Intermodal Logistics Policies in the EU, the U.S. and Japan

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1. Introduction

Intermodal freight traffic is increasing globally. According to the World Bank, the number of intermodal containers passing through ports worldwide doubled over the last decade, with similar progressions in intermodal air traffic, intermodal rail traffic and intermodal truck traffic. Indeed, the development of intermodal transport has become a key policy priority and challenge at global level. However, policy settings and approaches differ from country to country and between the major three industrial regions EU, NAFTA and Asia.

In Europe, the prevailing tendency is to try to force intermodal policies through a top-down approach led by the European Commission. In many EU member countries as well as Switzerland intermodal transport is an important part and objective of sustainable transport policies often accompanied by modal shift actions diverting freight traffic from road to rail and, where feasible, to coastal shipping and waterways. In NAFTA with the leadership of the United States, on the contrary, intermodal transport is driven by the market and it is the business sector with large shippers and carriers, railway and shipping companies, forwarders and integrators, etc. that has pushed intermodal use without major governmental subsidies. Asian countries - including Japan - have been concentrating on developing, building and operating their unimodal transport systems, and have only recently started to recognise the need for an overall intermodal transport policy to serve the international and Asian freight flows and promote more balanced modal shares domestically.

While an intermodal systems view should be the basic reference, modal programs continue to be necessary to build missing links and improve inefficient connections between modes. Even when

pursuing intermodal objectives through modal shifts from trucking to rail or coastal shipping, mode specific capacity and/or service improvements have to be envisaged. Rail, shipping and trucking are competitors, but they are also partners in door-to-door intermodal operations.

In this paper, we will review intermodal logistics policies in the EU, NAFTA and Asia, focusing on the United States and Japan in NAFTA and Asia respectively, because they have clear logistics policies and an influential position in the regions. Then, by identifying the commonalities and differences in the policy settings and approaches of the regions and by assessing their causes and effects, we will discuss what we can learn from the practices and experiences in other regions.

2. Review Framework

2.1 Definition of intermodal logistics

As part of integrated advanced logistics and supply chain management, intermodal logistics is defined in terms of seamless door-to-door freight transport operations using at least two different modes of transport. In general the initial/terminal portions are short and by road, and the main long haulage of containers, swap bodies, trailers or trucks is by rail, waterway, sea or air.

This concept[1] is built on the following essential key notions:

- door-to-door transport[2]
- two or more transport modes – in essence road (truck), rail, water, air
- seamless operation, i.e. predominant use of intermodal containers, swap bodies, etc., and no handling of the goods themselves in changing modes.

An intermodal freight logistics strategy is expected to optimize the supply chain and linkages between partner companies. The question is how policy strategies and innovations in intermodal transport can be streamlined with needs in logistics chains and operations; i.e. businesses' supply chain management. From a legal and institutional perspective which continues to be very important in the three regions, a further issue is how a new breed of freight transport governance can be developed in the face of the historically entrenched attitudes of competing modes, taking into account the interests of business and global supply chains on one hand and the public and social policy goals of the governmental authorities on the other.

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[1] See ECE, ECMT, EU, OECD

[2] either carried out by one 3PL or mega logistics provider, or through a coordinated chain of multiple mode or area specific logistics providers

2.2 Modal and intermodal freight share

How important is intermodal freight transport and logistics? This is not easy to answer in exact and quantitative form, for the simple reason that in most countries we lack true intermodal data; i.e. freight traffic tonnages for door-to-door transport by at least two modes.

Table 1 sets the general scene for a broad comparison of EU-15[3] -- the United States -- Japan based on a few demographic and economic indicators, and confronts the respective overall road, rail and water freight transport statistics. From the official tonne-kilometre data presented in the table the rather weak or very weak role of rail transport in Europe and Japan is apparent. Rail in the U.S. seems to do well currently.

Table 1 Overall Comparison EU-15 -- U.S. -- Japan

	EU	U.S.	Japan
Population (millions)	379	278	127
Area (million sq km)	3.24	9.4	0.38
GDP (bn $ in PPP's)	9593	10143	3364
Exports (bn $)	936	1019	402
Imports (bn $)	1023	1301	348
Road freight (bn tonne km)	1329	1499	307
Rail freight (bn tonne km)	243	2093	23
Inland shipping freight (bn tonne km)	1395	1025	242

Sources: ECMT, EU, OECD

Table 2 presents official modal split data. There is relative over reliance on trucking especially in Japan and also in Europe. Short sea shipping (SSS) in the U.S. seems to be lagging behind, while inland waterways are quite well used.

The share of intermodal transport is assessed in Table 3 using different sources. As shown by the official European statistics and the estimated U.S. data, 'intermodal' rail is between one fourth and one fifth of total rail traffic. The U.S. freight rail system provides the intermodal 'landbridge' operation across the country and is an essential intermodal link for international trade serving the seaports as the major container gateways.

[3] European Union with 15 Member countries

Table 2 Modal split (%, t-km) EU-15 -- U.S. -- Japan

	EU	U.S.	Japan
Road	43.8	30.0	53.7
Rail	8.1	38.2	4.0
Inland waterways	4.1	9.4	0.0
Coastal sea	41.3	7.4	42.3
Pipelines	2.8	15.0	-

Sources : U.S.-BTS, EU, MLIT 1999/2000

In Japan we can rely on on ad hoc survey in 2000 covering certain commodities domestically transported for a very limited period (3 days), distinguishing 'road only' and 'road and sea or rail' in detail. Based on the survey, half of rail traffic is intermodal using mostly 12 feet containers standardized by Japan Railway, though overall rail share is relatively low. Owing to the geographical situation, Japan has a high water/sea share, most of which is not intermodal, but water/sea only.

Table 3 Intermodal freight transport shares EU -- U.S. -- Japan

	% of total	% by water/sea	% by rail
EU-15 in t-km	8.6	15.0	25.8
-Germany in t			>10.0
- Netherlands in t	8.0	24.0	24.0
- U.K. in t	20.0	22.0	13.0
U.S. in t-km			19.0 – 30.0 (a)
Japan in t (b)	1.5 (c) (d)	7.9	50.0

(a) 30.0 % if automobile transport on rail (around 11 %) is included;

(b) According to an ad hoc 3-day survey for tonnes domestically transported in 2000, 82.9 % is 'road only';

(c) 'road and sea (container ship, ferry and RORO)' is 1.0%;

(d) 'road and rail (container train only)' is 0.5%, 1.0% if conventional freight trains are included.

2.3 Intermodal policy measures

Public authorities are directly called upon to further develop intermodal logistics policies and to

work on specific intermodal actions and projects as well as the most efficient implementation strategies.

The government's role is primarily to assure a level playing field for the market, provide a coherent and interoperable transport and logistics network of routes, corridors, ports, airports and terminals and promote its optimized use meeting environmental requirements. Shippers and logistics service providers will be mainly concerned with developing cost-efficient, and now more and more environment-friendly, logistics schemes and customer-oriented value added services. The September 11 terrorist attack has added a new priority on security measures that are affecting logistics procedures and operations.

Figure 1 presents examples of the variety of intermodal policy instruments and measures. In general, intermodal logistics policies comprise a combination of actions, which require co-operation among the public authorities concerned.

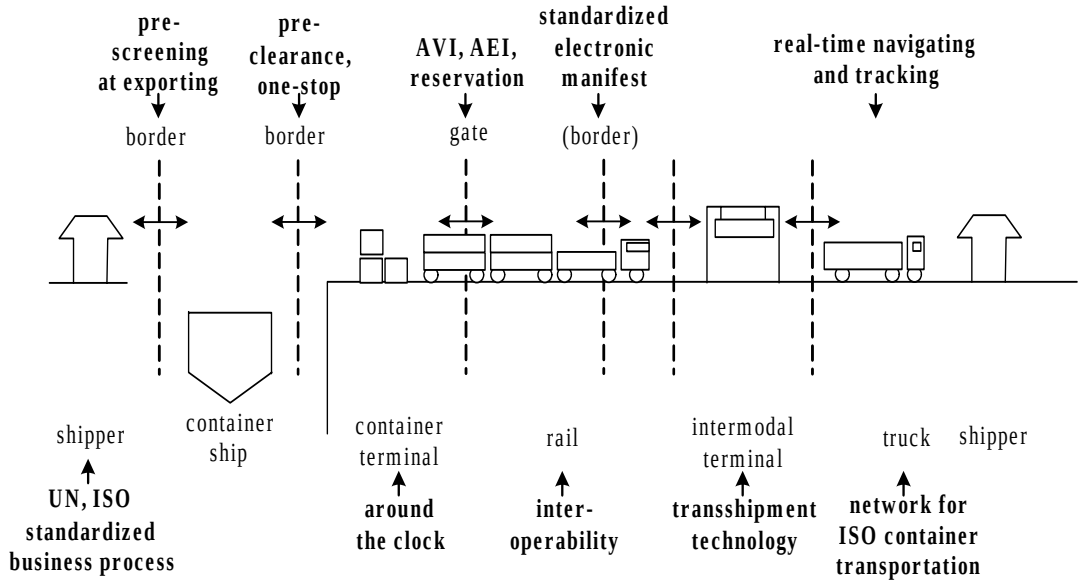


Figure1 Examples of intermodal policy measures

3. Reviewing Intermodal Logistics Policies

3.1 European intermodal policy

Many European governments emphasise the need for an intermodal transport and logistics policy to combat highway congestion and environmental problems, to increase overall traffic efficiency and profit from benefits of co-ordinating modes. Nine European countries invest yearly about 450

million Euros in intermodal transport. The intermodal transport of containers, trailers and swap bodies has increased by 150% during the past decade.

The European Commission is a mighty defender and promoter of intermodality[4] as part of the European Union's Common Transport Policy for sustainable mobility. The policy vision is to develop a structured approach to intermodal freight transport in the framework of a single transport market with advanced harmonisation of regulations and competition rules.

Table 4 summarizes the key elements of the EU's basic intermodal policy as put forward in the Commission's 1997 Communication. The declared goal is to optimise interdependence and complementarities of transport modes.

The EU policy recognises logistics to be a crucial factor of competitiveness. Taking into account the complex interaction of suppliers, manufacturers, retailers and consumers, intermodality should allow the integration of a broad range of transport services in the supply and distribution chains whereby well functioning information and communication technologies are indispensable. In other words the integration of intermodal transport in supply chains is a key challenge. Noteworthy in this regard are also the emphasis on establishing a uniform intermodal liability regime and the intention to create an electronic commerce market for intermodal freight logistics (E-logistics).

Table 4 Overview of elements of intermodal policy in the EU

Infrastructure	Operations	Technology R & D	Rules, Standards
Design of intermodal transfer points	Common charging and pricing	Interoperable systems & equipment	Transport standards (esp. load units)
Intermodal design of Trans-European Networks (TEN)	Freight routes in intermodal & interoperable system	IT system, EDI, ITS	Intermodal liability, Work regulations
Missing links: Intermodal priority projects	Value-added logistics services (esp. E-logistics)	Satellite based communication system	Intermodal competition rules

The EU's White Paper (2001) on European transport policy for 2010 proposes to take measures which should make the market shares of the modes of transport return by 2010 to their 1998 levels. The basic policy directions and means are:

- charging and pricing,
- revitalising road alternative modes, and

[4] "intermodalism" in U.S. terminology

- targeted TEN (Trans European Network) investments.

Against the background of a predicted 50% trucking increase from 1998 to 2010, the basic challenge is to reduce road congestion. The aim is to link up sea, inland waterways and rail and utilize the still untapped capacities of short-distance coastal shipping and inland waterways. One improvement proposal is therefore to develop “motorways of the sea” as part of the Trans-European Network; i.e. shipping links providing by-passes around the land bottlenecks in the Alps and the Pyrenees. Innovative port services and operations are also supported.

Another focus is on testing and implementing innovations in logistics concepts and systems, harmonising and standardising intermodal loading units (pallets, containers and swap bodies) and creating the right technical conditions for stimulating the development of “freight integrators” specialising in the integrated, seamless transport of full loads at European and world level.

As a follow-up to PACT (Pilot Actions for Combined Transport) which terminated in 2001, a start-up initiative for intermodal services is being launched in 2003, the new Marco Polo programme. The aim is to shift freight from the road to other more environment-friendly modes and to improve the operation of the entire intermodal chain. The programme supports actions in the freight transport, logistics and other relevant markets to contribute to return to 1998 modal share levels by helping to shift the expected increase in international road freight traffic of 12 billion tkm per year to short sea shipping, rail and inland waterways or to a combination of modes of transport.

The programme aims to support operations and services directly and offers incentives for the industry. It is based on calls of proposals. It is designed to last up to 2010 and has a budget envelope of 75 million Euros. All segments of short sea shipping, rail and inland waterway freight markets are eligible. The three different types of action are presented in Table 5 together with the conditions of funding.

The concrete modal shift projects would typically consist of new services in the non-road freight market. They should be viable on their own within a period of three years. The catalyst actions are oriented towards new innovative solutions and would tackle existing structural market barriers such as setting up “motorways of the sea” schemes, pools for tri-modally compatible containers, one-stop international freight rail services or intermodal logistics IT systems. Finally the common learning actions would concern exchange of know-how, training, improved procedures at sea and inland ports, adapting transport systems to meet logistics needs, shippers’ intermodal understanding and awareness and similar initiatives. It will be interesting to observe the outcome of the Marco Polo programme. The results of all these actions will be monitored and experience

Table 5 Actions and support conditions of EU's Marco Polo programme

Modal Shift -concrete projects & operations	Catalyst actions - break-through solutions	Common learning - better knowledge & methods
Aid to start-up services --1 Euro subsidy per 500 t-km shifted --min subsidy 0.5 Mio Subsidy up to 30% --ancillary infrast. 20% Subsidy up to 3 years, viable after subsidy	Overcome structural barriers -- innovative --min subsidy 1.5 Mio Subsidy up to 35% --ancillary infrast. 20% Subsidy up to 4 years, viable after subsidy	Co-operation, sharing of know-how, mutual training --min subsidy 0.25 Mio Subsidy up to 50% Subsidy up to 2 years

will be disseminated.

The implementation of intermodal initiatives will also depend on the image of intermodal logistics amongst shippers and marketing efforts promoting intermodal logistics as a competitive business advantage and as an effective tool in up-to-date supply chain management. A better understanding of shippers of the pros and cons of intermodal logistics operations is often necessary.

A successful example of such efforts has been the Dutch programme of business level logistics scans carried out amongst 100 pre-selected shippers (of originally 600 companies altogether) to introduce cost-effective intermodal solutions at micro level targeting the companies' specific business activities. Based on voluntary, clearly defined contractual agreements between companies and the Ministry of Transport, the scans were financed by 75% by the government and 25% by the individual companies. Independent logistics specialists were employed to assess in detail profitable intermodal opportunities in companies' logistics activities and business practices. The results were that 80 companies out of 100 – including many SME's – had a realistic potential to improve their intermodal practice, with often surprising benefits down to transport distances of 150 km or so.

3.2 American intermodal policy

The efficient logistics system in the North America is indispensable for the North America Free Trade Agreement (NAFTA) involving the U.S., Canada and Mexico. These three countries are required to harmonize their logistics policies and procedures, and to make the logistics systems interoperable. Because of the size of its economy and its central geographical location the U.S. has a factual leadership position and has taken initiatives in enhancing intermodal logistics and transport in the region including cross-border facilitation, and this is in spite of the tightened security situation. Indeed there are basically few conflicts of interests among the three countries in

integrating the logistics systems concerned. This is why we focus on the American policies from now on.

The original milestone of American intermodalism was the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA '91) which provided the legislative framework to develop "a National Intermodal System that shall consist of all forms of transportation in a unified, inter-connected manner …". The benefits of intermodalism were expected to be lower transport costs - through the use of the most suitable mode for individual segments of the entire transport chain - increased national productivity and efficiency, more efficient use of existing infrastructure and lower environmental impacts. Some flexibility for intermodal funding was introduced together with the possibility of joint public/private investments. The Office of Intermodalism was created at the highest executive level of the Department.

Nevertheless intermodal transport and logistics was and is largely driven by the industry through its search for least cost solutions. Market deregulation and competition among shippers and carriers reduced the transport-related transaction costs for business. Most of the large shippers and carriers have now corporate units responsible for intermodal transport, logistics or supply chain management.

However, there were and are still a number of impediments to intermodalism:

- inadequate infrastructure to accommodate double stack rail services,
- congestion on access roads serving intermodal terminals and ports,
- operational inefficiencies at terminals, including EDI system usage,
- regulations resulting delays and costs when building new facilities,
- impacts of changes in ship design on ports and intermodal facilities,
- financial bottlenecks both in private and public sectors, and
- institutional constraints – customs, domestic and foreign partner relationships, governmental data requirements.

In 1998, the Intermodal Surface Transportation Efficiency Act for the 21st Century (TEA-21) was enacted. The challenge was to meet the evolving needs of the private sector which was competing not only in the domestic market place, but increasingly in the global environment. In particular it was necessary to integrate the accomplishments of NAFTA agreed in 1994. The expanding trade and investment opportunities had significant impacts on trans-border transport between the three countries, and raised challenges specifically for intermodal operations. Intermodal rail has a clear advantage at border crossings; while trucks have to queue up for inspections and clearance, trains can be pre-checked and electronically tracked passing at full speed.

Table 7 summarizes the essential elements of the U.S intermodal policy[5]. Note its basic philosophy:

- Intermodal is industry and market driven, and
- Government acts as a convener and catalyst, i.e. few public sector interventions, few governmental initiatives.

Table 7 Overview of elements of intermodal policy in the U.S.

Strategy	Infrastructure	Technology
-Freight facilitation strategy, -Freight partnerships, -Intermodal freight capacity, -Freight analysis decision framework, -R&D, -Education & training	-NHS intermodal freight connectors, -Intermodal cargo hubs, -National corridor development, -Co-ordinated border infrastructure program	-ITS intermodal freight program, -Intermodal border clearance, -Standards, "size & weight", containers

Within this overall policy two targeted programs deserve special mention:

- NHS ("National Highway System") intermodal freight connectors, and
- ITS intermodal freight program.

As part of TEA-21, NHS freight connectors, i.e. public roads leading to seaports, airports and major intermodal terminals, were assessed by the Department of Transportation. The aim was to see how land access to U.S. intermodal cargo hubs could be facilitated. Ultimately, connectors to 517 freight terminals - port, rail, pipeline - and 99 major freight airports were identified for enhancement and improvement, altogether 1222 miles in length. Funding up to 2001/2 was about U.S. $ 1.5 bn through federal, state, local and private sources. The new draft federal legislations starting in 2004/2005 foresee a funding level of U.S. $ 3 bn. Co-funding selection criteria are shown in Table 8.

A few spectacular intermodal projects - Alameda, Maine, Washington State, New Jersey, New York City – were also undertaken. The Alameda Corridor is a project of national significance serving the ports of Long Beach and Los Angeles, major gateways for Asian trade. The ports, the railway companies and multiple public authorities joined to finance nd build the 20-mile

[5] The U.S. transportation policy itself is best summarized in a statement of the former Transportation Secretary Rod Slater (Feb 1997-Jan 2001) "…to produce a safe and sustainable transportation system that is international in reach, intermodal in form, intelligent in character and inclusive in service."

Table 8 Co-funding selection criteria

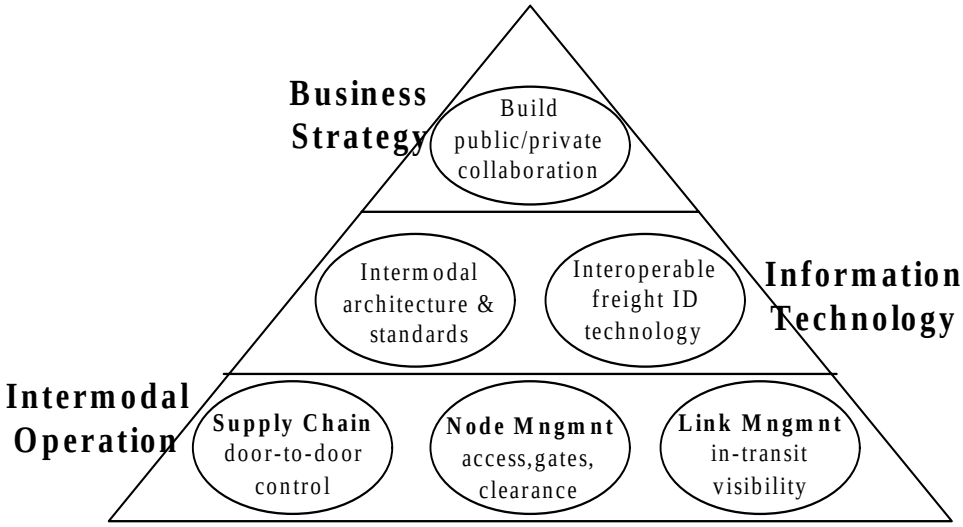
Airports	100 trucks/day in each direction or 100,000 tons/year arriving or departing
Ports	> 50,000 TEU's/year, 500,000 tons bulk /year or 100 trucks/day in each direction
Rail terminals	> 50,000 TEU's/year or 100 trucks/day in each direction
Pipelines	100 trucks/day in each direction

grade-separated intermodal freight rail corridor from the ports to the inland intermodal rail yards. The operations of three freight rail lines could be concentrated and streamlined and local trucking between ports and rail facilities was reduced. 200 railway grade crossings were eliminated and congestion, air and noise pollution decreased. The 2.4 billion U.S. $ project was financed through a private/public partnership by bonds – i.e. railway container charges – and a mix of local, port, state and federal grants and loans.

The second initiative concerns the improvement of intermodal freight operations through an increased use of information technology and ITS – Intelligent Transport Systems. The aim is to enhance the reliability, responsiveness and security of the intermodal freight system. Opportunities to accelerate the application of ITS to intermodal freight movements are investigated including operational tests and demo projects. These center on the development of an ITS architecture and standards, especially for freight identification technologies to ensure interoperability and security controls. Intermodal freight applications of ITS aim at:

- Supply chain management – e.g. door-to-door shipment,
- Node management – e.g. rail terminal, port, and airport management, and
- Link management –e.g. tracking and asset management of trucks chassis, rail equipment, vessels.

The figure presents the focus areas for ITS intermodal developments. With the increased pressure for supply chain logistics and just-in-time deliveries, public/private collaboration is warranted to stimulate efficiency and innovation in the intermodal freight transport process. It is needless to say that the September 2001 terrorist act has added a dramatic requirement for security controls and precautions to be taken in the freight industry. IT and ITS technologies can deliver both efficient and reliable control means. International co-operation and standardization are clearly necessary.



Source: DOT, Office of Intermodalism

Figure 2 Three action levels for ITS/Intermodal freight initiatives

To conclude, the U.S. executive and legislative bodies are discussing the renewal of the next long-term transportation legislation – called SAFETEA, i.e. the Safe, Accountable, Flexible and Efficient Transportation Equity Act. Several different drafts of the forthcoming legislation have been put forward and, as usual, discussions about funding and taxation are at the forefront. Broadly speaking, freight mobility, global connectivity, security and border infrastructure are amongst the priority goals. Also, emphasis is on domestic short sea and waterway shipping. When the final version of this legislation is enacted in 2004, it is likely that these broad policy goals will have been maintained.

3.3 Japanese logistics policy

In Asia bi- and multilateral talks have started to reach Free Trade Agreements. The major challenges are custom duties and other trade barriers such as quantitative restrictions. The issue of the logistics system in the region is rarely touched upon yet, even though Asian countries, mostly separated by sea, are in a basically advantageous position to establish an efficient and environmentally friendly intermodal logistics system.

According to the OECD report prepared by the Asian Task Force (2003), several countries including Singapore, Korea and Japan have developed well defined comprehensive logistics policies. Most of the countries, however, have mode specific freight transportation policies, while Malaysia and the Philippines explicitly refer to the importance of intermodality. Clearly, it will take some time to have a region-wide intermodal logistics policy in Asia. In this paper therefore, we concentrate on reviewing Japanese logistics policies as an Asian case study.

About the same time as the EU's intermodality communication, the Japanese Government decided on the "Comprehensive Program of Logistics Policies." The goal is to strengthen competitiveness by promoting integrated logistics. Note, as such, Japan does not have an "intermodal" policy, but clearly there are many elements and features that address the intermodal challenge.

The Japanese program is rich in content and proposes a wide range of actions and improvements. It was designed to enhance and strengthen Japan's national and international logistics base to offer one of the most convenient and attractive logistics services in the Asian-Pacific region. Business and industry should be able to profit from efficient logistics services and the general public should benefit from improved environmental and social framework conditions.

Table 9 summarizes the key elements of this policy agreed at a Cabinet meeting in April 1997. The measures focused on infrastructure improvements, regulatory reform, innovation and business practices.

Table 9 Overview of elements of Japan's 1997 logistics policy

Infrastructure	Deregulation	Innovation	Business practices
-co-operation between modes -Elimination of bottlenecks -Dev. of international hubs -Dev. of intermodal terminals - ports, harbors, airports -Strategic logistics outlay	-Less government interventions -Simplifying regulations -Facilitation to enter logistics market -Abolishment of demand/supply regulation	-IT applications computerization -Standards, EDI, codes, pallets containers -GPS -ITS -New transport technologies	-Better use of work resources -Logistics management -Pricing mechanism -SCM -CRM -E-com

Three levels of logistics systems were distinguished, each involving a number of intermodal elements:

- city logistics - rationalizing door-to-door deliveries, use of railway and inland waterway, waste logistics, improved terminal transport,
- regional logistics - modal role-sharing, promotion of coastal shipping and related equipment, promotion of rail cargo, access roads to other modes, and
- international logistics – container terminals and cargo handling, import/export procedures; domestic land transport of marine containers and larger semi-trailers, expansion of domestic coastal shipping; promotion of competitive international

sea and air cargo transport..

In July 2001, the “New Comprehensive Program of Logistics Policies” was issued to take stock of experience and achievements so far and to update aims, targets and measures against the background of the changing situation worldwide, in the Asian hemisphere and domestically. The general orientation of the program was realigned towards an internationally competitive logistics market and system emphasizing cost and environmental dimensions. Ways and means are better co-operation and partnerships between logistics stakeholders, a fair and competitive logistics market and the enhancement of logistics infrastructure.

The rather unique feature of the Japanese policy and program is setting of quantitative targets allowing verification of measures, monitoring and follow-up of results achieved. Table 10 provides a summary of some results of the 2001 logistics policy as published in the first two follow-up reports in 2002 and 2003.

Table 10 Japanese logistics policy targets and achievements so far

Target indicator	Aim	Year	Result so far
Modal shift to rail & coastal shipping (2000 : 40%)	50%	2010	2002 : 43%
Time ship arrival – cargo ready for port exit (1998: 3.6 days)	2 days	2005	2002 : 3 or 4 days
% of airports & ports reached in 10 min from highway (2001: air46%, port33%)	90%	2015	2003: air56%, port39%
Palletized ratio of cargo (2001:77%)	90%	2005	2002 : 77%

4. Commonalities and Differences

4.1 Comparison

In reviewing European, American and Japanese policy statements, we find a high degree of commonality. Policies are formulated within a general political framework aiming at sustainable development i.e. economic growth and environmental progress with global competitiveness as a primary goal.

Within this framework, the rationale of intermodality requires a seamless integrated transport

network. It aims at a balanced use of the total freight logistics system. Note however intermodal transport and logistics policies are not solely confined to modal shift actions, e.g. diverting freight traffic off the road to other surface modes. Intermodal policies also involve measures that enhance the interconnectivity and interoperability of networks.

We have found that the policy intentions pursue the same broad directions:

- (**efficiency**) global competitiveness, supply chain logistics through seamless intermodal door-to-door operations,
- (**sustainability**) environmental and societal enhancement through the improved use of the multi-modal transport system, and
- (**innovation**) systematic applications of advanced technologies and innovation in intermodal facilities and operation, emphasis on international standardization.

It is notable that there is strong common worldwide interest in standardization, especially standardizing load units, containers, pallets. The EU has now proposed a European intermodal loading unit (EILU), a unit optimized for the transport of palettes, and similar developments are going on in Japan. The EU estimates that the number of road vehicles required to transport the same amount of goods would be reduced by about 25%, if all fully loaded ILU's were to be replaced by fully loaded EILU's.

Although overall policy directions are similar, emphases differ:

- EU's main concern is the environmental issue, highway congestion, and technology improvements and innovations,
- U.S. stress global connectivity and trade, leading role of industry, market treatment of modes, and energy problem, and
- Japan's policy aims at competitiveness, increasingly in the Asia-Pacific market , and environmental and societal needs.

In the face of growing road congestion and more stringent environmental standards, many policy makers in different countries have decided to favour modal shifts diverting trucks off the road.

Table 11 Goals of intermodal logistics

EU	Move towards rail and coastal shipping (back to 1998 modal share in 2010) Move 12 billion t-km off the road every year (Marco Polo programme)
U.S.	Funding intermodal connectors and associated facilities Developing major intermodal cargo hubs
Japan	Targeted 50 % share for rail and coastal shipping in 2010 from today's 40% Non-road transport in city & regional logistics

In comparison, the intermodal logistics policies of the EU, the U.S. and Japan favour different policy instruments. The EU is focusing on operations and services (including subsidies) and has emphasized technology developments and innovations through its large Framework Research Programmes. The U.S. at the federal level is using co-funding mechanisms to stimulate intermodal infrastructure projects, Freight Corridors, and projects of national significance with emphasis on intermodal connectors as well as tracking and security technologies including joint ITS intermodal programs. Japan's logistics policy is a "comprehensive" package where all modes participate and contribute, setting quantitative targets and following them up.

Table 12 Major logistics policy measures

EU	Focusing on operations and services Incentives through subsidies Pushing technology applications and innovations
U.S.	Infrastructure oriented, projects of national significance Co-funding approach and partnerships Technology applications
Japan	"Comprehensive, multi-modal" package within traditional modal budgets Regulatory reform measures Pushing technology applications and standardization efforts

As to direct or indirect emphasis on modes, the U.S. and the EU seem to go hand in hand. The development of short sea shipping and, as far as possible, waterways is a clear priority, with the U.S. currently in a less advantaged situation with a 7.4% t-km share compared to EU's 41.3% for coastal shipping or Japan being in the 42 % range. The U.S. is targeting the short haul intermodal potential and is at the same time assessing the changes needed in their port structures, should the Panama Canal be up-graded to be used by larger vessels. Japan is also working on expanding its port structure, trying to re-establish their competitiveness vis-à-vis other container ports in the Asia-Pacific region. As to rail, the intermodal situation in the U.S. is far superior to that of the European countries that now have set new goals increasing their funding levels (albeit predominantly for passenger rail), while JR Freight has been concentrating on certain express routes and niche markets.

A somewhat neglected challenge in some overall logistics policy statements is the issue of intermodal logistics in urban and metropolitan areas, i.e. city logistics with intermodality in mind. Note most freight nodes, distribution centers and intermodal transfer points – ports, airports, railway terminals – are located in cities, generating important freight flows with impacts in terms of congestion, livability and pollution. Notable is the case of Chicago where all the major U.S. and

Canadian railroads interchange in the urban area, with 1.2 million containers annually moved by trucks over the local road and expressway network. Therefore a substantive intermodal infrastructure and improvement project is now being implemented to improve transshipment, access to facilities and regional distribution.

4.2 Policy implications

The decision making process on public policies should be transparent so that stakeholders could understand and support them. This is the case with intermodal logistics policies. In order to successfully implement the policies, we have to make shippers and logistics service providers aware of the goals and policy measures.

In this respect the EU provides some useful information. Their studies demonstrate what kind of social cost savings may accrue from the use of intermodal freight transport and logistics. The following figures convince us of the merit of intermodality:

- Intermodal freight transport results in 60-80 % lower accident figures and 40-50 % lower CO_2 emissions than road transport,
- Overall social cost saving is 33 - 72 % compared to road transport, and
- 1 Euro external cost saving for 85 t-km shifted from road to rail, for 52 t-km to inland waterway, for 50 t-km to coastal shipping.

What can be said about eligible intermodal projects? The U.S. intermodal connectors and the Marco Polo programmes provide some figures:

- Infrastructure (co)funding for access roads to intermodal terminals and hubs, if road traffic flows are >100 trucks/day in each direction or the port has >50 000 TEU's/year (U.S. context), and
- With the minimum subsidy set at 0.5 million Euros and a rate of 500 t-km shifted for 1 Euro subsidy, each individual European modal shift project accepted would move at least 250 million t-km off the road.

At present we cannot identify a common thread in project eligibility, since the projects will have different outcomes in the regions concerned and since some constraints, e.g. financial ones[6], may have a dominating influence.

We believe the target setting, project implementing and annual monitoring approach set in motion

[6] Note the considerable differences in the respective budget envelopes. The U.S. intermodal connector program has a planned 3 bn U.S.$ budget in the framework of the next 6 year SAFETEA legislation while Marco Polo has 75 million Euros budget for the next three years.

in the Japanese decision making process is positive and productive. We have little knowledge on the mechanism in which the logistics measures influence stakeholders' behaviors and bring benefits. With the usual cycles of plan-do-see completed, we could accumulate useful empirical information for future logistics planning.

To widen the constituency of the intermodal logistics sector, joint efforts and coalitions are necessary involving the full range of stakeholders. In the U.S., in the U.K. and also in Japan, such initiatives are being undertaken, involving the logistics industry and local and regional (state, prefecture) governments (e.g. transport and land use planning agencies). There is still much room for working on a common perspective of an efficient intermodal network for container transport between the ports and major inland destinations, especially in Asia.

A better public awareness of the sustainability issue (Kyoto agreement) should help to prepare a fertile ground for more co-operation amongst stakeholders and at the same time expanding the intermodal share. Green logistics management has been adopted by a number of European transnational corporations, such as BASF in Germany and Unilever in the Netherlands, and the recently adopted eco-certification system in Japan for medium and small sized enterprises are good examples.

5. Conclusions

In our market economies cost, transport time and environmental criteria will dominate the individual choice of modal or intermodal chain logistics, rather than top-down regulatory management and policy pressure at governmental level. This is reflected by the rather mixed and often disappointing results of modal shift actions so far. Note the still growing modal share of trucking in Japan or the limited impact of the EU's former PACT incentive programme (1997 – 99) which achieved just a 1% modal shift of combined transport. On the other hand, due to growing market demand, the domestic intermodal rail share in the U.S. has grown by an annual 5% for more than a decade.

In the face of the lagging modal shift results, we have found that there is a growing tendency towards multimodal funding for dedicated infrastructure and missing intermodal links as an overall cost-effective and an environmentally and socially welcome way to go forward. The U.S. program for intermodal connectors and freight corridors, the EU's intermodal priority infrastructure projects and the French and German policy changes towards multimodal financing from ETC toll collections, point to a changing recognition of the urgency to enhance the long-term functioning of the total multimodal transport system.

For intermodal logistics to be efficient, the application of IT systems - ICS and ITS – along the intermodal transport chain is absolutely essential so as to enhance the quality, time reliability and security of intermodal freight services. The information system is the glue that holds the intermodal logistics system together and allows to efficiently manage the supply chain.

Several R&D projects have been carried out in the U.S. and the EU to support smart border facilitation and promote innovative solutions for seamless shipping-port-hinterland operations and freight deliveries, respectively. However, the actual state of practice is still underdeveloped both for tactical intermodal operational management and companies' supply chain planning processes, albeit to a lesser extent in cargo tracking and tracing. The joint use of a common logistics data base at logistics hubs combined with up-to-date intermodal traffic and terminal management schemes could provide substantial improvements especially around Asian ports where port access problems may account for 30% of total international transport costs. It is likely that the European Marco Polo programme and the American ITS/intermodal freight initiative will stimulate progress in this area.

Our comparative policy review has shown that we can indeed learn from differing intermodal policy emphases and directions in the other regions. As a decision support tool, and to benefit from more detailed international analyses of intermodal projects and experience, it would be worthwhile to select and assemble data on a few global logistics indicators for monitoring and benchmarking, focusing on key features of intermodal logistics. This could be effectively done through the network of international organizations active in global trade and transport, and now security as well, for which an enormous amount of data are now being collected and exchanged.

The policies discussed in this paper dated mostly from before the September 2001 event. So the intermodal and global security issue that now dominates many international discussions between governments and between industry representatives, is scarcely addressed in the intermodal policy statements referred in this review. It will of course play an important role in the new American SAFETEA legislation. The effect of these considerations and the measures taken so far by the U.S. on trade facilitation, customs, inspections, productivity, costs, etc is substantial. All modes and the entire supply chain are concerned. While at first sight intermodal logistics is at an disadvantage, there are potential supply chain benefits as well. New control and tracking technologies are applied or being tested as are new global trade procedures. It is likely that these will also have an effect on domestic intermodal logistics.

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