of the sector. For this chapter, we use an analysis of the OECD's (2000) International Regulation Database, based on factor analysis (see Francois, 2005). The OECD database includes over 1 100 variables for each OECD Member on both economy-wide product market regulation as well as regulation at the sector level. For our purposes, it includes data on regulation in road transport, national and international air transport, and rail transport. Detailed descriptions of the data can be found in Nicoletti, Scarpetta and Boylaud (1999). In general, the data we are concerned with are centred around 1998.

While the database may contain over 1 100 variables, only a limited number apply to transport. In addition, many remain unanswered by a large number of member countries, and many others simply defy quantification. For this reason, the full set of transport questions is reduced to the set covered in Table 1 (see Annex). The table lists 18 variables for air transport, classified into domestic competition, international competition, and government ownership and regulation. For road transport, we have 15 variables, roughly classified into domestic competition and government ownership and regulation. For railways, we have six useable variables, again classified into domestic competition variables and government ownership and regulation variables.

Within each set of variables, we assign values ranging from 0 to 6 (so that for dummies, "yes" is generally 6 and "no" is zero), and weights have also been assigned based on the number of variables in a sector:category set. This scaling means that, when factor analysis is employed, the result is a set of regulatory indices ranging from 0 (generally open, competitive regimes with minimal regulation) to 6 (generally more regulated, with little or no competition). This corresponds roughly to the role of s in the theoretical analysis, where a small market share (s close to zero) represented a competitive transport sector, while higher values (s close to 1) reflected a concentrated, less competitive intermediation industry.

To analyse the variables summarised in Table 1, factor analysis is used. Multivariate factor analysis is a standard technique for summarising patterns in regulatory data (see Nicoletti *et al.*, 1999; and Boylaud, 2000). Factor analysis yields factors that are linear combinations of the variables we observe, and that in theory identify latent variables or indicators that lurk behind the observed data. In the present context, this approach permits the construction of indices of regulatory frameworks in the sample. This approach involves first applying factor analysis to the regulatory variables grouped by sector and type of regulation. This yields a set of indicators for road freight, air transport and the railways. These sector indicators are listed in Tables 2A, 2B and 2C in annex.

Another set of indicators, for the transport sector broadly defined, is presented in Table 3. Like Tables 2A, 2B and 2C, these are also based on a factor analysis of the regulatory variables. In this case, the full set of sector indicators in the tables above have been combined to yield a set of factors used to construct the composite index. This yields both a set of overall regulatory indicators for competition, regulation of industry structure, public service obligations, and financial involvement of

government, as well as an overall index, based on these four indicators and aggregated using rotated factor loadings. In this case, these four factors explain roughly 90 per cent of the regulatory variable variance (as they are constructed from sector indicators). For the overall index, the most important summary indicator is competition and price regulation (37.4 per cent), followed by regulation of industry structure (23.2 per cent), public service obligations and regulation of customer access (22.5 per cent) and, finally, indicators of government ownership and bailouts (16.9 per cent).

The sets of indicators in the tables are summarised in Figures 4-6. Figure 4 presents an overview of the general degree of regulation and competition in the major transport sectors across OECD member countries. The air transport sector is consistently less market-based than the road and rail sectors. Across a given sector, like road transport, there is also significant variation. From our discussion above, this implies that the benefits of "equal" market access concessions will also vary across OECD members, depending on these sector variations. This is because these sectors facilitate reaching the actual intermediate and final consumers that market access concessions provide better access to.

Figure 5 presents an alternative view, based on composite regulatory indices. These depend on the weighting shown in Table 3 (see Annex). This reveals that the variation across OECD member indices itself follows from variations in the underlying indices. Canada, for example, is similar to the United States in terms of public service obligations and government ownership, while they are significantly different when it comes to competition and price regulation. Across the EU we also see substantial differences in regimes of competition and price regulation, as well as in government ownership and bailouts.

For the present context, what is most important is the degree of competition and price regulation. In particular, following from our discussion of the importance of competition in the sector above, how does this actually vary by OECD member and by sector? This is shown in Figure 6. In the figure, we have plotted the competition and price regulation indices for all OECD members and all sectors in the sample. What we see, again, is substantial variation, but also some patterns. Switzerland, for example, has a relatively low degree of competition in all modes of transport, while Turkey has a competition-based road transport sector, with less price competition in rail and air. Canada and the United States have relatively competitive sectors across the board, while Mexico also has, except for road¹¹. Based on these indices, Greece apparently has the regime least friendly to price-based competition in road transport in our sample, while several countries share this distinction in rail transport.

We know from our recent work on the distribution sector (Francois and Wooton, 2005) that variations of this type in competition can have important implications for the volume of international trade. We expect, given our analytical discussion and the variations pointed to above in actual regimes, that there should also be an interaction between apparent market access and the variations highlighted in Figure 6. This should be especially true for trade between free trade partners (i.e. in the NAFTA and EU contexts). A logical extension along this line of research is therefore detailed analysis of how bilateral trade patterns interact with these measures of price competition.



Figure 4. A Comparison of Regulatory Regimes

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Figure 5. A Deconstruction of the Overall Regulatory Index

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4. CONCLUSIONS

Our goal in this paper has been to examine the importance of market structure in the transport sectors for the distribution of gains from trade and the benefits of trade liberalisation. We have shown that the presence of an imperfectly competitive intermediary can have a significant effect on trade flows and the allocation of gains from trade. Trade liberalisation, in the absence of some form of deregulation of the transport sectors, will not result in the increased benefits that would otherwise be imagined, as the shipping firms will grab a portion of the gains from trade.

Our theoretical results lead us to expect a linkage between service-sector competition and goods trade. At least in theory, an imperfectly competitive domestic service sector can serve as an effective import barrier. Regulatory data in turn suggest that there is substantial variation in price competition across OECD members in the transport sectors. In our view, this points to a need for further research on the linkages between transport regimes, transport services trade, and the pattern of and gains from trade in goods.

NOTES

- 1. Corresponding author. Address: Department of Economics, University of Strathclyde, Sir William Duncan Building, 130 Rottenrow, Glasgow G4 0GE, United Kingdom; Email: ian.wooton@strath.ac.uk.
- 2. This analysis is based upon our earlier papers, Francois and Wooton (2001, 2005), which focused on the impact of maritime shipping conferences, and the impact of competition in domestic distribution sectors, on trade and the effects of liberalisation under the GATT and GATS.
- 3. Under this assumption, a fraction of the finished good "melts" between production and delivery. The higher the transport costs, the larger the share that melts, requiring producers to increase the quantity produce in order to provide consumers with each unit of the good.
- 4. In this example, there is only one stage of intermediation (transport), though the analysis can be extended to consider a chain of intermediation.
- 5. We assume supply and demand curves to be linear simply for clarity. Our results would be qualitatively identical if this assumption were relaxed to some degree.
- 6. Note here that the relevant cost is that of full transformation of exports into imports, which includes the shipping margin on the outbound and inbound journey. Analytically, we solve here for a total value for this margin, though of course it may technically be shared across the inbound and outbound journeys.
- 7. Brander and Spencer (1984) examine the optimal trade restriction for an importing country when faced with an imperfectly competitive supplier. They show that, dependent upon demand conditions, this policy may take the form of a tariff or a subsidy. When demand is linear (as is the case in our model), Brander and Spencer find that a positive tariff is the appropriate instrument, but this will change with other configurations of demand. Their model has constant marginal costs for the supplier. In contrast, because we assume increasing opportunity costs for exports, our shippers face increasing marginal costs. As a result, a tariff becomes the preferred instrument for a wider range of cases than in the Brander and Spencer model. In any event, our focus is not on rediscovering the optimal strategic interactions between large players. Instead, we choose to consider the implications for the market of exogenous reductions in tariffs resulting from a round of trade liberalisation.
- 8. We do not consider changes in these real costs of transport, our focus being on the additional margin charged by shipping firms as a result of their market power.
- 9. This shipping margin is essentially the "best response" of the transport industry to the import tariff.

- 10. The figures for different numbers of shipping firms are qualitatively very similar, except in the case of competition, when shipping industry profits are zero at all times and, consequently, all the benefits of trade liberalisation accrue to the producers and consumers.
- 11. We are not dealing with cross-border market access, but with the apparent degree of domestic price competition, given current regulatory regimes.

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ANNEX

Table 1: Variables from the OECD Regulatory Dataset

OECD survey question number	QUESTION	Variable name
	AIR TRANSPORT	
	Domestic Competition	
547	Domestic market share of the largest airline (incl. Subsidiaries) (more than 500000 passengers a year)	ATDC1
548	Domestic routes (All): Share of traffic (passenger/ km) of the incumbent carrier	ATDC2
619	Herfindahl concentration index in domestic market	ATDC3
	National Regulations and Government ownership	
17	Do national, state or provincial government holds equity stakes in business company?	ATOR1
52	Do national, state or provincial laws or other regulations restrict in at least some markets the number of competitors allowed to operate a business?	ATOR2
572	Government ownership in largest airline (%)	ATOR3
573	Government golden share in a major airline	ATOR4
579	Government loss make-ups in major airlines in the past 5 years	ATOR5
580	The largest airline has public service obligations?	ATOR6
611	Domestic market deregulated?	ATOR7
1120	Ceiling on foreign ownership allowed in national air transport carriers	ATOR8

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Table 1 (continued)

OECD		
survey question number	QUESTION	Variable name
	International Competition	
558	International routes (All): Share of traffic (passenger/km) of the of the largest carrier in the international traffic of national carriers	ATIC1
566	Is the largest operator in international routes also the largest operator in domestic routes? (all routes)	ATIC2
567	Share of 100 international routes with more than 3 carriers	ATIC3
612	Open Sky Agreement with US?	ATIC4
613	Open Sky Agreement older than 6 years?	ATIC5
618	International market share of the largest airline (incl. Subsidiaries) (more than 500000 passengers a year)	ATIC6
620	Herfindahl concentration index in international market (%)	ATIC7
	ROAD FREIGHT	
	Domestic Competition	
48	Do national, state or provincial laws or other regulations restrict in at least some markets the number of competitors allowed to operate a business?	RTDC1
505	Does the regulator, through licenses or otherwise, have any power to limit industry capacity?	RTDC2
515	Do regulations prevent or constrain: Backhauling?	RTDC3
516	Do regulations prevent or constrain: Private carriage?	RTDC4
517	Do regulations prevent or constrain: Contract carriage?	RTDC5
522	Does the government provide pricing guidelines to road freight companies?	RTDC6

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Table 1 (continued)

OECD		
survey question number	QUESTION	Variable name
	National Regulations and Government Ownership	
13	Do national, state or provincial government holds equity stakes in business company?	RTOR1
492	Is there a firm in the road freight sector that is publicly-controlled (i.e. national, state or provincial governments hold the largest single share)?	RTOR2
493	Is registration in any transport register required in order to establish a new business in the road freight sector?	RTOR3
494	In order to operate a national road freight business (other than for transporting dangerous goods or goods for which sanitary assurances are required) do you need to be granted a state concession or franchise by any level of government?	RTOR4
495	In order to operate a national road freight business do you need to obtain a license (other than a driving license) or permit from the government or a regulatory agency?	RTOR5
496	In order to operate a national road freight business do you need to notify any level of government or a regulatory agency and wait for approval before you can start operation?	RTOR6
513	Are there any regulations setting conditions for driving periods and rests?	RTOR7
520	Within the last five years, have laws or regulations removed restrictions on: Commercial, for-hire shipments?	RTOR8
521	Are retail prices of road freight services in any way regulated by the government?	RTOR9
	RAILWAYS	
	Domestic Competition	
45	Do national, state or provincial laws or other regulations restrict in at least some markets the number of competitors allowed to operate a business?	RRDC1
528	Freight transport: Total number of operators:	RRDC2

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Table 1 (continued)

	QUESTION Variable name	and Government Ownership	ovincial government holds equity stakes in business company? RROR1	government has any liability for losses made by a railway company (excluding subsidies related to service RROR2	the past 5 years make up for any losses made by railway companies?	ng the infrastructure or providing railway services subject to universal service requirements (e.g. obligation to RROR4 ers or areas)?	Jy been rescaled from 0 to 6, with 0 being a positive indicator (more competition, less regulation, less participation by mership, golden shares, price setting, etc.). Questions have also been assigned inverse weights (i.e. if there are four domestic provides and solving evencies).
COMMINGER		National Regulations and Government Ownership	Do national, state or provincial government holds equity st	Please indicate if the government has any liability for lo obligations)?	Did the government in the past 5 years make up for any los	Are companies operating the infrastructure or providing raiserve specified customers or areas)?	Questions have generally been rescaled from 0 to 6, with government through ownership, golden shares, price setting convertions for sir each rate a 1/1 workhing for t
I anic I	OECI surve questic numbe		10	538	539	540	Note:

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AIR TRANSPORT	OVERALL	Government ownership or management	Government bailouts	Regulation and limits on restructuring	Public service obligations and custom guarantees	Domestic competition	International competition	Internationa reservation fo dominant domestic carrier(s)
United States	2.1	2.5	2.7	1.7	0.8	1.1	2.4	3.7
Japan	3.6	2.5	2.6	1.3	0.9	2.2	4.7	3.8
Germany	4.6	2.7	2.5	2.7	1.5	3.4	5.9	4.0
France	3.8	4.7	3.5	2.1	1.3	2.5	5.7	3.4
Italy	4.1	4.6	3.5	2.1	2.2	3.1	5.8	3.5
United Kingdom	3.7	2.7	1.7	2.3	2.8	1.9	4.7	4.4
Canada	3.4	2.5	1.9	0.7	1.2	2.3	4.7	3.2
Finland	4.0	4.4	1.4	2.4	1.2	3.4	6.0	2.8
Greece	4.2	4.7	3.4	1.5	2.2	3.8	5.9	3.0
Mexico	2.1	4.2	3.5	1.7	1.1	2.0	3.4	1.8
Netherlands	4.0	4.0	2.2	3.7	0.2	3.6	5.4	3.2
New Zealand	4.5	2.7	2.7	3.5	1.2	3.7	6.0	3.0
Norway	3.3	4.3	1.4	2.4	1.1	2.2	5.6	1.9
Portugal	4.2	4.7	3.4	1.5	2.2	3.9	5.9	3.1
Spain	3.7	4.7	3.6	2.9	1.0	2.5	5.6	3.1
Sweden	4.0	4.2	2.1	2.8	0.7	3.1	6.0	2.9
Switzerland	4.2	3.7	1.4	1.6	0.5	3.5	6.0	3.0
Turkey	4.1	4.8	1.3	1.6	2.2	3.7	5.8	3.3
Czech Republic	3.8	4.7	1.3	1.7	1.3	3.8	5.9	1.9
Hungary	2.8	4.4	1.3	1.8	1.1	2.6	4.9	1.0
Korea	3.9	2.6	2.5	2.1	1.5	3.2	4.8	3.6
Poland	3.7	4.9	1.3	1.6	1.3	3.7	5.7	2.1

Table 2A. Regulation Indices for Air Transportation

Indices range from 0-6, and are based on rotated factor loadings. The overall index is based on the first two factors for the summary indices, with 88 per cent of the variance explained. Note:

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Table 2B. Regulation Indices for Road Transportation

competition guidelines) (including Limits on price 3.9 2.9 1.7 2.4 L.1 1.7 1.71.7 3.4 1.7 1.7 3.4 L.7 3.2 4.1 2.1 [] backhauling, carriage, and Limits on carriage private contract 0.8 0.5 0.5 0.9 0.80.0 0.8 0.80.8 1.2 0.81.2 0.7 0.2 0.9 1.4 0.9 0.6 0.7 0.7 0.1 1.1 regulations Other 0 1.3 1.3 2.1 1.2 2.2 2.0 0.2 2.1 2.1 2.3 1.2 1.2 2.1 1.4 1.5 0.2 2.1 : required for establishment Regulatory approval $\begin{array}{c} 1.2 \\ 1.8 \\ 1.8 \\ 1.0 \\ 1.0 \\ 2.7 \\ 2.2 \\ 1.8 \end{array}$ 0.6 1.01.6 1.80.6 0.3 1.81.8 2.1 1.7 1.1 1.7 Ξ 2 requirements concession regulation and price State 1.32.3 1.2 1.1 3.9 1.4 1.3 1.3 3.9 1.2 $\frac{1}{4}$ 1.4 1.3 1.3 **1**.4 1.6 1.5 2.6 1.4 2 2.6 1.1 concessions ownership/ State 2.3 3.5 1.6 1.8 1.9 2.2 1.61.8 1.8 3.9 1.9 6.1 1.8 1.8 2.3 4.2 .0 1.9 **1**.4 1.7[.] 4.2 Government licensing 4.6 4.9 4. 4 4.6 4.4 4.8 4.5 3.0 3.2 4.7 4.6 4.5 1.8 1.8 4.6 4.6 4.7 4.7 4.7 4.4 4.7 4.5 **OVERALL** 1.4 1.2 1.6 1.0 1.9 1.4 2.4 $\begin{array}{c} 1.0\\ 1.8\\ 2.8\\ 2.8\\ 1.4\\ 1.2\\ 1.7\\ 1.7\end{array}$ 2.22.3 1.5 0.6 2.1 2.1 2.1 4 **United Kingdom** FREIGHT **Czech Republic** ROAD **Inited States New Zealand** Vetherlands Switzerland Germany Portugal Hungary Vorway Sweden urkey anada Finland **Mexico** Greece rance Poland apan Korea Spain **[talv**

The overall index is based on the first factor for the summary indices, Indices range from 0-6, and are based on rotated factor loadings. with 90 per cent of the variance explained. Note:

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		Government		
	OVFDALT	financial/	Government	Domestic
	OVENALL	operational	ownership	competition
		interventions		
United States	2.6	1.9	1.7	0.2
Japan	1.7	1.7	1.8	1.3
Germany	1.2	1.7	1.8	1.9
France	1.9	3.4	1.8	1.3
Italy	2.0	3.4	1.8	1.2
United Kingdom	0.9	2.2	0.3	1.3
Canada	1.8	1.9	1.7	1.2
Finland	1.9	1.3	2.2	1.3
Greece	2.1	3.0	2.2	1.3
Mexico	1.3	1.7	1.8	1.8
Netherlands	1.6	2.3	1.4	1.3
New Zealand	0.7	1.3	1.1	1.9
Norway	1.9	1.3	2.2	1.3
Portugal	1.9	3.4	1.8	1.3
Spain	1.9	3.4	1.8	1.3
Sweden	1.9	1.3	2.2	1.3
Switzerland	1.9	3.4	1.8	1.3
Turkey	1.9	3.4	1.8	1.3
Czech Republic	1.4	3.4	1.8	1.9
Hungary	1.9	3.4	1.8	1.3
Korea	0.3	2.2	0.3	1.9
Poland	1.7	1.9	1.7	1.3

Table 2C. Regulation Indices for Rail Transportation

Indices range from 0-6, and are based on rotated factor loadings. The overall index is based on the first factor for the summary indices, with 90 per cent of the variance explained. Note:

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ownership and Government bailouts 2.7 2.8 0.169 2.4 3.3 3.2 1.8 1.9 3.2 2.02.3 1.8 3.3 2.4 1.7 2.0 1.5 1.0 1.5 1.6 1.1 3.1 3.1 customer access **Public service** obligation, regulated 1.72.0 2.6 1.92.5 3.2 2.5 1.4 2.1 3.2 4.4 2.1 2.5 3.2 2.1 1.9 1.4 2.2 3.0 2.5 0.225 3.4 2.1 **Regulation of** structure industry 2.8 3.3 3.0 2.8 3.6 2.0 3.0 4.5 3.9 2.6 2.8 1.4 3.0 2.3 4.0 3.3 2.3 2.7 0.232 1.7 3.1 3.3 2.6 **Competition and** price regulation 5.3 4. 4 5.05.2 3.6 4.7 5.2 4.5 4.9 4.6 5.30.3742.2 4.3 4. 4 4.8 3.8 5.4 4.0 4.9 5.0 4.1 5.1 **OVERALL** 2.3 2.8 3.5 3.5 3.7 3.1 3.5 3.8 3.1 3.6 3.0 3.5 3.3 2.8 3.5 3.7 3.7 3.4 2.7 3.7 3.4 3.3 Finland Italy Poland Weight Japan Spain Korea France Norway Portugal Switzerland Turkey **United States** Germany **United Kingdom** Canada Greece **Mexico** Netherlands New Zealand Sweden Czech Republic Hungary MODES ALL

Table 3. Summary Regulatory Indices for All Transportation Modes

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LIBERALISATION OF AIR TRANSPORT AND COMPETITION CONCERNS IN ASEAN

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SUMMARY

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Bangkok, April 2005

1. TRANSPORT LIBERALISATION IN ASEAN

The Association of Southeast Asian Nations (ASEAN), established in 1967 by five member countries – Indonesia, Malaysia, the Philippines, Singapore and Thailand – is one of the most successful regional groupings to date. The Association was later joined by five more countries, namely, Brunei (1984), Vietnam (1995), Lao PDR and Myanmar (1997) and Cambodia (1999).

The region hosts a population of 537 million, half of which lives on islands where the mode of transport is limited to air and sea. The Philippines and Indonesia are archipelagos of more than 7 000 and 17 000 islands, respectively. Brunei is also an island state. The remaining seven member countries are located on the Indochina Peninsula. Lao PDR is the only landlocked country in the region.

ASEAN has made great efforts in liberalising trade within the region under the ASEAN Free Trade Agreement (AFTA). In January 2003, tariffs between member countries were reduced to 0-5% for all products, except a few on the general exception and sensitive list of each member country. Unlike trade, however, regional liberalisation in the service sector, including transport, has not been as forthcoming. This is because most member countries still hold a protectionist sentiment when it comes to the service sector. Also, less developed member countries are not prepared to open their service markets to more economically advanced member countries¹. For example, a regional open sky policy is likely to benefit major regional airlines with an extensive global network, such as Singapore Airlines and Thai Airways. On the other hand, more developed member countries are afraid of opening up the haulage industry to lower-wage neighbouring countries for fear of price competition. For example, imports of goods from Lao PDR into Thailand are required to reload onto Thai trucks at the border to be transported to Bangkok. Laotian trucks cannot operate beyond the border province of Thailand. On the contrary, goods from or in transit through Vietnam to Laos and *vice versa* can be transported by vehicles of either country².

As a result, unlike the AFTA, the ASEAN Free Trade Agreement on Services (AFAS) has made very little progress thus far. This is reflected in the fact that member countries' commitments made in AFAS are marginal compared to those made in GATS. In fact, commitments made in certain service sub-sectors are even less than those made in GATS³.

The lack of progress in the regional forum has prompted member countries to take their own initiatives in liberalising their service sector according to own preference. Singapore has made several open-sky agreements with many countries, including the United States. The new members of ASEAN, Cambodia, Lao PDR, Myanmar and Vietnam (CLMV countries), decided to have an air service agreement just among themselves. Indonesia's and the Philippines' liberal policy towards foreign carriers in the early nineties⁴, or Thailand's liberalisation of its domestic air transport in Thailand in 2002⁵, can be attributed mainly to unilateral policies rather than regional efforts.

Recognising the limitations of a regional service liberalisation, ASEAN has chosen to focus instead on establishing frameworks for co-operation and co-ordination in transport-related rules and regulations in order to facilitate intra-regional trade. This is because cumbersome border procedures and incompatible regulatory standards have proven costly to regional trade. The three Framework Agreements in transport therefore specifically target the removal of such regulatory hurdles:

- the ASEAN Framework Agreement on the Facilitation of Goods in Transit
- ASEAN Framework Agreement on Multimodal Transport and
- ASEAN Agreement on the Recognition of Commercial Vehicle Inspection Certificate of Goods Vehicles and Public Services Vehicles Issued by ASEAN Member Countries.

The Framework Agreement on the Facilitation of Goods in Transit is aimed at facilitating goods in transit across member countries by simplifying and harmonising transport and customs regulations. Only five out of ten members have signed the Framework Agreement and none has ratified the agreement in full.

The Framework Agreement on Multimodal Transport will facilitate door-to-door delivery of goods in the member countries under a single document. The agreement specifies rules regarding the carriage of goods by ASEAN multimodal transport operators (MTOs), including the minimum qualifications to register as an ASEAN MTO. The Framework Agreement also specifies liability limits for MTO operators, consistent with UNCTAD/ICC Rules for Multinational Transport and the UN Convention on Multimodal Transport 1980⁶. To date, nine members have agreed to the latest draft of the Framework Agreement and are in the process of seeking domestic clearance to sign.

Finally, the Agreement on Recognition of Commercial Vehicle Inspection aims at establishing mutual recognition of vehicle inspection certificates issued by member countries in order to facilitate cross-border hauling services.

While ASEAN may be comfortable with the approach and pace taken to foster greater regional co-operation and co-ordination in transport rules and regulations, many members face external pressures to liberalise their domestic transport markets. In the near future, ASEAN countries are likely to be placed under great pressure to liberalise their transport markets through bilateral free trade agreements, particularly those with large developed trading partners – namely, the United States, Japan and the EU. Vietnam also has a bilateral trade agreement (BTA) with the United States, while Singapore has a more comprehensive bilateral free trade agreement (FTA) with the United States that covers many issues other than trade in goods and services. Thailand is negotiating one with both the United States and Japan. The race to sign FTAs shows that ASEAN countries do not want to be left out in the race to secure market access to their major trading partners in light of a stalled multilateral forum.
2. TRANSPORT SECTOR LIBERALISATION AND COMPETITION CONCERNS

While liberalisation in the transport sector will no doubt foster greater competition in the usually highly protected industry, there are several competition concerns that may arise out of government policies or measures, such as state subsidies, discriminatory state procurement or distorted price regulations. Alternatively, competition concerns may also result from private practices – both foreign and local – such as predatory pricing, vertical restraints and denial of access to essential facilities.

Specifically, foreign investors may be concerned about lack of access to essential facilities, dominant incumbent's anti-competitive practices and state rules or policies that favour local or state-owned enterprises. Domestic service providers, on the other hand, are often concerned about restrictive or unfair trade practices that may be carried out by large multinationals with extensive financial resources. They are also cautious about subsidies that foreign service providers may receive from their governments, either directly or indirectly. Consumers are concerned about the possibility of market monopolisation or collusive practices in an oligopolistic market.

The author believes that competition concerns are likely to be more pressing where state enterprises are present in the market. Many transport sub-sectors in ASEAN are still dominated by state enterprises, as can be seen in Table 1 below.

Country	State-owned Enterprise		
	Aviation *	Maritime **	
Indonesia	• Garuda	Djarkata Lloyd Ltd.	
Malaysia	Malaysian Airlines	Malaysian International Shipping	
		Corporation	
The Philippines	Philippines Airlines (PAL)	Galleon Shipping	
Singapore	Singapore Airlines	Neptune Orient Line	
	• Silk Air		
Thailand	Thai Airways International	• Thai Maritime Navigation Co Ltd.	

Source: * Forsyth et al. (forthcoming).

** Meyrick & Associates (2001).

State ownership in airlines is common globally, although less true now in many developed countries. It is interesting to note that the two attempts to privatise national airlines in both Malaysia and the Philippines were unsuccessful. The privatised airlines eventually faced bankruptcy such that re-nationalisation of the airline was necessary. Other ASEAN countries, such as Thailand and Singapore, prefer to privatise only a minority share in the state enterprises.

ASEAN countries also joined the bandwagon in the late sixties, when developing countries established national shipping lines, in reaction to the growing dependence on powerful western shipping lines that colluded to maintain high freight rates. However, as national shipping lines proved too costly to maintain, many developing countries decided to relinquish state ownership in maritime services. Against the global trend towards privatisation of state-owned shipping lines since the late eighties, ASEAN governments continue to hold on to their ownership in national shipping companies. As a result, nearly all major airlines and shipping lines in ASEAN countries remain mostly state-owned to the present day.

The fact that a large part of the region's transportation sector remains in the hands of state enterprises does not bode well for competition for several reasons.

First, state-owned enterprises do not operate on a commercial basis. Their mandate is often linked to employment and expansion of the service network. Sappington and Sidak (2003) demonstrate mathematically that state-owned enterprises (SOE), which are concerned less about maximising profit and more about maximising revenue⁷ than private enterprises, have stronger incentives to pursue activities that disadvantage competitors. These include pricing below costs, misstating cost and choosing inefficient technologies to circumvent restrictions on predatory pricing – i.e. technologies that require large fixed costs and small variable costs. It should be noted that the conventional "predatory pricing" test, which gives importance to the likelihood of the alleged violator raising prices after the exit of the competitor, is not applicable to state enterprises, whose objective is to not maximise profit at any point of time.

Second, a state-owned enterprise is likely to carry social service obligations. Cross-subsidisation is the most common source of financing for service obligations in countries where financial allocation from the general budget is not market regulated, so that rents generated from the particular market can be used to subsidise social service obligations. This may give rise to competition problems if the latter market is a competitive one. Cross-subsidisation may effectively lead to predatory pricing in the "non-reserve" market, posing a barrier to entry.

Third, in the case where the state enterprise does not practice cross-subsidisation, state subsidy, rather than predatory pricing, is a cause for concern. Subsidies may come in different forms, such as direct operational subsidy, interest-free loans, loan guarantees or tax exemptions. State-owned enterprises also carry certain "privileges" that are not linked to subsidy. Such privileges may include exclusive rights to serve the government market (government procurement), exclusive rights to provide certain services, or even exemptions from certain state laws or regulations. Subsidies and privileges both contribute to an unequal playing field between state and private operators. Where state enterprises are absent, subsidy schemes are likely to be more transparent, as the government has no justification for favouring (or burdening) one private form over another.

Fourth, the incumbent state enterprise – privatised or not – is likely to inherit a dominant position in the market from its monopoly days. Market liberalisation in many cases is not preceded by a well-planned market restructuring that would help curb the market power of the incumbent. New competitors are thus likely to face abuse of dominance practices, as the incumbent undoubtedly fends for its market share. Where competition rules are effective, investors may expect prompt protection from the competition authority. Unfortunately, regulatory and competition regimes in markets dominated by state enterprises are likely to be relatively undeveloped.

Governments often regulate their state enterprises through the representation of its officials on the board of directors. Important business decisions, such as pricing of public transport services or large-scale investment, may require ministerial or cabinet approval, which can render the decision a political rather than an economic one. Worse, in many cases, the state enterprise acts as both the *ad hoc* regulator and operator. They often derive their regulatory power from laws that were enacted way back when the state was the sole service provider in the market. Alternatively, in cases where state enterprises are empowered to hand out private concessions, they may secure their regulatory power through concession contracts⁸.

While new foreign entrants may be concerned about unfair state rules and regulations and restrictive practices of local incumbents, in particular state-owned ones, local incumbents also have their share of worries. Certain transport services, in particular logistic services such as trucking, cargo agents and freight forwarding, display economies of network and economies of scope. Small local service providers find it difficult to compete with large shipping lines or large logistic service providers with a global network. There are thus concerns about price transfer and unfair cross subsidisation between different legs of the transport service. Local firms are also apprehensive about subsidies that foreign competitors may receive from their governments, directly or indirectly. In the absence of a capable and effective sector-specific regulatory authority or the general competition authority, there is very little protection that a domestic service supplier may seek.

The following section will examine in detail these competition concerns in the specific case of ASEAN countries.

3. COMPETITION PROBLEMS IN THE TRANSPORT SECTOR IN ASEAN

3.1. State subsidies

In the WTO, trade in goods enjoys protection against subsidies in the GATT, but trade in services does not have the same protection under GATS, unless the service concerned is linked to an exported good. However, work is currently underway to collect information on types of service subsidies implemented in member countries, in order to categorise subsidies into those that are prohibited, non-prohibited but subject to retaliation, or allowed; similar to the agreement on countervailing duties in the GATT.

In the absence of a multilateral discipline on service subsidies, most regional and bilateral trade agreements, too, do not include subsidies in the cross-border services chapter, whether NAFTA or US free trade agreements (FTAs) signed with Singapore and Chile in 2003. This implies that foreign *versus* domestic, or state *versus* private service providers in the same market may not be competing on a level playing field where state subsidy is present.

ASEAN countries have had their share of state subsidies in the aviation industry. The Philippines' Airline (PAL), Indonesia's Garuda and Malaysian Airlines (MAS) have all received large state bailouts in the past. In 1998, the Indonesian Government provided its national airline with a US\$ 100 million loan guarantee and extended US\$ 400 million worth of equity loans. In 2002, the Malaysian Government wiped out most of MAS' 2.4 billion debt after an unsuccessful privatisation that led to re-nationalisation of the national flag carrier. The Philippines' Government had provided its

privately-owned national flag carrier with an abundance of subsidies, including guarantees of all loans, debt write-offs, exclusive use of the government-owned and controlled airport, non-payment of take-off and landing fees, and tax exemptions on all inputs and other operating expenses.

Indeed, airlines on the brink of bankruptcy worldwide also receive state support, including those in the United States and the EU. But where there is free competition across borders the issue becomes more sensitive, as subsidies can put one national flag carrier ahead of that of the other state. Hence, rules are required to ensure that state aid does not lead to distortions in competition. For example, the European Commission (EC) adopted a common guideline on state aid in the aviation sector. Aid for restructuring is allowed, but not so for operation. It recommended that the aid should be:

- a one-off measure;
- linked to a restructuring plan, to be assessed and monitored by independent professionals appointed by the Commission;
- should not be used to buy new capacities;

and that the state needs to:

- refrain from interfering in commercial decision-making by the airline;
- ensure that the interests of other carriers are not adversely affected.

Aldaba (2005) found that in the case of the Philippines the dispensed state aid did not comply with the EC guideline. Specifically, the debt write-off was undertaken in the absence of any conditionality with regard to firm restructuring such as capacity reduction, or future debt redemption. As a result, management was able to expend the cash at its own discretion. Moreover, the exclusive use of the new airport and the reduction in take-off and landing fee are clearly discriminatory and constitute a continual operational subsidy, rather than a one-time restructuring subsidy. Many other transport services provided by state enterprises in ASEAN are also subject to state aid, in particular rail and public mass transportation.

Many ASEAN countries also provide subsidies relating to the construction and/or purchase of vessels, tax concessions for using domestically owned vessels and preferential tax treatment for Seamen. The Philippines Government offered preferential mortgage loans for financing construction, acquisition or initial operation of vessels. Similarly in 1979, Malaysia set up an Industrial Development Bank (IDB) to provide low-interest loans to ship-owners, ship-builders and ship-repairers. In Singapore, ship-owners, regardless of nationality, have access to low-cost financing for the purchase of new vessels from Singapore shipyards that match rates offered by other Asian countries. The scheme was designed to promote the development of Singapore shipyards, rather than the expansion of the Singaporean fleet.

The Philippines, Singapore and Indonesia have schemes whereby ship-owners/shippers using domestically owned vessels are given tax concessions, while Filipino and Thai seamen are exempted from the payment of income tax⁹.

To briefly conclude, in the absence of rules and guidelines governing state subsidies, ASEAN countries are likely to encounter competition problems in the liberalisation of its transport industry, in particular the aviation and maritime segments, where state aid proliferates as each member country competes to promote its own industry's interests. Hence, a regional agreement to open up the transport industry will need to be complemented by preparatory work on laying rules and regulations governing

state aid. Perhaps co-ordination and co-operation in containing the size or scope of competing subsidies catering to these services, to prop national providers ahead of others, can better serve to save member states' money and ultimately benefit their economies as a whole.

3.2. Cross subsidies

As mentioned earlier, cross-subsidy constitutes the most convenient – albeit non-transparent – source of financing for social service provisions in developing countries. It is convenient because the government need not allocate a budget to finance social services, but non-transparent because the actual cost of the subsidy required is not made explicit. That is, as long as the operator, often state-owned, is financially viable, the state need not be bothered about the size of the subsidy.

The presence of cross-subsidisation has two implications. First, the new entrant may face predatory pricing as a result of, or in disguise of, cross-subsidisation undertaken by the incumbent. Second, competition may erode the availability of the subsidy required to maintain social or universal services. For example, the owner of PAL claimed that the airline's massive loss was a result of President Ramos' decision to open up many international routes to foreign carriers. Singapore airlines was even granted the fifth freedom right to pick up passengers in Manila on the way to Seoul and Osaka. It claimed that these foreign carriers did not have to service unprofitable domestic routes¹⁰. As a result, all loss-making routes were eventually abandoned. Similarly, inter-city bus service providers in Malaysia complained that, as a result of many new licenses issued by the state authority, it was not able to sustain the provision of subsidised routes (Lee, 2004).

In order to ensure both fair competition in the market and a transparent and effective subsidy scheme, an overhaul of the subsidy regimes in the transport industry is a prerequisite for market liberalisation. Cross-subsidisation will have to be replaced by a more transparent subsidy scheme, such as auctioning the delivery of the targeted social service. At the minimum, state or private enterprises that carry social service obligations will have to allocate costs to services that are provided on a social rather than a commercial basis. Otherwise, the task of proving "price predation" will be impossible.

Phasing out the existing cross-subsidy schemes in transportation is likely to be a herculean task, as state-owned enterprises in the region are unaccustomed to allocating costs to different services that they provide. Worse, in most cases it is not even clear what constitutes a "social service". Usually, all loss-making services are conveniently defined as social services, without a thorough examination of the costs and benefits of providing and maintaining those services.

3.3. Distorted price regulations

Pricing is one of the most important factors determining a firm's competitiveness, as well as competition in the market. Since transportation is a regulated industry, certain transport services are subject to price control, in particular when there is no competition in the market. But in transport, there is intermodal competition. For example, rail transport may be a substitute for trucking for a particular type of bulky product such as cement or agricultural products. Similarly, planes and buses can be substitutes for long-distance passenger travel. Hence, it is important that the pricing of these competing modes of transport service is congruent, to ensure a level playing field across modes. The problem may arise in the case where a particular mode of transportation is liberalised, but not so for the other competing modes.

For example, the trucking or haulage industry tends to be more easily liberalised, as it is a relatively contestable market. Rail, sea and air transport, on the other hand, are more difficult, as they display significant economies of scale or economies of network. Hence, freight rates for air, sea and rail modes of transport may still be subject to tight price control regimes, while those in the haulage industry are determined by market forces. If the regulated price is too low, the competing trucking business may find it difficult to make a profit in the business.

Inconsistent pricing across different competing modes of transportation may threaten the commercial survival of private transport service providers in the market. For example, in Bangkok there are three different modes of public transportation: bus, sky train and subway. Both the sky train and the subway compete with the bus, but not between themselves, as their routes rarely overlap: in the future, however, their growing networks may do so.

The pricing for the Bangkok sky train service is based on "full cost recovery", since the private concessionaire financed all components of the project – i.e. civil and operational components – without any government subsidy. The Bangkok subway tariffs, on the other hand, are based on "partial cost recovery", as the infrastructure – i.e. the tunnel and stations – is financed by the state, while the private investors finance only the rolling stock. These price conditions are clearly stipulated in the contracts. Finally, bus fares are determined by cabinet decision, which is thus a political decision. The Bangkok Metropolitan Bus Authority does not receive any operational subsidy from the government, but is allowed to accumulate a large amount of arrears in its payments owed to the state-owned petroleum company.

Under such circumstances, the sky train operator no doubt faces a serious price constraint, as any price increase would cause users to switch to lower-cost alternatives that receive state subsidy¹¹. Hence, consistency in pricing schemes across substitutable transport services is vital to ensure fair competition across competing modes of transportation. This requires coherence, not only at the regulatory stage but also at the stage of project financing.

Another common problem with price regulation in the region is the setting of "price ceilings" and "price floors" for regulated transport services. While maximum and minimum prices may in theory prevent a dominant player in the market from setting monopoly or predatory prices, in practice, they tend to have adverse consequences in markets where there is effective competition. A price ceiling provides a convenient "target price" for a cartel, while a price floor can restrain price competition.

For example, following liberalisation in 1997, Malaysia's haulage industry faced intense competition as the number of firms increased from five in 1997 to about sixty firms in 2003, and container haulage rates fell by between 20 to 40 per cent. In order to end the destructive price war, the Container Hauliers' Association of Malaysia (CHAM) and the Association of Malaysian Hauliers (AMH) decided to stop giving rebates and charge the full regulated price instead. Such behaviour, known as "parallel pricing" resulting from "tacit collusion", does not constitute a violation of competition law in most countries.

Similarly, before the liberalisation of the domestic air transport services, price regulations worked in favour of the incumbent national carrier, Thai Airways, since smaller competitors may not price below those of the dominant incumbent. Only when the price floor was removed did domestic airfares fall by between 30-40%. The regulatory authority decided to keep the price ceiling, however.

To conclude, in face of the changing market structure and competition, ASEAN countries need to review their price regulations for transport overall. Otherwise, regulatory failure can pose a major obstacle to effective competition in the market.

3.4. State-owned enterprises' "privileges"

Besides subsidies of various forms, loss-making state enterprises are usually granted the right to operate in markets where they may generate "rents" to subsidise their social service operation. Thus, state-owned enterprises' exclusive rights to provide a particular service are often linked to the cross-subsidy scheme.

It is common that SOE is given the opportunity to exploit the rights to operate cross-border services that have been negotiated by the state. For example, Thai Airways is entitled to provide services on all international routes that Thailand had negotiated for under the bilateral air transport agreement with other countries. Similarly, as part of the 1993 agreement on transportation of goods in transit between Lao PDR and Thailand, the Thai Government authorised five carriers to undertake the transport of goods through Thailand to Lao PDR. Two of the five companies were the Express Transport Organization and the State Railway of Thailand, the state road haulage and railway companies¹². Usually, state-owned enterprises may also be exempted from certain laws and regulations to which private enterprises are subject. For example, the competition law in Thailand provides a blanket exemption for state enterprises, defined as all enterprises where the state holds a direct majority equity share. Fortunately, competition laws in Indonesia and Singapore do not provide such an exemption.

The exclusivity reserved mostly for state enterprises forecloses competition from the private sector. For these reasons, the Singapore-US bilateral free trade agreement contains a provision that prohibits corporatised state enterprises from carrying any special privileges that other private competitors do not enjoy.

3.5. Market concentration and abuse of dominance

Certain transport service markets, in particular air transport, are dominated by incumbents that are frequently state-owned. This is often the case because the opening up of the market to competition is made without a proper market restructuring, which would help dissolve the dominant market power of the incumbent service provider in order to ensure effective competition in the market. As a result, newcomers may face all sorts of restrictive practices carried out by the incumbent so as to protect its market share. The problem is – in the absence of an effective competition oversight – that some of these cases have gone unnoticed or unrecorded. In other cases, state regulation serves as a convenient means to pursue restrictive practices. As mentioned, price regulation may restrict rather than promote competition. It is not surprising that the regulatory body is captured by the state enterprise, as both often belong to the same ministry. In very small countries, like Lao PDR or Cambodia, they may even share the same two-floor building.

The only recorded competition case in transport is the case of air transport in Indonesia. In 2003, the KPPU, the competition authority in Indonesia, found Garuda, the national airline, to be in breach of national competition law by requiring travel agents to use only the Abacus reservation system to reserve its tickets. The authority ordered Garuda to terminate its exclusive agreement with Abacus and to withdraw the mandatory requirement for travel agents to use Abacus to reserve its tickets¹³.

Where there is no dominant state or private enterprise in the market, there are risks that smaller local service providers may face unfair competition from large, multinational competitors. This fear is most real in the road haulage industry, where the market is traditionally a relatively contestable one. However, since the dawn of the container age, major shipping lines became involved in the development of integrated logistic systems, providing door-to-door multimodal services, which

include land-based services such as road haulage. Local service providers fear that large shipping companies will collude to lower the prices of land-based services, and use rents from maritime services where they operate as a cartel, to cross-subsidise the activity. In effect, land-based service providers will be "squeezed out" of the market through the high cost of freight and low revenue.

This fear is well founded. In 1998, the European Commission (EC) found that the Trans-Atlantic Conference Agreement (TACA) had fixed prices for land transport, restricted the availability of individual service contracts between shipping lines and their customers, and fixed freight forwarders' commissions. The EC ruled that the TACA had abused its dominant position, since such practices did not fall within the ambit of the block exemption provided for liner conferences, nor did they qualify for individual exemptions. As a result, the TACA had agreed to adopt a "not-below-cost" rule, whereby land-based services were to be priced not less than the direct out-of-pocket expense of the carrier. Similar practices were carried out by the North Atlantic Conference Agreement, but were abandoned once the EC and the US Federal Maritime Commission (FMC) had begun inquiries¹⁴.

Another common concern of the local small and medium road haulage operators is access to exclusive ports. As mentioned earlier, shipping companies have invested extensively in ports in order to develop an integrated transport service. While private ports can be efficient and save government resources, they may not be accessible to non-vessel operators. As a result, the government needs to ensure port accessibility to independent operators, either by requiring exclusive private ports to share the facilities, or to operate a public port. A more efficient alternative would be to have the construction and operation of ports undertaken by parties that do not hold business interests in the shipping industry¹⁵.

In countries with strong regulatory and competition regimes, such restrictive or collusive practices will be restrained. Hence, smaller service providers or new entrants can take comfort in state protection against abusive business practices. The regulatory and competition regimes in most ASEAN countries are not yet sufficiently well developed to deal with such regulatory complexities. The next chapter will discuss the capacity of the competition and regulatory regimes in the region.

4. COMPETITION AND REGULATORY REGIMES IN ASEAN

As mentioned earlier, markets that have traditionally been dominated by state enterprises are likely to have a relatively undeveloped regulatory regime. This is because the state is not accustomed to regulating private companies whose business information is protected by law. Longstanding reliance on state-owned enterprises' non-proprietary business data and technical information for the purpose of regulation, has rendered state authorities particularly weak when it comes to dealing with private businesses.

In ASEAN, the authority to regulate often rests with a ministerial body that oversees both policy and regulation. An independent and specialised regulatory body is an exception rather than the norm in ASEAN. And, as mentioned earlier, in some cases, state-owned enterprises are vested with the regulatory power, either *de jure* or *de facto*.

For example, regulation of air transport in ASEAN mostly rests within the purview of a ministerial authority, such as the Department of Air Transport in the case of Thailand, the Civil Aviation Authority of Singapore, the Department of Civil Aviation in Cambodia, Myanmar and Brunei, the Ministry of Transport in the case of Malaysia and the Civil Aviation Administration of Vietnam. The Philippines is the only country that has a fully-fledged regulatory authority, known as the Civil Aeronautics Board, as can be seen in Table 2 below.

0 1		
Country	Air transport regulatory body	Competition law and authority
Brunei	Department of Civil Aviation	No competition law
Cambodia	Department of Civil Aviation	No competition law
Indonesia	Directorate of Air Transport	Competition law available
Laos PDR	Lao Transport Authority	Decree on Competition (effective August 2004)
Malaysia	Ministry of Transport	No competition law
Myanmar	Department of Civil Aviation	No competition law
Philippines	Civil Aeronautics Board	Article 186 of the Revised Penal Code, Civil
	(independent)	Code RA 386, RA 186 (Act to prohibit
		Monopolies and Combination in Restraint of
		Trade)
Singapore	Civil Aviation Authority of	Competition law available
	Singapore	
Thailand	Department of Air Transport	Competition law available
		(but a block exemption is provided for state-
		owned enterprises and major provisions are not
		yet enforceable)
Vietnam	Civil Aviation Administration	- (8 th Draft of Competition Law)

Table 2. Regulation of the Air Transport Industry in ASEAN

Source: Data collected by the author.

With respect to competition rules, only three ASEAN countries have a fully-fledged competition law that contains all major substantive provisions regarding restrictive practices, namely, abuse of dominance, collusive practices and mergers. These are Thailand, Indonesia and Singapore. Thailand has a law only on paper; its implementation has been obstructed by lobbying of big businesses and political intervention. Singapore's law was passed in late 2004 and became effective only at the beginning of 2005. Indonesia is the only country that has produced a few competition cases. The Philippines relies on the penal and civil codes to deal with anti-competitive practices. Work is under way to draft a competition law. Lao PDR has a Decree on Competition, which came into effect in August 2004. While the Decree contains sections addressing issues of monopolies, collusive practices and mergers, the provisions are so brief that it is unclear how the law will be implemented. Vietnam has not yet promulgated a competition law, but has been revising several versions of the law. The latest version is the 8th draft. The remaining ASEAN countries do not yet have a competition law.

To conclude, regulatory and competition regimes in many ASEAN countries are ill prepared to safeguard fair and effective competition in the market, both legally and institutionally. Dealing with competition issues, in particular those relating to pricing, can be extremely complex, both conceptually and practically. Determining costs of a private company, in particular a multinational one, will be much more difficult than that of a state-owned enterprise, where the government has free access to all cost figures.

5. CONCLUSION

ASEAN countries need to be cautious about opening up their domestic transport markets to international competition. Much preparatory work is required to ensure that liberalisation will bring forth a fair and effective competition in the market that will benefit their economies as a whole. ASEAN governments need to undertake the following major tasks before making market-opening commitments:

- Reform SOEs accounting system to ensure that costs are properly allocated for each service provided by the enterprise. Sappington and Sidak (2003) show that an SOE that values revenue will have stronger incentives than a profit-maximising firm to understate the marginal cost of production in order to relax a binding prohibition against pricing below cost. The same study also demonstrates that, to dodge pricing regulations, SOEs are also more ready to adopt excessively capital-intensive technology to lower marginal or variable costs, while raising fixed costs. Hence, the regulatory burden is much more complex in the presence of state-owned enterprise.
- Overhaul existing subsidy schemes to disentangle the complex web of ad hoc subsidies and to establish a transparent scheme that will guarantee efficient and fair allocation of state aid among different players in the market; and any cross-subsidisation between monopoly and competitive markets must be eliminated.
- Once cross-subsidy schemes are eliminated, state-owned enterprises are then no longer necessary and should therefore be eliminated as well.
- Undertake market restructuring before market opening in the case where the SOE holds a dominant market share. The more contestable a market is, the less the regulatory burden that will fall on the nascent regulatory or competition authority.
- Establish a comprehensive transport regulatory agency, staffed with personnel skilled in the field. Price regulation of all modes of transport needs to be revised. The agency will also need to develop clear rules before making market-opening commitments, particularly in bilateral free-trade agreements that provide for private-state arbitration. Non-transparent and unclear regulatory rules can be easily accused of being discriminatory or inconsistent with the minimum standard of treatment required by customary law. Hence, a host country government may face endless series of expensive lawsuits if it is ill prepared for the complexities of international competition.

• Promulgate a comprehensive competition law and ensure its effective implementation; and protect local small and medium land-based transport service providers.

Should ASEAN countries decide to liberalise their transport markets, either regionally or bilaterally, to ensure fair competition, the agreement should certainly contain provisions on state subsidies and mandatory co-operation on cross-border competition issues, such as those related to liner shipping.

NOTES

- 1. The level of economic development of member countries in the region is very diverse. In the year 2003, Singapore's GDP was US\$ 21 230, while that of Lao PDR was US\$ 10.
- 2. Although the administrative procedures for the releasing of transit goods can be cumbersome.
- 3. Stephensen and Nikomborirak (2003).
- 4. According to Leinbach (2004), the foreign carrier with the widest access to Indonesia is Silk Air.
- 5. Thailand now boasts at least seven domestic local carriers.
- 6. Liability is a major issue, since many ASEAN members are not signatories to international conventions that stipulate carriers' liabilities under different transport modes.
- 7. A proxy for employment and scale of service.
- 8. For example, the state-owned Bus Company Ltd. in Thailand derives its authority to set service and safety standards and regulate inter-provincial bus schedules from the terms and conditions stipulated in the concessions (or franchise) it hands out to private operators. Since private operators are not allowed to operate the reserved routes, given the SOEs exclusivity, they have no choice but to submit to the terms and conditions stipulated in the contracts.
- 9. Meyrick and Associated Pty Ltd (2001).
- 10. Aldama (2005).
- 11. The private concessionaire expected to generate greater gains from property development. But since 1997, when the property bubble in Thailand burst, the operation has faced a chronic operational loss up until the present time.
- 12. UNCTAD (2001).
- 13. The Asia Pacific Anti-trust Review 2004. Available at www.globalcompetitionreview.com/apar/indo_overview.cfm
- 14. EC Competition Policy Newsletter (1999).
- 15. This may also exclude investors that are foreign governments whose national port may be in competition with domestic ports.

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TRANSPORT INFRASTRUCTURE, TRADE AND ECONOMIC GROWTH

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SUMMARY

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1. INTRODUCTION

In a recent survey of trade costs, James Anderson and Eric van Wincoop (2004) provide a headline figure of 170% as an estimate of the tax equivalent of "representative" trade costs for industrialised countries. This figure, which includes all the costs of getting a product from the foreign producer to the domestic consumer, comprises 21% transport costs, 44% trade-related barriers and 55% retail and wholesale distribution costs. Anderson and van Wincoop also find that trade costs vary widely across product categories and that for developing countries they are even larger, by a factor of two or more in some important categories. The impact of trade costs on bilateral trade flows may, therefore, be much more important than the actual cost of production¹.

This paper focuses on one of the most important determinants of trade costs, namely, transport infrastructure, by drawing on relevant academic literature. In order to provide a good understanding of the role of infrastructure in facilitating trade, the paper first provides an economic analysis of the benefits and costs of infrastructure in a wider context. It then proceeds to explore its influence on trade facilitation, both analytically and empirically. Finally, the paper attempts to provide an answer to the key policy question of why countries may systematically choose to under-invest in transport infrastructure, which is either implicitly or explicitly implied by the literature reviewed in this paper².

The paper is structured as follows. Chapter 2 aims to provide an understanding of the full economic benefits of infrastructure, which are essentially dynamic in nature. The analysis, therefore, centres on a model of endogenous growth, constructed by Bougheas, Demetriades and Mamuneas (2000), in which infrastructure is modelled as a cost-reducing technology, funded by a tax on final consumption. Chapter 3 explores the relationship between trade and infrastructure, drawing on relevant studies. Chapter 4, which is somewhat speculative in nature, provides some new thoughts on what factors might explain why there may be under-investment in infrastructure, and which highlight avenues for further research. Finally, Chapter 5 summarises and concludes.

2. INFRASTRUCTURE, SPECIALISATION AND ECONOMIC GROWTH

"As by means of water-carriage a more extensive market is opened to every sort of industry than what land-carriage alone can afford it, so it is upon the sea coast, and along the banks of navigable rivers, that industry of every kind naturally begins to subdivide and improve itself..."

Adam Smith, Wealth of Nations, 1776

The above quote from Adam Smith is no less relevant today than it was at the time it was written, especially if we were to translate it into the modern context, by replacing "along the banks of navigable rivers" with "in industrial estates with good road, rail and air links" and "water-carriage" with "transport infrastructure". The key to understanding the full economic benefits of transport infrastructure, contained in Adam Smith's quote, is capturing its influence on the location and organisation of industry, both of which are dynamic processes. A common mistake frequently made by cost-benefit approaches or transport economists, when analysing the benefits of an infrastructure investment project, is to focus primarily on the static effects on existing industries and to ignore or under-play the future dynamic benefits on the macroeconomy. These effects include attracting new firms or new industries to the area and positive spillover effects emanating from these industries, as well as increased specialisation within an industry, all of which are difficult to assess.

In order to provide an analytical understanding of how important these macroeconomic effects are, the author follows Bougheas, Demetriades and Mamuneas (2000) – henceforth Bougheas *et al.* (2000) – who analyse the role of infrastructure in an endogenous growth framework. In their model, the production of a final consumption good is a function of intermediate inputs *à la* Romer (1987). The fixed costs of producing intermediate goods are assumed to depend inversely on the resources devoted to infrastructure accumulation. Infrastructure is provided by the government and is financed by a tax on final output; there is, therefore, a trade-off between final consumption and infrastructure investment. Given, however, the positive effects of infrastructure on specialisation – the engine of growth in Romer's model – the relationship between long-run economic growth and infrastructure investment is initially a positive one, and a positive tax rate exists that maximises final consumption.

Romer (1987) models specialisation using a production technology in which the output of a final consumption good is a function of intermediate inputs, defined continuously on \Re^+ . Specifically, the production function for final output *Y* is specified as:

$$Y(x) = \int_{R^+} x(i)^{\alpha} di , \qquad (1)$$

where x(i) denotes the amount of input i and $0 < \alpha < 1^3$. In order to provide an upper bound to the number of intermediate inputs, which captures the degree of specialisation, Romer introduces fixed costs in their production, which uses as input a primary resource, Z.

One of the cost functions considered by Romer is the following:

$$h(x(i)) = \frac{1+x(i)^2}{2}, \qquad \forall i$$
 (2)

where h(x(i)) measures the amount of the primary input that is needed for the production of x(i) units of the intermediate input *i*. This cost function "...*capture(s) the idea that fixed costs limit the degree of specialization* (Romer, 1987, p. 57)", and leads to a U-shaped average cost curve. Consequently, at the optimum x(i) is strictly positive and, because of symmetry across cost functions, takes a constant value \overline{x} . Equation (1) then implies that final output is directly proportional to the measure of intermediate inputs, *M*. In Romer's words: "*This loosely captures the idea that a ceteris paribus increase in the degree of specialisation increases output.*" (*Ibid*)

Bougheas *et al.* (2000) introduce infrastructure into Romer's model by endogenising the fixed costs in the above cost function. They argue that these costs are largely determined by the availability and quality of transport and telecommunications infrastructure. Specifically, they assume that the fixed costs of producing intermediate inputs vary inversely with the stock of infrastructure capital *relative to the size of the economy*. Because of congestion, a given level of infrastructure is likely to be less productive the greater the amount of economic activity that it supports. This intuition leads them to the following re-specification of the cost function for intermediate inputs⁴:

$$h(x(i), G/Y) = \frac{C(G/Y) + x(i)^2}{2}, \quad \forall i$$
(2')

where G measures the stock of infrastructure capital and Y measures, as before, final output. They also assume that C' < 0 and C'' > 0.

The primary resource constraint of the economy is:

$$\int_{R^+} h(x(i), G/Y) di = M \cdot h(\overline{x}, G/Y) \le Z$$
(3)

The model is closed by assuming that infrastructure is provided by the government, which runs a balanced budget and finances infrastructure by a proportional tax rate, τ , on final output⁵:

$$g \equiv \mathbf{G} = \tau \gamma \tag{4}$$

Starting with the single period version of the model, in which the initial stock of public capital is assumed to be equal to zero and the primary resource Z is constant, g = G and $G/Y = \tau^6$. In the decentralised equilibrium of this economy, which consists of a competitive final output sector and a continuum of monopolistically competitive intermediate input producers, agents treat τ and G as parameters. Final output producers maximise the following profit function:

$$\int_{R^{+}} (1-\tau) x(i)^{\alpha} di - \int_{R^{+}} p(i) x(i) di$$
(5)

where p(i) denotes the relative price of intermediate input *i*. The f.o.c. for each *i* yields a corresponding inverse demand function:

$$p(i) = (1 - \tau)\alpha \cdot x(i)^{\alpha - 1} \tag{6}$$

Intermediate input producers use these derived demand curves to maximise:

$$(1-\tau)\alpha \cdot x(i)^{\alpha} - R\frac{C(\tau) + x(i)^2}{2}$$
(7)

where *R* is the unit price, measured in units of final output, of the primary resource. In equilibrium, all intermediate input producers earn zero profits. Solving the system of equations consisting of the f.o.c. of the above problem, the zero-profit condition and the resource constraint (3), the following solutions for \bar{x} , *M* and *R*, as functions of the policy parameter τ , are obtained:

$$\overline{x} = \left(\frac{\alpha C(\tau)}{2 - \alpha}\right)^{1/2} \tag{8}$$

$$M = \frac{Z(2-\alpha)}{C(\tau)} \tag{9}$$

$$R = (1 - \tau)\alpha^2 \left(\frac{\alpha C(\tau)}{2 - \alpha}\right)^{(\alpha - 2)/2}$$
(10)

Equations (8)-(10) demonstrate the costs and benefits of infrastructure. The costs are straightforward and measured by the loss of income due to taxation. The equilibrium conditions (8) and (9) reveal that \overline{x} and M are, respectively, negatively and positively related to infrastructure investment, τ . Because infrastructure reduces the fixed costs in the production of intermediate inputs, it promotes competition in that sector, i.e. a higher M, and consequently encourages further specialisation, which in turn implies higher final output.

In the dynamic version of the model, the primary resource, Z, is allowed to accumulate, as in Romer, at the following rate:

$$\dot{Z} = (1 - \tau)Y_t(x) - c_t$$
⁽¹¹⁾

(1.1)

where, for simplicity, depreciation is set equal to zero and C_t denotes per capita consumption. Equations (11) and (4) describe the dynamics of the production side of the model. However, notice that there is now a need to distinguish between the rate of accumulation of public capital, $g_t \equiv \dot{G}_t$, and the stock of public capital, G_t . This requires that G_t/Y_t is substituted for τ in the fixed cost function. The above implies that the rate of return of the economy, R_t , is time-dependent.

On the consumption side of the model, intertemporal preferences are, conventionally, specified as:

$$\int_0^\infty U(c_t) e^{-\rho t} dt \tag{12}$$

.....

where $U(c_t)$ is given by:

$$U(c_t) = \frac{c_t^{1-\sigma} - 1}{1 - \sigma} \tag{13}$$

where $0 < \sigma < \infty$. The above specification of preferences implies that the growth rate of consumption equals:

$$\frac{\dot{c}_t}{c_t} = \frac{1}{\sigma} (R_t - \rho) \tag{14}$$

because in this economy the only asset that consumers own is the primary resource. Its rate of return is equal to R_t because the depreciation rate is equal to zero.

Along a balanced growth path, the variables c, Y, Z and G will grow at the same rate. In such a long-run equilibrium, the ratio G/Y will remain constant which, in turn implies that the fixed cost function, $C(\cdot)$ and, consequently, the rate of return, R, will take constant values. Equating the growth rates of G and c using (4) and (14) and substituting (10) for R, they get:

$$\frac{\dot{\mathbf{G}}}{G} = \frac{\tau Y}{G} = \frac{1}{\sigma} \left\{ (1 - \tau) \alpha^2 \left[\frac{\alpha C (G/Y)}{2 - \alpha} \right]^{(\alpha - 2)/2} - \rho \right\}$$
(15)

Bougheas *et al.* (2000) then show that there is a positive monotonic relationship between the policy parameter τ and the *G/Y* ratio. As a consequence, the government's choice of tax rate also determines the long-run growth rate of the economy. Suppose $C(\cdot)$ has the form:

$$C(G/Y) \equiv \theta/(G/Y) \tag{16}$$

where θ is a positive constant. This specification implies that: (a) in the absence of infrastructure, fixed costs approach infinity, i.e. specialisation becomes impossible; and (b) fixed costs never vanish, i.e. there is a limit to the degree of specialisation.

Substituting (16) into (15) and rearranging terms, they get:

$$\left(\frac{G}{Y}\right)^{2-(\alpha/2)} = \frac{\rho}{(1-\tau)\lambda} \left(\frac{G}{Y}\right) + \frac{\tau\sigma}{(1-\tau)\lambda}$$
(17)

where:

$$\lambda \equiv \alpha^2 \left(\frac{\alpha\theta}{2-\alpha}\right)^{(\alpha-2)/2} > 0 \tag{18}$$

For $0 < \tau < 1$, (17) has exactly one positive root⁷, i.e. the tax rate uniquely determines the long-run equilibrium ratio of *G/Y*. Furthermore, using the implicit function rule, they find that, for positive growth rates, the relationship between τ and *G/Y* is positive monotonic. In particular, let

$$\frac{G}{Y} = f(\tau), \qquad f'(\tau) > 0 \tag{19}$$

describe that relationship. Then, the balanced growth rate of the economy is given by:

$$\gamma \equiv \left[(1 - \tau) \lambda f(\tau)^{1 - (\alpha/2)} - \rho \right] \frac{1}{\sigma}$$
⁽²⁰⁾

The above describes a non-monotonic relationship between the tax rate and the long-run growth rate of the decentralised economy. There is, therefore, a unique growth maximising tax rate that balances the allocation of savings between private and infrastructure capital.

Bougheas *et al.* (2000) provide evidence from the US that suggests that the degree of specialisation in industry and the output of intermediates does indeed depend positively on core infrastructure. They also provide evidence from cross-country growth regressions, which suggests that, controlling for other determinants of growth, there is an inverse U-shape relationship between long-run growth and indicators of transport and telecommunications infrastructure (paved roads and telephone lines, respectively). Their findings suggest that most infrastructure remains below the growth-maximising level, in most countries. They also highlight the growth-promoting role of infrastructure, particularly for poor countries. There should, therefore, be little doubt that the growth-promoting effects of infrastructure are important, hence any cost-benefit analysis of new infrastructure investment may underestimate the long-run economic benefits if it does not take them into account.

3. INFRASTRUCTURE AND TRADE

If infrastructure promotes the growth and sub-division of industry, then it is plausible to conjecture that it may also promote (intra-industry and inter-industry) trade. A growing body of empirical literature explores the effects of infrastructure on trade⁸. Bougheas, Demetriades and Morgenroth (1999) – henceforth Bougheas *et al.* (1999) – is one of the few papers that also provides a theoretical, as well as an empirical, analysis of this relationship. Specifically, the paper examines the role of infrastructure in a simple Ricardian trade model with transport costs. The transport technology – which is of the standard "iceberg" variety⁹ – is extended to embed an inverse relationship between the level of infrastructure and transport costs. The idea modelled here is that infrastructure improves transportation conditions and it is, therefore, treated like a cost-reducing technology. The accumulation of infrastructure is, however, costly. Infrastructure investment takes away a resource that may be put into the production of final goods. The specification of the infrastructure technology includes both fixed and variable components, and takes into account geographical factors ("distance"). To fix ideas, let Λ denote the total amount of input that the two countries devote to infrastructure investment. Let D denote the "distance" variable, which is a summary measure of geographical

disadvantage; countries with a high D need to devote a higher proportion of their input endowment in order to reduce transport costs by a given amount relative to pairs of countries with a low D. Let g be the fraction of the quantity shipped that arrives at its destination. Bougheas *et al.* (1999) specify the following functional form for g:

$$G(\Lambda / D) = \begin{cases} \overline{g} & \text{for} & \Lambda / D \leq k \\ g(\Lambda / D) & \text{for} & \Lambda / D \geq k \end{cases}$$
(21)

where k is a parameter designed to capture the lumpiness of infrastructure investment projects and g is increasing in A/D at a decreasing rate. For example, connecting two coastal economies, like France and the UK, by a channel tunnel or a bridge, would involve a large initial outlay – transport costs do not begin to diminish until the tunnel or bridge is completed; hence the discontinuity captured by values of A/D below k. Once the tunnel or bridge has been constructed, i.e. for values of A/D above k, there can be marginal improvements that result in a continuous reduction of transport costs, but this reduction is, however, subject to diminishing returns.

The authors show that, depending on geography and initial endowments, equilibria with or without infrastructure can be obtained. Equilibria without infrastructure occur when considering either two geographically distant countries or two poor countries. In both cases the opportunity cost of infrastructure investment, as measured by the loss of final output, is too high compared to the welfare benefit, so the countries will choose not to invest in infrastructure. These findings reflect the lumpiness of infrastructure investments. Thus, geographically disadvantaged and/or poor countries may find it sub-optimal to develop their infrastructure altogether and, as a result, get stuck in a low-trade equilibrium.

The relationship between welfare and the level of infrastructure for poor or geographically disadvantaged countries, predicted by Bougheas et al. (1999), is depicted in Figure 1. Because of the large fixed costs, and the lumpiness of infrastructure investment, welfare is initially decreasing in infrastructure investment. Only once a certain minimum level of infrastructure investment (kD) has been exceeded does welfare begin to increase with the level of additional investment. Because of diminishing returns in the cost-reducing technology and the trade-off between infrastructure investment and the production of final goods, the relationship between welfare and infrastructure reaches a local maximum above kD. However, at that local maximum, welfare is below the level that accrues at a zero level of investment - the latter corresponds to the global maximum. This case could reflect low initial endowments ("poor" countries), which intuitively means that the trade-off between final consumption and infrastructure investment is a very steep one. These countries simply cannot afford to invest in infrastructure because the lumpiness of the cost technology means that for them to be able to put in the minimum investment required in order to obtain transport cost reductions, they would have to give up too large a chunk of their final consumption. Alternatively, the situation depicted in Figure 1 could be representative of a geographical disadvantage, i.e. very high value of D, which, in order to overcome too large a chunk of the initial endowment has to be diverted into infrastructure formation.



Figure 1. Infrastructure and welfare in poor or geographically disadvantaged countries

Figure 2. Infrastructure and welfare in rich or geographically advantaged countries



On the other hand, for pairs of countries with large initial endowments ("rich" countries) or with favourable geography (low values of D), positive investment in infrastructure is optimal. This is depicted in Figure 2, which shows that the relationship between welfare and infrastructure investment attains a global maximum at a level of investment that is above kD. For these pairs of countries, the model also predicts a positive relationship between infrastructure investment and the volume of trade.

Bougheas *et al.* (1999) offer empirical evidence, using an augmented gravity model and data from European countries, which strongly supports this prediction of the theory. In their estimations, they use two infrastructure variables, namely, public capital and the length of the motorway network. The estimated elasticities on the infrastructure indicators are not only positive and significant, they are also quite large. For example, a 10% increase in the transport infrastructure indicator (in one of the two trading countries) is found to increase bilateral trade by anything from 1.8% to 4.6%, depending on the specification.

Nuno Limão and Anthony Venables (2001) examine the empirical relationship between infrastructure, transport costs and trade, taking into account geographical factors. Their first set of results is based on the costs of shipping a standard 40-foot container from Baltimore to 64 different destinations in the world. They find that being landlocked raises costs by \$4 620, compared with a mean of \$3 450 for non-landlocked countries. They also find that an extra 1 000 km by sea adds \$190 to transport costs, while a similar increase in land distance adds \$1 380. Furthermore, they find that the increased transport costs of landlocked countries are not solely attributable to the extra overland distance that must be travelled; they suggest that landlocked countries may also face greater border delays and transport co-ordination problems, as well as higher insurance costs and direct charges by the transit country. They also find that own infrastructure explains 40% of the predicted transport cost of coastal economies, and 36% of the transport cost of landlocked countries; for landlocked countries, transit infrastructure explains 24% of the cost.

Limão and Venables (2001) also estimate a gravity model in order to assess the effects of infrastructure on trade flows, using a data set for 1990 that includes 103 countries. Their results are striking. They find that the infrastructure variables are significant at the 1% level and have very sizeable effects on trade volumes. Moving from the median to the top 25th percentile in the distribution of infrastructure raises trade volumes by 68%, which is equivalent to being 2 005 km closer to trading partners. Moving from the median to the bottom 25th percentile in the distribution of infrastructure reduces trade volumes by 28%, which is equivalent to being 1 627 km further away from other countries. Further analysis of Sub-Saharan African (SSA) trade reveals that (poor) infrastructure accounts for nearly half the transport cost penalty borne by intra-SSA trade. Additional empirical findings suggest that the under-performance of SSA countries in terms of international trade (both within and outside the SSA region), is explained by poor infrastructure and by a penalty on cross-continental trade in Africa.

4. FACTORS THAT MAY EXPLAIN UNDER-INVESTMENT IN INFRASTRUCTURE

The literature reviewed so far either indirectly or directly implies that countries systematically under-invest in infrastructure. This implication is consistent with much of the empirical literature that aims at estimating social rates of return to infrastructure using aggregate data¹⁰. For example, Demetriades and Mamuneas (2000) find that the long-run net rates of return to public capital in twelve OECD economies exceed those of private capital. One plausible answer to this puzzle (consistent with the findings of Demetriades and Mamuneas, 2000) is the asymmetry between political horizons and the timing of costs and benefits of large infrastructure projects. To put it differently, politicians may have too short horizons to invest in projects that will only result in costs during their period of office,

while most of the benefits will occur after that period. To illustrate this point, some of the key findings in Demetriades and Mamuneas are reproduced in Table 1.

It is important to note that these estimates are derived using an optimising framework, in which the private sector makes optimising (profit-maximising) decisions in relation to the stock of private capital and employment, taking the stock of public capital as exogenous. Increases in the stock of public capital are empirically found to increase both employment and private output and, subsequently, the private capital stock, which takes time to adjust. Once the private capital stock adjusts in the second period (the intermediate run), there will be subsequent adjustments in output and employment, which may trigger subsequent adjustments in private capital. This process aims at capturing empirically the full dynamic effects of public capital and explains why, in Table 1, the net rate of return of public capital is much higher in the long run than in the intermediate run. The findings also suggest that if one were to empirically assess whether there is under-investment in public capital, just by looking at the comparison between the net rates of return of public and private capital in the intermediate run, one would come to the conclusion that this is the exception rather than the norm. Only Belgium and, to a lesser extent, Finland exhibit rates of return to public capital that are visibly higher than that of private capital in the intermediate run. When looking at the long-run rates of return, however, a very different picture emerges: public capital has a much higher net rate of return than public capital, suggesting under-investment in public capital. In several cases, the public rate of return exceeds the private one by a factor of two (e.g. Belgium, Germany, US and UK), or even three (Japan).

Country	Intermediate-run		Long-run	
-	Public	Private	Public	Private
Australia	0.112	0.153	0.165	0.134
Belgium	0.183	0.130	0.237	0.125
Norway	0.121	0.136	0.172	0.134
Sweden	0.137	0.144	0.181	0.123
Finland	0.160	0.121	0.204	0.114
United States	0.106	0.315	0.265	0.113
Canada	0.146	0.156	0.204	0.130
Japan	0.240	0.215	0.357	0.095
Germany	0.168	0.183	0.260	0.100
France	0.192	0.206	0.277	0.129
Italy	0.255	0.257	0.354	0.153
United Kingdom	0.204	0.210	0.284	0.143

Table 1.	Estimated Net	t Rates of Return	to Public and P	rivate Capital
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Source: Table 5 in Demetriades and Mamuneas (2000).

Looking at the same results from the point of view of politicians, it is clear that the economic benefits from investments in public capital may be felt well after the end of their term of office, while their costs may be upfront. Even in those cases where such investments are financed through bond issues or loans, the concomitant squeeze in public finances may crowd out other expenditure with more immediate political benefits¹¹. Financing large infrastructure projects through borrowing may also have undesirable implications for interest rates in the short to medium run, which influence the re-election prospects of incumbent governments. Thus, it is not difficult to explain why politicians

may shy away from large public investment projects, particularly from those with long gestation periods. It is also easy to see how government mandarins can justify such preferences by focussing on the short-run or medium-run rates of return that are much closer to those obtained by cost-benefit analyses, which typically fail to take into account the dynamic benefits that accrue from large public investment projects in the long run.

Chapter 3 has already hinted at an alternative explanation of why countries may choose to underinvest in public capital, by suggesting that the determinants of transport costs for landlocked countries include a component that depends on the infrastructure of transit countries. In international trade, this is quite common – the trading countries frequently have to rely on the infrastructure of a third country in order to trade. Thus, investments in infrastructure by one country will benefit not only itself but also other countries, which may not even be trading partners of the country that invests.

Bougheas, Demetriades and Morgenroth (2003) analyse this problem in a bilateral setting in which it is assumed that each country's social planner behaves strategically¹². They show that, in general, the equilibrium levels of infrastructure are not optimal from a global perspective. They also provide empirical evidence from 16 European countries in the period 1987-95 which is consistent with the predictions of the model. Specifically, they regress four different indicators of infrastructure investment (investment in roads, rail infrastructure, maritime ports and investment in airports) on both domestic and trading partners' GDP (weighted according to contiguity, trade or distance), population, population density, long-run interest rate, debt to GDP ratio and a cohesion country dummy. They typically find the coefficient of foreign income to be negative, suggesting that strategic effects are present. In other words, when the income of foreign trading partners goes up, the home country may choose to invest less in domestic infrastructure, in some sense hoping to "free-ride" on foreign investment. The authors conclude that their findings might have important policy implications, in that they highlight an important co-ordination problem associated with the provision of trade-promoting infrastructure. The need to centralise public infrastructure provision is, of course, widely recognised within federal systems. For example, highway construction in Germany is the responsibility of the federal authorities. In the US, while it is carried out by the state authorities, which are the legal owners of the highways, it is mostly funded by the federal government. However, the EU structural funds, which are aimed at economic growth and recovery of underdeveloped regions, do not explicitly address co-ordination failures.

5. CONCLUDING REMARKS

This paper provides an overview of academic literature, which suggests that investment in transport infrastructure may have important positive influence in promoting both international trade and economic growth. It also provides some relatively new ideas as to why levels of infrastructure investment may be sub-optimal, not only in developing but also in developed economies.

While the academic literature on the effects of infrastructure on productivity and growth has grown quite considerably in recent years, there is, thus far, very little work that has been done on the relationship between infrastructure and trade facilitation. Further work in this area is needed, not only in order to advance the academic literature but also to inform policymakers around the world. An important dimension in the context of international trade relates to the externalities and spillover effects of infrastructure across countries – which remains an under-researched question, especially in a multilateral context. One possible finding that could emerge from such research is that, given its international public good aspects, both the provision and financing of infrastructure should involve much more regional and international co-operation among policymakers than has hitherto been the case, even within trading blocks like the EU.

NOTES

- 1. Feenstra (1998) provides the example of Mattel's Barbie doll, the production costs of which are \$1, yet it sells in the US for \$10. Thus, trade costs are equivalent to a 900% ad-valorem tax.
- 2. This is a wider phenomenon in the literature on infrastructure, starting with the work of David Aschauer (1989a, 1989b, 1989c), which placed the rate of return of public capital in the US at around 60% per annum. Even though Aschauer's findings have been questioned by subsequent literature, on balance the literature suggests that there may well be under-investment in infrastructure, not only in developing countries but also in developed ones. See, for example, Nadiri and Mamuneas (1994), Lynde and Richmond (1992), Gramlich (1994), Morrison and Schwartz (1996), Demetriades and Mamuneas (2000).
- 3. This production function is analogous to the Dixit-Stiglitz utility function, which captures consumer preferences for product diversity. It exhibits constant returns to scale but labour is set to unity, as population growth is assumed zero.
- 4. In his cost function, Romer sets the fixed component to unity, which conveniently achieves a minimum average cost of unity when output equals 1.
- 5. This is a standard assumption in the growth literature.
- 6. In a single period model, the flow of government spending is equal to the stock of public capital.
- 7. The LHS of (17) is increasing and convex in G/Y while the RHS is linear in G/Y. Both the intercept and slope of the latter are positive for admissible values of G/Y.
- 8. This literature is fairly new and has not examined, as yet, the types of trade that it promotes.
- 9. This means that only a fraction of the quantity shipped arrives at its destination the rest evaporates like an iceberg.
- 10. It may, however, be inconsistent with cost-benefit analyses of specific infrastructure projects.
- 11. The Millennium Dome in the UK, which cost £800 million, is a very telling example in this respect.
- 12. Analysing the same problem in a multi-lateral setting should produce further insights, but at this stage this remains a question for further research.

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SECURITY AND TRANSPORT

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SUMMARY

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1. INTRODUCTION

Transport security is a concept that can be interpreted in a number of different ways and not always in the generally accepted sense of the term *security*. During the first half of the twentieth century, *transport security* was taken to mean mainly transport safety, i.e. preventing accidents in passenger and freight transport. Nowadays, besides this traditional interpretation, the term is used in a wider sense and covers a number of different issues.

The following definitions more adequately reflect our contemporary understanding:

- Safety: "freedom from unacceptable risk" [1];
- Security: "a combination of measures and human and material resources intended to safeguard ... against acts of unlawful interference" [2].

Frequently, the topic *security and transport* is defined as *security and trade facilitation* and the two should obviously be considered as synonymous [3].

One of the most striking aspects of the way in which the concept has evolved is the idea that transport security is an inseparable part of the security of modern society. As a result, particular attention is now being paid to ensuring high safety standards for passengers and goods in transit on national and, especially, international transport networks. Achieving this strategic aim requires an integrated approach to a number of important issues, such as: increasing the reliability of transport systems, a prerequisite for safe and punctual transport services; eliminating or limiting possible threats to passengers and goods during transport, including defence against terrorist attack; minimising the risks of natural disasters; providing safe accompanying services; organising the prevention of smuggling, illegal drugs and arms traffic, etc.

Since a thorough examination of all these aspects would be impossible in a short study, this presentation focuses on three topics which are currently of prime importance for developing co-operation in Europe, and especially for accelerating the economic and social integration of the Southeast European countries (SEECs) with the rest of the continent. These are:

- New factors influencing transport security development;
- Policies and actions aimed at increasing security in transport;
- Some problems with trade facilitation in Southeastern Europe.

Under the last item, a case study is presented illustrating practical problems and difficulties at border crossings in the SEECs.

2. TRANSPORT SECURITY AS A PRESENT-DAY PROBLEM

As already mentioned, transport security originally meant mainly transport safety. Although huge progress has been made on improving safety during the past few decades – especially in air transport – it remains one of the most important security problems in Europe. Statistics show that about 40 000 persons die every year in road accidents and almost 1 000 lose their lives as a result of accidents involving other transport modes [4]. Under these circumstances, the main actors of the automobile industry, the EU, government administrations, research institutions, non-governmental organisations, etc., are continuing their efforts to reduce the number of accidents and casualties through appropriate policies and actions [5, 6].

However, a number of other economic and social factors have emerged in recent years and imposed new requirements on transport security. Among them, *economic globalisation* now plays a very important role.

As a matter of fact, the intensification of international economic co-operation demands higherquality transport services in terms of punctuality and security. Moreover, safe and reliable transport is increasingly becoming the *sine qua non* of successful development in the modern world economy.

The *boom in tourism* at the end of the last century gave strong impetus to fast growth in international passenger transport. More and more countries are developing tourism as an important part of their national economy and this remarkable progress has brought various transport security issues to the forefront, and prompted policies leading to their resolution.

The *climate changes* currently taking place on our planet are not only a long-term problem of the utmost importance for the existence of humanity, but in some cases appear to pose a threat to transport systems as well. Therefore, they must be taken into consideration in creating and managing transport resources and networks. The recent disasters – not only the *tsunami* in South-East Asia but disasters on other continents, including Europe – are a serious argument in support of appropriate measures, which should protect transport systems from such catastrophic events.

On the other hand, as the principal consumer of fossil fuels, world transport is the main contributor to the greenhouse effect and therefore to climate change. Security for future generations must be ensured through the development of clean and environmentally safe transport systems.

The *development of new transport technologies* is another factor that requires the implementation of new security concepts and measures. The operation of high-speed trains, very high-capacity aircraft, ultra-heavy tankers and other modern means of transport, along with the more widespread use of multimodal transport systems for both freight and passenger transport, will require more efficient action and at times even totally new approaches in solving transport security problems.

At the same time, some modern technologies are offering new tools for improving trade facilitation/security. These are chiefly information and communications technologies (ICT), which are opening up a new era in transport operation and management.

The internationalisation of *organised crime and terrorist attacks* over the past thirty years has added a new dimension to security issues.

Persisting tension and conflicts that periodically flare up at various flashpoints throughout the world pose serious threats, especially to transport systems. The tragic events in the United States on 11 September 2001, the terrible crime at the Atocha railway station in Madrid in March 2004, the gas attack on the Tokyo subway and many other terrorist acts have targeted components of these systems and have shown that transport is very susceptible and unfortunately still vulnerable to such attacks.

International drug traffic is also emerging as a major problem, directly related to trade facilitation/security, and therefore necessitates new efficient measures and counteractions.

The rapid *propagation of some atypical diseases* over long distances and across borders makes it evident that new standards for sanitary, veterinary and phytosanitary protection and control will have to be adopted and maintained by transport operators.

In the light of all of these factors, transport security has become and will remain a fundamental issue.

3. THE INTERNATIONAL COMMUNITY: POLICIES AND ACTIONS TO IMPROVE TRANSPORT SECURITY

The growing awareness of the need to focus more efforts on global security has led to the adoption of new policies and initiatives in this area worldwide. These consider transport as a very important field in which a great number of measures will be needed to minimise a wide range of risks for passengers and goods.

An analysis of the steps already taken or planned for the near future by different countries leads one to the conclusion that international co-operation on enhancing trade facilitation/security is very active at all levels.

A number of influential international institutions – the EU, G8, ASEAN, the UN and NATO – have voiced their commitment to protecting the safety and security of transport networks in the new political and socio-economic context and in compliance with the generally accepted contemporary concept of security [7, 8, 9 and 10].

Several bilateral and multilateral initiatives have also been planned and launched with the aim of increasing transport security and safety in all spheres. For example, the EU and the US have actively co-operated and reached an agreement on the Passenger Name Record [11]; significant progress has been made with the implementation of joint initiatives on container security [12]. The ASEAN countries and Japan have successfully continued to implement their own joint Maritime Transport Security Program and Automobile Technical Cooperation Project on Safety and Environment and, in 2004, launched a new joint initiative – the Aviation Security Project [13].

It should be noted that, while there is some logical divergence, international and national policies converge on several priority issues:

- Protecting air transport against terrorist attacks;
- Increasing port and ship security;
- Improving container security;
- Enhancing passenger and freight rail transport security;
- Improving surface transport conditions for hazardous materials;
- Reducing the vulnerability of transport networks to all kind of threats (terrorism, natural disasters, emergency situations, etc.).

In the aftermath of the terrorist attacks of 11 September 2001, which turned transport security into a high-priority issue, large scale research work has been conducted in different countries. This work is aimed at the preparation of new legislation, the study of various risk factors, the creation of more reliable security systems, etc., and has been accompanied by a large number of administrative and practical measures.

The following short review covers policies, actions and trends in enhancing trade facilitation/security in Europe, the US and certain other countries.

3.1. EU policies and actions

The European Commission (EC) considers transport security issues as part of its strategic task "to help ensure the security of the citizens [4]."

The Directorate General for Energy and Transport (DG TREN) has pointed out that besides the political and humanitarian reasons for pursuing a policy of zero tolerance of any threat of terrorism and common crime, there are also economic reasons. "The direct costs of breaches in transport security, particularly theft, cost the European economy several billions of euros each year. The costs of a major terrorist incident (e.g. interruption of trade, loss of life, cost of diversions, etc.), involving a key piece of transport infrastructure, could also be of major concern for the European economy [14]."

It is expected that in a forthcoming policy statement the Commission will "urge national governments and industry across its 25 member nations to equip themselves with high performance monitoring and reaction systems to safeguard passengers travelling by road, rail, inland waterways and maritime transport against terrorist events [15]."

Currently, the EC is funding several pilot projects on new security technologies, which are to be completed by 2007. Spending on security and defence research in the Commission's budget is expected to amount to $\notin 1$ billion per year over the period 2007-2011 [15].

Following its policy of long-term commitment to transport security, the EC supports a number of institutions engaged in security research.

One of these is the Institute for the Protection and Security of the Citizen (IPSC), which is part of the EC Joint Research Centre: "IPSC provides research-based, systems-oriented support to EU policies so as to protect the citizen against economic and technological risk. The Institute maintains and develops its expertise and networks in information, communication, space and engineering technologies in support of its mission [16]." The Institute has eight research units which cover three application areas:

- Non-proliferation and nuclear safeguards;
- Anti-fraud, compliance monitoring and cyber security;
- Risk management and mitigation.

A number of national research institutions are also involved in security research. Some of them cover transport security as well.

For example, the *Institut für Verkehrssicherheit und Automatisierungstechnik* (Institute for Transport Security and Automation), based in Braunschweig, Germany, is specialised in this field. This research organisation focuses its activities mainly on the technological aspects of security: application of a systems approach to transport security problems, increasing vehicle safety and transport system reliability through the implementation of automatic control, modern ICT, etc. [17].

A recent EC initiative aimed at improving security research was the launch of a Preparatory Action for the purpose of preparing an EU Security Research Programme, starting in 2007 [18]. The Action will be organised outside of the 6th Framework Programme and is to last for three years. Budget provisions for the period 2004-2006 total €65 million.

The priority areas of the Programme will be:

- Improving awareness of the situation;
- Security and protection of networked systems, infrastructures, utilities;
- Protecting against terrorism (including bio-terrorism);
- Enhancing crisis management;
- Achieving interoperability/integrated systems for information and communications.

Research work under this programme will be built on existing complementary activities.

According to information from EC sources, transport issues will be also included in the future EU Security Research Programme.

The forthcoming Inaugural European Homeland Security & Emergency Management Conference, *Homeland Security Europe 2005*, is expected to generate new initiatives in the field [19].

3.2. US policies and actions

The US Government has always followed a consistent policy of high transport security, but after 11 September 2001 many new initiatives were launched.

There are a large number of government institutions which deal with transport safety and security issues, including:

- US Department of Homeland Security (DHL) [20];
- US Department of Transportation (DOT);
- US Transport Security Administration (TSA);
- Federal Aviation Administration (FAA);

- Federal Railroad Administration's (FRA) Rail Safety Advisory Committee;
- Federal Highway Administration (FHWA);
- US Environmental Protection Agency (ERA);
- General Accounting Office (GAO);
- US Coast Guard (USCG);
- American Association of State Highways and Transportation Officials (AASHTO) Special Committee on Transportation Security Items [21].

In recent years, a series of government security programmes have been launched, covering all transport modes and the transport sector as a whole [20]. These include strategic security plans (DHS National Response Plan, National Incident Management System, ERA Homeland Security Strategic Plan, etc.), new legislation and regulations (Maritime Transportation Security Act, rules for the secure transport of hazardous goods, USCG maritime security regulations, etc.), research and development strategies on various transport security issues, and others. Considerable financial resources are provided by the Government for these initiatives.

A number of non-government institutions – centres, universities, associations etc. – are also involved in studies and research activities related to transport security. Some of them publish very interesting reports containing relevant information. For example, in March 2004, the RAND Corporation issued a report on a study on terrorism and rail security [22], which provides a thorough analysis of the problem and highlights the main steps for improving the situation.

It is significant that many initiatives are undertaken by consortiums composed of different government and non-government institutions. For example, the FHA (Operations Security) works on emergency preparedness and management, in close co-operation with other DOT administrations and Federal agencies, its State and local partners, universities, industry associations and the private sector [23].

Another example of best practice is the on-going research programme started in 1996-97 by the Mineta Transportation Institute (MTI) at San Jose State University, and supported by government institutions. MTI was established in 1991 by Congress and focuses on international surface transport policy issues as related to three priority areas: research, education and technology transfer [24].

The programme focuses on the security of public surface transport against terrorist attacks and other serious violent crimes. Phase I identified best transport security practice in Paris, Atlanta, New York and on Amtrak, as well as on nine other transportation systems in the US.

The main results of Phase II were published in a thorough and comprehensive study in 2001 [25].

The Transportation Research Board also conducts a number of interesting research activities relating to transport security. Most of them result in publications covering a wide range of issues [26].

3.3. Other countries' policies and initiatives

For the past 10-15 years, practically all industrialised countries have been committed to anti-terrorist policies, and after 11 September 2001 efforts in this area were stepped up. Besides countries like the UK, Spain and France, which have been combating terrorist organisations for decades and have acquired considerable experience in this area, several other governments have

started to mobilise more resources for improving legislation, building appropriate structures, supporting transport security research and staff training.

The *Government of Canada* is systematically implementing a range of initiatives to improve security on all transport modes. For example, Canadian \$2.2 billion have been allocated to improving Canada's air security. On April 2004, a C\$308 million programme to support marine security was announced. A number of measures taken have aimed at improving the safety and security of the surface transport system: security enhancement at strategic points (bridges and tunnels); deployment across the country of advanced systems for emergency response management (Intelligent Transport Systems); ensuring safe and secure transport of dangerous goods; enhancing security of passenger rail transport at critical locations and facilities etc. [27].

The *Australian Government* works actively to enhance security of the country's entire transport system. The main activities are carried out under the National Counter-Terrorism Plan, and aim to:

- "provide strategic leadership and national consistency in transport security;
- set and enforce a preventive security framework for aviation and the maritime sector; and
- work with State and Territory governments to implement effective and consistent preventive security measures in road and rail transport [28]."

An important role is played by the Department of Transport and Regional Services, which provides policy advice to the Government and is in charge of the development of a National Transport Security Strategy. It is also developing a national threat and risk assessment strategy for transport security and is engaged in the development and implementation of a Transport Industry Assurance Advisory Group, as part of the Trusted Information Sharing Network.

Although fewer publications are available on other industrialised countries, it is well known that some, such as Russia and Japan, have transport security strategies and carry out relevant activities, as well as participating in initiatives in an international framework [9, 13 and 29].

4. SOME TRANSPORT SECURITY PROBLEMS IN SOUTH-EAST EUROPE

4.1. Improving the reliability of transport links between Southeast European Countries and with the rest of the continent

Southeast Europe's transport links have always been part of the global European network. Even before the substantial socio-economic changes that took place on this part of the continent in the 1990s, road, railway, water and air transport in Southeast Europe had been efficiently integrated into the transport systems of the old continent. Practically all national transport administrations of the SEECs were members of, or worked in close co-operation with, the main international organisations, such as the UIC¹, EUROCONTROL², the IATA³, the RTU⁴, etc. Consequently, basic standards for transport security were adopted and applied in the SEECs. However, the fundamental reforms implemented in these countries have given rise to a number of challenges relating to security, and particularly to transport security.

Some of these security problems were of the same nature as those faced in EU countries and were caused by the same global factors.

The other set of problems facing the transport systems of the SEECs after 1990 resulted from the institutional and financial destabilisation of transport structures, which was itself the logical consequence of the deep socio-economic crisis that had occurred. Although significant progress was made in the period 2000-2004, some specific problems still persist and are hindering speedier development of the region and its more efficient integration into EU structures.

The following are typical transport security issues in the SEECs:

- Punctuality of road and rail public transport;
- Threat of attacks on road vehicles;
- Corruption problems;
- Inadequate safety of associated services (hotel accommodation, bank services, medical care, information and communications services, etc.).

The poor performance of public transport in terms of punctuality is an old problem in Southeast Europe. It is due to multiple factors – ranging from obsolete and underdeveloped infrastructure and vehicle fleets to lack of appropriate management culture and traditions. Since attaining the normal European standard for this criterion depends to a large extent on financial resources, no significant progress has been made over recent years and, therefore, punctuality will remain a challenge for the SEECs in the near future.

The security of rail and road transport links in the SEECs is not yet good enough. Attacks on road vehicles are periodically reported, particularly in Bulgaria. The victims are mostly foreign tourists or trucks transporting valuable goods, which is an indication that the authorities are facing organised crime, supported – unfortunately – by corrupted customs or border control officers.

Police forces in these countries are systematically fighting such gangs – not without success – but obviously more co-ordinated efforts by a number of institutions are necessary to solve this problem. Especially in Bulgaria, the reform of the judicial system is of the utmost importance, as its poor efficiency is considerably slowing progress in eradicating organised crime and improving security in the country.

In some cases, foreign freight carriers or passengers travelling through the SEECs are blackmailed by corrupt customs, border control or police officers. Although there are not so many such cases, and the statistics show a declining trend, this phenomenon has a very negative impact on passenger security and requires severe anti-corruption measures from all SEEC governments.

Transport security in the broader sense also includes the safety of all associated services when travelling: safety of hotel accommodation, bank services, medical care, information and communication services, etc. In this area, the SEECs have obtained relatively good results since 1990, but have not yet reached EU standards. The gap is particularly wide in medical services.

Generally speaking, more and better co-ordinated action is still needed to achieve a high standard of safety in all these services.

In order to overcome existing obstacles, more attention will have to be focused on:

- developing and upgrading infrastructure and existing transport facilities to European standards;
- modernising rail and road fleets;
- implementing joint policies and carrying out co-ordinated actions to combat organised crime and corruption;
- supporting the development of all associated services related to transport security.

Quite clearly, these problems will not be solved by isolated or sporadic action. *Infrastructure development*, for example, requires considerable investment that cannot be provided by national sources alone. There is already awareness at national and European level that more financial resources will have to be mobilised for regional transport infrastructure projects, and a number of strategic EU projects are planned or already under way.

A series of links along European Transport Corridors IV, VII, VIII, IX and X will be built or upgraded in the near future, with key financial support from the EC [30].

This long-term EC policy will help to achieve a substantial improvement in rail and road networks in the region and hence in transport security.

Modernisation of the rail and road fleets in the SEECs is also problematic, as it requires the availability of substantial investments, often beyond the capacities of the local stakeholders. For this reason, it is very important to proceed with speedy liberalisation of the transport market, which will guarantee free access to private operators from the EU countries and so contribute to improving the quality and security of transport services.

The latest up-date of the relevant legislation in Bulgaria and Romania, in connection with their preparation to join the EU, is a very positive step and there is every prospect that it will bring positive results soon.

The *fight against organised crime* must also be carried forward by both national and international institutions. It is well known that the main routes for drug imports from Asia to western Europe are across the Balkan Peninsula. According to an Interpol estimate, by 1991, 65-75 per cent of the heroin seized throughout the continent came in via the "Balkan route" and, despite some changes in the last decade, the area remains a key link in European transport security channels [31].

Hence, the efficiency of national customs and security services plays a very important role in reducing drug traffic through the SEECs.

4.2. Practical problems and difficulties at border crossings in Southeast Europe – case study

Border crossing points are very important elements of the transport links between countries all over the world. However, since the creation of the Schengen area, they have virtually disappeared within the EU [32]. As this historical achievement has not yet reached all of the SEECs, problems crossing borders in Southeast Europe have to be studied and appropriate measures will have to be taken in order to remedy them.

In 1997-98, a study focusing on this issue was carried out by the Southeast Europe Transport Research Forum (SETREF) [33, 34]. It attempted to identify the main difficulties and to propose adequate measures for improvement. The study was based on data acquired in Bulgaria, Greece,

Romania, Slovakia and Yugoslavia, and therefore could be considered as sufficiently representative of the region.

The main results and conclusions for the rail and road border crossings studied are presented here, as they are still pressing issues for transport security in Southeast Europe.

4.2.1 Types of procedure at the border crossings covered by the study

The system of border controls usually includes:

- passport (police) controls;
- customs controls;
- railway administration or road administration controls;
- sanitary, veterinary and phyto-sanitary controls.

Other types of control procedure may also be directed, for example, against crime, drug trafficking and smuggling, or aimed at increasing traffic, etc.

Although every country has its own rules and methods, police and customs control procedures have to comply with international standards set by multilateral conventions and, as a whole, they follow a set routine. Equally, both rail and road transport are subject to a variety of international regulations, so the main control procedures applied by the respective administrations are also similar in all of the countries studied.

However, the implementation of border controls varies significantly in each case, influenced by a number of local factors. The most important of these are:

- Infrastructure development for adequate accommodation of services, parking and movement of vehicles and people;
- Implementation of modern telematics and other technical control methods;
- Availability of adequate equipment;
- Organisation structures of the authorities;
- Co-ordination with neighbouring administrations;
- Staff motivation and training.

The result of the combined influence of these factors is waiting time at border crossings. This parameter has been chosen as the main criterion for assessing border crossing efficiency. At the same time, the contributing factors above were also analysed, as far as possible.

4.2.2 Railway border crossings

Passenger trains

Waiting time at the border crossings for passenger trains in Southeast Europe has a major impact on the total transit time. In order to clarify the reasons for excessively long stops at borders, two pairs of international express trains were studied, connecting Thessaloniki and Munich (the northbound D334, D392 and the southbound D335, D393, see Figure 1). For these trains, the total scheduled waiting time at borders is four hours, while the observed average time totals five hours.



Figure 1.

After a thorough analysis, several reasons for this considerable loss of time have been established:

- a. *Increased number of border crossings since the dissolution of Yugoslavia.* Before its dissolution, this country accounted for four out of a total of six control points; now there are twelve such points (with actual controls taking place at ten of them). On the alternative route through Hungary, the problem is also severe, since there are ten control points.
- b. *Passport and other police controls,* including a basic security check of all wagons. Due to issues of a political nature (especially between the former Yugoslav republics and between Greece and the FYROM), police and customs controls are more scrupulous and time-consuming, while new formalities have been introduced for passengers of certain nationalities (e.g. issuing of visas). This produces a marked difference in the time taken by police controls on trains running in opposite directions.
- c. *Issuing visas at border stations* (at Gevgelija, Tabanovci, Dobova, Jesenice and Kelebia) can in some cases cause additional delays, especially for overcrowded trains.

- d. *Customs checks* as well as sanitary, veterinary and phyto-sanitary controls. These include the following procedures:
 - Control of baggage;
 - Filling in declarations for or clearance of valuables;
 - Passport control for contraband suspects or for persons with anything to declare;
 - Inspection of wagons for hidden contraband;
 - Inspection of accompanied cars;
 - Control of veterinary documents for pets.

The time needed for these checks (some of them are facultative) depends largely on a number of factors. Some, such as the number of non-EU citizens on board, are beyond control, but some are appreciably affected by the availability of staff, facilities and organisation.

For example, valuables are usually declared at the border station, while other controls take place on board. So, if all of the formalities could be taken care of on board, the time needed for customs control could be reduced to zero.

- e. Control procedures carried out at border stations by railway administrations. These are virtually standard in all border crossings and include:
 - inspection of the train;
 - recording of wagons by the neighbouring administration;
 - change of locomotive (optional) and brake application control;
 - issuing tickets for some passengers.

As a rule, all these tasks are performed concurrently by round-the-clock shifts and take from five to twenty minutes (the latter if the locomotive is changed). In some cases, ticket issuing or – though not frequent – locomotive or passenger car failure or telecommunications problems can lead to additional delays.

According to the above, police controls are the critical activity that defines the waiting time at borders. Waiting time – which depends on the time spent on data input – is proportional to the number of passengers. Therefore, during summer peaks (especially for the D334), border delays are due to more time-consuming police control procedures.

Table 1 shows the distribution of scheduled and observed waiting times for the trains under study.

Border station	Scheduled waiting time	Observed waiting time	Visa issue	Loco change
	32 min (334)	52 min		
Idomoni	29 min (392)	30 min	NO	(VES)
Iuomem	35 min (335)	65 min	NO	(11.5)
	54 min (393)	72 min		
Gevgelija	30 min	30 min	YES	YES
Tabanovci	25-30 min	40 min	YES	NO
Presevo	30 min	40 min	NO	NO
Savski Marof	1 min	1 min	NO	NO
Dobova	15 min	15 min	NO	YES
Jesenice	15 min	15 min	NO	YES
Rosenbach	2 min	2 min	NO	NO
Salzburg	17 min	17 min	NO	NO
Freilassig	-	-	NO	NO
Subotica	40 min	45 min	YES	NO
Kelebia	25 min	40 min	YES	YES
Hegyeshalom	2 min	2 min	NO	NO
Bruck a.d. Leitha	1 min	1 min	NO	NO

Table 1. Scheunen and observen warning times for tran	Table 1.	Scheduled	and	observed	waiting	times	for	trains
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A further investigation of the main factors influencing international passenger train delays was carried out on the basis of data collected by the Bulgarian State Railways (BDZ) for the period 1 January to 31 December 1997.

Figures 1a) and 1b) show the breakdown of delays for each component at border stations: Kalotina (border between Bulgaria and Yugoslavia) and Svilengrad (border between Bulgaria and Turkey) for international express train 15, Budapest-Istanbul (Figure 1). The same distribution for train 14, Istanbul-Budapest, is given in Figures 2a) and 2b).



Border station Kalotina - Train 15 (Budapest-Istanbul) Scheduled waiting time - 34 min Observed delay (mean value) - 44.7 min



Figure 1b)

Border station Svilengrad - Train 15 (Budapest-Istanbul) Scheduled waiting time - 35 min Observed delay (mean value) - 85 min





Border station Svilengrad - Train 14 (Istanbul-Budapest) Scheduled waiting time - 50 min Observed delay (mean value) - 104.9 min





Border station Kalotina - Train 14 (Istanbul-Budapest) Scheduled waiting time - 32 min Observed delay (mean value) - 118.8 min



The analysis of delay component distribution shows that the most frequent reason for longer waiting times was (again) police controls.

The checking procedures are similar to those applied at the borders of the other countries in the study. Passport control is usually carried out on board, except where any additional checks are necessary, in which case the documents of individual passengers can be brought to the police office. The observed delays are due in most cases to *overcrowded trains and understaffing*. The same factors result in delays for customs controls.

As to railway administration procedures, they rarely cause delays. The fact that there is no locomotive change at Kalotina (Bulgarian locomotives continue on until Nish, in Yugoslavia), means that it is possible to reduce the time necessary for this type of control.

The impact of the passenger numbers on the time taken for passport and customs controls, and consequently on train waiting times can be observed by analysing delays on the Sofia-Bucharest and Bucharest-Sofia trains at the Russe border station, for the months of June and July (Table 2).

	Train					
	27/382 Sofia- Bucharest	383/26 Bucharest- Sofia	411/482 Sofia- Bucharest	481/410 Bucharest- Sofia		
Scheduled waiting time, min.	85	175	35	35		
Delay, min. (observed mean value)	1.5	33.2	28.5	1.8		

Table 2. Delays for specific trains at the Russe border station

There is an obvious asymmetry in the parameter under study, due to the significantly higher number of passengers travelling by trains 383/26 and 411/482. A substantial number of these passengers are street vendors who make one-day trips to the neighbouring country, crossing the border in one direction in the morning and coming back in the evening.

The effect of the number of passengers can easily be observed from the length of delays in the course of the year. Figure 3 shows this impact for train 26/283.





Train 26/383, entry station Russe. Change in delays in the course of the year.

Freight trains

For rail freight transport, the most time-consuming activities are customs controls. These usually comprise:

- wagon recording;
- inspection of the lead seals (affixed by customs at the loading station);
- cross checking of customs documents with the documents delivered by the railway administration (regarding wagon numbers);
- controls of accompanying documents.

The latter depends on the transport direction (export or import), local and international regulations, transported goods, etc. The most frequently used accompanying documents are: export licences, export declarations (item description, value, volume, codes), bills of lading, invoices, veterinary control certificates, etc.

The observed times taken for freight train controls vary widely (see Table 3).

	Transit (minutes)						
Stations	Railway admin. Customs		Veterinary examination	Phyto- sanitary examination			
1	2	3	4	5			
Subotica (H)	49.0	50.0	29.0	—			
Kikinda (RO)	_	_	_	_			
Vrsac (RO)	95.0	43.0	_	_			
Dimitrovgrad (BG)	_	_	_	_			
Presevo-Ristovac (FYROM)	52.0	37.0	31.0	-			
Deneral Jankovic (FYROM)	_	_	_	_			
Average time for all stations	65.3	43.3	30.0	_			

Table 3.	Average	delays fo	r freight	trains at	selected	border	crossings
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In some cases, specific factors can give rise to additional difficulties. For example, at the Cierna station on the Slovak-Ukraine border (where bogies are changed because of the change in gauge), hold-ups of goods transit trains destined for Russia were observed. These delays were due to administrative problems between the two countries.

4.2.3 Road border crossings

Since 1990, road transport has been playing a greater role in some eastern European countries (Slovakia, Bulgaria, Romania, etc.) Consequently, the distribution of international passenger and freight flows in the area is changing.

There are prospects that the resulting road traffic increase will lead, in the long term, to the development of adequate border crossings facilities. However, for the time being they are not yet ready to meet the requirements of heavy truck and passenger cars flows.

Since no reliable records of waiting times at road border crossings have been found, this part of the study focused on analysing the current situation and outlining the main factors influencing waiting time.

Excessively long waiting times, sometimes several days for trucks entering Bulgaria at certain road border crossings, were typical. The main factor behind such intolerable delays was an *inadequate customs service*, the lack of modern facilities, unmotivated staff and poor organisation.

Serious difficulties have been observed at the new borders established between certain countries in the wake of the political changes in eastern Europe after 1990. They were due, to some extent, to the *lack of adequate infrastructure and equipment*.

For example in Slovakia, some of the worst delays occurred along the newly established Czech border (although in general, waiting times/delays at Slovak borders were not serious and were reduced over the period 1994-97). The same problem was found in Yugoslavia, where the poorest level of

infrastructure was noted at border crossings (Presevo and Batrovci) with the newly established countries in the former Yugoslav area.

There were also some border crossings with insufficiently developed infrastructure in Romania. (Giurgiu, Nadlac, Bors Calafat, Bechet, Iron Gates 1, Siret, Sculeni and Oancea).

The analysis of the situation at road boarder crossings in Yugoslavia (the number of transit vehicles at Yugoslavian borders in 1996 totalled 38 546) showed that the major obstacles encountered were related mainly to political problems.

Passengers and goods from Yugoslavia were subject to different procedures to those applicable to passengers and goods in transit through Yugoslavia (foreign shipping companies or citizens from foreign countries who were in transit). Procedures for EU countries were also different to procedures for other countries. The main reason was that *Yugoslavia was not authorised to issue or receive a number of documents* which are necessary for quick and efficient passport and customs formalities (Green Card for insurance, TIR carnets for freight transport, permits for Yugoslav carriers to transit through certain other countries). On the other hand, Yugoslavia applied some of these measures reciprocally to foreign carriers. For example, at the border, foreign drivers had to pay fees for insurance during their stay in Yugoslavia, or for transit through Yugoslavia, and this also caused delays. If drivers or passengers did not have visas, the delays became longer and the procedures more complex.

In the case of vehicles in transit to countries where the relevant documents were not accepted, delays were longer, because the taxes and formalities required had to be settled through forwarding agents. Since there were no other payment facilities with the countries concerned, most frequently drivers had to bring cash to pay the relevant taxes.

Another reason for excessive delays at road crossings in Yugoslavia was the relatively complex organisation of control procedures and inadequate or no modern equipment.

For example, customs clearance for Yugoslav carriers was right at the border. This sometimes caused longer delays, as vehicles in transit waited in the same line with Yugoslav carriers. In some cases, lack of equipment at the border crossing for a specific commodity, necessary for sanitary control, meant that some goods (or samples) had to be sent to larger urban centres for inspection, which also extended the waiting period.

The analysis, carried out in 1998, showed a number of problems at road border crossings in eastern European countries. However, it also showed some positive experiences that should not to be neglected.

- Since 1991, Romania and Bulgaria with significant technical assistance from the PHARE programmes have taken a series of steps aimed at improving existing infrastructure and facilities at a number of road border crossings;
- Rapid and very positive progress was noted in Slovakia with infrastructure upgrading, implementation of ICT and improvement of the organisation of clearance procedures;
- At some border crossing points (primarily at railway stations) waiting time was reduced to a minimum. This was the case at Savski Marof/Dobova (on the border between Croatia and Slovenia), Jesenice/Rosenbach (Slovenia/Austria), Hegyeshalom/Bruck an der Leitha (Hungary/Austria), etc.;
- A modern, computerised information system for freight railway wagons was in operation on the Bulgarian-Turkish border;

• Reciprocal procedures improved co-ordination between the teams on both sides of the Yugoslav-Bulgarian border.

4.2.4 Measures to improve conditions at border crossing points, outlined in 1998

Improving infrastructure and facilities at border crossings

This is one of the most important long-term tasks, one which could substantially improve capacity at a number of border crossings and consequently reduce waiting times. The task has already been defined and a series of actions have been undertaken by some of the countries involved, most of them with the assistance of the EU's PHARE programme. The study confirmed the need to continue the infrastructure projects already started and to expand them to include crossing points at which underdeveloped infrastructure causes considerable delays.

Among the priorities in this field are:

- For road crossing points: construction of new lanes (especially for trucks), construction of new facilities and renovation of existing facilities for weighing, cleaning and sanitary control, enlargement and rehabilitation of parking areas; construction of new access roads, etc.;
- For rail crossing points: modernisation of existing telecommunications links and signalling systems, installation of axle counters, construction of facilities for cleaning and sanitary control of rolling stock, construction or upgrading of terminals for combined transport operations.

It is important to note that the shortage or total lack of modern communications and computer equipment for all services – police, customs, and national road and railway administrations – is a crucial issue which should receive most attention in the near future. Modernisation could quickly yield dividends, bearing in mind that the rate of investment in this field is relatively low (compared with investments in other infrastructure improvements), and the potential positive impact is quite high.

Simplifying procedures and harmonising regulatory documentation

Although the main documents that have to be checked during inspection procedures are governed by international regulations and have therefore been standardized, in many cases considerable difficulties can arise when documents differ. Such problems are typical at Yugoslav border crossings, but have also been observed at the borders of EU countries (Greece and Austria). Hence, further steps will have to be taken to attain a higher standard of harmonization of regulatory documentation and to simplify control procedures.

Rationalising procedures and improving organisation

The study established that almost all border crossing stations are suffering to some extent from shortcomings in the organisation of controls. On the other hand, it is common knowledge that in many cases a simple change in organisation can lead to a significant increase in crossing point capacity. At road crossing points, for example, the introduction of a flexible system for assigning traffic to existing lanes provides an adequate response to the intensity of vehicle flow.

The analysis showed that, with very rare exceptions, joint organisation of controls at border crossings is not the practice. Considering that the experience of many countries shows that this is the

most effective and least time-consuming system, the efforts of the countries involved must be directed towards its implementation.

Staff training

Regular staff training and refresher training is a prerequisite for more efficient implementation of controls. It plays a key role in the introduction of new, modern techniques, especially computer-aided technologies, telematics, etc. Staff refresher training is also needed for the correct interpretation of updated documents, and will be important for the implementation of new harmonized procedures.

4.2.5 The period since 1998

Waiting times at border crossings in the SEECs have not been systematically studied since 1998. However, some qualitative assessments can be given, based on observations at Bulgarian border checkpoints.

The situation at the four *border railway stations*, Kalotina, Russe, Svilengrad and Kulata, has shown no substantial improvement: quite the opposite. Since 2000, train delays have tended to increase, particularly at Russe and Kalotina stations, where they are sometimes excessive. While these deviations from the schedule can mostly be put down to cumulative delays on neighbouring networks, because of rail track repair work, for instance, they are also frequently caused by inadequate implementation of border control procedures – especially customs control procedures – on both sides of the border. For this reason, in the near future, the Bulgarian and Romanian governments are considering the organisation of joint control procedures by teams of Bulgarian and Romanian passport and customs control officers. The expectation is that this will drastically reduce waiting times at border crossings.

Although railway administration control procedures themselves are not too time consuming, freight trains are increasingly delayed at border stations for purely technical reasons. The old freight wagon fleet is already proving to be an additional obstacle to normal operation in the region.

There are no projects for renovating and upgrading railway stations on Bulgaria's borders with Greece and Turkey.

Information on *road border crossings* is not any more optimistic. Despite some improvements in infrastructure (opening more lanes, enlarging parking areas), and more rational organisation (Svilengrad), there has been no appreciable change in waiting times, with the exception of the border crossing with Greece.

Some of the obstacles identified in 1998 no longer exist. For example, the administrative difficulties which existed in Serbia and Montenegro because of regulatory differences have been successfully resolved. However, bottlenecks are still regularly observed at border crossings with Romania, Turkey and Serbia and Montenegro. The situation at the Kalotina checkpoint has deteriorated dramatically during the last year. Some days, there are queues of vehicles more than 20 km long on both the Bulgarian and Serbian sides of the border.

These can be put down partly to the lack of motivation of the staff involved in control procedures and to bad organisation, but one particularly negative impact is the appalling condition of several access roads, where the average speed cannot exceed 20 km/h.

Corruption is still a common problem at both rail and road border crossings. Very often, routine standard control procedures are used by corrupt officers to blackmail passengers and drivers; this also causes delays and creates a depressing atmosphere.

The lack of any substantial progress at border crossings in the region suggests that even some good infrastructure projects – such as those of the Southeast European Co-operative Initiative (the SECI programme) – are unable to solve the major problems and deliver positive results in the short term.

4.2.6 Conclusions

- This analysis of the situation at border crossings in the SEECs shows that there are a considerable number of outstanding problems. An objective assessment of the scale of work ahead leads to the conclusion that it will not be possible to achieve immediate and radical change. However, sustained efforts by all of the countries involved would bring the necessary improvements.
- The design of a rational and realistic strategy, as well as good co-ordination of action by all participants in this process the countries of the area, the EU, various national and international organisations and financial institutions is a prerequisite for the success of this initiative.
- Rational scheduling of the action to be taken in line with short- and long-term priorities will also be crucial. Some very important projects along these lines have started under the Southeast European Co-operative Initiative (SECI).
- Experience from recent years shows that some problems, for example, staff training and motivation, corruption and ICT implementation, will take more time than initially envisaged and therefore more effort will have to be concentrated on them.

5. ACHIEVEMENTS AND CURRENT TASKS IN TRANSPORT SECURITY DEVELOPMENT

The events of 11 September 2001 have considerably accelerated the development of transport security and, as a result, substantial progress has been made on several fronts. Summarising the findings from this short survey, the following *positive results* warrant mention.

- a) A worldwide consensus has been reached concerning the need to improve transport security through consistent policies and appropriate measures. The governments of the industrialised countries are committed at national and international level to ensuring higher safety and security standards for transport networks, and their efforts are supported by the entire international community.
- b) A common vision of transport security has emerged, and the main principles of a generally accepted concept have taken shape:

- An integrated approach that includes all links of existing transport chains;
- Active international co-operation based on co-ordinated action at different levels;
- Broad harmonization of the regulatory basis and of national legislation;
- Implementation of consistent research and development policies, aimed at improving existing technologies and implementing new methods for the prevention of terrorist attacks and crime, and for the efficient protection of passengers and goods;
- Mobilisation of additional financial and human resources in order to improve transport security;
- Establishment of new administrative structures and/or reform of existing institutions responsible for transport security in order to enhance their efficiency.
- c) Several medium and long-term programmes have been started and include various measures and actions that target practically every transport mode and contribute to the attainment of strategic goals: implementation of a common global standard based on UN/EDIFACT⁵ standards for the collection and transmission of Advance Passenger Information (API); common standards for electronic customs reporting; the development of systems for advance electronic information on containers, installation of automatic identification systems (AIS) on ships, etc. [8].
- d) A series of important national and international documents has been issued and can be considered as a new phase in creating the appropriate regulatory basis for modern trade facilitation/security.
- e) New technologies for enhancing security and ensuring high protection standards have been successfully developed, especially through the implementation of modern information and telecommunications tools. For example, the UK authorities have introduced a CCTV video system for round-the-clock observation of public transport facilities, which has already proved its efficiency. Modern devices for container checking and tracking are under development; GPS-based systems are now widely used for security purposes, etc.

At the same time, there are several problems yet to be solved that set the following objectives:

- a) Even greater awareness of transport security problems among experts, stakeholders, policymakers and industry representatives should be the goal. It is true that the need to improve transport security is already beyond dispute, but there is less understanding about what practical steps are appropriate.
- b) Sources of financing for trade facilitation/security programmes have not been clearly identified, particularly in the EU, where the EC has not yet ensured enough funds to expand all appropriate activities. Besides this, a number of less-developed economies do not have sufficient funds to enable them to participate efficiently in common initiatives. On the other hand, they cannot and must not be excluded from security trading channels, and therefore additional financial support must be provided by industrialised countries [3].
- c) For a number of geographic, political and economic reasons, trade facilities in the SEECs are a very important part of European and global networks. Their security should be considered a key issue in ensuring reliable and safe transport links and appropriate co-ordinated policies must therefore be pursued, not only by national governments but also by the EU and other industrialised countries. The SECI programme is a good example of productive co-operation.

- d) Better co-ordination of policies and action and further productive co-operation between key actors must be achieved. This will improve the overall efficiency of the effort and of the financial resources engaged. This has now become a burning issue in the US, where there is much overlap and duplication of activities and measures. There are expectations that the EC approach will help to avoid such inefficiency, especially in transport security research work, co-ordinated by the Framework Programmes.
- e) An assessment should be made of acceptable risk and the costs of the requisite security measures, not just because it could facilitate fund planning, but because this is a conceptual issue of the utmost importance. Since qualitative assessment of the threat is difficult enough and in some cases even impossible we will have to apply new approaches for determining appropriate security levels, or adapt classical methods such as cost-benefit analyses, for example to this purpose [25].
- f) As air transport is currently more advanced in terms of safety and security, more attention will have to be given to other transport modes, especially to surface transport as its specific characteristics require different approaches and methods [25].
- g) Adequate data protection systems must be developed for modern ICT applications. This issue also relates to the global trade facilitation approach, since new, efficient prevention and protection technologies are, in turn, vulnerable to threats and need special security measures.
- h) Appropriate training has to be organised for a number of target groups involved in the transport sector. Training should improve their knowledge and skills in preventing unlawful interference and their emergency preparedness.

6. GENERAL CONCLUSION

Transport security is a complex problem, and improving it is an on-going process needing sustained, well co-ordinated efforts by governments, international and national institutions and transport operators. The mobilisation of considerable financial and human resources is a prerequisite for the successful implementation of large-scale programmes aimed at substantially improving safety and security in the transport sector. Such programmes should cover numerous issues – ranging from legislation to the implementation of modern prevention and protection technologies. Research and development activities should have a key role in providing appropriate policies and support for action.

NOTES

- 1. UIC Union international des chemins de fer (International Railways Union).
- 2. EUROCONTROLE European Air Traffic Control Association.
- 3. IATA International Air Transport Agency.
- 4. RTU Road Transport Union.
- 6. UN/EDIFACT United Nations Electronic Data Rules for Interchange for Administration, Commerce and Transport.

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ENHANCING TRANSPORT SECURITY AND EFFICIENCY. CONTRADICTION OR CHALLENGE ?

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SUMMARY

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1. INTRODUCTION

Transport infrastructure and equipment has been the target of terrorist action for a number of reasons; among them, it:

- is relatively accessible;
- can attract significant public attention and media coverage;
- is often linked with national symbols such as national airlines;
- can affect large numbers of people in a single strike.

The terrorist attacks of September 2001 in New York and Washington modified probably forever the way security is approached in the transport sector. The use of transport vehicles as actual weapons of destruction, targeting both passengers in the vehicles and individuals located in the target buildings, exposed a whole new degree of vulnerability within the transport system.

Recent events have served to reinforce fear of terrorist action in transport: two terrorist truck-bombs exploded near the British Consulate and a British bank in Istanbul in November 2003, killing at least 27 people and injuring 450. In February 2004, a terrorist bomb exploded in the Moscow metro, which carries upwards of 8 million passengers per day, killing forty and injuring more than one hundred. Later the same month, a terrorist entity threatened to explode bombs throughout the French railway system unless several million euros were paid by the French Government. Shortly thereafter, in March, ten deadly bombs exploded in commuter trains and in three of Madrid's rail stations, killing two hundred people and injuring more than one thousand.

These events have called transport ministries to the frontline to respond, requiring them to co-ordinate emergency response plans with other government agencies – notably ministries of the Interior – and to reassure a traumatised public that all necessary measures are being taken to address the crisis and restore calm.

When the ECMT Council of Ministers deliberated on the topic of transport security and terrorism at their Bucharest Council in 2002, broad-sweeping international policy responses for the aviation and maritime sectors had already been defined and were under implementation within multilateral bodies. On the inland side at that time, international road and rail organisations were examining ways to adapt their existing anti-crime and security structures to respond to anti-terrorism priorities. And national governments were assessing where adjustments needed to be made to national regulations and legislation and where further actions were needed to address the heightened security threat.

The three years since the Bucharest Council have seen considerable progress in the development and implementation of policies to respond to the new transport security climate. They have also seen the emergence of a number of fundamental questions concerning, for example, the balance between tighter security measures – for example, those now in place in the aviation and maritime sectors – and their costs (e.g. delays in travel time of air travellers, as a result of tighter security procedures in airports, and hold-ups in freight movements caused by more stringent port security requirements). Whether tighter security measures can, on the contrary, provide benefits in terms of trade facilitation is also a question under debate at this time.

Ministers in Bucharest recognised the need to reach a balance between enhanced security measures and their costs, while also acknowledging the need to respond to the unprecedented level of perceived terrorist threat that has characterised the transport policy climate since September 2001.

At the same time, methodologies enabling comprehensive assessment of the actual risks of terrorist action, as well as the costs and benefits of measures to mitigate the threat of terrorist attack, are not yet fully developed. Consequently, transport-sector measures are in many cases being defined and implemented without the refinement that comes from solid *ex-ante* assessment.

Whereas transport authorities are called to the forefront in cases of crisis, they do not have all of the legal and regulatory tools at their disposal to take action to mitigate threat or respond to attack. Ministers in Bucharest recognised this, agreeing that a co-ordinated approach to security was essential, both within governments and among countries in a multilateral framework. This multilateral forum exists for both maritime transport and aviation, but has yet to be fully established for inland transport modes and, more generally, for the transport chain as a whole.

This report is organised as follows: Chapter 2 examines policy developments in transport security since 2002 – it also includes a special reference to the transport security measures during the Athens 2004 Olympic Games; Chapter 3 points to some of the key policy questions that have emerged since 2002; and Chapter 4 proposes key conclusions for transport decisionmakers.

2. KEY POLICY DEVELOPMENTS IN TRANSPORT SECURITY SINCE 2002

The 2002 report to Ministers described in some detail the key security aspects of each of the main transport modes and outlined main areas of international and national action within these modes. Building on that information, this chapter will focus on policy initiatives since that time in each of the sectors, focusing on those concerning passenger transport.

2.1. Aviation

Aviation, the initial area of focus in the immediate aftermath of September 11, has undoubtedly received the most attention and most funding for security enhancements since the September 11 attacks. Measures were immediately taken following the attacks to significantly increase scrutiny of passengers and baggage.

Efforts to improve aviation security have continued since that time. In June 2002, the International Civil Aviation Organization (ICAO) adopted a Plan of Action to enhance aviation security, which includes a Universal Security Audit Programme (USAP), designed to be carried out in
co-ordination with the AVSEC audit programme of the European Civil Aviation Conference (ECAC). According to ICAO, approximately twenty countries underwent USAP audits in 2003 and forty more are to be audited in 2004.

In August 2003, the UK Government tightened the control of validation of known consignors of air cargo, with UK Department for Transport-appointed agents carrying out the validation instead of regulated agents and airlines, as was previously the case.

In 2003, the World Customs Organization (WCO), the International Air Transport Association (IATA) and the International Civil Aviation Organization (ICAO) updated the WCO/IATA/ICAO Advanced Passenger Information Guidelines (API), a set of guidelines for administrations and industry, which cover the technical aspects of API as well as their operational costs and benefits. API systems are used to help identify individuals posing potential security risks in advance of their arrival in a country.

In December 2003, the US Department of Homeland Security and the European Union reached an agreement on the sensitive issue of Passenger Name Record (PNR) data transfer, to enhance air passenger screening in advance of entry to the United States. The European Commission and the European Parliament had objected to the US request for use of passenger data, collected through an airline reservation system, citing breach of EU privacy laws.

Following a year of difficult negotiations, the EC found that US privacy protections are legal and sufficient to protect passenger privacy. Under the terms of the agreement, the 34 data elements to be used for screening passengers for possible involvement in terrorist activities or other serious crimes will be retained for no longer than three and a half years.

On the freight side, US requirements for advance cargo information on all flights to the US by no later than four hours before arrival, came into effect in March 2004 for Europe.

In the European Union, EC Regulation 2320/2002 – building on ECAC's Document 30, which provides a policy framework for aviation facilitation – establishes common basic standards for civil aviation security measures in EU countries. These include access control to sensitive areas of airports and aircraft, control and monitoring of passengers and cargo, and enhanced training and physical security measures (i.e. reinforcement of cockpit doors).

Also in the EU, a Commission Regulation, (EC) 68/20045, was signed in January 2004, proposing a detailed list of articles prohibited on European airlines. There are also discussions under way for a regulation on technical specifications for screening equipment.

2.2. Maritime

Maritime transport security initiatives are examined in detail in the ECMT-OECD report on Container Transport Security Across Modes [CS/CCT (2004)1], presented to Deputies alongside the present report. They are therefore not examined in detail here.

Of particular policy note in Europe, however, is the European Parliament and Council Regulation, COM(2003)229, on enhancing ship and port facility security. The proposed Regulation fully aligns the EU with IMO security requirements, transposing the International Ship and Port Facility Security Code (ISPS) into law. Specifically, it presents rules on ship security assessment, security plans, introduction of security officers on ships and equipping ships with enhanced security

devices (e.g. Automatic Identification Systems). Furthermore, a proposed Directive of the European Parliament and Council, COM(2004)76 Final, on Enhancing Port Security, will extend coverage of the Regulation beyond areas covered by the ISPS (only port facilities) to adjacent areas with direct or indirect impact in the port (e.g. rail facilities, warehouses). The Directive also sets out provisions for port security assessments and measures: a distinction of security levels based on the concentration of threat; and establishment of security officers to train staff and monitor the implementation of port security measures.

Also of significance is the recent agreement between the EC and the US to intensify container security co-operation, including expansion of the US Container Security Initiative (CSI) – including its so-called "24-hour before loading" rule, which requires advance cargo information to be supplied to the US 24 hours before loading of any cargo destined for the US – to all ports in the EC. The agreement – in force since June 2004 – will end EU infringement proceedings against eight EU countries that had adhered bilaterally to the CSI. Further agreements of this kind are anticipated between the EC, Canada and countries in Asia.

2.3. Inland transport

The events of September 11 were not the beginning of policy actions to improve security in inland transport. In place already at that time were a number of anti-crime and security measures that have served as a springboard for further, more stringent terrorism-focused initiatives. In this way, 9-11 was a catalyst for focusing the existing transport security policy agenda on terrorism.

Security developments within inland transport modes since 2002 include the following:

2.3.1 Rail

The World Security Forum, organised by the International Union of Railways (UIC) in Rome in October 2002, concluded that security is now a key strategic issue in the management of railway companies and in the delivery of quality rail services.

In this context, the UIC has recently established a permanent security structure within the organisation, the function of which is to monitor rail security issues and co-ordinate security discussions within UIC.

Via its Ad Hoc Security Group, the UIC has recently increased its focus on providing this forum with a basis for multilateral dialogue on rail security issues; specifically, on developing a comprehensive security strategy for the rail sector. Key objectives of the Group include the following:

- To facilitate exchanges of experience and co-operation on security issues among all actors in rail transport;
- To foster sharing of best practice in such areas as protection of sensitive infrastructure, station design and management; measures to prevent terrorist acts on rail infrastructure and vehicles; organisation of rescue plans;
- To define guidelines for dealing with, inter alia, illegal immigration and crisis communication.

COLPOFER, the organisation for railway police and security services that holds UIC Special Group status, continues to provide a forum for railway police organisations to share information and experience on crime and security issues, notably by fostering personal contacts among railway police organisations in order to minimize formal bureaucratic procedures. Their agenda includes the following aims:

- To agree on joint measures to fight crime on the railways;
- To share experience on the methods and systems used to prevent railway crime;
- To exchange information on security risks and incidents.

Formalizing their existing co-operation on rail security issues – underway since the September 11 attacks – the International Union of Railways (UIC) and the US Federal Rail Administration (FRA) signed an agreement in November 2003 to further develop their co-operation on rail security, specifically as concerns information exchange, technological research, crisis management, and transport of dangerous goods.

Cross-border, bilateral co-operation on rail security is also growing. A bilateral accord between Deutsche Bahn AG and the Polish Railways, PKP, was signed in October 2003, aimed at improving this co-operation. The agreement includes:

- Exchange of information on security incidents and risks in international rail traffic;
- Joint patrolling by PKP and DB AG security services on selected trains, particularly at night.

2.3.2 Road

As described above, anti-crime and security initiatives have been underway in the road sector for many years, notably via the conventions on the carriage of dangerous goods (ADR) and the TIR.

The UN's revised rules for the ADR referred to above came into effect on 1st January 2005. The International Road Transport Union (IRU) has developed "Guidelines for Road Transport Security", clarifying how the new ADR rules will affect safety advisors, records, operations, employees, reporting and confidentiality. The IRU is also producing a "Standard Security Plan", to help transport operators meet the new requirement for them to develop a security plan when transporting "high consequence dangerous goods".

International Road Transport Union

Building on long-standing work in road transport security, the General Assembly of the International Road Union adopted a Resolution on Security in Road Transport in November 2002. The Resolution covers a wide range of road transport crime issues; however, a number of elements relate to terrorism in particular.

The IRU Resolution emphasizes that security cannot be imposed by decree; rather the most effective mechanism for maximising security is a public-private partnership, in which government provides the regulatory framework, while capitalising on private sector developments and initiatives.

2.3.3 Public transport

Local public transport companies in many countries have, over the last three years, carried out enhanced vulnerability assessments, developed and implemented a variety of training and emergency response measures to ensure effective response in case of attack, and conducted drills to ensure emergency preparedness.

A recent US Government survey of local transit agencies showed that further support at a federal level was needed for enhanced information transmission and funding of additional security measures.

Co-ordination among levels of government and public transport stakeholders is, in fact, essential for the sharing of important information and to provide financial support to the system. Whereas transport security policy is largely the domain of national governments, terrorist attacks first call into play the actors at a local and regional level. Efficient interagency co-ordination is therefore of paramount importance, though not always easy to achieve.

In Paris, security forces for the public transport company, RATP, operate 24 hours a day in collaboration with dedicated police services. A special transport police for the region was recently established to enhance prevention of terrorist attack. Contingency measures, via the national "Vigipirate" threat evaluation and response plan, are also in place. Similarly in Moscow, inter-agency co-operation between transport operator personnel and passengers of the system has been established: a Metro Police Agency ensures collaboration between the Chief of Police and the Metro administration. A commercial Metro Security Agency has also been set up. In New York, the transit authority has established co-operation with FBI, State and local police, which includes a website for information-sharing and regular inter-agency meetings.

Financing of measures to improve public transport security, including better communications systems and surveillance equipment, remains a stumbling block for many public transport authorities and operators, however. Already tight budgets with competing priorities (notably for enhancing quality of services) mean that funding for additional security measures is often drawn from budget lines attributed to initiatives to improve the quality and overall competitive status of public transport. This is examined further in Chapter 3.

2.4. Security measures in the transport sector during the Athens 2004 Olympic Games

The experience of previous organising committees has shown that transport is critical to the success of the Olympic Games. The daily transportation of thousands of athletes, media professionals, spectators and members of the Olympic family, as well as the everyday operation of the city, was a complex undertaking that played a significant role in the success of the Olympic and Para-Olympic Games.

In the midst of international terror concerns, Greece went to extraordinary lengths to ensure the safety of the Games. The Greek Government budgeted US\$800 million for Olympic security infrastructure and equipment, and assigned some 50 000 security personnel to the Games (three times as many as in Sydney and Salt Lake City).

Olympic security was the responsibility of the Hellenic Police (Ministry of Public Order) and specifically of the Olympic Games Security Division (OGSD) – a special police unit created for the 2004 Olympic Games, that reported directly to the Chief of Police and was staffed by police, coast guard, fire-brigade and defence forces personnel. OGSD was responsible for the planning of all

security and public order measures required during the preparation and hosting of the Games, the implementation of all security operational plans and the co-ordination of all organisations and agencies involved in Olympic security.

The ATHENS 2004 Organising Committee also established a Security Division, with principal responsibility to support the work of OGSD, as well as to co-ordinate and integrate the plans of OGSD with those of the functional areas of ATHENS 2004. The ATHENS 2004 Security Division also acted as a liaison between the Olympic movement agencies and OGSD, conveying all requirements that the Olympic agencies set, and informing them on the progress of OGSD operations. ATHENS 2004 has employed independent security consultants with vast experience from the Olympic Games of Sydney and Salt Lake.

ATHENS 2004 and OGSD organised and worked with the Olympic Advisory Group, a sevennation task force with extensive experience in the security planning of large sporting events, including the Olympic Games. The seven nations were Australia, France, Germany, Israel, Spain, the UK and the US.

Using the applications, experience and practices of the recent Olympic Games in Barcelona, Atlanta and Sydney, as well as the conclusions drawn during the Winter Olympics at Salt Lake City - the first Games after the September 11 events – incorporating thus all these elements into Greek reality, the Olympic Games Security Division completed an Olympic Security Planning, which was applied during the Olympic Operational Period (1-7-2004 to 4-10-2004).

Olympic Security Planning was based on constant identification, analysis and evaluation – threat assessment – and on anticipating potential risks, which in turn resulted in prevention and deterrence and in the determination of the appropriate security level.

The basic planning aspects comprised the Special Operational Plans, which were:

- Olympic Venue Security;
- Dignitaries' and Athletes' Protection;
- Traffic Management;
- Vital Venue Security; and
- Special Actions.

2.4.1 Traffic management

During the Games period, traffic management in the Attica Region and co-ordination of all agencies involved, were enacted from a fully-equipped and modern centre, the Traffic Monitoring and Control Operation Room (TMC), based on a special plan that provided a series of traffic measures.

The TMC reported directly to the Attica Traffic Police Department. Representatives from the Ministry of Environment, Physical Planning and Public Works; the Ministry of Press and Media; the Ministry of Transport and Communications; the Athens 2004 Organizing Committee for the Olympic Games; the Fire Corps; as well as the public transport agencies such as Athens Urban Transport Organization (OASA), Athens-Piraeus Electric Railway (ILPAP) and Tram-bus (TRAM), participated in the operations.

The traffic measures were implemented by the Attica Traffic Police Department and its subordinate services, as follows:

a) On the **Olympic Road Network:**

- The **Olympic Ring** (covering a total length of 36.6 km) was used for the transport of virtually all Olympic family members and for this reason traffic police measures were extensive (traffic police wardens at all intersections with traffic lights and patrols of vehicles, motorcycles, towing cranes);
- The **Primary Olympic Road Network** was the part of the network on which the main routes were planned (total length 238.5 km);
- The **Secondary Olympic Road Network** was the part of the network on which secondary routes were planned (total length 330 km);
- **Emergency routes:** Roads or lanes in the Olympic Road Network were used by emergency vehicles, such as ambulances, vehicles of the Fire Corps and the Greek Police.

b) Surrounding road network and access network

Arrival and Departure areas; Competition venues; Training sites; Ceremonies-Events areas; Road race courses; Accommodation; Hospitality areas; Olympic hospitals.

Traffic Police measures:

- Full coverage of road junctions with traffic police officers on foot;
- Preventive policing, with vehicle and foot patrols;
- Technical means (traffic monitoring video cameras, cameras recording violations of traffic regulations, variable message sign panels, traffic density measurement sensors);
- Control by air (helicopter, airship);
- Establishment of zones around competition venues (Controlled Traffic Zone, Controlled Parking Zone);
- Special traffic arrangements to help the flow of traffic (Olympic Road Network, Olympic lanes to assist the flow of accredited vehicles, additional traffic signalling, dedicated parking lots, etc.);
- Restrictive traffic measures for certain vehicle categories (vehicles carrying hazardous materials, establishing specific time delivery schedules to malls and open-air markets, etc.);
- Providing extensive information to the public about all traffic changes and arrangements.

For the implementation of all the above-mentioned measures, police personnel, security volunteers and skilled workers were deployed: for this purpose they had material and technical equipment as well as the appropriate means to perform their tasks.

Similarly, the Thessaloniki Traffic Police Division and the other local police authorities took corresponding measures, as the case might be, in the other Olympic cities (Thessaloniki, Volos, Patras, Heraklio and Ancient Olympia) and on the national road network that leads to the Olympic cities.

2.4.2 Special operations

Characteristically, major special actions were the following:

A. Border surveillance

A security umbrella was created, both from land and sea.

To strengthen the surveillance of the borders, the operations of the defence forces, coast guards, border guards and police personnel were intensified and reinforced with additional resources.

For the protection of land borders, police operations and thorough checks were conducted on a 24-hour basis, by means of foot and mobile patrols, as well by aerial surveillance, with parallel deployment of observers and special police squads at predetermined locations.

For the protection of Greek territorial waters, the following actions were undertaken: open-sea patrol boats; high-speed coastal patrol crafts; deterrence launches; sea patrol aircrafts; coast guard helicopters; patrol vehicles; and coast surveillance systems.

Special provision was made to increase passport and customs controls at the points of entry to the country, in order to ensure the smooth flow and safe movement of people, materials and means.

B. Protection of airspace

The defence forces were mainly involved in airspace protection. They possessed the capability, readiness and resources required and worked closely with the Civil Aviation Authority and the security services on the ground.

Air protection measures concerned the following:

- Flight safety reinforcement;
- Transportation and technical support to special forces;
- Airspace surveillance in support of security operations;
- Banning flights over specific areas;
- Air medical evacuation;
- Fire-fighting.

Regarding air threats, a planning similar to that of the Salt Lake City Winter Olympics was followed.

C. Urban domain security

The plan covered the whole of the Greek territory, placing special emphasis on the urban domain of the Olympic cities.

The aim was to increase the security level to the highest possible standard, through strengthening the measures currently in place.

Special emphasis was placed on the security of the areas surrounding the Olympic venues, on the security of Olympic routes and of public transport (buses, metro, tram, suburban rail) and on the security of areas where cultural events were held, as well as of archaeological sites and areas used for Olympic conferences.

The security measures for urban areas were divided into visible and non-visible measures and included foot, mobile and air patrols.

D. Fire safety

The Fire Safety Operational Plans developed by the Fire Corps covered all Olympic venues and events and were based on special vulnerability and threat assessment studies. To apply the Venue Fire Safety Planning, the largest-ever fire-fighting force deployed for the Olympic Games (some 1 400 fire fighters) was made available, supported by 150 new, all-purpose vehicles, four co-ordination helicopters, 12 fire-fighting aircraft, and a modern Fire Corps Olympic Operation Centre (FCOOC), linked to the Olympic Security Command Centre.

E. Terrorist activities response

For preventing and deterring potential terrorist activities, a Special Anti-terrorist Plan, a Crisis Management System, an Intelligence Network and Rapid Response Units were established.

In the framework of Olympic training, special emphasis was placed on the provision of high-level training to the Special Rapid Deployment Units and First Response Units of the Greek Police, and more specifically, to the Special Antiterrorist Unit, the Explosive Mechanisms Disposal Unit, the Special Negotiators Team and the Marksmen Team, as well as to the Submarine Missions Unit of the Coast Guard.

The planning included the involvement of the defence forces in certain types of special operations, particularly in consequence management and dealing with mass casualties.

F. CBRN threat response

A plan for dealing with Chemical, Biological, Radiological and Nuclear (CBRN) threats was developed, with the assistance of experts from countries participating in the Olympic Advisory Group.

The procedures for the procurement of the required equipment and training of personnel were set. Nevertheless, asymmetrical threats necessitated international co-operation, which was obtained.

3. KEY QUESTIONS EMERGING FROM THE CURRENT POLICY CONTEXT

Clearly, in the immediate aftermath of crises such as the 2001 attacks in New York and Washington, and the recent public transport and commuter rail bombs in Moscow and Madrid, the costs of security measures are not the principal priority for decisionmakers. First and foremost is the need to address the crisis and reassure the public that everything possible is being done to respond to

the attacks, and to ensure their safety as they continue to travel on the transport system. Times of crisis are undoubtedly not the appropriate moments to bring forth, at least publicly, questions of proportionality.

But over time, in a medium- to long-term perspective, the public needs to be helped to understand that a one hundred per cent secure transport system is not possible to achieve. And questions do arise as to how to assess the risk of tragic terrorist scenarios such as these. To what extent are existing policies able to respond – even with some adjustment – to the heightened risk of terrorist action? Where are additional measures needed?; and how to accurately evaluate their benefits in terms of threat mitigation against the costs that will be incurred? This is particularly important given the need for measures that are proportional to resource availability and perceived risk. What institutional adjustments are necessary in order to respond to security needs, across transport modes, as efficiently and effectively as possible?

These are perhaps just some of the questions that governments, and transport ministries in particular, have had/continue to wrestle with in this post-September 11 policy framework.

3.1. Seeking efficiency in transport security

3.1.1 Weighing the costs of tighter transport security against their benefits

The costs of increased security measures and who is to bear them are two of the most important questions emerging from the current policy context. For the moment, however, answers to these questions remain elusive, pending better understanding of the nature of these costs and refinement of the methodologies to assess them.

The OECD identifies two general types of security cost: first, the investment required to put in place the requisite security measures, and second the negative impact that security arrangements may have on transport operations, as well as on the economy as a whole.

Measures to improve transport security have proven costly in several cases. The initial cost of the IMO security measures, for example – borne by ship operators – is estimated at over US\$600 million. However, who will pay for the longer-term operating costs brought about by enhanced security measures (e.g. government or business), and whether these costs should be borne by one or more countries, is as yet undetermined.

The costs of additional aviation security measures for European airports on airline companies alone is estimated in hundreds of millions of euros. However, again, the question remains as to who shoulders the burden of higher operating costs due to tighter security measures (e.g. governments, airline companies, users, taxpayers).

On this particular topic, there has been considerable debate in European aviation organisations regarding financing for civil aviation security. In February 2004, the US TSA announced additional funding of US\$185 million to US airports, to cover installation costs for permanent explosives detection systems. Since July 2003, TSA and Federal Aviation Administration funding have reached US\$1.5 billion in assistance for meeting enhanced security requirements. European airports have likewise faced significant costs for increased security since the September 2001 attacks; however, European governments vary in their coverage of these costs, tending to be less prone to defraying

costs for enhanced security measures in airports. This has led to some fear of competitive distortions among EU States, between the US and the EU, and among modes. With this in mind, the EC is currently examining differentiation in airport security funding.

The negative impacts of passenger security measures (e.g. delays in air travel for additional security controls) have been shown to engender significant costs as well – particularly as concerns losses in tourism.

On the freight side, more restrictive security measures can lengthen delivery times, disrupt global supply chains and hinder just-in-time delivery systems. Trading companies have faced additional costs, including those related to transport, handling, insurance and customs. These so-called "frictional" costs can make trade more expensive and reduce trade flow. The OECD estimates that measures introduced following September 11 may increase business "friction costs" in daily operations by one per cent, engendering welfare losses of approximately US\$75 billion per year.

Whereas security measures should by no means obstruct legitimate trade – and this, again, is important for transport ministers who play an important role in facilitating trade – security and trade facilitation is not necessarily a zero-sum game. Evidence shows that measures such as the WCO Advance Cargo Information Guidelines, or other measures employing the "Single Window" concept – which streamlines procedures for information provision on consignments for traders – provide faster clearance and release of consignments (thereby reducing delays and their associated costs), and increase transparency and integrity, all of which can facilitate trade.

Assessing where that optimal balance lies between tighter security measures, their impact on efficiency in transport sector operations in the short and medium terms, and the benefits that they accrue for a more secure transport system and for trade facilitation in general may, however, be easier in some cases than others; and assessment tools currently available are not adequate in all circumstances to measure the effectiveness and efficiency of measures to improve security.

3.1.2 Balancing security v. other transport policy priorities

Another factor in the efficiency equation involves balancing enhanced security prerogatives with other priorities for transport policy. The need to mitigate terrorist threat in urban public transport – a prime target for terrorist action because of the opportunity to inflict mass casualties and economic damage – is one illustration of this.

Most public transport authorities and operators seek to offer accessible, affordable, reliable services for their clients in order to remain competitive with the private vehicle for urban travel.

For the reasons cited above, however, public transport authorities and operators are also obliged to have tight security measures and emergency response plans in place in case of a terrorist scenario.

Competition for limited resources can lead to a funnelling of funding away from initiatives to improve the service quality of public transport and into enhanced security measures. These measures, while necessary, can also be constraining for public transport service providers in a variety of ways: they can limit access, engender delays and possibly lead to increases in fares. This could serve the purpose of inconveniencing transit riders just enough to push them back into their private automobiles. And this represents in a larger sense a compromise to objectives for more sustainable travel practices in urban areas, in the meeting of which public transport has an important part.

3.2. Assessing and managing the risk

Limited resources in transport sector budgets require that resources should be linked with the highest priority budgetary needs. In the transport security context, evaluation of risk is essential in order to efficiently allocate limited resources to actions of the highest importance.

Managing risk involves systematic analysis of security threats, vulnerabilities in the system and the relative importance of assets and functions based on specific criteria, for example, the economy, public safety, etc. An example of decision-making using this approach might be the following: an airport that is determined to be an important or critical asset, vulnerable to terrorist attack and a likely target for attack, could be determined to be a higher priority for funding than an airport that is only vulnerable to attack. With this in mind, airport security measures that would reduce the level of risk to the most important or critical airport assets would provide the greatest level of security protection for the cost.

Distinctions have to be made between different levels of risk. For example, risk is no doubt higher for the transport of dangerous goods than of other kinds of goods. It follows that security measures needed to combat terrorism may be distinct from those needed against other forms of transport crime (though this does not preclude the need to capitalise on existing anti-crime measures in transport terrorism policy planning).

Further, threats may vary between different countries, Europe-wide or world-wide; measures handed down in one country or within one geographical context may not be appropriate in all cases. Whereas measures for counter-terrorist security need to be aligned with and proportionate to the threat level – which may vary from country to country and from time to time – measures to combat transport crime (e.g. for transport of dangerous goods) will most likely remain constant across countries and time.

Differentiating risk among modes is also necessary. The very significant measures for aviation security may not be necessary or appropriate for all modes, and unless the threat level justifies it, there is no reason why one mode of transport should pay for costly security measures because of the threat to another mode. This being said, there may be a risk that mode-specific security measures, sometimes carrying considerable cost, create some level of competitive distortion among modes. This may need to be explored further.

3.2.1 Institutional co-ordination

Part of managing the risk of terrorist action against transport involves carefully planned institutional co-operation. Undoubtedly, the overall strategy for transport security lies with national government; however, clear delineation of the roles and responsibilities of all levels of government is essential in responding to crisis situations brought about by terrorist action in transport.

As has been mentioned earlier, the involvement of regional and local levels of government is critical in enhancing the security of the transport system. Regional and local areas often own significant portions of transport infrastructure (airports, public transport systems, motorways and ports). As a result, the responsibility for protecting the infrastructure and responding to emergencies involving transport infrastructure lies with regional and local levels.

As terrorism has risen in the list of priority areas for attention in the transport sector and throughout the economy, the need to align institutional and organisational responsibilities with actions to ensure security has become clear.

Germany has developed a "strategy for the protection of the population in Germany", which involves the grouping together of federal responsibilities for managing natural disasters, industrial accidents, infectious diseases and international terrorism.

Along similar lines, the UK has set up a joint Home Office/Department for Transport-led Multi-Agency Threat and Risk Assessment (MATRA) initiative, designed to co-ordinate assessment efforts among national agencies. The MATRA work has recently been applied to most airports in the UK and will be extended to maritime ports, pending Ministerial decision.

Recently, and on an inter-governmental scale, the EU has recognised that better co-ordination among EU Member States on security issues for all sectors, including transport, is essential. The recent train bombings in Madrid incited EC ministers of the interior and permanent representatives to the EU to agree in principle to a proposal by the EU Foreign Policy Commissioner, Javier Solana, to appoint a European security co-ordinator under his responsibility.

In addition, to facilitate co-operation among national intelligence and police agencies, the Commission has proposed a "clearing house" for the exchange of information between Europol, Eurojust and intelligence services.

4. CONCLUSIONS

4.1. Progress in adjusting to the new security environment

In examining developments in transport security over the last three years since the Bucharest Ministerial, there appears to have been some progress overall within the transport sector in coming to terms with a new transport policy environment, in which security is close to, if not at, the top of the policy priority list in many countries.

Individual transport sector modes have made efforts since 2002 to facilitate multilateral exchange on security issues, although an intermodal framework for inland transport security remains for the moment an objective, despite several initiatives underway.

Whereas the maritime and aviation sectors have continued to enhance measures employed in the immediate aftermath of September 11, inland transport has begun to define ways to build on existing regulations, governing, for example, transport of dangerous goods, to meet the more stringent requirements of the current security policy context.

Many complex challenges concerning how to deal with transport terrorism remain to transport policymakers. But policymaking is carried out within a framework that brings with it constraints – be they economic, financial, regulatory, legislative or others. Assessing and addressing the security threat, translating that threat into effective and efficient policy measures to mitigate the threat, while considering costs – who will pay for the measures, how these costs weigh against their benefits, and how tighter security can be reconciled with safe and efficient transport of persons and goods throughout the economy – these are just some of the emerging transport security policy challenges to transport decision-makers in this post-September 11 transport security policy environment.

4.2. The need to balance security measures and efficiency

Ministers in Bucharest pointed to the need for a balancing of security measures with efficiency considerations. However, questions remain as to the nature of these costs (e.g. investments, costs from the negative impact of security arrangements on transport operations or due to an absence of security measures, time delay costs, running and operating costs) and who (e.g. government, industry, users, taxpayers) will bear the cost burden over time.

Whereas the costs of transport security measures have been shown to be significant in certain cases, the possible benefits for trade facilitation of enhanced security measures should not be ignored; indeed security and trade facilitation may go hand in hand, particularly inasmuch as certain measures can facilitate information flow and increase transparency and integrity – all of which can facilitate trade.

Ministries of transport can support the development and refinement of assessment methodologies to better ascertain the costs and benefits of enhanced security measures for the transport sector.

4.2.1 Risk assessment

Transport-sector measures to enhance security are, in many cases, being defined and implemented without *ex-ante* assessment of threat and vulnerability. A more comprehensive approach to risk management, that takes into consideration the differentiation of threat levels and geographic and modal contexts, in addition to institutional arrangements and funding streams, is indispensable in order to more efficiently align the risk of terrorist action with policies to mitigate the threat.

Government – transport ministries in co-ordination with other national ministries and agencies – can work together to define and establish this overall intermodal framework for risk management. Within this context, regional and local authorities, as well as modal associations and industry, may be better equipped to carry out specific vulnerability and risk assessments.

4.2.2 Institutional co-ordination

The realignment of the transport security priority has carried with it necessary adjustments at different levels of government, among them the institutional, budgetary and organisational levels. Whereas national government holds responsibility for the overall strategy for transport security, regional and local levels are called upon first to react in times of crisis; therefore a clear delineation of the roles and responsibilities of all levels of government is essential in order to respond effectively and efficiently to crisis situations brought about by terrorist action in transport.

Ministers of Transport in Bucharest recognised the need for an intermodal framework for transport security, co-ordinated among ministries and agencies handling national security and terrorist issues – in particular ministries of the interior and defence – and among levels of government.

Within this context, ministries of transport can continue to work towards better reconciling transport security and efficiency questions, as summarized in this report, by:

• Defining a transport security policy framework – in co-ordination with other relevant governmental bodies, intelligence services and police – assigning specific transport security responsibilities to appropriate levels of government and relevant agencies;

- Supporting the development and refinement of assessment methodologies, to better ascertain the costs and benefits of enhanced security measures for the transport sector;
- Working together with other national ministries and agencies to establish an overall intermodal framework for risk management. Within this context, regional and local authorities as well as modal associations and industry may be better equipped to carry out specific vulnerability and risk assessment;
- Sharing experience and good practice in these areas with other governments, in order to further understanding and co-operation.

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FACILITATING TRADE ALONG PAN-EUROPEAN CORRIDORS Nos. X, V AND ADRIATIC IONION, VIA PLANNING OF FREIGHT AND LOGISTICS CENTRES: THE IMONODE PROJECT RECOMMENDATIONS

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Thessaloniki, May 2005

1. INTRODUCTION

The enlargement of the EU has given added impetus to the development of Trans-European Networks (TENs). Traffic volumes and the share of international traffic in the accession countries is expected to grow more rapidly than in the EU Member States.

According to EC studies, by 2020 the increase in international freight and passenger transport in EU countries is expected to be between 15%-70%, while in the accession countries the increase in volumes is expected to reach the level of 95% of the current traffic.

This is a result of the estimated socioeconomic development of these countries and the increase in trade between Accession and EU Member States. The main role of the TEN Corridors is to serve the major portion of the increased transport demand. In this context the transportation planning processes undertaken at national and EU level are mainly aimed at achieving efficient, environmentally friendly and cost- and time-effective transport operations along the corridors. In order to achieve these objectives, the relevant studies and political decisions of the EU for the development of the TENs adopt a *top-down planning approach*. However, this approach often results in well-justified, at the strategic level, transport infrastructure development projects, but in limited added value for the improvement of transport systems operation after the realisation of these projects.

In this context, and after the second EC decision for the extension of the TENs, we still lack:

- Efficient, accessible transport links to the TEN Corridors that will support the economic development of polycentric regions;
- Good records of modal shift towards environmentally friendly transport modes, such as rail transport;
- Increased figures of intermodal transport and balancing of transport volumes among transport modes;
- Improved and common levels of quality of service along international transport chains.

In other words, we stand far behind the fulfilment of the goals of the EC White Paper for Transport.

The enlargement of the EU in South East (SE) Europe provides new opportunities for achieving better results in the fulfilment of the White Paper goals. This is mainly due to:

- The extended railway infrastructure maintained by these countries;
- The existence of "trade routes" in the region that are historically justified and well accepted and recognised by transport industry actors;
- The good connectivity of modal transport networks for creating the intermodal network of the region;
- The rich experience of the EU in creating transnational transport infrastructure projects;
- The optimistic forecasts for trade evolution in the area.

In order to benefit from the above circumstances, it is important to focus in South East Europe on a transport development planning process that will follow a bottom-up approach, starting from the regional development requirements for transport, continuing through the prioritised fulfilment of the region's transport demand to enable regional development, and ending with the trans-national justification for the transport infrastructure project.

In the following paragraphs we present the work and main results of the IMONODE project, which followed a bottom-up planning approach in suggesting solutions and concrete measures for strengthening intermodal transport development in South East Europe. "IMONODE" is a trans-national project, part-financed from the European Regional Development Fund (ERDF), under the INTERREG III B/CADSES (Central, Adriatic, Danubian and South East European Space) programme. The programme supports trans-national co-operation to enhance the balanced and sustainable development of the European territory. In this context, the project contributes to the development of efficient transport systems in South East Europe with regard to sustainable development.

More specifically, the IMONODE project aims at studying options and suggesting solutions and solid actions that will enhance the greater use of, and accessibility to, Trans-European Corridors V and X for freight transport, *giving priority to rail*. The strengthening of intermodal transport operations along the Adriatic Ionian Corridor is one additional objective of the project.

2. MAJOR CONSIDERATIONS FOR INTERMODAL TRANSPORT DEVELOPMENT AND TRADE FACILITATION IN SOUTH-EAST EUROPE

When focusing on intermodal freight transport system development and improved operation in South-East Europe, we should always keep in mind that:

- An intermodal transport system is a complex system to manage and optimise;
- Transport and trade sector particularities exist in South-East Europe that should be taken into account for the successful development of intermodality schemes in this region;
- A sound understanding of logistics as a concrete business sector (based on the experience gained in western Europe) may contribute to a greater strengthening of intermodality in South-East Europe.

2.1. The intermodal transport system and its elements

An intermodal transport system consists of various elements (as shown in Figure 1), deriving from a physical subsystem and a service subsystem. Information and communications technology facilitates these two subsystems and lies between them, but is not regarded as a single subsystem *per se*. The focus in this project is on the physical and service subsystems. The physical subsystem consists of infrastructure and transport equipment. The infrastructure consists of nodes and links, and the network composed of these nodes and links is the physical intermodal transport network. The links

are mode-related, e.g. railways, roads and waterways. The nodes are intermodal terminals, for example, seaports, inland ports, airports and transfer stations. The transport equipment includes rolling stock (lorries, trains, ships, barges and planes) and intermodal transport units (containers and pallets).



Figure 1. The Intermodal Transport System

The links considered in the scope of the IMONODE project for South East Europe include the following transport modes:

- Road transport;
- Rail transport;
- Maritime shipping.

As suppliers of infrastructure for the physical intermodal transport network, one distinct group of actors within the system is formed by the rail, terminal and airport operators and, to a lesser extent, the road providers and owners of waterways.

The actors of the service subsystem form a second group, which includes the set of companies and organisations that deliver the services (e.g. forwarders, shippers, sea carriers and road transport companies). They provide the actual transport of goods between the nodes of the intermodal transport network. They also offer other logistics services, such as distribution, storage, processing and administration.

2.2. Structural parameters affecting intermodal transport development for trade facilitation in South-East Europe

In the past, many studies and projects (such as TIRS, REBIS, ESPON-*European Spatial Planning Observation Network*, INTERMODA, Aprocot, IQ, IRIS) have assessed the impact of economic, organisational and infrastructure-related parameters that affect the development of demand for transport, trade forecasts and transport sector reorganisation in the countries of the region. The most important of these considerations, relating to intermodal transport development for serving international traffic issues, may be summarised as follows:

- Different levels of economic development in each country;
- Varying processes for adopting standards and achieving interoperability in the transport domain;
- Limited available national funds for transport infrastructure project development;
- National transport plans often compete with each other, resulting in the availability of high transport capacity but with an uncertain level of capacity use according to forecasted transport demand;
- The traditional actors of the transport chain change roles and competition profiles;
- Ports become major "players" for achieving intermodality, especially where the overseas container market is concerned;
- New types of synergies are observed, and most probably required, among transport industry actors;
- Private/public co-operation is recognised as indispensable for developing efficient intermodal chains;
- Transnational agreements are needed in order to develop truly international transport infrastructures that will accommodate intermodal cargos, and bundling along main transport corridors;
- Nodal points (terminal) development is crucial, but in order to be successful it has to be integrated and harmonized with regional economic and environmental objectives.

2.2.1 The understanding of logistics

Logistics processes translate the demand for goods and services into demand for transport. The European Commission can only develop and implement transport policies through the understanding of logistics processes and trends that will meet the current and future needs of European industry.

In other words, logistics is the art of optimising production and distribution. But today, there is the problem in Europe of a strong increase in transport demand, which will further increase with the enlargement process. We have to create functioning transport markets; we need appropriate infrastructures and we should make better use of existing resources and capacities through the alternative modes of transport, such as short sea shipping, rail and inland waterways. But these important endeavours should be underpinned by a strong drive to make all the options work better together by applying information technologies for planning, executing and controlling transport.

Logistics is business. Then, why is it important for administrations and governments to understand logistics? From the transport policy angle, the answer is straightforward: logistics generates and shapes transport demand requirements. For example, today's logistics trends with decentralised production patterns favour, to a certain extent, the flexible and versatile transport solutions provided by road transport. If we want industry to have more recourse to intermodal transport, using short sea shipping, rail and inland waterways, we have to understand those logistics trends and enter into a debate with industry on how those trends and the performance of the alternative modes can meet in order to provide viable and client-oriented transport solutions.

Enlargement, consumer protection regulations, e-commerce, environmental regulations, packaging regulations, fiscal policy, production patterns, etc., all have an impact on logistics processes and influence the demand for freight transport; thus, it is important to understand these trends and the impacts they have on transport demand.

We still have much to do in order to make intermodality a reality, but the concepts and the will are there today, as never before. However, conceptually, while we are implementing intermodality throughout Europe, we should now plan the next step. And that's where logistics comes in. Increased reliance on intermodal transport will not structurally affect the growth in transport demand. If successful, it will spread the growth of demand more evenly, but capacity is limited for railways and the waterborne modes. In that sense, intermodal transport policy does not address the one central challenge which we have to face concerning a sustainable transport system – how are we going to manage the demand for transport without affecting our competitiveness and wellbeing?

Less transport means lower logistics costs for industry, and lower social costs for all of us. It means filling trucks and trains better, reducing empty hauls, reorganising transport networks, and using less space for production. Better logistics means better transport. Logistics is an organisational science, and thus based on intelligence. And for intelligent transport, we need to use many more available and new technologies and innovations in transport and the handling of goods.

The above considerations result in major requirements when planning transport infrastructure projects and formulating policy in the transport (and intermodal transport) sector in South-East Europe:

- Integrate from the early beginning and through a bottom-up approach the transport industry actors to the planning process;
- Build synergies among TEN Corridors, focusing on the specialisation of transport chains and the appropriate development of the logistic services at transport terminals in accordance with regional development;
- Create an efficient and realistic intermodal network in South East Europe by focusing on nodal points operation in the area and improvement of the quality of the transport and logistics services provision;
- Match priorities for the development of intermodal transport nodes with existing and possible transport chains, based on the transport industry tendencies;
- Identify best practices for public-private collaboration schemes for the development of transport terminals;
- Set priorities for the development of regional, national and transnational intermodal nodes.

3. THE IMONODE APPROACH AND SCOPE FOR INTERMODAL TRANSPORT DEVELOPMENT IN SOUTH-EAST EUROPE

The project's emphasis is on rail and maritime, since these transport modes are declared by EU transport policy to be major driving forces for achieving intermodality. Also, the CADSES countries involved in the project have a long history of rail supremacy over road, while the Mediterranean countries participating in the project have a strong maritime transport tradition.

The project attempts to meet the needs of the planning process mentioned above, as appropriate for intermodal transport development in South-East Europe. The emphasis is mainly given to "transport and logistics nodal points". The efficiency of transport systems depends very much on infrastructure and service quality at nodal points. This is more crucial for intermodal transport chain operations, since the non-physical processes and logistics services to be implemented in the major nodes of these chains are quite complex and quality-demanding. In this context, IMONODE directed its work towards:

- Assessing available infrastructure and services at major terminals of the project area;
- Identifying problems and bottlenecks in terminal operation along the intermodal or bimodal transport chains in the CADSES area, and along TENs corridors;
- Proposing solutions to enhance and develop terminal operation;
- Prioritising the existing nodal points and selecting new ones that have the potential for future development within the IMONODE area, in order to achieve increased intermodality and seamless operation in the years to come;
- Performing case studies for successful terminal development, by checking alternative types of involvement of the private and/or public sectors, and specifying requirements in technology implementation and logistics service operations.

4. BRIDGING REGIONAL SOCIOECONOMIC DEVELOPMENT OF SE EUROPE AND TRANSPORT LOGISTICS DEVELOPMENT (TRANSPORT SUPPLY SIDE) FOR ACHIEVING EFFICIENCY OF INTERMODAL TRANSPORT OPERATIONS

South-East Europe (the IMONODE study area) includes countries (Italy, East and West Balkan countries, Austria, Greece) with different economic profiles, development levels and national economic prospects. The national transport plans of these countries, although varying with regard to type of infrastructure to be developed and measures to be implemented in the transport sector, have as common ground the high investment required for developing new infrastructure. The EU or national funds available for transport project development may cover only part of the required investments.

In this context, the *transnational evaluation of transport infrastructure projects* and the attraction of private funding are considered of high priority for achieving efficient planning in the transportation domain.

In IMONODE, the intermodal transport terminal development plan for the CADSES area is based on the following:

- A regional demand-forecasting model, developed in the context of the project;
- Assessment of the existing terminals' inefficiencies and formulation of possible solutions to bottlenecks;
- Current transport chains and cargo bundling opportunities along the main TENs corridors;
- Identification of needs for new terminal development, justified at transnational level; and
- Case study in-depth analysis for defining PPP schemes in logistics infrastructure development and operation of intermodal terminals.

4.1. Regional demand assessment

The GIS-based socioeconomic evaluation of the regions of the study area (NUTS 2 and 3) was concluded within the project and provides comprehensive results concerning categorisation and ranking of the regions according to various socioeconomic criteria, and the economic prospects for each region.

As shown in <u>Map 1</u> (see index at the end of this report), the regions with the best socioeconomic conditions/development are located in Italy (Milan, Rome, Latina, Como, Padua, Naples, Bari, Bergamo, Rimini, Venice, Trento, Bologna), Austria (Vienna, Salzburg, Rheintal, Innsbruck, southern Vienna, Linz-Wels, Tyrol-Unterinntal, Graz) and Greece (Attiki, Thessaloniki). The strongest region in Slovenia is the area of Ljubljana. In Hungary, the area of Pest can be identified as the strongest region. The Balkan States, but in particular Romania and Bulgaria still show a lower level in their socioeconomic development. However, these areas are interesting from the point of view of possessing a positive age structure in population development and therefore a higher potential labour force for all sectors than in the regions of the EU15.

It was also found possible to evaluate the regions' potential for modal and intermodal transport development, through the estimation (horizons 2005 and 2015) of the volumes of cargo exchanged between regions, as presented in <u>Map 2</u>, and the potential volume of freight by block trains at regional level (<u>Map 3</u>).

The current intermodal flows have been identified in the study area, which are mainly orientated in a North-South direction. There are only a few intermodal continental links within the study area, the largest number of links are between destinations outside the study area, namely between Italy and Germany and the Benelux countries. Sea links between Italy and Greece are increasingly gaining importance.

The modal split in freight transport in the EU15 has changed considerably in the last decades; the market share of rail freight has fallen from 21% in 1970 to about 8% in 1998. On the other hand, the share of combined transportation within rail transport now presents about 25%. Following the changing industrial and economic structures in Europe, the railways have substituted their traditional core business, such as the transport of coal, cokes, ores and semi-finished products, with substantial

market shares in the downstream steel industry, the automotive and petrochemical industries, the paper and forest industry and in finished products, as the examples of freight flows according to commodity groups in Italy, Austria and Slovenia show.

The 2001 EU White Paper on Transport states that, if nothing changes, road transport will increase by 50% by 2010 and the costs related to congestion will by then have increased by 142%, representing 1% of EU GDP at that time. This situation would affect the competitiveness of the European economy and the quality of life.

European intermodal transport has shown considerable growth over the last years. Nevertheless, its market share is still limited to only 8.6% of all intra-European tonne-kilometres. European intermodal transport mainly concerns hinterland transport of maritime containers arriving at ports. For rail there is a North-South corridor, inland shipping is served by the Rhine corridor and the Antwerp-Rotterdam link, and short sea shipping operates in the western Mediterranean Sea, in the English Channel and in the Baltic Sea. Germany and Italy are the leading countries with the highest volumes in unaccompanied combined transport, followed by the Benelux countries, Spain, France, Switzerland and Austria.

A number of best-case intermodal transport chains have been identified, showing that innovative solutions can be created in close co-operation in the client-supplier-forwarder chain. The EU has started the Marco Polo Programme to fund project proposals for building up new transport chains.

As a next step, the forecasting of transport flows for road and rail has been undertaken and assigned to the reference network. From the O/D matrices on freight traffic for the base year 2001, a potential for intermodal transport has been calculated which has been allocated to the regional level.

The regions' potential for intermodal transport operations was quantified by taking into account the levels of transport accessibility in the different regions and the forecast of road and rail transport volumes as assigned to the reference network of the study area.

<u>Map 4</u> shows the calculated potential intermodal freight volume for each NUTS 2 region (covering relations within Imonode countries and with outside regions) in the study area for the base year. The height of the column displays the total potential volume divided into volumes for arrival (in red) and dispatch (in blue). Additionally, the green colour of the region indicates the proportion of potential for building up block trains from one region to another as a percentage of the total potential volume. The regions with dark green colours dispose of a high potential to form block trains with another region. Regions with light green colours and columns are characterised with a low proportion for formation of block trains and a higher share in single-wagon potential, due to the fact that transport relations exist with a number of other regions where the volumes do not enable the formation of direct trains with one region. However, there is the potential to bundle the single-wagon traffic of a few regions by innovative operational measures and a functional concept for terminals to transport the volumes over a longer distance to other destinations. Regions with light green colours and no columns dispose of a very low potential for intermodal services.

From the comparison of the potentials as expressed above with the potential of intermodal transport within the IMONODE area only it can be concluded that the potential of intermodal freight relations between regions in the IMONODE area is rather low. The main potential in shifting road freight transport to intermodal transport chains can be registered in the relations between individual regions within the Imonode area and the outside regions in Europe, in particular in Germany, the Benelux countries, France, Spain, Scandinavia, and Poland.

The largest potentials for intermodal volumes (including Imonode study area countries and outside regions) can be related to the Italian regions alongside the Adriatic coast and northern Italy, in particular to Calabria (block train potential: 81%, volume: 4.2 million tonnes), Puglia (block train potential: 81%, volume: 4.2 million tonnes), Puglia (block train potential: 81%, volume: 6.1 million tonnes) and Veneto dispose of a high potential in Italy. In Austria, the regions of Lower Austria with Vienna (block train potential: 14%, volume: 1.5 million tonnes) and Upper Austria dispose of a good potential, as well as in Greece the regions around Athens and Thessaloniki. Other regions of interest are the areas around Bucharest (block train potential: 63%, volume: 450 000 tonnes), Constanza (block train potential: 46%, volume: 620 000 tonnes), Sofia (block train potential: 24%, volume: 400 000 tonnes) and Budapest (block train potential: 13%, volume: 1.4 tonnes) for single wagon potential. Carinthia has no potential for forming block trains, but disposes of a large volume in single wagon traffic with 470 000 tonnes. Currently, the Balkan regions do not have any significant potential in intermodal volumes.

For the year 2015 the forecast for road freight traffic shows an even more interesting potential for intermodal transport.

Regarding the present situation of intermodal transport, the following *general conclusions* can be made:

- The intermodal flows within the EU and in relation with the CEEC are low and concentrated on a limited number of relations (4% in the EU15, 2-4% between the EU15 and the CEEC, 0.5% in the CEEC, 5 main corridor relations exist between the EU and the CEEC);
- Intermodal flows are mainly concentrated in the North-South direction crossing the Alps;
- The intermodal flows between EU15 and the CEEC fluctuate too much; the reason for this is that the intermodal transport market in particular in the CEEC is not yet mature;
- Intermodal statistics are not accurate and not complete (in general, but especially not for the CEEC);
- For RoLa (Rollende Landstraße) flows, it is expected that the volumes will decrease in the future when border crossing problems are solved due to the EU enlargement, or can slightly increase depending on the implementation of administrative and policy measures;
- Too many bottlenecks still hamper the development of intermodal transport in the area;
- Intermodal transport is often not taken into consideration in decisionmaking when choosing the transport modes.

Finally, the main findings and conclusions can be consolidated to obtain answers to the following main questions:

- Which transport flows can be organised in intermodal transport chains?
- What are the reasons for the low share of intermodal transport in transcontinental transport in Europe?
- Which terminal locations can be used for the chains; is there the need of new terminal locations to increase the accessibility for regions?
- Which capacity constraints exist in the terminals and on the infrastructure links to cover the potential demand?
- Which infrastructure investment is required to close the gap?

The following considerations were made to come to a final conclusion:

- Potential intermodal freight flows (road flows>400km);
- Terminal availability, port/rail infrastructure available, including the maritime links (RoRo, container) identified as hinterland transport;
- Competitiveness to road transport (i.e. travel cost/time rail compared to travel cost/time road);
- Minimum weekly transport volumes (critical mass for the formation of block trains and regular sea services) for both directions;
- Possibility to specify the potential flows according to train formation options.

<u>Map 5</u>.

As a final conclusion on the IMONODE project on socioeconomic development and cargo transport evolution, the *potential intermodal volumes per region* in arrival and dispatch for the base year 2001 are matched with the existing infrastructure:

- NUTS2 regions with intermodal freight potentials in arrival and dispatch;
- NUTS2 regions with a good to very good potential for forming up block trains by reaching the critical mass of 60 000 tonnes per annum (by forming a block train of 1 200 tonnes and one service trip per week and direction);
- Availability of a terminal in the region and standard of the terminal (terminal screening and definition of a function to this terminal will be made in the following WPs);
- Access to the priority rail or road network as defined by the TENs corridors, TINA process, SEE Core network and AGTC. Capacity analysis will be made in the following WPs.
- Compliance with the results of the socioeconomic evaluation of the regions.

5. ASSESSMENT OF INTERMODAL NETWORK IN SOUTH-EAST EUROPE

Based on previous studies, the IMONODE reference network was defined. This network includes major intermodal and nodal terminals of the project study area, selected on the basis of their geographical location, importance in serving major transport chains and influence area along main transport corridors. The network was updated during the project's life period (as shown in <u>Map 6</u>), taking into account national plans for transport nodal point development, and expert opinion resulting from project dissemination and consultation events with transport industry representatives.

During 2004, the terminal infrastructure assessment survey was concluded, covering the majority of t he terminals involved in the IMONODE reference network. This survey resulted in an exhaustive inventory of terminals that provides infrastructure and operational data characteristics for each assessed terminal and incorporates the opinion of both operators and users.



Figure 2. Indicative results from the Transport and Logistics Terminals status survey

The analysis of the terminal inventory for the CADSES area provided interesting results, such as:

- Low involvement of the private sector in terminals operation;
- The observed terminal inefficiencies are heavier on the organisational than on the infrastructure side;
- Existing infrastructure capacity is below current demand;
- Specialised terminal operations and terminal synergy could create added value solutions for alleviating intermodality obstacles without directly affecting the investment cost.

6. PROPOSALS FOR NEW OR UPGRADED TRANSPORT AND LOGISTICS TERMINALS (TLT) DEVELOPMENT IN THE CADSES AREA

The main objective of this process within IMONODE was to define the future nodal points network in the CADSES area that would facilitate intermodality development in SE Europe. During 2004, the various country representatives were asked to provide candidate sites to be included in this network for time horizons of 2005 and 2015, which may belong to one of the three terminal categories:

- 1) *Existing terminals:* Already developed establishments, which currently operate Transport and Logistics Terminals (TLTs);
- 2) *Planned terminals:* Planned establishments, which have been adopted by national and European policies, to serve as TLTs;

3) *Potential terminals:* Strategic locations, identified by national and European experts in the domain of combined transport at trans-national level. These terminals were considered and selected on a transnational, and national level by applying a multi-criteria methodology for assessing alternative positions and selecting the most appropriate ones.

The final IMONODE proposals for future transport terminals development were to be announced in early 2005.



Figure 3. IMONODE methodology for evaluation of Transport Terminals

Currently, there are 105 TLT terminals of the above categories that have been selected and three scenarios have been evaluated, taking into account the following:

- Synergies of terminals regarding provided services;
- Contribution of terminals to bundling of cargo flows of the regions to main TENs corridors;
- Level of service provided by the terminals, included in the IMONODE scenarios, to future transport chains expected to be set up and operated in the future.

Map 7 presents an indicative scenario for TLT development that is evaluated by the project.

7. IMONODE DEMONSTRATORS – PILOT BUSINESS CASES ASSESSMENT

The IMONODE project includes five pilot cases, which constitute real business scenarios for developing new or upgrading existing transport terminals in the project study area. In the context of the pilots and based on the results of the previous project work at transnational level, dedicated studies will be performed for proving the feasibility of each terminal scenario. In the majority of the IMONODE pilot cases, public and private actors are involved and the feasibility of PPP schemes for the set up and operation of any given terminal or network of terminals, is to be assessed.

During the previous year, the setting up and analysis of the pilot cases was carried out. Results on all feasibility studies of real cases were expected in the summer of 2005.

Demonstrator No. 1 deals with the development of business concepts at international, national and local level for the transport and logistics of perishable goods. As an example, the following schemes are being prepared:

- 1) Handling of reefer containers for fresh and frozen food arriving at the Taranto Container Terminal from abroad and forwarded to final markets by road or by railway (International level);
- Agromed, as the terminus of a network of nodes in the Imonode context, receiving perishables from Greece and south-eastern Mediterranean countries, and forwarding them along the Adriatic route to the Emilia-Romagna area and then beyond the Italian north-eastern border (International level) (see figures on next page);
- 3) Agromed, as a warehouse and processing centre for fresh fruit (grapes and other fresh products), acting as an absorber, operating between the producers and the market (Local level);
- 4) Using the platform as a redistribution centre for fresh fruit for the area, including the following regions: Puglia, Basilicata, Calabria, Sicily and South Campania (Local level).

Demonstrator 2 – Virtual marketplace development to match demand and supply and rationalise flows for intermodal transport operation along major transport chains (IT).

Demonstrator 3 – Development of Astakos Port Terminal as a node for perishable goods management and transportation (GR).



- The demonstrator will identify potential development of logistics, storage and transhipment operations in the port area. The feasibility study to be performed in the context of the demonstrator will aim at assessing the economic and technical parameters for setting up and operating a perishable goods logistics chain that will involve:
 - Collection of perishable goods and transportation by road to the port of Astakos. The fresh products to be collected are agricultural products produced in the region of western Greece or alternatively perishable goods from Crete transported by sea to the port;
 - Unitisation of products in the port premises;
 - Storage of the goods under appropriate conditions in the perishable goods terminal;
 - Transhipment of products through a sea motorway scheme from the port of Astakos to Italian ports; and
 - Transportation to the final destinations. The work within the demonstrator also includes the specification of additional infrastructure needed in the port for handling perishable goods.

Demonstrator 4 – Assessment of feasibility for PPP scheme implementation in developing railway terminals and share capacity of terminals along Corridor V (AT).

Demonstrator 5 – Feasibility study for private sector involvement in upgrading and operating railway terminals along Corridor X (GR)

8. CONCLUSIONS

The development of intermodal transport in SE Europe is a challenging planning process that has to follow a bottom-up approach, starting with the strengthening of regional development and concluding with realistic proposals for infrastructure projects and operational measures in the transport domain. Since intermodal transport efficiency relies considerably on logistics business development and service quality, the ensuing planning process should take into account the opinions of the actors of the transport and logistics industry.

In SE Europe there is a considerable availability of transport infrastructure. When organising the efficient intermodal transport system of the future to serve the forecasted increase in transport demand, we should mainly focus on building added value to the existing infrastructure by giving priority to the:

- upgrade of existing terminals;
- creation of a "network" of terminals that will operate under shared capacity models;
- specialisation of transport and logistics terminals in logistics services and operations in order to achieve better ratios of used capacity of the infrastructure and quality of services;
- development of new terminals in regions that have big potential for intermodal transport demand for arrival and/or dispatch and good accessibility to the TENs corridors;

- development of transport and logistics terminals inside or in the vicinity of the ports that act as major gates to SE Europe and have efficient railway connections. This will create the opportunity for developing long-distance intermodal chains using railways;
- application of new technologies for facilitating information exchange along the intermodal chain terminals, and use of new technologies (such as virtual marketplaces available through Internet) for achieving cargo bundling at the origin points of cargo expedition;
- development of terminals along the transport corridors (and intermodal chains) at nodal points that have already attracted the interest of the actors of the transport and logistics industry.

The policy to be applied for intermodal transport infrastructure development in SE Europe should be validated at transnational level, taking into account that:

- intermodal transport demand is expected to be low in the area of SE Europe;
- the area of SE Europe is a major gateway for the Asia-Europe trade flows and this long-distance transport demand is by definition served by "intermodality". It will remain intermodal (and provide additional demand for the transport system of the area) for the part of the journey inside EU territory only if efficient logistics terminals are made available;
- the public investments in transport infrastructure in the area should result in the attraction of private-sector investment for both infrastructure building and operation;
- the TENs corridors create the basic network of the enlarged EU. The infrastructure development along these corridors should strengthen synergy of corridors rather than their competition for attracting long-distance transport demand;
- national transport plans should focus on the development of transport infrastructure (links and terminals), which will act as "feeders" to the TENs and alleviate bottlenecks.

The European Commission can only develop and implement transport policies through the understanding of logistics processes and trends that will meet the current and future needs of European industry. Logistics processes translate the demand for goods and services into demand for transport.

In South East Europe we have to create functioning transport markets; we need appropriate infrastructures and we should make better use of existing resources and capacities in the alternative modes of transport, such as short sea shipping, rail and inland waterways. But these important endeavours should be underpinned by a strong drive to make all the options work better together, by applying information technologies for planning, executing and controlling transport.

Logistics is a business that generates and shapes transport demand requirements. Today's logistics trends with decentralised production patterns favour, to a certain extent, the flexible and versatile transport solutions provided by road transport. If we want industry to have more recourse to intermodal transport, using short sea shipping, rail and inland waterways, we have to understand those logistics trends and enter into a debate with industry on how those trends and the performance of the alternative modes can meet in order to provide viable and client-oriented transport solutions.
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(see http://www.cemt.org/jtrc/index.htm)

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- Map 2 Existing intermodal links
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- Map 5 Potential intermodal volumes with core rail network and main terminal locations, year 2001
- Map 6 IMONODE intermodal reference network for SE Europe
- Map 7 Average IMONODE intermodal nodes development scenario

	Institution	Country
LP	CERTH/HELLENIC INSTITUTE OF TRANSPORT (H.I.T.)	GREECE
PP n. 1	HELLENIC RAILWAYS ORGANISATION	
PP n. 2	PROODOS S.A.	
PP n. 3	CCIAA Ravenna	
PP n. 4	CCIAA Taranto	
PP n. 5	CCIAA Forli Cesena	ITALY
PP n. 6	Region of Emilia Romagna	
PP n. 7	Region of Veneto	
PP n. 8	Region of Friuli Venezia Giulia	
PP n. 9	Agroter S.a.s.	
PP n. 10	IC CONSULTENTEN	
PP n. 11	Government of Carinthia	AUSTRIA
PP n. 12	BMVIT/Ministry of Transport Innovation and Technology	
PP n. 13	Ministry of the Environment, Spatial Planning and Energy – National Office for Spatial Planning	
PP n. 14	Ministry of Economy	SLOVENIA
PP n. 15	Transport Logistic Cluster – TLG	
PP n. 16	Municipality of Celje	
PP n. 17	County of Primorje & Gorski Kotar Country Institute for Sustainable Development and Spatial Planning	CROATIA

ANNEX

Note: LP = Lead Partner; PP = Project Partner.

SUMMARY OF DISCUSSIONS

SUMMARY

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The Thessaloniki Regional Round Table on "Europe and Central Asia: Trade In Transport Services, Market Access and Trade Facilitation" explored trade issues through a careful examination of a specific geographical area. It focused on the following points:

- the multilateral liberalisation of trade in transport services;
- the consequences of liberalisation in imperfect transport markets;
- the issue of underinvestment in infrastructure;
- security and trade facilitation.

The brief report that follows provides a summary of the discussions held at the Round Table.

2. MULTILATERAL LIBERALISATION OF TRADE IN TRANSPORT SERVICES

The Round Table started with a discussion of the progress made in liberalising trade in transport services. A point of reference for this discussion is the process of negotiated, mutual access to transport markets under the auspices of the World Trade Organisation. The background paper of the WTO representative and the discussion clearly showed that there are no strong arguments, *in principle*, as too why transport should be a particular focus in the liberalisation of service sector industries. *In practice*, however, a special role for the transport results from the strong role played by the public sector in providing transport and transport infrastructure services. This is compounded by high levels of market concentration in the market for transport services, at least for some modes.

As a result of the high level of inter-reliance between transport policy, competition policy and trade policy, the WTO negotiations on liberalising trade in transport services have developed into a very complex process, which has considerably distanced itself from the basic principles of trade negotiations, i.e. reciprocity and "most favoured nation" status.

Given the current impediments to global multilateral negotiations, bilateral or regional arrangements to liberalise trade in transport services might be considered useful stepping stones towards a more general process of liberalisation of international trade in transport services. The larger the country – or rather, the more an individual country is able to influence bilateral terms of trade – the greater is the danger that agreements bias the outcomes towards individual, national interests rather than a mutual, international benefit. An unequal distribution of gains from bilateral or regional agreements may restrict the benefits for some countries to such an extent as to impede the liberalisation process altogether.

Bilateral agreements can be the first stage for broader agreements. The greater bargaining power of large countries may disappear if small countries form a coalition with negotiating powers. In this case, bilateral agreements may be seen as the first stage towards broader agreements if the coalition is also able to impose its bargaining power on large countries. However, an agreement negotiated multilaterally from the start will produce more positive results, in particular by keeping transaction costs to a minimum.

The liberalisation of transport services must take into account the current structure of transport markets and its consequences in terms of transport costs. The most salient feature of the structure of transport markets in relation to trade between Europe and Asia is how imperfect they are in terms of the basic requirements for competition.

3. THE CONSEQUENCES OF LIBERALISATION IN IMPERFECT TRANSPORT MARKETS

The Round Table discussion pointed out that trade in goods between countries has a cost, which will be called here the cost of trade. This can be viewed as equivalent to a tax. For the United States, this "tax" has been estimated to average 170 per cent of the value of the goods. Within this amount, transport accounts for slightly over one quarter of the cost of trade.

Given the magnitude of these costs, the Round Table suggested that there was a lack of competition and competitiveness in transport and related services. Some transport markets are imperfect and it is not sufficient to liberalise trade in goods. Producers are even subject to a form of rent capture in international trade, for the closer one comes to free trade in goods, the more the transport sector is able to capture the benefits of this trade. As a result, the gains of international trade may be absorbed by transport. This being the case, it can be affirmed that insufficient competition in transport has a greater impact in a regime of free trade in goods between countries, and that transport may even become a serious barrier to trade.

In this context, the role played by public transport enterprises is considerable. They often do not run services on a commercial basis, but benefit from a transfer of subsidies from one activity to another (cross-subsidisation). They receive direct subsidies from the state and also engage in price wars on certain markets using the public service subsidies that they receive on other markets.

Consequently, there is a frequent explicit and implicit subsidisation of public enterprises which distorts competition and resource allocation. Many countries in the region of South-East Asia are still not aware of the need for a separation between the operation of enterprises and the bodies responsible for regulating the sector. This inevitably results in regulatory bodies being "captured" by the public enterprise in the same sector of activity.

Certain precautions must be taken in liberalising the transport sector when public enterprises have a dominant position on markets. In such cases, it is essential:

 to set up an internal accounting system for the activities of public enterprises so as to be able to allocate costs on the basis of activities with complete transparency;

- that subsidies are also made transparent with regard to the activities they are intended to cover;
- to ensure that any market dominance is eliminated, which implies that no "grandfather" rights should be granted;
- to introduce competition law, which ensures that all enterprises are in a fair position and have identical obligations;
- to establish regulatory authorities in the field of transport which will monitor developments in the sector and prevent any practices contrary to the interests of individuals and businesses.

In some cases, public enterprises have a significant advantage over their competitors, benefiting from asymmetric access to information provided by government. As their survival is given, they are never as accountable as private companies. Because of the market penetration by public enterprises of different nationalities, the issue of governance and regulation should logically be handled by supranational authorities.

In this regard, the Round Table emphasized that the transport relations between Asia and Europe involved a high degree of market concentration and that the issues raised concerned the market power of certain players and the creation of value in this framework. It seems very difficult to ensure perfect competition on these markets. This means that it will never be possible to reap all, but only some of the benefits of international trade. Although international trade has undergone an expansion, this process has remained threatened by the imperfections of transport markets, whether they involve land, sea or air transport. It therefore seemed appropriate for the Round Table to recommend a restructuring of transport markets in relations between Asia and Europe, in particular with regard to public enterprises, before undertaking a complete liberalisation of these markets.

4. THE PROBLEM OF UNDERINVESTMENT IN INFRASTRUCTURE

This point was introduced by distinguishing between physical and non-physical infrastructure. For example, while the improvement of physical infrastructure leads to productivity gains in transport and promotes interregional integration of local economies, non-physical infrastructure, such as improved customs clearance, telecommunications networks and deregulation processes, lowers transaction costs and promotes the international integration of economies.

In both cases, the integration process is driven by an increase in the variety of products available and a decrease in their prices. This leads to an expansion of markets and a specialisation of economies through the global complementarity of products. In some cases, production processes are disintegrated spatially and reconstituted elsewhere.

A qualitative leap in the integration of economies can be achieved by reducing transport costs, a reduction that can be due to new infrastructure. However, it is important to point out initially that the cost of building and making a new physical infrastructure available is considerable, and this holds true for virtually all countries. With regard to the impact of this infrastructure, it will depend largely on the context into which the infrastructure is integrated. In developed countries, whith dense transport infrastructure networks, the impact of an additional segment is sometimes marginal even though the gains in time, safety and comfort are clearly felt in the economy. As a result, before any decision to

invest in infrastructure is made, it is essential to compare its potential contribution in relation to other investments. It must also be borne in mind that infrastructure also promotes agglomeration economies, which lead to spatial concentration of activities and therefore to problems of congestion.

It should also be pointed out that new infrastructure can create divergence in economic integration, for there are often losers because of imported competition. These are the employees of the least productive companies that cannot meet the challenge of competition. This reveals the importance of policies to support the development of new infrastructure.

If the link between infrastructure investment and international trade is considered more specifically, there is evidence to suggest that a 10 per cent increase in investment in infrastructure is associated with bilateral trade growth of between 1.8 and 4.6 per cent. Infrastructure promotes international trade if it leads to the subdivision and relocation of enterprises, in particular through the internal trade of companies. This being the case, if a country creates infrastructure on its territory that promotes trade with a neighbouring country, it is obvious that the other country will also benefit from this infrastructure without having to pay the price. This shows that any discussion of the problems involved in transport and international trade always raises the underlying issue of the need for international co-ordination of initiatives. In addition, it can be shown that there is a tendency to under-invest in this type of infrastructure because the benefits stretch beyond national borders.

In his introductory report, P. Demetriades showed that public investment tended to have a higher socioeconomic rate of return than investments made in the private sector. The Round Table participants thought this observation should be investigated further through additional studies, one aspect of which would be to test the ability of cost-benefit analysis to encompass all the benefits of new investments. It was suggested that cost benefit analysis is not imaginative enough and misses some of the benefits. Cost benefit assessments ought to be evaluated *a posteriori* to be fully satisfactory. The Round Table clearly saw a need for additional research on this issue.

5. SECURITY AND TRADE FACILITATION ISSUES

The main idea to emerge from the discussions was that the removal of trade policy barriers was not sufficient to promote the integration of the economies of South-East Europe and Central Asia. Complementary measures had to be taken, linked to port throughput, information technologies, market regulation, technical interoperability of means of transport, etc. However, the greatest gains could be expected in the field of port efficiency and information technologies. These two approaches are complementary, since port operations are dependent on advanced information technologies, in particular for customs clearance operations.

The issue of customs clearance was discussed specifically and it was concluded that there had been no tangible improvement in South-East Europe and Central Asia, but that customs clearance and border crossing conditions had deteriorated in some cases. It is clear that transport markets that are over-regulated are also a barrier to trade, but the main barrier remains waiting times and the costs of border crossings. In this regard, econometric studies have shown that a 63 per cent reduction in waiting times and a 65 per cent reduction in the time required for the operations themselves will result in a 45 per cent increase in trade between two countries. One of the problems is that the sources of

financing to improve the situation are not clearly identified and that customs clearance often involves corruption. Solving this problem will require strong policies and consistent action, not only in the transport sector.

Another aspect highlighted during the discussions was security and, here again, the sources of financing to change the situation are not clearly identifiable. There may be some benefits to tighter security measures, for shippers and carriers have been forced to redefine their chain of operations and this has proved highly beneficial to the movement of goods, which has in fact been accelerated in somes cases. For example, advance notification of cargo has made it possible to speed up transport, storage and customs operations in many cases, while increasing transparency. However, the implementation of tighter security measures raises the issue of determining who has the legal responsibility in this area. There must be an evaluation of the risk level as well as of the advisability of taking measures to reduce it. For countries which are relatively weak economically, multilaterally agreed security measures might act as barriers to trade. Technical assistance on security could help avoid trade losses for the most disadvantaged economies. The technologies needed to carry out cargo verification operations are controlled by only a few producers, which raises potential problems of excessive costs as a result of market dominance; the United States, for example, requires that its own technology be used.

Assuming that all these issues can be settled, the fact would still remain that there is a lack of logistic platforms in South-East Europe, as the IMONODE project showed. What is needed here is a local approach to transport policies (i.e. bottom-up), to ensure the specialisation and improvement of the facilities of existing platforms rather than the creation of new ones. In this regard, until now there has perhaps been a failure of co-ordination between the various players.

6. CONCLUSIONS

Transport and trade facilitation issues are not simple, for they mix aspects such as investment in infrastructure with port efficiency, and the security of operations. However, it is clear that if time can be saved in transport operations, this will increase trade between the countries concerned. This increase in trade can, in turn, generate growing income for the trading country and thus a favourable growth dynamic. These mechanisms should be studied further through additional research, for the linkage between transport and economic development in connection with international trade is a key issue at a time of rapidly growing trade between Asia and Europe and Asia and the United States. The Thessaloniki Round Table showed clearly that the cost of trade was equivalent to a tax, and that it was often higher than the production cost of goods. This points to areas for further investigation, such as the degree of competition on export transport markets, the role of public enterprises, standards for transport markets and border crossing, as well as other aspects. It would also seem that there is an inherent underinvestment in infrastructure of international importance, which calls for greater co-ordination of international transport policies.

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MARKET ACCESS, TRADE IN TRANSPORT SERVICES AND TRADE FACILITATION

The Round Table discussed the role of the transport sector in supporting regional economic integration. The event was hosted by the Hellenic Institute of Transport, Thessaloniki. The discussion focused on the following sub-topics:

- Regional integration in the context of multilateral trade liberalisation
- The effects on market structure of liberalising international trade in transport services
 - Interaction of the liberalisation of trade in transport services and national competition policies
 - Demand for coordination of:
- international transport infrastructure policies
 - international transport security
 - national logistics policies

In view of the complexities of the multilateral process of liberalising international trade in transport services, regional integration efforts will continue to play a major role. However, there is a risk of inconsistencies between different agreements. Regional integration processes in trade and transport require strong international coordination, not only of transport policies but also of related policies such as security and logistics.





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