

COMPETE

Analysis of the contribution of transport policies to the competitiveness of the EU economy and comparison with the United States

COMPETE Annex 8

Transport policy in the EU and the US

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Analysis of the contribution of transport policies to the competitiveness of the EU economy and comparison with the United States

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List of abbreviations

bill	Billion
CBA	Cost-Benefit-Analysis
EC	European Commission
ERF	European Union Road Federation
EU	European Union
EU10	EU member states acceding to the EU in 2004
EU15	EU member states before accession in 2004
FHWA	United States Federal Highway Administration
GDP	Gross Domestic Product
mill	Million
pkm	Passenger-kilometres
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SIB	State Infrastructure Banks
TEA-21	Transportation Equity Act for the 21st Century
TEN-T	Trans-European Transport Networks
TIFIA	Transportation Infrastructure Finance and Innovation Act
TINA	Transport Infrastructure Needs Assessment
tkm	Ton-kilometres
U.A.	Urbanized area, which is larger than a city
UK	United Kingdom
US	United States of America
US-DOT	United States Department of Transportation

Annex 08: Transport policy in the European Union and the United States

1 EU and US fact sheet

Table 1-1: Glance on structural parameters of the EU and the US

	Unit	European Union						United States	
		EU15		EU10		EU25		US	
		2000	2004	2000	2004	2000	2004	2000	2004
Area	1000 km ²	3,236		738		3,974		9,360	
Population	mill	377	381	75	74	452	455	282	294
GDP (current prices)	bill EURO	8,710	9,963	381	486	9,091	10,449	10,689 ⁽⁵⁾	9,434 ⁽⁵⁾
Cars	1000	179,020	189,672 ⁽¹⁾	20,567	22,824 ⁽¹⁾	199,587	212,496 ⁽¹⁾	191,930 ⁽³⁾	205,672 ⁽³⁾
Motorways	km	51,625	55,093 ⁽³⁾	2,863	3,038 ⁽³⁾	54,488	58,131 ⁽³⁾	55,567 ⁽⁴⁾	56,818 ⁽⁴⁾
Railways	km	151,781		49,997		201,778		159,792	
Passenger performance	bill-pkm	4,779		972		5,751	5,970	7,586	8,087 ⁽¹⁾
Freight performance	bill-tkm	3,078		385		3,463	3,804	5,383	5,524 ⁽¹⁾

(1) 2003. (2) 2002. (3) includes car, pickups and sports-utility-vehicles. (4) includes interstates, freeways and expressways. (5) in current dollars: 2000: 9,817; 2004: 11,734 bill \$.

Source: EC 2002, EC 2005, ERF 2004, EUROSTAT 2006a, FHWA 2004, own calculations

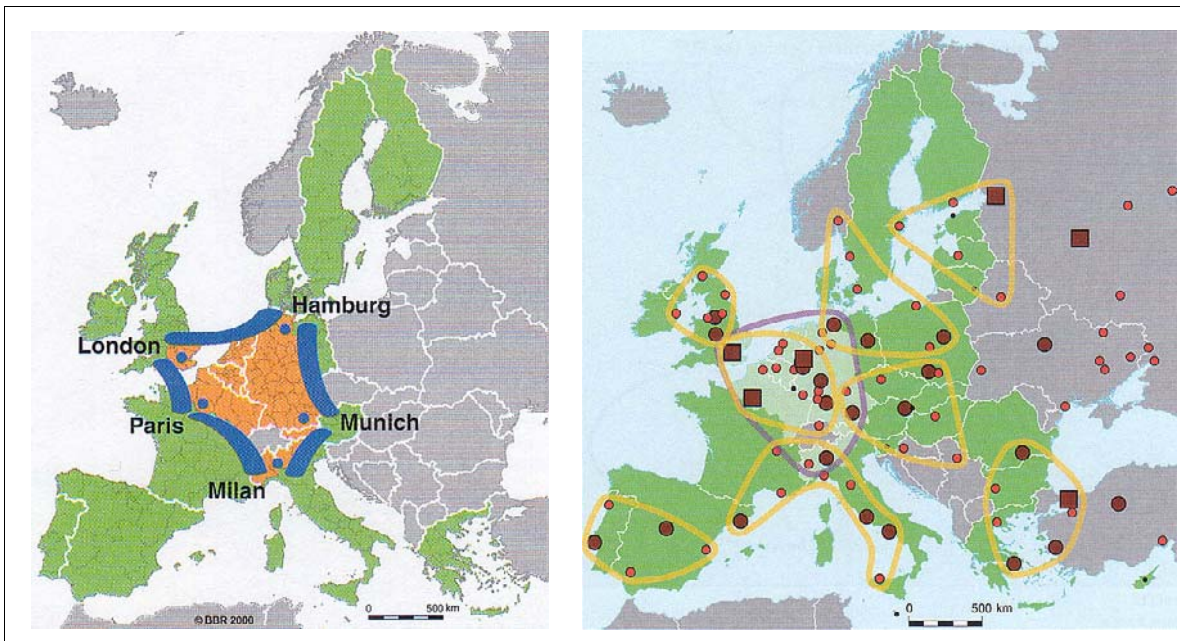
2 Introduction: the spatial scope for EU and US transport policy

The spatial structure is one important factor shaping the transport system of a country or a region. Looking at the spatial structure of the EU and the US several significant differences can be detected. First, the US is by more than a factor of two larger than the EU25 (rather exact a factor of two if one excludes Alaska from the US). On the other hand, the US population is about 35% lower than the EU25 population (see Table 1-1), such that the average population density is more than three times higher in the EU25 than in the US.

The distribution of population and economic strength also determine the spatial structure and thus influence the transport system. Again the EU25 and the US differ significantly. For the EU in the past the "Blue Banana" ranging from London via the Benelux countries and the Rhine-valley to Milan in Northern-Italy was seen as densely populated and most important economic area of the EU15 (see Figure 2-1). This concept is further developed into the "20-40-50 Pentagon" describing a spatial structure with London-Hamburg-Munich-Milan-Paris forming the corners of a pentagon whose area covers 20% of the EU15 area, 40% of the population and 50% of the GDP of the EU15. With the enlargement of the 10 new member states (EU10) in 2004 this ratio should be even more pronounced in a way that on a significantly smaller share of the EU25 area nearly the same share of GDP is generated. The most important thing to note here is that the "20-40-50 Pentagon" is located in the centre of the EU25 and the travel distances between the corner cities of the pentagon range from about 1000 to about 1200 km.

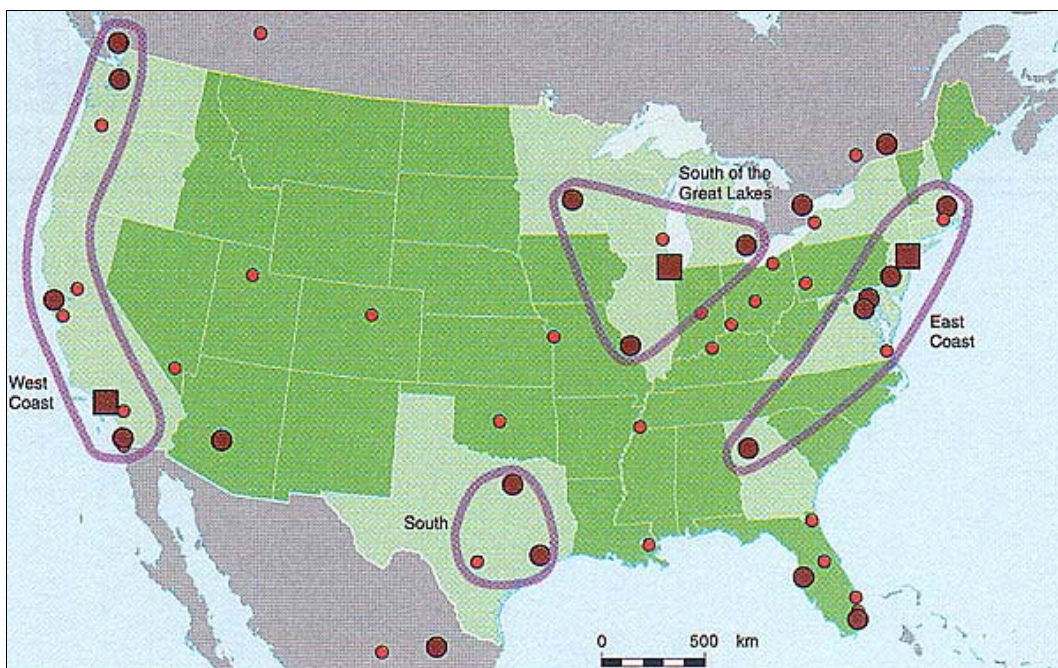
In contrast to this rather high centrality of the European economic centre of gravity the US reveals four economic centres, which in European terminology are located at the periphery of the country (excluding Alaska): the *West-Coast* with Los Angeles as the dominant centre (and a second centre with Seattle-Portland), the *East-Coast* with New York as the dominant centre, the *South-of-the-Great Lakes* area with Chicago as the dominant centre and the *South* formed mainly by the Texan cities (e.g. Houston, Dallas, San Antonio) (see Figure 2-2). Only the distance New York to Chicago is in the same range as the distances within the European "20-40-50 Pentagon" (about 1200 km). The distances between the other combinations of the four economic centres are at least double that far (e.g. Houston-Chicago, Los Angeles-Seattle), or about triple the distance (e.g. Los Angeles-Houston, Los Angeles-Chicago) or even more than four times longer like New York to Los Angeles (about 4500 km).

The first impact of the difference in spatial structure should be that the US shows a higher transport performance than the EU25 because the travel distances to connect the population and economic centres of the nation are longer than distances between the centres in Europe. This is confirmed by the data presented in Table 1-1. Of course, also in Europe long travel distances can be identified (e.g. Lisbon-Helsinki with about 4000 km), but they do not carry significant flows. Most of the significant flows emerging from the peripheral locations will be either attracted by the central "20-40-50 Pentagon" area or by other regional attractors like Madrid for the case of Lisbon. In both cases the flows will have shorter travel distances than between the four US economic centres. The second impact, would be that to some extent other modes are favoured in the US than in the EU. E.g. in the US air transport will play a more important role for passenger transport than in the EU and rail transport for freight, because on average these modes enable to provide better services for longer distances. This is confirmed by the data presented in Table 3-1.



Source: Faludi 2002

Figure 2-1: EU spatial structure: the 20-40-50 Pentagon (EU15) and development kernels



Source: Faludi 2002

Figure 2-2: US spatial structure: distinct four far-off economic centers

Besides the global spatial structure of the EU and the US the structure of cities and urbanized areas determines the transport system. For this analysis Table 2-1 presents the cities and major urbanized areas of the EU and the US ranking them by population size. The table is limited by showing only those cities in Europe, which have more than 500.000 inhabitants in the European Urban Audit¹ for the period 1999 – 2003 plus the two urbanized areas (U.A.) Inner London and Paris Petite Couronne (EUROSTAT 2006b). For the US the data comes from the US Census from the year 2000 (US Census Bureau 2006). The US data comprises both cities and counties or groups of counties that are grouped together to form an urbanised area. Actually the number of cities over 500.000 inhabitants is significantly lower for the US than for the EU with 34 to 51 cities of which in the US five cities belong to New York and its boroughs, respectively (see Table 2-1²). Only looking at the urbanized areas it seems that their number is higher in the US than in the EU. However, one should take into account that the delimitation of what makes an urbanized area (U.A.) is not straightforward and might differ between EU and US e.g. for London U.A. and Paris U.A. also alternative delimitations than presented in Table 2-1 exist such that using these they would be in the size range comparable to Los Angeles or New York. Furthermore the European Urban Audit is not exhaustive i.e. it does not include all U.A. and not all smaller EU cities.

However, taking those cities classified as city over 500.000 inhabitants by the quoted EU and the US statistics it can be noted that the population density in the EU is about 60% higher than in the US (4265 to 2574 persons per square km). In fact, only Chicago, Philadelphia, New York and its boroughs (counties) reach the European average of population density for this category of cities.

Of course, this also proposes implications for transport policy and the transport system as the higher the population density the better are the opportunities to successfully establish and use public transport in cities and urbanised areas.

¹ The EU Urban Audit already includes cities of Bulgaria and Romania where e.g. Bucuresti is included in Table 2-1 though these countries are expected to join the EU only in 2007.

² The data presented in Table 2-1 is taken from EUROSTAT 2006b and US Census Bureau 2006 and is extended by other sources in particular for the EU countries to complete the list and to enable own calculations with the data.

Table 2-1: Ranking and structure of cities and urbanized areas in the EU and the US (2000)

Rank	EU-City / Area	Population	Density	US-City / County	Population	Density
1	Greater London U.A.	7,172,091	4562	New York--Newark U.A.	17,799,861	2024
2	Paris Petite Couronne U.A.	6,164,000	8089	Los Angeles--Long Beach--Santa Ana U.A.	11,789,487	2707
3	Berlin	3,388,434	3800	Chicago U.A.	8,307,904	1497
4	Madrid	2,957,058	4886	New York city, NY	8,008,278	6595
	Inner London city	2,766,000	8671	Philadelphia U.A.	5,149,079	1100
5	Roma	2,546,804	1982	Miami U.A.	4,919,036	1664
	Paris Commune city	2,125,000	20238	Dallas--Fort Worth--Arlington U.A.	4,145,659	1132
6	Bucuresti	1,936,724	8137	Boston U.A.	4,032,484	877
7	Budapest	1,777,921	3385	Washington U.A.	3,933,920	1310
8	Hamburg	1,726,363	2286	Detroit U.A.	3,903,377	1169
9	Warszawa	1,609,780	3259	Houston U.A.	3,822,509	1136
10	Wien	1,550,123	3735	Los Angeles city, CA	3,694,820	2863
11	Barcelona	1,505,325	15252	Atlanta U.A.	3,499,840	684
12	Milano	1,256,211	6902	San Francisco--Oakland U.A.	2,995,769	2691
13	München	1,227,958	3955	Phoenix--Mesa U.A.	2,907,049	1403
14	Praha	1,169,106	2357	Chicago city, IL	2,896,016	4778
15	Lyon	1,168,000		Seattle U.A.	2,712,205	1081
16	Lille	1,091,000		San Diego U.A.	2,674,436	1313
17	Napoli	1,004,500	8585	Brooklyn borough, Kings County, NY	2,465,326	9823
18	Marseille	982,000		Minneapolis--St. Paul U.A.	2,388,593	981
19	Bruxelles / Brussel	978,384	6062	Queens borough, Queens County, NY	2,229,379	4828
20	Birmingham	977,087	3646	St. Louis U.A.	2,077,662	964
21	Köln	967,940	2389	Baltimore U.A.	2,076,354	1170
22	Torino	865,263	6656	Tampa--St. Petersburg U.A.	2,062,339	970
23	Athina	789,166		Houston city, TX	1,953,631	1254
24	Lodz	786,526	2672	Manhattan borough, New York County, NY	1,537,195	17575
25	Riga	756,627	2465	Philadelphia city, PA	1,517,550	4108
26	Stockholm	750,348	4013	Bronx borough, Bronx County, NY	1,332,650	8959
27	Valencia	746,612	5551	Phoenix city, AZ	1,321,045	1074
28	Amsterdam	734,594	4452	San Diego city, CA	1,223,400	1270
29	Leeds	715,399	1296	Dallas city, TX	1,188,580	1192
30	Sevilla	702,520	4965	San Antonio city, TX	1,144,646	1073
31	Palermo	686,722	4319	Detroit city, MI	951,270	2569
32	Bordeaux	660,000		San Jose city, CA	894,943	1939
33	Frankfurt am Main	641,076	2581	Indianapolis city, IN	791,926	819
34	Wroclaw	634,047	2165	San Francisco city, CA	776,733	1293
35	Zaragoza	610,976	575	Hempstead town, Nassau County, NY	755,924	1525
36	Genova	610,307	2501	Jacksonville city, FL	735,617	325
37	Rotterdam	595,255	2890	Columbus city, OH	711,470	1292
38	Essen	591,889	2813	Austin city, TX	656,562	981
39	Dortmund	589,240	2102	Baltimore city, MD	651,154	2730
40	Toulouse	583,000		Memphis city, TN	650,100	852
41	Glasgow	577,869	3293	Milwaukee city, WI	596,974	2378
42	Poznan	571,985	2189	Boston city, MA	589,141	2538
43	Düsseldorf	570,765	2630	Washington city, DC	572,059	3232
44	Lisboa	564,657	6674	Nashville-Davidson, TN	569,891	418
45	Helsinki	559,718	2996	El Paso city, TX	563,662	869
46	Vilnius	554,281	1384	Seattle city, WA	563,374	1526
47	Nantes	554,000		Denver city, CO	554,636	1382
48	Bremen	540,950	1656	Charlotte city, NC	540,828	860
49	Málaga	534,207	1356	Fort Worth city, TX	534,694	691
50	Hannover	516,415	2530	Portland city, OR	529,121	1405
51	Sheffield	513,231	1395	Oklahoma City city, OK	506,132	315
	Average of 51 EU cities		4265	Average of 34 US cities		2574

Table 2-2 provides a closer look onto the differences in number of cities and in population density between the EU and the US. In summary one can note that both the number and the population density of medium size cities (200,000 to 1,000,000 inhabitants) is significantly larger in the EU than in the US, while for the Mega-Cities (> 1,000,000 population) number and density are quite close to each other. Considering that the Urban Audit is not exhaustive in particular for the smaller cities (< 200,000 inhabitants) it looks that at the lower end of city size the density and number of cities are similar in EU and US.

Table 2-2: Population density of different groups of cities in the EU and the US (2000)

Size class of city	Average density [Pers/km ²]		Difference EU to US	Number of cities		Difference EU to US
	EU	US	[%]	EU	US	[%]
Population >1,000,000	5808	5030	15	15	13	15
500,000< Population <1,000,000	3030	1297	134	36	25	44
300,000< Population <500,000	2246	1516	48	45	31	45
200,000< Population <300,000	1827	1317	39	> 41	34	21
100,000< Population <200,000	1525	1445	6	> (66)	172	n.a.

Source: own calculations

Looking at the overall situation of transport in the EU15 and the US described by the modal-split based on transport performances presented in Table 3-1 broadly the initial conclusions concerning the implications of the spatial structure on the transport system are confirmed:

- modes that suit better for longer distances transport are of higher importance in the US compared to the EU due to their longer distances between the economic centers. In particular this concerns air mode for passenger transport and rail mode and pipelines for freight transport.
- bus, tram, metro and rail transport are more relevant in the EU due to the higher density within EU cities and the closer proximity of European cities to each other.
- not discussed above but also obvious from the comparison of EU and US geography in Figure 2-1 and Figure 2-2 is that short-sea shipping has higher potential in the EU both because in some cases it constitutes the only relevant option to transport heavy goods e.g. for Ireland and the UK because of their island situation and because in some cases short-sea shipping provides the shortest path for transport e.g. for Italy-Spain or Finland-Germany transport.

However, it should be clearly stated that the spatial structure is one determinant of the transport system and other determinants like transport policy or technology are at least of equal importance to shape the transport system.

3 Framework of transport policy-making in the EU and the US

Completing the reflection on the impact of spatial structure on transport in the EU and the US a glance on the actual situation of transport should provide the starting point for the following analyses. Table 3-1 presents the modal-split for passenger and freight for the year 2000 comparing the EU15 with the US. Obviously car transport is the dominating mode of passengers for both regions. In the EU15 rail and bus attract significantly higher shares than in the US, while air transport is nearly double in size in the US than in the EU15. For freight transport the differences are even more significant with road being the strongest mode in EU15 while it is rail in the US, though road also holds a strong position in the US and according to other statistics even has a larger share than rail. The amazing differences with respect to freight transport concern rail and sea shipping, which differ by about five times with rail being strong in the US and sea shipping in the EU15. One of the reasons for this, the difference in spatial structure has been discussed in the previous section.

Table 3-1: Passenger and freight modal-split in EU15 and US in 2000 [in %]

Passenger modes	EU15	US	Freight Modes	EU15	US ³
Passenger car (1)	77.8	84.8	Road	44.3	29.8
Bus / coach	8.6	3.4	Rail	8.0	38.3
Railway	6.4	0.3	Inland waterways	4.0	9.4
Tram + metro	1.0	0.3	Oil pipeline	2.7	15.1
Waterborne	0.5		Sea (domestic/intra-EU)	40.9	7.4
Air (domestic / intra-EU)	5.9	11.2			

Source: EC 2003; (1) including light vans in US

Despite these differences in the actual transport situation the EU and US policies are rather congruent with respect to the core topics of COMPETE i.e. to reduce transport cost and congestion, to improve transport productivity and overall competitiveness. This will be discussed in the following sections.

3.1 Strategic policy documents in the EU and the US

The major strategic transport policy documents of the EU are the White Paper on "*The future development of the common transport policy - A global approach to the construction of a Community framework for sustainable mobility*" (EC 1992) and the White Paper on "*European Transport Policy for 2010: time to decide*" (EC 2001), which is reviewed in detail in

³ A recent publication of the US-DOT (2006) provides different modal shares for freight given as composite estimates measured in terms of ton-miles for the single modes in the year 2002: road: 37.2%, rail: 33.7%, inland-waterway: 11.9%, air: 0.3%, pipeline: 16.9%. The difference emerges due to the inclusion of a number of sectors that in statistics derived from the US Commodity Flow Survey (like the one shown in Table 3-1) have not been considered.

2005 (e.g. De Ceuster et al. 2005) leading to an adaptation of strategies published in "Keep Europe moving - Sustainable mobility for our continent" (COM(2006) 314, EC 2006). These strategic documents are accompanied by a number of modal- or topic-related policy documents e.g. on infrastructure funding, on revitalising of railways, on motorways of the sea.

The four major objectives of the 2001 White Paper are (1) shifting the balance between modes of transport, (2) eliminating bottlenecks, (3) placing users at the heart of transport policy and (4) managing the globalisation of transport. The review of this White Paper though confirming the objectives of both previous White Papers slightly shifted the focus and added a new objective by putting less emphasis on modal-shift and more emphasis on efficiency improvements of the major modes, in particular road, and by highlighting that transport is one of the drivers for innovative solutions that could both improve the transport system of Europe and become an asset of Europe to be exported to the world market.

The US transport policy in the last two decades developed through three major acts related to surface transport: the *International Surface Transportation Efficiency Act* (ISTEA) in 1991, the *Transportation Equity Act for the 21st Century* (TEA-21, US-DOT 1998) and the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU, US-DOT 2005) in 2005. Separate acts like the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR21) in 2000 for air transport covered the other modes. Every 3 to 5 years the US-DOT publishes a strategic plan for about the following 5 years. Currently the *Strategic Plan 2003 to 2008* promoting the strategic objectives: safety, mobility, global connectivity, environmental stewardship and security provides the guidelines for policy-making (US-DOT 2003). From time-to-time long-term visions for the transport system are prepared by the US-DOT like "The Changing Face of Transportation" (US-DOT 2000). The latter also emphasizes the EU White Paper objective to "place users at the heart of transport policy" stating to develop a "vision that puts people first and strives to leave no one behind".

Summarising the strategic documents it can be noted that the **major objectives are quite similar between the EU and the US** e.g. providing mobility, increasing safety and security, managing globalization and protecting the environment. However, some differences can be observed looking closer into the details. One difference concerns **transport pricing** policies: the EU has strongly promoted these policies in the recent years (e.g. by publishing a White Paper, several directives and fostering research) but decreased the emphasis in the recent review, while pricing policies have not been in the focus of TEA-21 but receive more attention in the current strategic documents of the US. Of course, these opposing tendencies in the EU and the US reflect the different degree of implementation of transport pricing in the two world regions, which has been more successfully implemented during recent years in the EU e.g. with the London congestion charge, the German heavy goods vehicle charge for motorways, the Stockholm congestion charging (yet only temporary implemented), toll collection on bridges (e.g. Öresund bridge) or tunnels (e.g. Warnow tunnel). However, the US also reports about significant experience in congestion pricing starting with the State Route 91 in California in 1995 (Finch 1996).

On the other hand, to promote **innovations** for transport and by transport has been earlier emphasized by the US policy and there the review of the EU White Paper is catching-up the US headstart. In practice, this can be observed e.g. at the "race" for developing new engines

and cars to shift the transport system towards alternative fuels like biofuels or hydrogen where the EU established the *Hydrogen and Fuel Cell Technology Platform* (HFP) while the US founded e.g. the *California Fuel Cell Partnership* (CaFCP) and the *FreedomCAR and Vehicle Technologies* (FCVT) initiative.

3.2 Highlights of transport policy implementation in the EU and the US

At a first glance the structure of the EU and the US the latter being one country since more than 200 years and the former being a grouping of 25 countries with different cultures and policy-making contexts seems to be quite different. However, also the US integrates 50 Federal States, some of them like California as large as the largest European countries, to form the nation. This similarity also shows up in major elements of the transport policy: first, both EU and US develop plans and fund infrastructure to **create supra-national transport infrastructure**. For the EU these are the Trans-European-Transport-Networks (TEN-T) starting with the 14 projects of the Essen list in 1994, extended to 19 projects plus Galileo in 2001 and in 2005 after the accession of 10 new member states comprising 30 priority projects with funding requirements of 225 billion EURO for the major projects. In the US the three past transport acts amounted to similar orders of magnitude for spending on highways and transit infrastructure and improvements (ISTEA about 150 billion \$, TEA-21 about 200 billion \$ and SAFETEA-LU about 240 billion \$ of which about 77% are dedicated to highways, each for a period of 5-6 years). The SAFETEA-LU act includes programs similar to the concept of the TEN-T like the *High Priority Projects Program*, the *National Corridor Infrastructure Improvement Program* and the *National Highway System Program*. All these programs are defined to implement a US nationwide i.e. cross-federal states highway and corridor system (including also a few high-speed rail corridors), which in fact is rather close to the TEN-T basic idea of generating a European-wide multi-modal transport network.

A further similarity between EU and US strategic policy making is the **consideration of cross-border (or close to border) infrastructures**, which received special attention by the EU e.g. expressed by higher EU funding shares for cross-border infrastructures. In addition to the US national corridor programs further specific programs to build transport infrastructure to connect to the US neighbours Canada and Mexico like the *Coordinated Border Infrastructure (discretionary) program* form part of TEA-21 and SAFETEA-LU, respectively. In both cases, the EU and the US acknowledge the lower regional benefits and the higher significance of such cross-border infrastructure for trade and globalization to provide the argument for the (supra-)national funding.

Congestion is recognised as a significant and growing problem in both the EU and the US policy documents. The US SAFETEA-LU beyond its program on *Congestion Mitigation Provisions* includes a program to establish a nationwide harmonised Real-Time Management Information System, which should collect real-time performance information of the national highway system to steer measures against congestion and to relief congestion. In the EU such a harmonised system is not foreseen, yet. But suggestions how such a congestion monitoring can be started are given in the main text of the Final Report and in Annex 2.

The US National policy promotes **cycling and walking** modes as in TEA-21 it is one of the objectives to foster these modes. In SAFETEA-LU the program *Safe Routes to School* is set-up,

which should enable walking and cycling for children on their way to school. In the EU the subsidiarity principle hinders the EC to develop cycling or walking policies since these are clearly local issues. However, the EU indirectly aspires to positively influence urban transport policy via the CIVITAS program and those projects of CIVITAS that promote sustainable urban mobility including better opportunities for walking and cycling. The review of the 2001 EC White Paper (EC 2006) also foresees to develop an Urban Transport Green Paper for 2007.⁴

The most significant difference between the transport policy of the EU and US concerns the level of **fuel taxation** and hence fuel prices. Taxation of fuel in the European countries is about five to fifteen times higher than in the US, where it is about 6 Eurocent/l gasoline. In the US more than 80% of the fuel tax revenues go into highway funding and about 15% into funding of transit systems. Similar approaches are followed in European countries though the dedication for infrastructure funding is not always that strict.

An interesting aspect concerns **equity between regions** in terms of distribution of (supra-)national funds. The US includes in their policy documents the *Equity Bonus Program* (FHWA 2005a), which (1) ensures that each state gets of his contributions to the Highway Trust Fund at least 90.5 percent in 2005 building toward a minimum 92 percent relative rate of return by 2008, (2) guarantees a specified rate of growth of the national funds to the state, and (3) Selected States are guaranteed a share of apportionments and High Priority Projects not less than the State's average annual share under TEA-21 (the previous policy program in the US). This approach provides for continuity of national funding, but, of course, bears the risk that funds are not spent in the most beneficial way as it can be assumed that beneficial projects are not evenly distributed across the country. That means, in this case the US policy weights equity higher than efficiency. In the EU such equity considerations are not that obviously placed into the transport policy documents. However, they are present both in formal and informal ways. The formal aspect concerns the objective of cohesion, which should help to develop more peripheral regions and hence provide more equity across EU regions. Informally equity is a criteria of most infrastructure decisions of the EU. An example could be observed during the TINA discussions (Transport Infrastructure Needs Assessment) about the infrastructure development for the new member states, where according to the CBA results (Cost-Benefit-Analysis) a number of regions would not have been qualified for receiving European infrastructure funds. However, due to equity reasons still a number of projects was defined for such regions.

3.3 Mega-trends globally shaping transport cost, congestion and logistics

Three mega-trends can be identified that are of utmost importance for the transport system. The first mega-trend are the demographic changes affecting in particular passenger transport. This trend differs to some extent between the EU and the US. Common to both regions

⁴ The US policy also acknowledges the subsidiarity principle as can be seen from the following quote: "*SAFETEA-LU promotes more efficient and effective Federal surface transportation programs by focusing on transportation issues of national [European] significance, while giving State [National] and local transportation decision makers more flexibility for solving transportation problems in their communities.*" (FHWA 2005a). In brackets the corresponding terminology is given to transfer the FHWA statement to the European idea of the subsidiarity principle.

is the ageing of the societies, which changes the transport patterns increasing the importance of the patterns of the "grey hair" generations. However, in the EU the birth rates are reduced significantly in the past years such that population in the future is stagnating or even will decline, which is not expected for the US, yet. This means, for the EU population growth as one of the drivers of passenger transport will cease in the years to come reducing also the contribution of passenger transport to congestion.

The second mega-trend is constituted by globalization. Increasing globalisation drives the economic interaction between different countries and world regions and, hence, trade flows are growing leading to a continuous increase of freight transport. But also passenger transport is fostered by globalisation due to the growing number of business trips in the global economy and the growth in tourism always looking for farther destinations. For both, passenger and freight transport this implies longer distances and longer transport chains and hence increased cost per trip that have to be counterbalanced by improved transport efficiency to keep transport viable.

The third mega trend is the price increase of fossil fuel, which is driven by the continuous growth of world demand due to the fast economic development in countries like China and India and the limitations on the supply side i.e. the geological restrictions to pump more crude oil out of the existing wells (peak-oil) and the limitations of the refinery capacity. Growing crude oil price will of course drive the transport fuel prices and hence the transport cost. However, the linkage between crude oil price and the price for gasoline or diesel is dampened by the fuel taxes, which differ significantly between the EU and the US. The lower fuel taxes in the US lead to relatively higher fuel price increases for transport in the US, while in the EU where in some countries the taxes paid on fuel are higher than the crude oil cost such that a 100% increase of crude oil price would on average result only into a 40% increase of fuel price in the EU (see also ECORYS 2006). In that sense, the transport cost in the US will grow stronger than in the EU by the raise of the crude oil price. This holds for road transport, while e.g. air transport does not pay fuel taxes at all such that the crude oil price increases directly feed through into the air transport cost.

4 Comparison of objectives of EU and US transport policies

This chapter is devoted to the comparison of objectives of the transport policies in the European Union and the United States, by assessing the main objectives underlying the development of such transport policies and the measures and measurements adopted. To perform the comparison the following main documents are assessed:

- The White Paper on the "European Transport Policy for 2010: time to decide" (EC 2001); and,
- The "TEA 21 – Transportation Equity Act for the 21st Century" (US-DOT 1998) and "SAFETEA-LU - Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users" (US-DOT 2005).

As expected the main issues that led to the development of these overarching documents are broadly similar: i) increase accessibility and mobility options, ii) increase safety and security; iii) place the users at the centre of transport options and through that promote the economic growth, i.e. leading to higher productivity, efficiency and competitiveness.

Transportation Equity Act for the 21st Century (TEA-21, 1998) builds on the initiatives established by the Intermodal Surface Transportation Efficiency Act from 1991 (ISTEA) which was the main authorising legislation for surface transportation. TEA-21 combines the maintenance and improvement of current programmes with the new initiatives to meet the challenges of improving safety, protecting and enhancing communities and the environment and advancing economic growth and competitiveness both at national and international levels through efficient and flexible transportation. In short terms TEA-21 advocates “Safer, Simpler and Smarter Transportation Solutions”.

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU, 2005) supplies the funds and refines the programmatic framework for investments needed to maintain and grow the transportation infrastructure. SAFETEA-LU promotes more efficient and effective Federal surface transportation programs by focusing on transportation issues of national significance, while giving State and local transportation decision makers more flexibility for solving transportation problems in their communities.

The TEA-21 consolidates the previous planning factors into seven broad areas:

- Support the economic vitality of the United States as a whole, the States and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency;
- Increase the safety and security of the transportation system for motorised and non motorised users;
- Increase the accessibility and mobility options available to people and for freight;
- Protect and enhance the environment, promote energy conservation, and improve quality of life;
- Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight;
- Promote efficient system management and operation; and
- Emphasize the preservation of the existing transportation system.

The **White Paper “European Transport Policy for 2010: time to decide”**, analysed the existing situation with regard to transport in the EU and set out an ambitious action programme up to the 2010 time horizon. Whilst supporting the economic growth and maintaining the right to mobility, the white paper proposed to improve sustainability of transport through restoring the balance between road, rail, waterway and shipping, developing inter-modal transport, combating congestion and putting safety and service quality at the heart of the transport policy.

The White Paper presented **four action priorities**, desegregated into 12 policy guidelines and 76 measures:

- Shifting the balance between modes of transport;
- Eliminating bottlenecks;
- Placing users at the heart of transport policy; and,
- Managing the globalisation of transport.

With this Action Plan, the EC aimed to bring a transportation policy and a transport network that increases the competitiveness and efficiency of Europe, including all modes of transport. A strategy designed in particular to revitalise railways and other alternative modes to road transport is presented. Through that set of measures, the EC pretended to enable the gradual break between transport growth and economic growth in order to reduce the congestion of the transport networks and the pressure on the environment without restricting the mobility need to maintain and increase competitiveness.

As the White Paper was published in 2001, some important action lines were not specifically addressed in it. This is the case of the transport security aspects resulting from the terrorist attacks and the optimistic assumptions of stable and low crude oil prices, which were in line with any projections of the International Energy Agency (IEA) until mid 2005.

4.1 Challenges for transport development

As already highlighted, the background issues underlying the transport policy in the US and EU are broadly similar. In more detail the following challenges emerge:

- Transport is a key factor in modern economies, however cities and bottleneck parts of the long distance network are confronted with growing congestion problems, evoking the risk of losing competitiveness;
- The continuous demand for mobility can no more be solved through the building of new infrastructures and opening of new markets;
- Demographic changes are contributing to an increase in the number of elderly people with new demands and requirements for transport, and in some regions reduced needs for transport infrastructures;
- The vulnerability to terrorist attacks (US and EU) and natural disasters (more visible in US, though also present in the EU) becomes a reality;
- Challenges in environmental issues in particular noise and the greenhouse effect and energy dependencies;
- Financing aspects in particular the parallel financing of new infrastructure and the maintenance of existing infrastructure;
- Pricing and new approaches to generate revenues for transport spending purposes;
- Equity and accessibility to transport facilities;
- Safety of transport modes, in particular road safety;
- Demand for more quality services;
- Facilitate the decision making processes through institutional and organisational arrangements.

Besides these common approaches the US and European transport policy also reveal some differences. Preservation of existing transportation system is mentioned by TEA-21 as one out of the seven broad areas for action. However, the White Paper mentioned the problem of ageing transport infrastructure just once (p.57) in conjunction especially with rail tunnels. Nevertheless, that ageing and even deterioration of existing transport infrastructure will become a significant problem in the medium term is becoming more obvious in some member states like Germany, where analysis of bridges along motorways and major roads conclude that about 15% reached a critical level of maintenance, about one third would be just sufficient and the number of excellent structural quality bridges decreased from 17 to 7% within five years. The problem is aggravated by the fact that transport infrastructure investment in the past was not spread evenly over time such that in Germany a large number of motorways and bridges were built during the 1960ies. In Spain this would hold for the 1990ies.

The following sections continue the discussion and comparison of policy approaches in the US and the EU around five main issues:

- Increasingly congested facilities across all modes;
- Shift the balance between different transport modes;
- Place users at the heart of transport policies;
- Security: a new challenge; and,
- Sustainability: energy and environment opportunities.

4.2 Increasingly congested facilities across all modes

Since the nineties Europe suffers from congestion, in particular in urban areas, but also almost 10% of the interurban road network is affected by daily traffic jams. This problem not only reflects in the mobility and accessibility patterns, it is expected also to influence the economic competitiveness.

This is not only a problem of road mode. Almost 20% of rail network is classified as "bottle-neck", and sixteen of the EU's main airports recorded delays of more than a quarter of an hour on more than 30% of their flights. Studies conducted in the end of nineties, showed that external costs of road traffic congestion amount to 0,5% of Community GDP and if no decisive measures are taken, the costs attributable to congestion could increase to 1% of Community GDP. For the US similar congestion-cost to GDP ratios are calculated.

As argued in the White Paper, the increasing success of road and air transport is resulting in ever worsening congestion and contributes to failure to exploit the full potential of rail and short sea shipping as alternatives to road haulage. This persisting situation is leading to an uneven distribution of traffic generating increasing congestion. To solve this problem, the EC White Paper aimed to gradually shift the balance between the modes towards the more sustainable transport modes, rail and maritime. In the review of the EC White Paper the emphasis is put more on the improvement of the efficiency of the main modes than on modal-shift to solve these problems.

The issue of congestion is also a critical aspect of the US transport system. Congestion has grown everywhere in areas of all sizes, it occurs during long periods of the day and delays more travellers and goods than throughout the US as ever before. Airports, ports and railways are straining to meet demand, but highway congestion is most familiar as 87% of passenger trips are done in private car mode. According to several studies, highway congestion costs roughly an amount of \$65 billion per year in wasted time and fuel. Improved transportation system operations, the use of high occupancy vehicles (HOV), expanded public transit systems⁵ and other demand management strategies have hardly slowed the rate of increase.

Emphasis on improved coordination and collaborative decision making about investments are a necessity, but building new infrastructures and transit systems alone do not solve the congestion problem. Thus, efforts towards improved system operations, more sophisticated user fees and improved information for users about system performance are deemed to be necessary.

The US Department of Transport (DOT) has directed its efforts to launch a comprehensive approach to congestion relief that involves new, creative and effective solutions. For that the DOT strategic plan for 2003-2008 plans to accelerate the application of technologies to improve operations for a more efficient use of existing infrastructures, maintaining them through a better asset management and provide users better access to the network state. Furthermore, emphasis is placed in local decision making procedures as well as in the exploration of ways to improve the intercity passenger rail network and develop a robust domestic short sea shipping system (growth in port container is expected to double the present traffic by 2020), as currently coastal and waterway shipping system is under-utilised, while it could provide a practical, safe and efficient mode of transport.

4.3 Shift the balance between different transport modes

As highlighted in the previous point, the continuous demand for mobility cannot be solved through building new infrastructures. Not only a shift of balance between modes is needed, but also innovative strategies conducting to more effective use of those infrastructures.

Both EU and US strategies reinforce these ideas. In both cases policies towards an effective charging for transport, turning to a price structure reflecting the costs of infrastructure, congestion, environmental damage and accidents are followed.

To promote such shift, EC policy guidelines are orientated towards five main lines:

- Improve the overall quality of the road transport sector;
- Revitalising railways;
- Striking a balance between growth in air transport and the environment;
- Promoting maritime transport and inland waterways; and,
- Turning intermodality into reality.

⁵ Public transport networks in US terminology.

The US approach is also focused on the promotion of intermodality to achieve that balance. As indicated in DOT strategic plans, America has a vast and highly productive network of transportation assets based on the strengths of individual modes, being the present challenge to turn those separate constituencies into a single and fully coordinated system that connects and integrates the individual modes under the principles of safety, economical efficiency, equitability and environmental soundness.

4.4 Place users at the heart of transport policies

The emphasis on putting users at the centre of transport policies was clearly a central point in the EC's White Paper. One of the main concerns of this orientation was road safety, though emphasis was also put in other aspects such as user costs, rights and obligations, accessibility and equity.

The same approach is followed by the US policies. Turning the transportation into a safer (with a greater emphasis on saving lives and reducing accidents), simpler and smarter system is a key issue for the DOT. In fact, two of the five strategic issues of the DOT are:

- **Enhance public health and safety by working towards the elimination of transportation related deaths and injuries; and,**
- Promote advanced, accessible and efficient intermodal transport systems for the movement of people and goods.

As mentioned above, safety (in particular road safety) is a prime concern, as road transport is in fact the most dangerous and most costly mode in terms of human lives, both in the US and the EU. In this respect it cannot be disregarded the fact that this is one of the few measures where a quantitative target was mentioned in the EC document (reduce the number of deaths on road by 50% in 2007). In the US the target is to reduce the highway fatality rate to not more than 1.0 per 100 million of vehicle-miles travelled by 2008 (against 1.7 in 1996). Similar targets are established by the DOT for railways, aviation, pipelines and hazardous materials.

For the road sector, the central strategies adopted by the US tackle several points of interest concerning the improvement of the accident rates are the following:

- Reduce alcohol impaired driving;
- Increase the use of safety belts;
- Improvements in commercial vehicle operations;
- Highway safety research and development;
- Improvements of the National Drivers Register; and,
- Create facilities and improve safety for bicycles and pedestrians.

The EU approach for the road sector was based on a set of nine measures, some common or very similar to those in the US:

- A common road safety action programme;
- Harmonisation of road safety checks and penalties;
- Tackle the “black spots” on the TERN;
- Increase the use of seat and head restraints;
- Tackle dangerous driving;
- Improve technical investigation of road accident causes;
- Harmonisation of driving licences;
- Introduction of speed limitation devices;
- Use of intelligent transport systems and e-safety as well as pedestrian and cycling protection.

Besides the strong effort on road safety, both EU and US documents provided other measures aimed at placing users at the centre of transport policies. One of the aspects particularly emphasised by both policies regards the accessibility to a quality mobility system in a future different context: changes in population structure will also change the demand for transport services. As population will become increasingly elderly and more diverse, accessibility and equity issues occur, alternatives to traditional individual transport modes have to arise.

Investments in transport infrastructure are necessary to face current challenges. However, and as both EU and US documents highlight, problems cannot be solved through the construction of new roads, instead focus has to be put on a more efficient use of current infrastructures. This has to be supported by an adequate use of cost and revenue methods. This is, adopting policies tackling effectively the issue of charging for transport use. Different studies and documents on this issue have been produced. The EU aims at replacing gradually the existing transport taxes with more effective instruments for integrating infrastructure costs and external costs. However, progress in the implementation of such policies has been slow.

4.5 Security: a new challenge

Security turned out as a new challenge for transportation systems and became a basic element in the definition of transport services. Up to the terrorist attacks in US (9/11 2001) and Europe (London and Madrid) focus has been put mainly on safety aspects aimed at the prevention of functional aspects and minimisation of consequences. Security measures targeted to the prevention, repression and mitigation of intentional acts such as vandalism, crime and terrorism were not directly addressed in the two main documents in analysis as both have been developed previously to the mentioned attacks. However security is now an essential addition to those documents.

Civil aviation, maritime transport, infrastructures, land passenger transport, supply chain, transport of dangerous goods, energy facilities and infrastructures are now object of security measures along with other quality of services measures, but this implies that a balance between operational elements and security requirements must be held. Furthermore, the discussion on the added costs of security (and how to pay them) is also a hot issue. Particularly in the EU, but also in the US, this question raised important discussions around the privacy issues as the EU has always striven for the citizens' rights and liberties, this is, the privacy issues of security measures cannot be disregarded.

4.6 Sustainability: energy and environment opportunities

Fostering a successful implementation of sustainable transport policies is an objective pursued by both the EU and the US. It is also a big challenge faced by all countries, this is, balancing transportation goals with economic, environmental and fairness goals.

Despite the several energetic alternatives that have been introduced (such as electric power, hydrogen or biodiesel), both US and EU economies rely very much on oil with the transport system depending to over 97% on fossil fuels. Furthermore, most of energy issues are intertwined with environmental consequences, as transportation itself contributes to a variety of environmental problems, including greenhouse gas emissions and local air pollution.

TEA-21, in combination with the Clean Air Act Amendments, aims to ensure that air quality is a major consideration in planning future urban transportation. For that, in the coming years US-DOT will target the balance between the need for a safe and efficient transport network with the importance of preserving environmental quality (about 57% of US population lives in areas that fall to meet the federal clean air standards). Review of all vital transportation projects will have to be consistent with the requirements of the environmental law⁶, which aims to speed up decision making on vital airport, highway, transit and intermodal transportation projects while safeguarding environment.

Noise and air pollution and their effects are of greater concern in urban areas and the European Commission is very much in line with the objective of putting research and technology at the service of clean and efficient transport. This has been done either by the adoption of stricter standards for noise, safety and emissions, but also by integrating intelligent systems in different modes for a more efficient management. In this respect EC transport and energy policies now point to the following targets: by 2020 20% of conventional fuels should be substituted by alternative fuels and by 2010 there should be a 5.75% bio fuel penetration rate. Encouragement to exchange of good practices is also advocated by the EC, given the principle of subsidiarity.

5 Actual implementation of transport policies in the EU and the US

So far, the comparison between the EU and the US transport policy explained the broad policy guidelines and the main objectives defined by the key policy documents. The following sections provide a more detailed overview on how the policies have been implemented, which program or measures have been defined and if progress was achieved.

5.1 EC White Paper measures and their advancement into practice

This section lists the 76 policy measures suggested by the EC White Paper of 2001 to provide some more details about the intentions of the EC behind the 12 policy guidelines. Furthermore, for each of the measures the status of implementation in the year 2005 for the EU level as a whole is shown in Table 5-1. The evaluation of progress is taken from the ASSESS study (De Ceuster et al. 2005), which undertook the mid-term evaluation of the EC White

⁶ Environmental Stewardship and transportation infrastructure project reviews, executive order 13274.

Paper of 2001. It should be taken into account that the evaluation result is valid for the EU level as a whole, while for single countries the progress concerning specific measures could be quite different. In particular, it should be taken into account that the EU15 countries had a full five year period to implement the measures while for the new member states it was about one year since the enlargement of the EU happened in 2004 plus a short period during which these countries were preparing to fulfil the *acquis communautaire* before entering the European Union.

Table 5-1: Progress of implementation of the 76 policy measures defined by the EC 2001 White Paper

Policy	Nr	Measure	Progress
Improving quality in the road transport sector	1	Harmonise clauses in commercial road transport contracts	
	2	Driving restrictions on heavy goods vehicles on designated roads	
	3	Training of professional drivers	
	4	Social harmonisation of road transport	
	5	Introduction of the digital tachograph	
Revitalizing the railways	6	First railway package: separated management of infrastructure and services, opening international services in rail freight TENS	
	7	Second railway package: opening up the national and international freight market	
	8	Second railway package: ensuring a high level safety for the railway network	
	9	Updating the interoperability directives on high-speed and conventional railway networks (ERTMS)	
	10	European Railway Agency	
	11	Third railway package: certification of train crews and trains on the Community rail network	
	12	Third railway package: gradual opening-up of international passenger services	
	13	Third railway package: quality of rail passenger services and users' rights for international services	
	14	Third railway package: improving quality of the rail freight services	
	15	Enter the dialogue with the rail industries in the context of a voluntary agreement to reduce adverse environmental impacts	
	16	Support the creation of new infrastructure, and in particular rail freight freeways	

Policy	Nr	Measure	Progress
Controlling growth in air transport	17	Single European Sky	
	18	Technical requirements in the field of civil aviation and establishing a European Aviation Safety Agency	
	19	Air transport insurance requirements	
	20	Harmonisation of airport charges	
	21	Introduction of market mechanism in slot allocation procedures on Community airports	
	22	Community framework for airport noise management	
	23	Protection against subsidisation and unfair pricing practices in the supply of air services from third countries	
	24	Safety of third country aircraft	
	25	Air service agreements with third countries	
	26	Airport capacity expansion	
	77	Introduction of kerosene taxation	
78	Introduction of differential en route air navigation charges		
Promoting transport by sea and inland waterway	27	Motorways of the seas	
	28	Port services liberalisation	
	29	Simplify sea and inland waterway custom formalities and linking up the players in the logistic chain	
	30	Ship and port facility security	
	31	European Maritime Safety Agency	
	32	Double-hull oil tankers	
		Penal sanctions for ship source pollution	
	33	Oil pollution damage compensation fund	
	34	Transfer of ship register	
	35	Training of seafarers	
	36	Eliminating bottlenecks in inland waterway transport	
	37	River Information System	
	38	Greater harmonisation of boatmasters' certificates	
	39	Social legislation inland waterway transport	
Turning intermodality into reality	42	Marco Polo Programme	
	43	Intermodal Loading Units and freight integrators	
Building the Trans-European transport network	44	Trans European Network projects	
	45	Funding of TENs	
	46	Tunnel safety	
	72	TEN infrastructure in the candidate countries	
	73	Funding of infrastructure in the New EU Member States	

Policy	Nr	Measure	Progress
Improving road safety	47	European Road Safety Action programme	
	48	Harmonisation of road safety checks and penalties	
	49	"Black Spots" on TENs	
	50	Seat and head restraints	
	51	Tackling dangerous driving	
	52	Technical investigations of the causes of road accidents	
	53	Harmonisation of driving licensing systems	
	54	Speed limitation devices	
	55	Intelligent transport systems and e-Safety	
	56	Pedestrian and cycling protection	
Adopting a policy on effective charging for transport	57	Infrastructure charging	
	58	Uniform commercial road transport fuel taxation	
	59	Electronic road toll system (interoperability)	
	60	Harmonising VAT deductions	
	61	Taxation of passenger cars according to environmental criteria	
	62	Taxation of energy products and exemptions for hydrogen and biofuels	
	63	Introduction of a minimum share of biofuels consumption in road transport	
Recognizing the rights and obligations of users	65	Compensation of air passengers	
		Information for air passengers, assistance for persons with reduced mobility	
	66	Extending protection of users' rights to other transport modes	
	67	Intermodality for people	
	68	Public service requirements and the award of public service contracts in passenger transport by rail, road and inland waterway	
Developing high-quality urban transport	69	Support for pioneering towns and cities (CIVITAS initiative)	
	70	Promote the use of clean vehicles in urban public transport	
	71	Promotion of good urban transport practices	
Putting research and technology at the service of clean, efficient transport	64	European Research on new clean car technologies and ITS application to transport	
Managing the effects of globalization	74	Develop administrative capacity in the candidate countries	
	75	EU external relations in the transport sector	
	76	Galileo programme	

	No progress, the status of the policy is not beyond the proposal stage as laid down in the White Paper
	Low progress, most of the policy is still in the proposal phase. There is not yet much approved legislation
	Medium progress, part of the policy has been implemented by approved directives/ regulations.
	High progress, almost all of the measures proposed has been implemented by means of approved legislation

Source: ASSESS study (De Ceuster et al. 2005)

The evaluation of progress of policy implementation could be summarised for the 12 policy guidelines listed by the EC White Paper. Table 5-2 presents the results of this evaluation showing that in general on EU level implementation is more advanced, while the EU15 countries slightly lack behind and the NMS reveal a slightly larger backlog than the EU15 countries.

Good performance of implementation can be observed in particular for the implementation of the Trans-European Transport Networks (TEN-T), the development of high quality urban transport and the fostering of research onto clean and efficient transport systems. In particular lagging behind is the effective charging of transport and the controlling of air transport growth.

Table 5-2: Status of implementation of the 12 policy guidelines defined by EC 2001 White Paper in 2005

		Advancement at			None
		EC	Member States EU15	new Member States NMS10	
1	Improving quality in the road transport sector				Medium
2	Revitalizing the railways				High
3	Controlling growth in air transport				n.a. =
4	Promoting transport by sea and inland waterway				not applicable/
5	Turning intermodality into reality				no data available
6	Building the Trans-European transport network				
7	Improving road safety				
8	Effective charging for transport				
9	Recognizing the rights and obligations of users				
10	Developing high-quality urban transport				
11	Putting research and technology at the service of clean, efficient transport		n.a.	n.a.	
12	Managing the effects of globalization		n.a.	n.a.	

Source: ASSESS study (De Ceuster et al. 2005)

5.2 EC policy update by "Keep Europe Moving"

In June 2006 the European Commission published the mid-term review of the EC 2001 White Paper on the European Transport Policy (EC 2006). Based on the experiences of five years of implementation of the transport policy formulated by the White Paper and assess be the ASSESS study (De Ceuster et al. 2005, see Table 5-1 and Table 5-2) the review concluded that:

- the broad policy guidelines of the White Paper should be maintained i.e. transport policy should provide a competitive, secure, safe and environmentally friendly mobility leading to a transport system supporting both the revised Lisbon strategy (on competitiveness and growth) and the revised Gothenburg strategy (on EU sustainable development).
- some policy areas are lagging behind with their implementation. In particular, this concerns the implementation of transport charging to make transport more efficient, internalise external cost and generate funds for transport infrastructure, and the control of air transport growth.
- some policy areas require an adaptation of focus. In particular, increased emphasis should be put on the improvement of the major modes compared with the objective on modal-shift towards more environmental friendly modes. Also EU enlargement adds a new focus to transport policy as problems may differ between the EU15 and EU10 e.g. where in the EU15 increase of freight rail modal-share is an objective it would be stabilisation of rail modal-share for the EU10.
- new policy areas emerged either due to external developments or due to development of the nature of the transport system. The former concerns security issues that became obvious and demanding after the terrorist attacks in the US and the EU as well as security of energy supply which increased in importance both because of security issues and because of price increases and potential scarcities of fuel supply. The latter reflects that transport became a high technology sector depending on and generating technological and organisational innovations for future development of the EU.

As a new key word the EC coined **co-modality** which promotes the efficient use of different modes on their own and in inter-modal combinations to optimise resource use and foster sustainability.

Finally, the review presents a workbook for the years 2006 until 2009 describing which steps and measures should be taken in these years by the EU and the member states. This workbook outlines an integrated policy approach across all modes consisting of soft measures, regulation, economic instruments and infrastructure measures that seems to go beyond past sectoral policy approaches and hence can, if actually implemented, evoke synergies of the different policies that should be promising for European development, as it has been shown in the past that synergistic integrated policy approaches generate better results than partial approaches (IWW et al. 2000).

5.3 US Policy implementation

As explained above the EU and US follow quite similar broad policy guidelines. Also in terms of structuring the guidelines the approach is similar, which can be seen with the following example of the SAFETEA-LU programs related to highway provisions described by the US Federal Highway Administration (FHWA). The FHWA explains two levels of objectives, where the first level is more strategic and the second level more operational. Beyond these objectives the individual programs are defined, which would correspond to the 76 measures of the EC

2001 White Paper. Individual programs can fulfil and belong to a number of different objectives.

1) The strategic level of objectives comprises (FHWA 2005a):

- improving safety,
- reducing traffic congestion,
- improving efficiency in freight movement,
- increasing inter-modal connectivity,
- protecting the environment, and
- laying the groundwork for addressing future challenges.

2) The second more operational level of objectives includes (FHWA 2005a):

- **Safety:** SAFETEA-LU establishes a new core *Highway Safety Improvement Program* that is structured and funded to make significant progress in reducing highway fatalities. It doubles the funds for infrastructure safety and requires strategic highway safety planning, focusing on results.
- **Equity:** as explained above the Equity Bonus Program aspires to balance the national funding between the different states in a fair way.
- **Innovative finance:** SAFETEA-LU makes it easier and more attractive for the private sector to participate in highway infrastructure projects, bringing new ideas and resources to the table. Flexibility to use tolling to finance infrastructure improvements, and broader loan policies (TIFIA and SIB) are expected to stimulate private investment.
- **Congestion relief:** flexibility to use road pricing to manage congestion and the promotion of real-time traffic management in all States form the core of this objective.
- **Mobility and productivity:** SAFETEA-LU provides programs to improve interregional and international transportation, to address regional needs and to fund critical high-cost transportation infrastructure projects of national and regional significance. This objective comes close to the objectives of the TEN-T. Also, improved freight transportation is addressed in a number of planning, financing, and infrastructure improvement provisions.
- **Efficiency:** the *Highways for LIFE pilot program* is expected advance longer-lasting highways using innovative technologies and practices to speed up the construction of efficient and safe highways and bridges.
- **Environmental Stewardship:** SAFETEA-LU increases funding for environmental programs of TEA-21 and adds new programs focused on the environment, including a pilot program for non-motorized transportation and *Safe Routes to School*. It also includes significant new environmental requirements for the Statewide and Metropolitan Planning process.

- **Environmental Streamlining:** the process of environmental assessment for transportation projects should be improved and streamlined by developing a new environmental review process for highways, transit, and multimodal projects, with increased authority for transportation agencies, but also increased responsibilities.

3) The following Table 5-3 presents the 53 programs defined by SAFETEA-LU related to highway provisions.

Table 5-3: Programs defined for highway provision under the US SAFETEA-LU act

No	Program of SAFETEA-LU Highway Provisions
1	Appalachian Development Highway System Program
2	Congestion Mitigation and Air Quality Program
3	Congestion Mitigation Provisions
4	Construction of Ferry Boats and Ferry Terminal Facilities Program
5	Coordinated Border Infrastructure Program
6	Delta Region Transportation Development Program
7	Denali Access System Program
8	Emergency Relief Program
9	Environmental Review Process
11	Environmental Stewardship
12	Equity Bonus Program
13	Federal-aid Highways Obligation Limitation
14	Federal Lands Highway Programs
15	Future Strategic Highway Research Program
16	Guaranteed Funding
17	High Occupancy Vehicle Lanes
18	High Priority Projects Program
19	Highways for LIFE Pilot Program
20	Highway Bridge Program
21	Highway Safety Improvement Program
22	Highway Trust Fund and Taxes
23	Highway Use Tax Evasion Projects
24	Idling Reduction Facilities in Interstate Rights-of-Way
25	Interstate Maintenance Program
26	Interstate Oasis Program
27	Metropolitan Planning Program

No	Program of SAFETEA-LU Highway Provisions
28	National Corridor Infrastructure Improvement Program
29	National Highway System Program
30	National Historic Covered Bridge Preservation
31	National Scenic Byways Program
32	Projects of National and Regional Significance
33	Program Administration
34	Railway-Highway Crossings
35	Real-Time System Management Information Program
36	Recreational Trails Program
37	Safe Routes to School Program
38	State Infrastructure Bank Program
39	Statewide Planning
40	Stewardship and Oversight
41	Surface Transportation-Environmental Cooperative Research Program
42	Surface Transportation Program
43	Surface Transportation Research, Development and Deployment Program
44	Tolling Programs
45	Training and Education
46	Transportation, Community, and System Preservation Program
47	Transportation Conformity
48	Transportation Enhancement Program
49	Transportation Improvements
50	Transportation Infrastructure Finance and Innovation Act
51	Transportation Systems Management and Operations
52	Truck Parking Facilities
53	Work Zone Safety Provisions

Source: FHWA (2005b)

6 Conclusions

The spatial structure of the EU and the US differs quite significantly both in what concerns the global geographical structure and the structure of cities and urbanised areas. The economic centre of the EU lies within a pentagon of which the longest distances between the corner cities of the pentagon are about 1200 km. The US is facing a structure with four far-off economic centres where exchange between the centres requires two to four times longer distances than within the EU centre. Also cities in the EU are more compact than in the US, which is most obvious for the size group of cities with 200,000 to 1,000,000 inhabitants. Of course, this spatial difference influences the transport system of the two regions and form part of the causes of differences e.g. expressed by a higher modal share of public transport by surface modes in the EU, a higher modal-share of air transport in the US and a higher share of rail freight transport in the US.

The policy comparison between the EU and the US mainly concluded that the broad policy guidelines in both regions were rather similar. This conclusion was based on the EC 2001 White Paper and the TEA-21 and SAFETEA-LU legislation in the US. Policy approach and structuring of higher and lower level of objectives are comparable. Differences can be detected for a number of specific aspects. Of the more broad aspects one can note that pricing policies were promoted more strongly by the EU, while in the US a stronger focus was on the innovative contributions that transport and in particular logistics could provide.

The EU White Paper presented an action programme with concrete measures. Some objectives and measures lacked detail and described a development path rather than a desired end situation. There was some lack of clear quantified objectives. As described, road safety was one of the few policies where the EC White Paper clearly defined a quantitative target. While this could be partly explained due to the difficulty of assessing a strategic document, mostly based on policies somehow holistic, on the other hand it also provides a clear opportunity for policy improvement through the establishment of quantified objectives and measurement tools.

As highlighted by the ASSESS study (De Ceuster et al. 2005), almost all measures proposed in the EC 2001 White Paper have had some kind of follow up activity until 2005. However, and as referred in the study, it is difficult to assess to what extend a piece of legislation, which is often the result of multiple adaptations and compromises, reflects the intentions and ambitions established in the strategic document.

The mid-term review of the EC 2001 White Paper in 2006 shifted the policy priorities by putting a higher priority on the competitiveness impetus that can be gained from transport and the efficiency of the main modes and reducing the postulation for modal-shift, which was the core objective of the EC 2001 White Paper.

The United States documents highlighted the need for a safer, more equitable and efficient system. US-DOT's main priorities are to keep transport system users safe, increase their mobility chances while ensuring that transport system enables the economic growth and development. Answering to this broad objective a strategic plan was defined, including for each of the five strategic objectives (safety, mobility, global connectivity, environmental friendliness

and security) the respective outcomes, strategies, targets and performance measures as well as the milestones that should be accomplished.

In the previous pages the overview of the approaches followed by the EU and the US for the development of the respective transport policies has been undertaken. The highlighted background issues as well as the main strategic challenges are similar in both economies. Furthermore, development perspectives are also fairly common: growth in transport demand in particular freight, new mobility requirements, slow down of economic consumption growth, accompanied by the need to invest in research and development, stressing and putting emphasis on the promotion of local decision making.

Evaluating the policy impacts one should take into account that a significant number of the measures would not directly affect monetary measurable indicators. Rather they are having an impact on the quality of transport services e.g. frequency, accessibility or safety. For this reason a judgement of the policy only by looking at monetary indicators like GDP seems not to be sufficient. Of course, employment provides another relevant indicator but it seems that measures related to transport times and accessibility are of equal importance to assess the policy impacts.

One single aspect of lack of policy in the EU should be mentioned. The preservation of existing infrastructure appeared among the priorities of TEA-21, while this problem of ageing infrastructure in Europe is so far only noticed by some countries' policies.

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