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# Bridging infrastructural gaps in Central America: prospects and potential for maritime transport

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# Abstract

Central America needs a regular, flexible, safe and affordable infrastructure and transport services in order to prevail over the existing bottlenecks and constrained intra-regional trade patterns. This need is widely recognized to achieve a sustained economic development, both national and regionally.

Today, Central American countries face the following problems in their transport systems: lack of sufficient transport infrastructure and high transport costs. These problems have led to a decline in the competitiveness of the regional economies and sluggish economic growth rates. Additionally, it is a highly vulnerable region due to geological, geomorphologic and climatic regional conditions.

This paper argues that short sea shipping (SSS) can play an important role in creating the pathway towards a more environmentally friendly, financially rational and sustainable transport system, and it is eminently suitable as a solution to bridge the Central America (CA) infrastructural gaps.

Nevertheless, strong political support for inter-regional cooperation and the set-up of public-private partnerships have to be launched in order to unlock the development potential of transport by water. A combination of measures by all stakeholders is the way forward for more sustainability. The focus to develop these potentials includes the integration of maritime links and inland hinterland links with ports and their logistic centres and terminals as operating intermodal nodes. In this paper, authors bring high importance to a strategic association between SSS and truck and rail transportation modes, considering an intermodal transportation system that takes advantages of each one.

# Introduction

In recent decades, Central America (CA) has seen a divergence between the myth and the reality of the benefits of transport infrastructure development. Despite the official agenda in the transport sector, which emphasized the many advantages of waterborne transport (low emissions, no congestion etc.), the road transport sector has continued to expand, resulting in a substantial loss of market share for waterborne transport.

This development is due to a number of factors, not least being the severe problems in economic performance in Central American countries, which delayed sufficient and necessary investment flows in transport infrastructure. Missing infrastructure links are perceived as a major obstacle to the development of Central American economies in trade and economic growth.

Central America needs to facilitate regular, flexible, safe and affordable transport infrastructure and services in order to prevail over the existing bottlenecks and constrained intra-regional trade patterns. This need is widely recognized and the search for solutions is one of the main topics in political discussions on regional development. The construction of transport infrastructure and transport facilitation, however, is coupled with a substantial need for financial resources, concise development strategies and external effects, such as energy consumption, emissions and destruction of natural habitats.

- Currently, Central American countries face the following problems in their transport systems: lack of sufficient transport infrastructure and high transport costs. These problems have led to a decline in the competitiveness of the regional economies[1] and sluggish economic growth rates;
- Altough there are great efforts for creating the necessary common vision and criteria, the region lacks both an integrated transport policy and a common political vision for a regional diversified transport market, including sustainability issues, long-term planning, intermodal and multimodal concepts, and criteria on resources allocation;
- It is a highly vulnerable region owing to geological, geomorphologic and climatic regional conditions.

Due to the extensive coastline, the distances between the coast and the economic centres are normally short. Central America's geography features a high degree of vulnerability to natural disasters, because of its geomorphology and geographic location has to be considered. The natural geographic impetus for coastwise shipping in combination with the inadequacy of the road and railway transport system should be a good starting point for an integrated regional policy framework making use of the advantages of waterborne transport. Conversely, political discussions on regional development focus on the creation of regional development axes through the road transport infrastructure.[2] Short sea and inland shipping are left behind in these discussions. We argue that short sea shipping (SSS) is eminently suitable as a solution to bridge the infrastructural gap and at the same time reduce the pressure for extensive road infrastructure construction at a time when public financial resources are tight.

The paper consists of two parts. First part describes and analyses trade and transport flows, the situation of the transport services and physical infrastructure and regional transport infrastructure policies. Second part evaluates the substantial SSS potentials in CA to bridge land infrastructure gaps and available policy instruments, based on European and other regional policy experience.

[1] For details see Global Competitiveness Reports, 1999-2004 [online] http://www.weforum.org/.
[2] For details see Puebla-Panama Plan [online] http://www.iadb.org/ppp.

# I. Trade, transport infrastructure and regional policy initiatives

## A. Trade and transport flows in Central America

In Central America, Governments and private-sector representatives have the political will to promote the integration of the regional economies. Since 2003, Costa Rica has been part of the Association of Caribbean States (ACS), which could be instrumental in establishing a common customs union, albeit with some imperfections. Even though the countries have not yet corrected shortcomings in terms of compliance with some of the rules governing integration or completed the relevant regulatory framework, they have nonetheless pursued the efforts begun in the past decade to fulfil these agreements. Violations of free trade rules have declined and work to improve the customs union has begun. Moreover, there is increased awareness of outstanding problems and possible solutions and the time–frames for agreeing on the latter are longer. One of the main issues to be addressed is the development of the region's infrastructure to improve crucial regional interconnectivity, as envisaged in the Puebla-Panama Plan.

In 2002, Central America accounted for only 0.3% of total global exports, and 0.43% of imports respectively (while, in terms of population, it represented about 0.5 of world population). In a regional context, the region accounted for 5.4% of exports and 8.3% of imports of total Latin American and Caribbean trade in 2002. As Central

America's participation in world trade is restricted, all Central American countries had negative trade balances in 2002 (see table below).

**Table 1**

**GLOBAL TRADE OF GOODS BY REGION, 2002**

| Region/Country | Exports | Imports | Trade balance | Total GDP | GDP per capita |
|---|---|---|---|---|---|
| | Million USD | | | Billion USD | USD |
| Global total | 6 316 546 | 6 514 655 | -198 109 | 32766.6 | 5 383 |
| North America | 948 571 | 1 423 853 | -475 282 | | |
| Latin America | 357 525 | 342 843 | 14 682 | | |
| Western Europe | 2 684 615 | 2 688 983 | -4 368 | | |
| Transition economies | 312 500 | 320 338 | -7 838 | | |
| Africa | 141 967 | 141 025 | 942 | | |
| Middle East | 250 000 | 172 477 | 77 523 | | |
| Asia | 1 621 367 | 1 469 491 | 151 876 | | |
| Central America (seven countries) | 19 181 | 28 315 | -9 134 | 75,3 | 2 082 |
| Costa Rica | 5 259 | 6 523 | -1 264 | 16,8 | 4064 |
| El Salvador | 3 017 | 4 922 | -1 905 | 14,2 | 2203 |
| Guatemala | 2 629 | 5 578 | -2 949 | 23,3 | 1939 |
| Honduras | 1 930 | 2 804 | -874 | 6,6 | 980 |
| Nicaragua | 721 | 1 636 | -915 | 2,5 | 470 |
| Panama | 5 315 | 6 352 | -1 037 | 11,0 | 3612 |
| Belize | 310 | 500 | -190 | 0,9 | 3128 |

**Source:** Authors on the basis of World Trade Organization (WTO), *World Trade Report, 2004* and data from the Economic Commission for Latin America and the Caribbean (ECLAC).

According to official sources, the gross domestic product (GDP) of the Central American countries amounted to USD 75.3 billion in 2002. Guatemala (USD 23.3 billion: 2002) had the highest GDP in the region, while Belize only reached a GDP of USD 900 million in the same period.

Per capita GDP varied significantly throughout the region. Nicaragua and Honduras had a per capita GDP significantly below USD 1,000 in 2002, which rates them among the poorest countries in the Western Hemisphere. On the contrary Panama and Costa Rica's per capita GDP reveals some wealth and a good standard of living. Average per capita GDP was approximately USD 2,100 in 2002. The estimates for demographic development expect the population to reach 54.5 million inhabitants in 2020, almost twice as many as in 1990. The highest growth rates are expected in the less developed Central American countries.

**Table 2**

**CENTRAL AMERICA: POPULATION AND POPULATION ESTIMATES, 1990-2020**

| Country | Population (in thousands) | | | | Annual average growth rate | | |
|---|---|---|---|---|---|---|---|
| | 1990 | 2000 | 2010 | 2020 | 1990-2000 | 2000-2010 | 2010-2020 |
| Belize | 186 | 240 | 291 | 337 | 2,9% | 2.0% | 1.5% |
| Costa Rica | 3 076 | 3 925 | 4 695 | 5 328 | 2,8% | 1.9% | 1.4% |
| El Salvador | 5 110 | 6 276 | 7 441 | 8 534 | 2,1% | 1.7% | 1.4% |
| Guatemala | 8 749 | 11 225 | 14 362 | 18 123 | 2,7% | 2.5% | 2.2% |
| Honduras | 4 879 | 6 486 | 8 203 | 9 865 | 2,9% | 2.4% | 1.9% |
| Nicaragua | 3 827 | 5 074 | 6 529 | 7 997 | 2,0% | 2.6% | 2.0% |
| Panama | 2 411 | 2 948 | 3 504 | 4 239 | 2,3% | 1.7% | 1.3% |
| Total | 28 238 | 36 174 | 45 025 | 54 423 | | | |

**Source:** Latin American and Caribbean Demographic Centre (CELADE)-Population Division of ECLAC (2004), *Demographic Bulletin*, No. 73 (LC/G.2225-P), Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC), March 2004.

## B. Intra-regional trade

In response to the weak stimuli of the international economy, Central America's GDP growth rate was between 2.3% and 3.3% in 2002 and 2003, which has caused reductions in per capita GDP for the third consecutive year (ECLAC, 2004a). Total Central American exports recovered remarkably after modest growth in 2002, –reaching a rate of 11.4%– especially in Costa Rica and Honduras, and to a lesser extent, in El Salvador, Guatemala and Nicaragua.

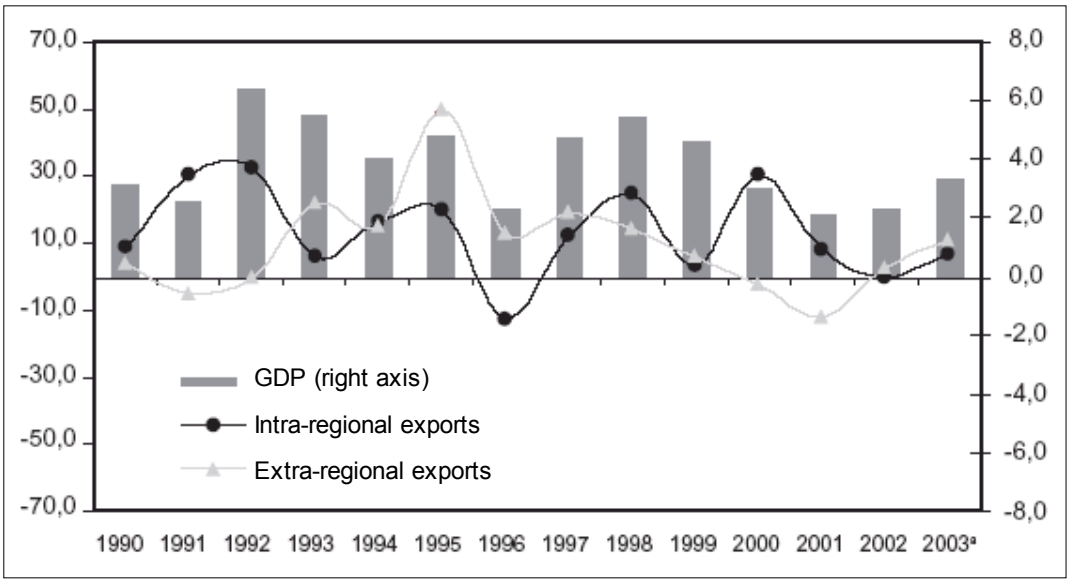
Intra-regional exports increased at a lower rate in proportion to the total, approximately 7% versus 11%. In 2003 the share of intra-subregional exports of the total trade fell from 28.9% in 2001 to 26.9% in 2003 (see graph below). However, compared with the South American integration schemes, the behaviour of the flows of intra-regional commerce in the Central American Common Market (CACM), in the long term, appears more stable and less procyclical.[3] Total intra-regional trade is estimated to have reached USD 3.2 billion in 2003.

[3] For details see ECLAC (2004b).

**Table 3**

**CENTRAL AMERICAN COMMON MARKET (CACM): EVOLUTION OF GDP AND INTRA- AND EXTRA-REGIONAL EXPORTS, 1990 – 2003**

*(Percentage of annual variation)*




**Source:** Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official data. a) preliminary figures.

**Table 4**

**INTRA-REGIONAL TRADE IN VALUE, 1998-2003**

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003[a] |
|---|---|---|---|---|---|---|
| Central America | 2534,9 | 2684,3 | 2853,0 | 3191,5 | 3085,2 | 3272,9 |
| Central America | 2423,9 | 2580,2 | 2741,4 | 3068,2 | 2971 | 3178,6 |
| Costa Rica | 573,4 | 637,5 | 663,2 | 675,9 | 633,5 | 696,5 |
| El Salvador | 642,2 | 674,1 | 774,7 | 770,1 | 784,6 | 792 |
| Guatemala | 815,9 | 854,3 | 870 | 1103 | 1059,9 | 1156,2 |
| Honduras | 268 | 260,4 | 266,8 | 328,4 | 292,4 | 306,1 |
| Nicaragua | 124,4 | 153,9 | 166,6 | 190,8 | 200,6 | 227,8 |
| Panama | 111 | 104 | 111,6 | 123,3 | 114,2 | 94,3 |

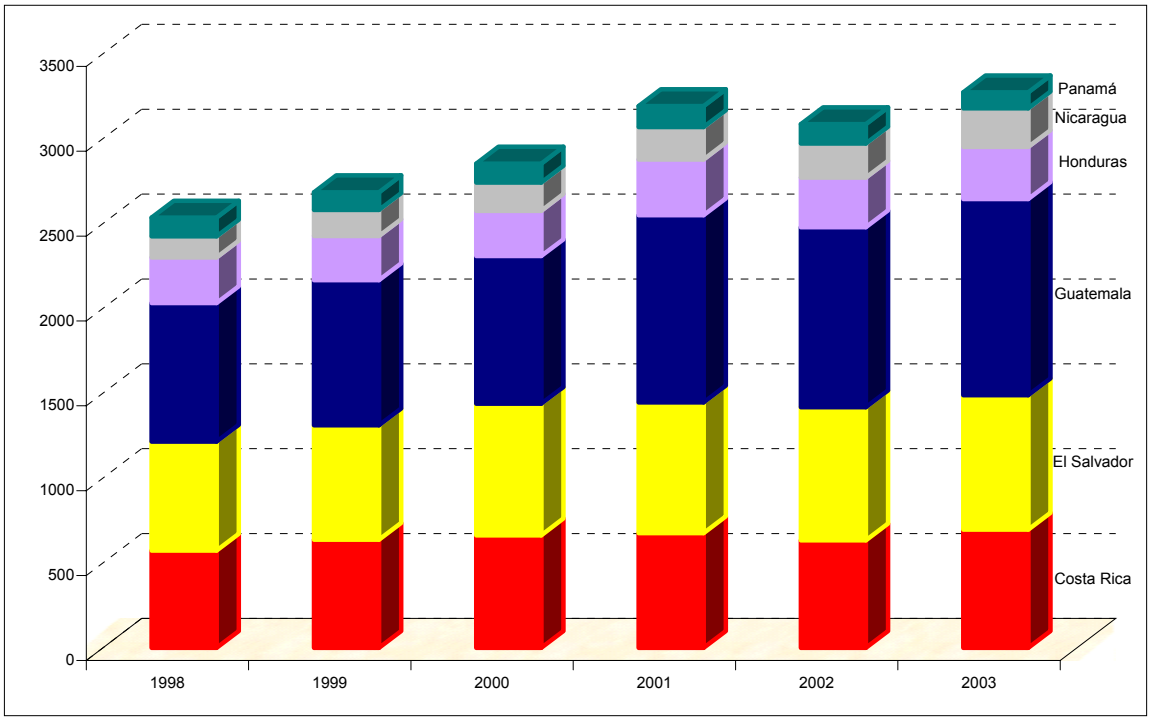
**Source:** Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures from the Central Banks and the Office of the Comptroller General of the Republic of Panama. Notes: values in USD millions; a/ preliminary figures.

Costa Rica, El Salvador and Guatemala have the highest participation in intra-regional exports in terms of value (see table below). The intra-regional markets are of the highest significance for Guatemala, El Salvador and Nicaragua (around 26% of total exports in terms of value). Costa Rica, Panama and Honduras export less than 14% to intra-regional markets. Intra-regional trade patterns show that the poorest countries in the region depend more on regional imports than the more developed countries in the region. Costa Rica is the second smallest importer of goods from the region in terms of value, but the second biggest exporter to the region.

**Table 5**

**CENTRAL AMERICA: INTRA-REGIONAL EXPORTS, 1998-2003**

*(Million USD)*




**Source:** Economic Commission for Latin America and the Caribbean (ECLAC), based on official data. 2003 preliminary figures.

Intra-regional trade is more diversified than trade with other parts of the world. The 20 main products make out only 41.4% of all regional trade (77% respectively in trade with the US). Of the 20 main intra-regional trade products only two are agricultural products, palm oil and bovine meat (see table below); all other products are industrial goods or manufactures, which account for 38.6% of total intra-regional trade.

**Table 6**

**CENTRAL AMERICA: 20 MAIN TRADE PRODUCTS IN INTRA-REGIONAL TRADE**

*(Percentage of total intra-regional trade)*

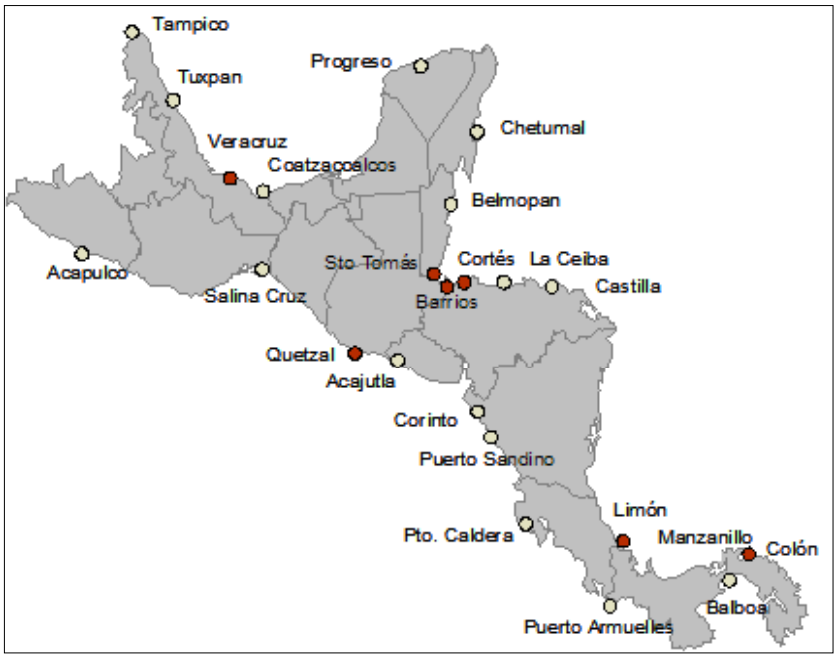
| SITC (4-digits) | Products | 1990 | 2000 | Variation 1990-2000 |
|---|---|---|---|---|
| 5417 | Medicinal and pharmaceutical products | 9.43 | 5.94 | -3.49 |
| 0980 | Edible products and preparations | 5.37 | 5.08 | -0.29 |
| 5541 | Soap | 1.96 | 3 | 1.04 |
| 5530 | Perfumery, cosmetics and toilet preparations (except soap) | 2.8 | 2.4 | -0.40 |
| 0481 | Cereal preparations | 1.59 | 2.28 | 0.69 |
| 6749 | Iron and non alloy steel | 0.24 | 2.07 | 1.83 |
| 5542 | Soap, cleansing and polishing preparations | 1.45 | 1.95 | 0.50 |
| 6421 | Paper and paperboard | 2.02 | 1.85 | -0.17 |
| 8939 | Articles of plastics | 1 | 1.81 | 0.81 |
| 0484 | Cereal preparations and flour preparations | 1 | 1.72 | 0.72 |
| 8931 | Plastic lids | 1.25 | 1.68 | 0.43 |
| 6428 | Paper and paperboard articles | 0.59 | 1.64 | 1.05 |
| 4242 | Palm oil | 0.01 | 1.5 | 1.49 |
| 6651 | Glassware | 1.7 | 1.45 | -0.25 |
| 0111 | Meat of bovine animals | 0.14 | 1.31 | 1.17 |
| 6842 | Aluminium | 1.41 | 1.25 | -0.16 |
| 7731 | Cables etc. | 0.33 | 1.18 | 0.85 |
| 3510 | Electric current | 0.37 | 1.13 | 0.76 |
| 6732 | Iron and non alloy steel flat-rolled products | 0.96 | 1.13 | 0.17 |
| 0224 | Milk and cream | 0.23 | 1.12 | 0.89 |

**Source:** Authors on the basis of data from CAN and Jorge Mario Martínez Piva and Enrique Cortés), "Competitividad centroamericana", *Estudios y perspectivas series*, No. 21 (LC/MEX/L.613; LC/L.2152-P), Mexico City, ECLAC Subregional Headquarters in Mexico, August 2004. United Nations publication, Sales No. S.04.II.G.80.

## C. Waterborne trade and services

Central America has 2,880 km of coastline, 1,480 km in the Caribbean and 1,400 km on the Pacific side. A total of 23 ports exist in the region, of which 10 are in the Caribbean and 13 along the Pacific coast. Port Caldera and Port Quetzal on the Pacific and Port Castilla and Port Moin in the Caribbean are the most modern ports, together with Panamanian ports.

**Map 1**
**SOUTH MEXICO AND CENTRAL AMERICA - MAIN PORTS**




**Source:** Secretariat for Central American Economic Integration (SIECA).
**Note:** The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

In order to assess the potential of maritime commerce in relation to infrastructural gaps it is important to analyse the trade flows in terms of volume at a bilateral level (see table below).

**Table 7**

**CENTRAL AMERICA – INTRA-REGIONAL TRADE, 2002**

*Tons*

| | Imports | Exports | | Imports | Exports |
|---|---|---|---|---|---|
| Belize with: | | | Guatemala with: | | |
| Costa Rica | 2 313 | 20 | Belize | 4 178 | 37 471 |
| El Salvador | 8 449 | 177 | Costa Rica | 130 399 | 101 263 |
| Guatemala | 53 434 | 6 410 | El Salvador | 414 749 | 778 519 |
| Honduras | 10 299 | 164 | Honduras | 134 615 | 306 708 |
| Nicaragua | 21 | 31 | Nicaragua | 27 261 | 140 467 |
| Panama | 620 | 48 | Panama | 143 492 | 31 287 |
| Total Central America | 75 136 | 6 850 | Foreign trade zones | 44 520 | 2 249 |
| El Salvador with: | | | Total Central America | 899 214 | 1 397 964 |
| Belize | 97 | 14 313 | Costa Rica with: | | |
| Costa Rica | 124 326 | 51 219 | Belize | 111 | 2 399 |
| El Salvador | 54 | 1 | El Salvador | 51 299 | 135 411 |
| Guatemala | 777 597 | 483 085 | Guatemala | 98 254 | 135 018 |
| Honduras | 195 585 | 220 161 | Honduras | 27 596 | 72 527 |
| Nicaragua | 63 007 | 108 274 | Nicaragua | 68 408 | 301 138 |
| Panama | 51 729 | 94 635 | Panama | 86 273 | 123 647 |
| Total Central America | 1 212 395 | 971 688 | Foreign trade zones | | 4 649 |
| Honduras with: | | | Total Central America | 331 941 | 774 789 |
| Belize | 111 | 7 993 | Panama with: | | |
| Costa Rica | 51 902 | 8 389 | Belize | | 44 |
| El Salvador | 189 066 | 141 278 | Costa Rica | 94 859 | 52 476 |
| Guatemala | 226 373 | 72 469 | El Salvador | 13 462 | 4 797 |
| Nicaragua | 35 328 | 35 108 | Guatemala | 27 147 | 22 037 |
| Panama | 188 946 | 3 895 | Nicaragua | 3 370 | 6 866 |
| Total Central America | 691 726 | 269 132 | Foreign trade zones | 66 505 | 2 433 |
| Nicaragua with: | | | Total Central America | 205 343 | 88 653 |
| Belize | 15 | 124 | | | |
| Costa Rica | 303 812 | 78 355 | | | |
| El Salvador | 141 481 | 82 456 | | | |
| Honduras | 35 171 | 57 914 | | | |
| Guatemala | 145 519 | 46 329 | | | |
| Panama | 88 412 | 2 613 | | | |
| Total Central America | 714 410 | 267 791 | | | |

**Source:** Free Trade Area of the Americas (FTAA), Hemispheric Database [online] http://198.186.239.122/Default.htm

**Notes:** Differences between import-export figures originate from reporting methods. Products exported in December of the referenced year will appear as imports at the destination country in the following year. These lags in reporting might cause differences between import-export figures up to ten percent...

In the year 2002, approximately 4 million tons were moved in intra-regional trade. These figures stand in high contrast to the more than 58 million tons handled in the regional ports in the same year (see table below). Additionally, significant imbalances in trade between the Central American countries can be observed, which contribute to the difficulties in employing regular services and the problem of repositioning of empty units in land or sea transport.

**Table 8**

**CENTRAL AMERICA – CONTAINER PORT TRAFFIC AND TOTAL TRANSFERRED TONS, 2000-2003**

| | TEUs 2000 | TEUs 2001 | TEUs 2002 | TEUs 2003 | MT 2000 | MT 2001 | MT 2002 | MT 2003 |
|---|---|---|---|---|---|---|---|---|
| Belize (*) | 25 514 | 26 900 | NA | NA | 164 703 | 178 860 | NA | 197 644 |
| Costa Rica | 585 427 | 577 621 | 602 568 | 669 259 | 6 738 474 | 6 731 124 | 9 574 325 | 10 362 240 |
| El Salvador | 14 815 | 17 674 | 43 135 | 66 216 | 2 487 549 | NA | 4 546 100 | 4 698 000 |
| Guatemala | 540 028 | 526 634 | 364 929 | 725 976 | 12 692 106 | 13 272 006 | 14 221 026 | 14 639 900 |
| Honduras | 220 565 | 406 359 | 413 842 | 470 340 | 5 398 285 | 6 876 040 | 7 090 700 | 7 658 200 |
| Nicaragua (**) | 10 494 | 9 566 | 8 875 | 10 936 | 2 215 364 | 2 363 019 | 2 093 906 | 2 145 716 |
| Panama | 1 357 499 | 1 590 165 | 1 851 627 | 1 991 659 | 20 546 652 | 23 364 317 | 21 194 418 | 25 803 598 |
| Total | 2 754 342 | 3 154 919 | 3 284 976 | 3 934 386 | 50 243 133 | 52 785 366 | 58 720 475 | 65 505 298 |

**Source:** Economic Commission for Latin America and the Caribbean (ECLAC), Maritime Profile of Latin America and the Caribbean (LC/W.001, Rev.1), 2004 [online] http://www.cepal.cl/transporte/perfil/indexe.html.

**Notes:** MT: metric tons; NA: not available. (*) Belize: 2003, estimated data; (**) Nicaragua: TEUS only Port of Corinto, MT: the entire port system.

The net maritime trade, excluding transhipments, in the region reached over 30 million tons in the year 2002. The maritime trade was then concentrated on 10 regional ports: Santo Tomás de Castilla, Port Barrios, Port Quetzal (Guatemala), Acajutla (El Salvador), Port Cortés, Port Castilla and San Lorenzo (Honduras), Corinto (Nicaragua) and Limón y Caldera (Costa Rica). The sparse traffic of Belize is distributed in two ports of the country.

**Table 9**

**CENTRAL AMERICA: PORT ACTIVITY, 2001, 2003 AND ESTIMATES FOR 2010 AND 2020**

| | | 2001 | 2002 | 2003 | *2010* | *2020* | 2001 | 2002 | 2003 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PAISES/ PUERTOS** | **Coast** | **freight** | | | | | **ships handled** | | | **TEU** | | |
| Santo Tomás de Castilla | A | 4 502,1 | 4 935 | 4 540 | *12 098* | *19 707* | 1 263 | 1 281 | 132 | 283 761 | 308 902 | 312 154 |
| Barrios | A | 1 679,7 | 2 046 | 1 956 | *5 354* | *9 498* | 535 | 570 | 508 | 188 008 | 241 608 | 242 112 |
| Quetzal | P | 5 064,1 | 5 236 | 5 904 | *13 073* | *23 193* | 736 | 786 | 947 | 126 006 | 130 568 | 17 171 |
| San José | P | | | 2 239 | | | | | 137 | | | 0 |
| **Total Guatemala** | | **11 245,9** | **12 217** | **14 640** | | | **2 534** | **2 637** | **2 912** | **597 775** | **681 078** | **725 976** |
| Acajutla | P | 4 591,7 | 4 546 | 4698 | *4 644* | *7 170* | 445 | 451 | 546 | 17 721 | 42 221 | 66 216 |
| **Total El Salvador** | | **4 591,7** | **4 546** | **4 698** | | | **445** | **451** | **546** | **17 721** | **42 221** | **66 216** |
| Cortés | A | 5 661,9 | 5 782 | 6 306 | *12 505* | *17 811* | 1 786 | 1 742 | 1 792 | 338 932 | 352 983 | 399 612 |
| Castilla | A | 450,8 | 487 | 115 | *586* | *736* | 179 | 184 | 11 | 55 724 | 58 346 | 69 451 |
| Tela | A | | 95 | 4 | | | | 16 | 70 | | 0 | 0 |
| La Ceiba | A | 5,9 | 1 | 574 | | | 28 | 19 | 177 | 0 | 0 | 0 |
| Roatán | A | | 0 | 0 | | | | 103 | 110 | | 0 | 0 |
| San Lorenzo | P | 763,3 | 718 | 659 | *2 497* | *3 557* | 161 | 148 | 133 | 3 003 | 2 513 | 1 277 |
| **Total Honduras** | | **6 881,9** | **7 083** | **7 658,3** | | | **2 154** | **2 212** | **2 293** | **406 359** | **413 842** | **47 034** |
| Corinto | P | 1 114,8 | 1 107 | 1 088 | *3 117* | *9 519* | 264 | 241 | 225 | 9 566 | 8 875 | 10 936 |
| Sandino | P | 1 184,5 | 933 | 1 000 | | | 47 | 37 | 44 | 0 | 0 | 0 |
| San Juan del Sur | P | 9,7 | 0 | 0 | | | 32 | 12 | 13 | 0 | 0 | 0 |
| Cabezas | A | 18,8 | 11 | 21 | | | 65 | 41 | 59 | 118 | 156 | 0 |
| El Bluff | A | 21,4 | 27 | 26 | | | 78 | 51 | 55 | 302 | 313 | 194 |
| Arlen Siu | A | 13,9 | 16 | 12 | | | 58 | 40 | 36 | 947 | 1 103 | 1 198 |
| **Total Nicaragua** | | **2 363** | **2 094** | **2 145,7** | | | **544** | **422** | **432** | **10 933** | **10 447** | **12 328** |

**Table 9 (Conclusion)**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Caldera | P | 2 005,8 | 2306 | 2 430 | *3 102* | *4 088* | 330 | 439 | 466 | 39 211 | 4 344 | 57 275 |
| Puntarenas | P | 75,2 | 36 | 77 | | | 23 | 79 | 70 | 0 | 0 | 0 |
| Punta Morales | P | 266 | 235 | 269 | | | 28 | 23 | 29 | 0 | 0 | 0 |
| Limón-Moín | A | 6 731,1 | 7 182 | 7 664 | *13 025* | *17 504* | 2 005 | 2 101 | 2 167 | 577 689 | 603 531 | 611 994 |
| **Total Costa Rica** | | **9 078,1** | **9 760** | **10439** | | | **2 386** | **2 642** | **2 732** | **616 900** | **646 971** | **669 269** |
| Almirante | A | 561 | 527 | 517 | | | 201 | 165 | 170 | 17827 | 15 518 | 13 948 |
| Bahía Las Minas | | 4 894,1 | 3 146 | 1 753 | | | 141 | 122 | | 79 | 0 | |
| Colon Port Terminal | A | 53,1 | 13 | 6 | | | 569 | 379 | 319 | 1308 | 114 | 1 333 |
| Chiriquí Grande | A | 266,5 | 1 551 | 700 | | | 164 | 199 | 124 | 2538 | 9 908 | 8 212 |
| Colon Container Terminal | A | 1 181,9 | 1 707 | 2 248 | | | 778 | 887 | 627 | 210 446 | 239 604 | 335 066 |
| Manzanillo Int´l Terminal | A | 6 416,9 | 6 736 | 8 670 | | | 1 600 | 1 724 | 2 008 | 959 674 | 899 456 | 1 136 193 |
| Aguadulce | P | 81,9 | 72 | 92,7 | | | 41 | 31 | 46 | 0 | 0 | 0 |
| Armuelles | P | 2,4 | 0 | 4 | | | 0 | 1 | 61 | | 0 | 0 |
| Charco Azul | P | 2 785 | 1 006 | 1 790 | | | 64 | 41 | 49 | 0 | 0 | 0 |
| Pedregal | P | 19,3 | 20 | 17 | | | 10 | 13 | 11 | 0 | 0 | 0 |
| Terminal Decal | P | | | 839 | | | | | 49 | | | 0 |
| Panama Ports Company | AP | 6 877,2 | 6 514 | 7 987 | | | 1 343 | 1 224 | 1 504 | 399 600 | 379 148 | 496 907 |
| **Total Panama** | | **23 139,2** | **21 291** | **24 626** | | | **4 911** | **4 823** | **514** | **1 591 472** | **1 544 774** | **1 991 659** |
| **Total Central America** | | **57 300** | **56 991** | **64 206,8** | | | **12 974** | **13 187** | **14 055** | **3 241 160** | **3 339 333** | **3 935 788** |

**Source:** Central American Commission of Maritime Transport (COCATRAM), Central America Transportation Study (ECAT).

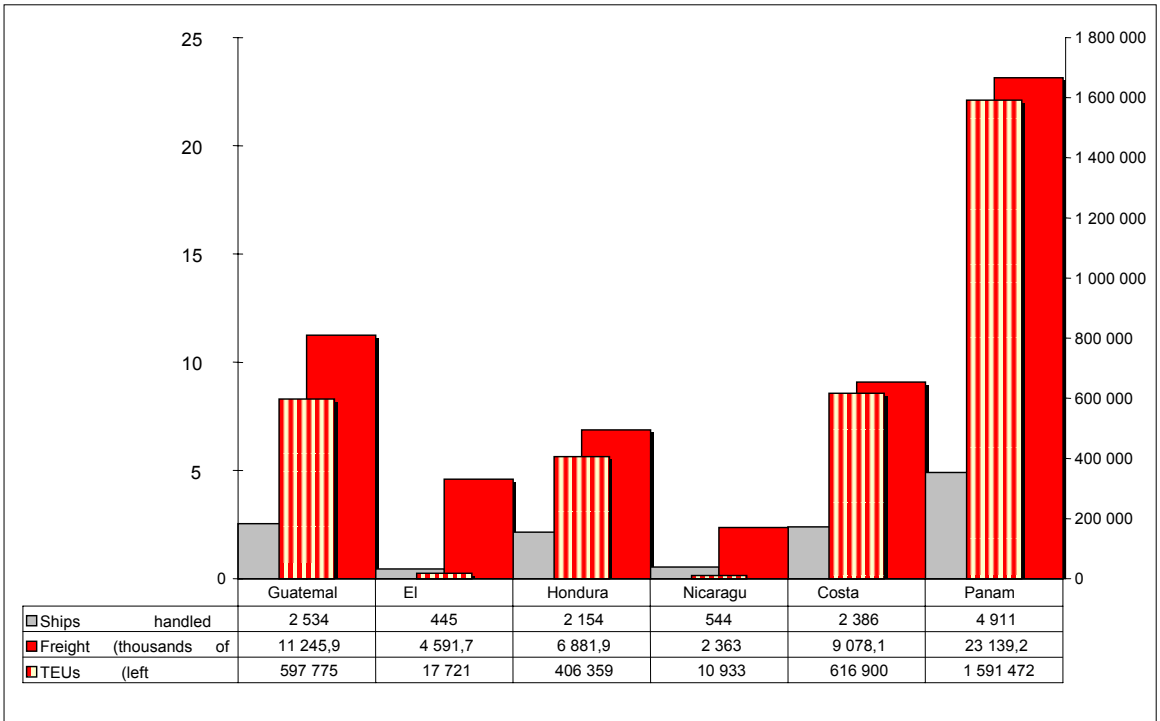
The ports in Panama, Guatemala and Costa Rica moved the greatest share of the 65.5 million tons in 2003 in loading, discharge and transhipment operations. The Panamanian ports have the highest rate of transhipment operations outnumbering foreign trade operation three to one. 56% of the freight was moved in ports on the Atlantic side, where Limón-Moin, handling almost 40% of all Central American freight, was the busiest port. These figures exclude transhipment activity.

Freight movements in terms of volume on the Atlantic coast were relatively balanced in 2001 (a difference of 8% between export and import volumes). At the same time the Pacific coast ports face a difference of 56% in favour of imports. This significant imbalance could only be solved by moving great volumes of empty units.[4]

Of the freight handled in Central American ports in 2003, 40% was containerized; if the Panamanian ports are excluded, the percentage of containerized freight in ports declines to 20%. In 2003, 14,055 ships called in Central American ports, of which about 45% were handled on Panamanian ports. Eleven per cent of all handled ships were Roll-on Roll-off, while container vessels accounted for 45%. The total number of ships handled showed an increase in comparison with the previous year. Roll on-roll off ships reflected an increase of 15.6% with respect to the previous year. MIT in Panama handled the greatest share of this type of ships.

**Graphic 1**

**PORT ACTIVITIES BY COUNTRY, 2003**




| | Guatemal | El | Hondura | Nicaragu | Costa | Panam |
|---|---|---|---|---|---|---|
| Ships handled | 2 534 | 445 | 2 154 | 544 | 2 386 | 4 911 |
| Freight (thousands of | 11 245,9 | 4 591,7 | 6 881,9 | 2 363 | 9 078,1 | 23 139,2 |
| TEUs (left | 597 775 | 17 721 | 406 359 | 10 933 | 616 900 | 1 591 472 |

**Source:** Authors on the basis of data from the Central American Commission of Maritime Transport (COCATRAM) and Susana Arcusín, "Evaluación de los servicios de transporte en la region Meso-Americana", Guatemala City, Secretariat for Central American Economic Integration (SIECA)/Inter-American Development Bank (IDB), September 2003.

The high regional port capacity contrasts with the low volumes of freight moved in intra-regional trade. Estimates from ECAT show strong growth at the major Central American ports. Port traffic is expected to grow at a rate of about 8.7% until 2010, with higher growth rates in the Pacific (9.6% per year) than in the Atlantic (8.1% per year).

[4] In 1998 72% of all transported containers from CA to the US were empties (Arcusín, 2003).

The above-mentioned port capacity in the region as well as the estimated growth are elements to be considered for future infrastructural development in Central America. The ports in the region will be required to expand their capacities to satisfy the estimated growth in external demand throughout the next years. Port development is an important factor for the potential of SSS in the region, because ports are decisive interfaces for the development of SSS.

High costs in international transport in general are a major obstacle to Central America's ability to expand and diversify its exports more rapidly. Air- and waterborne transport rates are high, partly because of low volumes of trade, small capacities deployed and lack of competition.

Domestic and intra-regional traffic within CA is mostly transported by road. This is partly due to the fact of port costs and coastal shipping restrictions placed on international liner operators, but it also reflects a very strong reliance on the rudimentary highway network. The trucking industry is working with very low rates of return and prices probably do not always cover the true costs if all regulations were complied with and all taxes paid. As a matter of fact, shippers or truck owners will make their choice of transport mode exclusively on the basis of their personal costs and benefits.

In maritime transport low transport volumes contribute significantly to make ocean-transport rates so high that goods can often cross the Pacific Ocean more cheaply than the Gulf of Mexico. High port charges partly due to obsolete cargo-handling technology add to overall transport costs. Building or modernization of container-handling facilities can help reduce these costs, and the passage of time will solve some low-volume problems as export levels increase.

The current situation of intra-regional maritime services is worrying. The analysis shows that the number of TEUs and ships employed in these services has decreased significantly between 2003 and 2004 (see table below). The number of ships deployed in intra-regional services has decreased more than $^{1}/_{5}$.

**Table 10**

**DEVELOPMENT OF CONNECTIVITY IN MARITIME TRANSPORT SERVICES**

| | | TEUS | | Ships | |
|---|---|---|---|---|---|
| **Route between** | | **Between Dec. 2003 and Jun. 2003** | **Between may. 2004 and jun. 2003** | **Between deck. 2003 and jun. 2003** | **Between may 2004 and jun. 2003** |
| Central America/Caribbean | Far East | 19,5 | 21,2 | 18,6 | 18,6 |
| Central America/Caribbean | USEC | 19,7 | 20,4 | 6,0 | 6,0 |
| Central America/Caribbean | USWC | 11,7 | -1,2 | 10,6 | -8,5 |
| Caribbean | MED | 3,6 | 7,4 | 0,0 | 5,5 |
| Caribbean | Europe | 9,1 | 30,4 | 4,5 | 14,9 |
| Central America/Caribbean | NCSA | 3,4 | -3,6 | 9,4 | 1,9 |
| Central America/Caribbean | ECSA | 3,0 | 4,0 | 2,9 | 2,9 |
| Central America/Caribbean | US-Gulf | 2,2 | -0,3 | -1,9 | -5,6 |
| Central America | Europe | 4,3 | -6,2 | 0,0 | -9,8 |
| Central America | MED | 46,9 | 45,2 | 31,6 | 36,8 |
| **Intra Caribbean/Central America** | | **-19,6** | **-18,0** | **-21,2** | **-21,2** |
| Central America/Caribbean | South Africa | 21,5 | 21,5 | 14,3 | 14,3 |
| Total CA – Caribbean | | 12,6 | 10,9 | 5,5 | 4,7 |

**Source:** Authors based on information of CI-online.

In summary the following are the main maritime and port issues in CA:

- Low connectivity caused by a reduction of regular liner-services from international shipping lines within the region (see Table 10)
- Lack of efficiency – undue delays; unpredictability, non-transparent processes;
- Lack of data;
- Unclear appeal procedures.;
- Greater trade requires greater efficiency;
- Lack of regional institutional setup;
- International carriers are not permitted to participate in CA coastal shipping;
- Customs procedures are more onerous at the ports than at land frontier posts?

Forecasts from the Central American Centre for Transport Studies (ECAT) expect that the gap of modal participation between road and waterborne transport will grow even further (SIECA, 2001).

Moreover, port development in terms of handled volume and services will significantly affect the needs for accessibility improvements between the ports and their hinterlands. Provision of efficient regional maritime transport services can take pressure off the underdeveloped and low quality road network and can reduce losses of financial resources for repairs and new construction in road transport infrastructure.

# D. Physical infrastructure and transport services in Central America

## 1. Current situation of transport infrastructure

The transport market in Central America still requires further integration and improvement of the transport network in and between the countries,[5] in order to create competition and strengthen economic growth. Accordingly, one of the main tasks is to remove bottlenecks due to specific spatial layout of nodes and links and mismatches between different modes at the technological, organizational and institutional levels (Greenhuizen, 2000).

The rising importance of private operators in the transport market is a result of new market forces. These are bringing faster progress in the use of information and communication technology than under public or semi-public ownership.

Currently the main shortcomings in the transport sector are:

- Limited capacity, poor condition and lack of maintenance of roads, airports, and railways and ports;
- Restrictions in the access to public funding provided by international financial institutions;
- Legal and regulatory framework is unattractive for private capital in the sector; and
- Organizational and institutional shortcomings in each country.

[5] The countries in this context: El Salvador, Panama, Guatemala, Mexico, Belize, Honduras, Mexico, Nicaragua and Costa Rica.

These shortcomings in the sector are reflected by the high operating costs in product handling and therefore, by the loss of competitiveness of Central American economies (SIECA, 1997). The table below shows in summary the diagnosis of the main transport problems in Central America.

**Table 11**

**DIAGNOSIS OF INFRASTRUCTURE AND TRANSPORT SERVICES IN CENTRAL AMERICA**

| | |
|---|---|
| Road transport and road network:<br>• Fails to comply with the basic standards to ensure a smooth, safe, and effective regional traffic.<br>• Improve the quality and standards of pavement.<br>• Improve bridge load capacity.<br>• Improve the geometrical design.<br>• Need for self-funding maintenance programs. | Maritime transport and ports:<br>• Technical problems with fairway depth, and availability of equipment for loading and unloading operations.<br>• Institutional framework limitations, lack of long-term vision and technical cooperation among countries.<br>• Operational limitations with low productivity.<br>• Lack of infrastructure to meet the needs of maritime transport. |
| Rail transport:<br>• Infrastructure designed as per the requirements at the beginning of the century.<br>• Investments needed to set up a new network with high technical standards would only be possible in lanes whose traffic density allows for a competitive participation. | Air transport and airports:<br>• Shortcomings as to the length of sidewalks for passenger circulation.<br>• Insufficient parking lots.<br>• Insufficient and glutted loading terminals.<br>• Difficulties to increase the number of strips for plane take-off and landing. |
| Passenger and cargo regulations:<br>• Overregulated transport of passengers.<br>• Lack of cargo transport regulations.<br>• Poor technical expertise, credit limitations, lack of contractual liability, poor social security benefits. | Operational and bureaucratic limitations:<br>• Long and troublesome customs and border requirements.<br>• High operating costs for users.<br>• Poor quality cargo services. |

**Source:** authors on the basis of studies of Economic Commission for Latin America and the Caribbean (ECLAC) and Secretariat for Central American Economic Integration (SIECA), Estudio centroamericano de transporte (ECAT), 2001; and "El sector transporte para la competitividad e integración de Centroamérica", 1997.

The transport corridors in Central America comprise highways, sea-lanes, seaports, and intermodal terminals. Each mode suffers from distinctive deficiencies with differential impacts. For example, the deteriorating highways in Costa Rica are a common problem for exporters. The highways, in particular, fall prey to robbery. Moreover, the planned extension of the Pacific and Caribbean road corridors includes the concessioning of the routes, to recover construction and maintenance costs, which will add further direct costs to transport services.

**Table 12**

**CENTRAL AMERICA: TRANSPORT INFRASTRUCTURE INDICATORS. COMPARISON BETWEEN MAIN REGIONS**

| Country | Paved Roads/Total | Total Roads/Km² | Paved Roads/Km² | Total Road/ Population | Total Rail/Km² | Total Rail/Population |
|---|---|---|---|---|---|---|
| Unit | | Km | Km | Km/inhabit. | Km | Km/inhabit |
| Belize | 17.0% | 0.13 | 0.02 | 0.0108 | - | - |
| Costa Rica | 22.0% | 1.00 | 0.22 | 0.0092 | 0.026 | 0.0002 |
| Guatemala | 34.5% | 0.13 | 0.045 | 0.0010 | 0.008 | 0.0001 |
| El Salvador | 19.8% | 0.48 | 0.09 | 0.0015 | 0.013 | 0.0001 |
| Honduras | 20.4% | 0.12 | 0.02 | 0.0020 | 0.006 | 0.0001 |
| Nicaragua | 11.0% | 0.15 | 0.02 | 0.0037 | 0.001 | 0.0001 |
| Panama | 34.6% | 0.15 | 0.05 | 0.0039 | 0.005 | 0.0001 |
| Average Central America | 13.9% | 0.15 | 0.02 | 0.0062 | 0.006 | 0.0002 |
| Average Europe | 95.2% | 1.04 | 0.99 | 0.0099 | 0.048 | 0.0005 |
| Average EC candidates | 54.3% | 0.81 | 0.44 | 0.0088 | 0.040 | 0.0004 |
| Average USA | 59.0% | 0.66 | 0.39 | 0.0218 | 0.020 | 0.0007 |

**Source:** authors on the basis of information from International Road Federation (IRF), *World Road Statistics 2000;* Economic Commission for Latin America and the Caribbean (ECLAC); Central Intelligence Agency (CIA), *World Factbook 2003*; European Union, Directorate-General of Energy and Transport, *Statistical Pocket Book 2003*.

The differences in the provision of physical transport infrastructure between Central America and developed countries are extremely significant. Only 13.9% of all roads in the CA region are paved. Moreover, in LAC (Latin America and the Caribbean) the road network density[6] is only ¼ of that of the US and around $^1/_6$ of that of the EU respectively. Similar differences can be observed in the rail sector. According to the Central American Transport Study (SIECA, 2001), defects in the design and technological layout of the current road network are evident in various features. Today only 26% of the main road network complies with the legally required road width; the percentage of compliance with technical requirements of connection networks ranges from 14% to 17%. Moreover, 84% of the broad secondary network fails to comply with standard requirements. In total only 17% of the overall Central American road network complies with the standard technical characteristics.

[6] Road network density = road km /area.

**Table 13**

**CENTRAL AMERICA - NUMBER OF MAIN LAND BORDER CROSSINGS**

| | El Salvador | Honduras | Nicaragua | Panama |
|---|---|---|---|---|
| Costa Rica | | | 1 | 1 |
| Guatemala | 3 | | | |
| El Salvador | - | 1 | 1 | |
| Honduras | | - | 2 | |

**Source:** Authors.

The number of border crossing is another decisive fact as it describes the permeability between countries, and gives an idea of the connectivity between countries, which significantly influences trade costs and trade facilitation (Wilmsmeier, 2003). The small number of border crossings (see Table 13) depicts the relative low landside connectivity in CA.

Earlier studies have shown that distances below 500 km between main economic centres cannot be considered as potential SSS corridors (see Table 14). This eliminates the routes between Guatemala and El Salvador as well as those between Belize and Guatemala as potential SSS routes. Discounting the cargo flows on the above-mentioned routes, a movement of 2,050,000 tons in the year 2000 can be considered as potential cargo for SSS services in the future. This does not consider the natural affinities of certain products for road or air transport.

**Table 14**

**MESOAMERICA. DISTANCES**

| From: | To: | Distance, in Km: | From: | To: | Distance, in Km: |
|---|---|---|---|---|---|
| Panama | San Jose | 525 | San Jose | Managua | 342 |
| | Managua | 828 | | Tegucigalpa | 569 |
| | Tegucigalpa | 1 018 | | Guatemala | 869 |
| | Guatemala | 1 359 | | San Salvador | 688 |
| | San Salvador | 1 179 | | Mexico | 1 932 |
| | Mexico | 2 420 | Managua | Tegucigalpa | 234 |
| Guatemala | San Salvador | 181 | | Guatemala | 534 |
| | Mexico | 1 064 | | San Salvador | 353 |
| San Salvador | Mexico | 1 246 | | Mexico | 1 598 |

**Source:** Authors.

As can be seen in box 1 port modernization and privatization have not yet been completely successfully implemented in CA and, have failed i.e. in the case of El Salvador, or delayed as in Costa Rica. Port reform has only progressed partly in CA. Infrastructural problems at ports as interfaces and entry points to the maritime corridors still prevail. Several ports in the region, therefore, still lack efficient terminal and container facilities.

**Box 1**
**ADVANCES ON PORT REFORM IN CA**

**Belize**: The two main ports (Monkey River and Big Creek), are concessioned to a local/British company.

**Costa Rica**: Concession processes for the ports of Caldera and Puntarenas were delayed until August 2004. In a first attempt, concessioning of ports was ruled unconstitutional by the Supreme Court. The franchising of Caldera is expected to be finished this year. For the time being, port services are rendered through private stevedoring (or, cargo handling) companies in Limón-Moín.

**El Salvador**: After the enactment of the port law, the bidding process, which called for the concession of Acajutla was declared void. There is a call for bids for the construction of a second port. La Unión.

**Guatemala**: A Guatemalan/American (majority interest) company was granted a 25-year beneficial owner concession for Port Barrios. At Port Quetzal two specialized terminals (hydrocarbons and sugar, respectively) are concessioned with significant involvement of the private sector. In Santo Tomás de Castilla vessel loading, unloading and port trans-shipment are done by private companies.

**Honduras**: Currently no port is concessioned, but a new port bill has been presented in national Congress. The stevedoring (or, cargo handling) services are rendered by private companies at all Honduran ports. The ENP Organic Law provides broad facilities to grant partial or full concessions to vessels and cargo services. At Port Cortés, private stevedoring (or, cargo handling companies perform the vessel loading/unloading operations. There exists no regulation for these operations. At Port Castilla stevedoring (or, cargo handling) services are private.

**Nicaragua**: Port Cabezas is concessioned for 25 years to a Nicaraguan shipper. At present the concessionaire is being sued by Government for alleged breach of contract. Arlen Siú was the first international port in which stowage was privatized, and workers organize the stowage company for two years with an optional one-year-extension. At port El Bluff, stevedores organized their own private stowage company. On the Pacific coast, stevedores of Port Sandino organized two stowage companies negotiating a concession agreement for stowage services with the EPN. In Corinto, stevedores organized three stowage companies. The administration of Port Corinto supplies the infrastructure, equipment and ship gears to handle cargo, among others. The stowage companies provide services for vessel loading and unloading.

**Panama**: Since port reform, new ports have been created and others were granted concessions, leaving a given number of ports under public administration. Sound investments were made and a major portion of regional transshipment became concentrated. In few years, there was growth from almost zero to the top positions in terms of regional transshipment operations. Most terminals are single-shippers, and the private sector accounts for 98% of the activity in terms of tons.

**Source: Authors, based on a survey.**

Further external factors such as damage/loss and highway robbery are affecting trade in CA. Political risk and political uncertainty influence trade. Currency fluctuations result from political risk causing reversals in trade balances.

## E. Areas of vulnerability

In addition to the problems mentioned above, the subregion's vulnerability to natural phenomena further affects its economic performance. Hence, a series of conditions related to geology and/or hydrometeorology have an impact on its orography. Central America, a particularly unstable region of the earth's crust, is on the western edge of the Caribbean plate, and on the Pacific coast of the Americas. The subduction of the oceanic crust beneath this edge, beginning in the Miocene Epoch, about 25 million years ago lifted the land from the sea. In the earliest stage, a peninsula and archipelago were formed. Later, about three million years ago, the scattered islands coalesced to form a true land bridge, or isthmus, linking North and South America. Keeping pace with subduction and uplift have been volcanic eruptions—Central America has at least 14 active volcanoes—and frequent earthquakes (for instance, Mexico 1985). In the last century alone Managua, the capital of Nicaragua, has twice been destroyed by earthquakes. The most recent, in 1972, took 10,000 lives. In 1976 some 25,000 people were killed in an earthquake registering 7.5

on the Richter scale and centred in the Motagua depression in Guatemala. This quake left 25% of the country's population homeless.[7]

In October 1998 Hurricane Mitch ravaged Central America, killing at least 11,000 people, leaving thousands more missing, and displacing more than two million others. Nicaragua and Honduras bore the brunt of the damage, but El Salvador, Guatemala, Belize, and other countries in the region also felt the effects of the storm. Some observers called Mitch the worst natural disaster ever to strike Central America.

This vulnerability causes the regional infrastructure to be frequently damaged. The most frequent threats are: a) heavy rains; b) hurricanes c) swampy soils; d) earthquakes; e) volcanic eruptions and f) deforestation.

These threats often result in creeps, floods, avalanches, landslides, erosion, destruction of landfills, and the collapse of existing infrastructure. The effects are worsened due to the poor design and construction standards of civil and road infrastructure. Technical shortcomings related to the setup of such infrastructure i.e. means of communication and human settlements and lack of disaster prevention and mitigation plans add to the poor situation. Moreover, threats and disasters have a direct impact on population due to damages to health, deaths, and economic loss and also undermine the countries' social, economic and political stability (SIECA, 2000) as it causes a step back in the development processes.

Since disasters are not limited to the political borders, it is essential to have a regional and a holistic view of the problem. Historically, the region has always responded "after the event" allocating over 90% of international funds to the management of natural hazards in the region such as emergency action, and post-disaster rehabilitation and reconstruction; only 10% has been assigned to mitigation and preventive activities.[8] Other causes, which lead to increased vulnerability in the region are: rapid and uncontrolled urbanization, the persistence of widespread urban and rural poverty, environmental degradation resulting from poor management of natural resources, inefficient or reactive public policies, and insufficient or poorly planned investments in infrastructure (ECLAC/GTZ, 2003).

In conclusion, the vulnerability situation represents a two-sided problem. First of all, activities and financial resources for natural disasters (to which the region is highly prone) are mainly spent to cure needs after the occurrence of disasters, but are not spent effectively on prevention and planning. Second, the planning of improvements in regional connectivity to strengthen regional cohesion provides for the assignment of financial resources to road infrastructures (pavement and bridges), which are more susceptible to damage from natural disasters than waterborne transport. We argue that it is necessary to re-evaluate current infrastructure investment plans and to reframe the set of transport infrastructure in the region, modifying the modal distribution with greater priority on waterborne transport and ports, while, at the same time, installing road infrastructure which serves waterborne transport for landside feedering and distribution. This will reduce the total cost of road infrastructure development and in addition allow the road network to develop in a favourable manner not only for intra-regional development, but also for international trade facilitating exports.

If the current plan of rehabilitating and improving intra-regional connectivity and accessibility is followed, the resulting network will have severe deficits which will leave it highly vulnerable to natural disasters. Either the structural design and engineering will require great amounts of scarce financial resources, which will therefore probably be left uncompleted or the provisioned network will be constructed with sub-standard quality leaving it even more vulnerable to the inevitable natural disasters to which the region is prone. At the same time waterborne

[7] http://encarta.msn.com/text_761574502__1/Central_America.html.

[8] This 10% does not include investments in non structural measurements.

transport is not as susceptible to natural disaster threats because it does not need physical infrastructure to navigate. One example for the costs implied through natural disasters is the case of Hurricane Mitch, in 1998. The hurricane induced costs of USD 3.100 billion, in a year when the total GDP of the seven CA countries barely exceeded USD 65 billion. The cost of reconstruction with low standards and without re-planning transport infrastructure clearly exceeded the direct costs.

## F. Regional infrastructure policies

The Governments have tried to face and solve obstacles imposed by the natural geographic characteristics and insufficiency of transport services and infrastructure. Nevertheless, these efforts are slanted towards road transport infrastructure and services as it can be observed in Plan Puebla Panama (PPP).[9] The PPP is based on four main theoretical and philosophical pillars:

- Real poverty alleviation can only be achieved through economic development and productive investment;
- Given the irreversible process of globalization of the world economy, the region can only develop by positioning itself globally and attracting the attention of multilateral organizations, developed countries and private investors;
- It is indispensable to build basic infrastructure in sectors such as education and training, transport, telecommunications and overland communications;
- The development of Mexico's south-southeast can only be envisaged in an international context in which the Central American countries should play the main role in generating basic synergies for developing the Meso-American region as a whole.

This plan for integration is based on specific projects and formed from eight initiatives which have been defined and approved by the respective governments.[10] The main initiative for transport infrastructure deals particularly with the road sector: to improve the internal and external connectivity of the region's economies, improving the road infrastructure corridors and harmonizing legislations and transport regulations. The project contemplates the construction, rehabilitation and improvement of the main Meso-American highways:

- One corridor along the Pacific with 3,159 km and;
- One corridor along the Atlantic with 1,746 km;
- In addition 4,130 km of branch lines and connections (see also Map 2).[11]

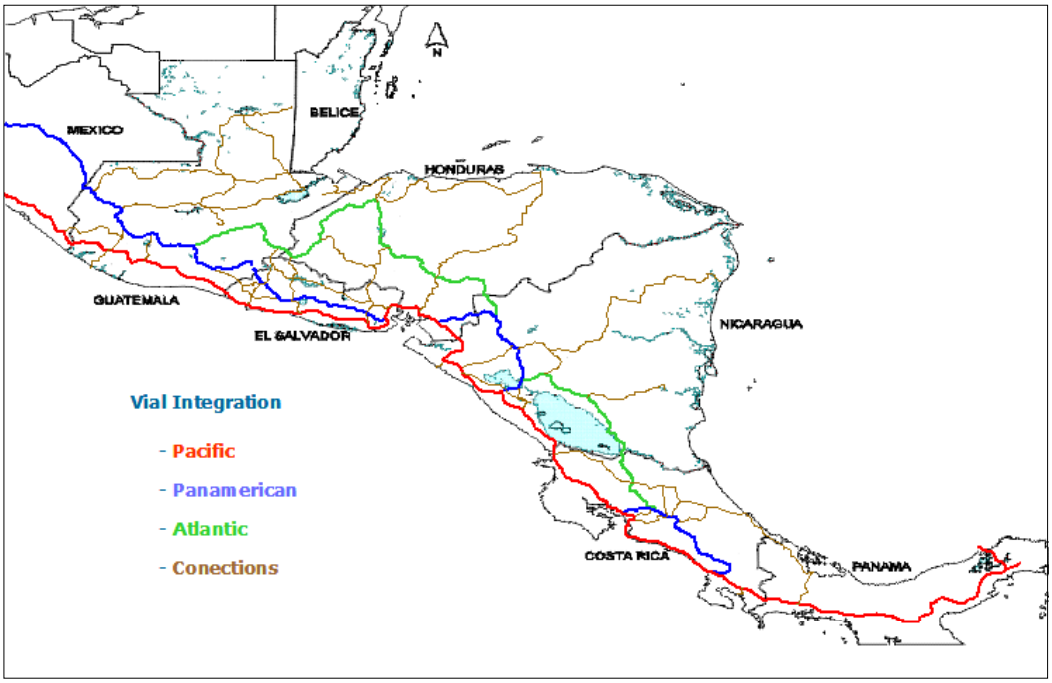
[9] Involving nine states from south east Mexico (Campeche, Chiapas, Guerrero, Oaxaca, Puebla, Quintana Roo, Tabasco, Veracruz y Yucatán) and the seven countries of the Central American Isthmus (Belice, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama).

[10] The eight initiatives are: sustainable development; human development; natural disaster prevention and mitigation; tourism promotion ; trade facilitation; highway integration; electric power interconnection; and telecommunications interconnection. The plan includes a monetay funding of about USD 4, 600 millions.

[11] The other seven initiatives focus on the energy sector, telecommunications sector, facilitation of the commercial interchange and competitiveness; promotion of tourism; sustainable development; human development; disaster prevention and mitigation.

**Map 2**

**PLAN PUEBLA PANAMA. VIAL INTEGRATION - MAIN ROADS**




**Source:** SIECA.

The late integration of the role of coastal shipping in PPP is indicative of the problems faced in overcoming entrenched ways of thinking, but shows also that this can be done. As the approach seems reasonable it seems to be lacking impetus to achieve its goals. A relevant criticism is that there is no feasibility comparison of the different transport modes involved.

**Table 15**

**INTERNATIONAL MESO-AMERICAN ROAD NETWORK - FINANCIAL REQUIREMENTS**

| Network | Total network in Km | Km to be rehabilitated | Cost USD Millions | Financed | Financial requirements | | |
|---|---|---|---|---|---|---|---|
| | | | | | Private | Public | % Invest. |
| Pacific | 3 159 | 1 911 | 1 090 | 882 | | 208 | 19% |
| Atlantic | 1 746 | 671 | 419 | 162 | 130 | 127 | 61% |
| Connections | 4 130 | 2 751 | 2 812 | 1 291 | 1 068 | 453 | 54% |
| Total | 9 034 | 5 333 | 4 321 | 2 335 | 1 198 | 788 | 46% |

**Source:** Inter-American Development Bank (IDB), Puebla-Panama Plan [online ] www.iadb.org/ppp.

It is evident that regional policies insist on allocating the greatest share of financial resources in the road transport sector. Indeed, the funding estimates for the transport infrastructure of the five countries of the Central American Common Market (CACM) allocate 88% of the total to the road sector, 7% to ports, and 6% to airports. In total USD 4.3 billion are estimated for road development in the Inter-American Network of Meso-American Roads.[12] This requires a great effort both in terms of taxes and involvement of the private sector.

[12] For details on the Puebla-Panama Plan see www.iadb.org/ppp.

# II. Short sea shipping (SSS) potential in Central America

## A. Potential for SSS in Central America

Central American Governments are making a great financial effort to improve road infrastructure and to encourage regional integration, involving the private and public sector in the Puebla Panama Plan. However, the experience of the European Union and other developed regions shows that it is necessary to direct efforts in a wider context ensuring greater intermodal balance and environmental protection. It is indeed in this sense that SSS has a great potential to contribute towards creating a greater modal balance and moving freight in a more environmentally friendly way. SSS can contribute by lowering transport costs and infrastructure investments and contributing to higher modal diversification. SSS has a substantial potential for alleviating pressures from two of the three main problems related to the transport sector in Cemtral America. (a) the lack of transport infrastructure provision, and high transport costs; (b) the high physical vulnerability of transport services emerging from the regional geological and climatic conditions.[13]

In Central America as in other regions in the world short sea shipping has rapidly gained approval. Nearly everyone agrees that it would be a good thing to use coastwise ocean routes and inland waterways to move cargo that is clogging highways (Edmonson,

[13] Among other advantages, SSS has growth potentials, because using maritime corridors adds security to the trade flows.

2003). But at the same time a coastal shipping system for moving truck or other intermodal cargo at this point is only an intellectual concept: Neither the infrastructure (be it specialized port facilities or vessels) exists nor a clear-cut economic rationale that trucking companies and their customers could buy into.

The challenges ahead are two-fold: 1) with the globalization of production and the liberalization of services, developing countries and countries in transition, now, more than ever, need to increase their capabilities in offering reliable and cost-effective transport and logistical services, taking advantage of technological development by "leap-frogging" into modern technologies and commercial practices; and (2) there is a world-wide need for harmonization of the legal environment for multimodal transport, in particular considering the development of new forms of international transport (combined road/rail transport and short sea shipping in Europe, for example).[14]

## B. Background

There is no concise, unambiguous and agreed definition of short sea shipping. The concept has been defined in various ways. The following quote shall be the basis for this discussion *"[SSS is defined] as commercial waterborne transportation that does not transit an ocean. It is an alternative form of commercial transportation that utilizes inland and coastal waterways to move commercial freight from major domestic ports to its destination."*

An alternative definition is that short sea shipping encompasses maritime transport between the ports of a nation as well as between a nation's ports and the ports of adjacent countries. Non-generic definitions are also offered: short sea shipping is situated within a region. There are a lot of different definitions of SSS and a lack of consensus about SSS definiton. This condition does not lead merely to semantic confusion; but rather the inability to analyze short sea shipping universally in such a way as to develop public policy initiatives and understand the market conditions essential for commercial success.

To be able to define the potential of SSS in CA it is important to define the maritime services, which can contribute to develop this potential. The contributing services can be defined as regular short sea shipping services between ports along the CA coastlines (Rowlinson and Wixey, 2002; Paixao and Marlow, 2002). SSS services are needed and can be used both for feedering hub ports in the region either on the Caribbean or Pacific side and intra-regional transport. A further potential to SSS services would be the liberalization of coastal shipping, which would open SSS services to operate in national maritime services as well.

Short sea shipping in the region can try to solve the following types of non-tariff transport barriers:

- Slow average speeds on land interconnection due to precarious conditions of road or rail infrastructure;
- Lengthy customs procedures and related waiting times on border crossings;
- Different levels of safety and security standards;[15]
- Cost reduction.

Today a SSS service would be "novel" and there are no other serious shipping competitors. More important short sea shipping in the case of Central America could compete with the trucking

[14] Standing Committee on Developing Services Sectors: Fostering Competitive Services Sectors in Developing Countries: [Shipping], 3rd session (6-12 June 1995) Item 3: Fostering competitive multimodal transport services.

[15] See also, Bulmer-Thomas, V. (2000), pp. 313-322.

industry, not only in terms of costs, but also in service. In some cases truckers have to drive long distances on roads in rudimentary conditions with high maintenance costs. There is also the insecurity and the significant delays at border crossings. The sea route in many cases is the same distance. In the case of the Grimaldi group in Europe, the company ensured its success in this niche market by transforming into a multimodal operator controlling the freight throughout the transport chain and improving service reliability and transit times. The aim was to offer good quality and competitiveness in door-to door-services. Besides investing in maritime SSS services the group also invested in road transport and set up a network of port terminals in strategic locations throughout the Mediterranean (Parker, 2003). The truck driver has to enter SSS if it is to be a success. Otherwise the trucker can defeat the intermodal truck-ship combination.

## C. Restrictions from existing coastal shipping regulation

Coastal shipping is widely practised and is generally considered, but rarely demonstrated, to be crucial for ensuring the maintenance of domestic transport capacity and acting as an inhibitor to foreign influence in domestic transport services. Liberalization of coastal shipping trades has not progressed to the same extent as liberalization in international maritime trade or other transport services and transport infrastructure in CA.

Coastal shipping regulations are a source of network inefficiency. Current regulations inhibit the development of regular coastal services with connectivity beyond that of SSS services. Moreover, these regulations restrain equipment from being efficiently placed in areas which are of demand and are a principle cause for the imbalance in equipment availability in several regions of Central America. These regulations increase the magnitude of empty mileage because many containers must be repositioned without carrying a payload by ship or even by land transport. Moving empty equipment consumes capacity and wastes fuel and other resources. In Central America there are hardly any rail carriers, which are able to reposition marine containers while carrying cargo. The road network in its current state does not allow an efficient and effective positioning within the countries either, and also adds additional costs to these movements under current conditions. It can be expected that the relaxation of coastal shipping regulations would create access to available slots on international (intra-regional) services, which would contribute to more efficient use of available slots. In return a cost reduction can be expected.

To analyse the potential of SSS, coastal shipping services have to be differentiated in services for liquid and dry bulk cargo and services for general cargo. The coastal shipping services for dry and liquid bulk are not considered to contribute to the potential of SSS in general. These services often do not operate on a regular basis and can be characterized as regulated, stable, and efficient. Some types of freight are usually moved in specialized terminals, which in general causes a delay in distribution.

Coastal shipping services play a more important role in analysing the potential for SSS to bridge prevalent infrastructural gaps. These services face increasing competition from road transport. This weakness imposes increasing barriers, since in general this type of cargo is moved by regular services, which require a relative stability in the freight volumes at regular intervals and the demand for freight in either direction of a service. Under an enlightened regulation and legal framework, coastal shipping can compete with road transport services in certain market segments, especially with the current lack of physical infrastructure provision.

Traditionally, coastal shipping laws have attracted considerable domestic attention, and generally are jealously guarded by domestic shipping lines. The discussion is on whether coastal shipping laws protect a country's shipping "capability", or whether they simply act to increase the costs of domestic shippers. Throughout the world interest groups have been formed on both ends of the spectrum. For example, on the one hand is the United States opposition to coastal shipping laws,

which conflicted with statistics from the United States International Trade Commission (USITC), who calculated the economic costs of coastal shipping legislation for the United States.[16] Consultants reported to OECD that coastal shipping policy is clearly market distorting and should be addressed by national administrations, and ideally be removed or minimized (OECD, 1999). On the other side of the spectrum is the group of vessel owners and operators, labour organizations, trade associations that opposes the idea of coastal shipping liberalization. This group argues that a qualified merchant marine is necessary to provide readiness in the case of war and that preserving related employment to that coastal trade is not very profitable and that most companies operating in such services operate at a loss. They also claim that the difference in door-to-door transportation costs with or without coastal shipping restriction is so minor that it is unlikely to make a substantial difference in the final price of consumer goods.

In the European Union, national coastal shipping is being gradually opened up amongst member countries, but coastal shipping is not generally open to those outside of the EU. An exception is the UK where any flag can and does offer coastal shipping services including for example Buquebus from Uruguay in the 1990s. The opening of maritime coastal shipping among EU members has had a strong positive impact on overall cargo trades in the region. Prices overall have decreased mainly because of increased competition and use of open-registry vehicles.

# D. Necessary conditions to bridge land infrastructure deficits by waterborne transport

A successful short sea shipping programme offers an opportunity to add value to a national or international transportation network and, thus, increases the affected economy's efficiency and ultimately the standard of living of the society. These benefits will accrue when the short sea shipping programme addresses the myriad issues inherent in the transportation infrastructure network (Lombardo, 2004b).

## 1. General considerations

The current situation in CA is such that the potential advantages of SSS are not transformed into market advantages. Three main obstacles have to be overcome:

### a) A lack of awareness

Three equally important and critical activities can build awareness. Increased coordination and prioritization are needed among local, state and provincial authorities in Central America. A greater understanding of the complementary interests and relationships among the various transportation nodes is needed. Further, increased knowledge about the costs of short sea shipping is of crucial importance. Increased education and outreach to governmental leaders, organized labour, and the general public are essential as well as increased participation in shipper organizations to make short sea shipping's beneficial aspects known.

### b) The need for competitive shoreside and port costs

- identification of short sea shipping costs and assessment of these costs in relation to other transportation modes;
- reduction of port operational costs
- public and/or private investment for shoreside infrastructure; and

[16] For details see USITC (1999).

- financial aids. The expected benefit would be to reduce costs to make short sea shipping competitive with alternative transportation modes.

**c) Public funding needed to complement private investment**

- secure funding for start-up costs;
- receive funding for inland waterway and landside improvements; and
- use existing taxes on other infrastructure to fund balances to support short sea shipping initiatives. Expected benefits include public transportation improvements, highway congestion relief, environmental and health and welfare benefits and the growth in the short sea shipping industry with a commensurate increase in employment (Lombardo, 2004a).

Another obstacle standing in the way of the potential economic development of CA is the lack of transport infrastructure and transport facilitation, which prevents the countries from accessing regional markets. As a result, the regional economic integration has developed sluggishly throughout the last years (see table 3). The lack of infrastructure could only be solved with major public sector investment in infrastructure (see the recommendations of the Puebla-Panama Plan). Furthermore, given its harbours and its strategic geographical location, Central America's coast is underused for intra-regional trade flows. The wealth of transport possibilities offered by its ports has not been exploited for regional trade, despite the fact that ports are more and more equipped with the necessary facilities and that shipping causes less pollution than other means of transport.

National transport policies imply market distortions and provide comparative advantage to road transport. The realization of the planned PPP corridors will further reduce the current potential advantage of SSS in terms of time and reliability of road transport delivery. Additionally, the PPP will by no means internalize all externalities of road transport. In case of road transport, coastal shipping is not liberalized. The liberalization of coastal shipping in any mode should be based on the principle of reciprocity, and might be included in the discussions relating to the Central American Free Trade Area (CAFTA).

In earlier studies Hoffmann argues that coastal shipping should be liberalized in South America, to permit international carriers that are passing to take national cargo from one port to another in the same country (coastal shipping) or between adjoining countries (regional coastal service). Breulliet, Harding and West (2002) claim that the volume of passing traffic is not so great and the total potential cargo pool for regional coastal movements in Central America is limited. They conclude that complete liberalization without flanking measures would probably provide a somewhat sporadic service, depending on external factors such as the space available on the ocean carrier and would add an additional element of risk to the emergence of a true regional service. Paixao and Marlow (2002) stress the inevitable multi-modality of coastal shipping operation if it is to compete with door-to-door truck operators. Coastal shipping requires substantial and regular cargo volumes if it is to be economically viable.

The current distortions in the freight transport sector result from market and government failures. As mentioned before the market failure is based on the fact that external costs of freight transport are not internalized and paid for in the same manner as in all other transport modes. Thus, when dealing with the potential of SSS, attention has been paid, first of all, to creating an institutional set-up that addresses the tradeoffs and compatibilities between different modes of transport, as well as providing a level playing field between all modes of transport with regard to the internalization of their external costs. Secondly, SSS has to be analysed in a wider context within the transport sector, that is, considering the parallel liberalization of coastal shipping and port services (i.e. pilotage, towing) and efforts to cross subsidize financial resources for investment from road transport to more environmentally friendly waterborne transport services.

The ambition in the region should aim to provide the means for developing a comprehensive system of high quality transport and transport-related services adjusted to the regional potentials and financial resources. SSS contributes to better accessibility within CA and improves links to extra regional markets. Intensified and smoother goods and passenger flows will show its effect on faster economic growth and sustainable development of the area under study. SSS in CA allows an efficient system servicing intercontinental, transnational and cross border flows.

The exploration of SSS corridors makes the CA region more competitive and attractive for international traffic flows. Another important point is that with the implementation of SSS, secondary land links can be adjusted to the financial capacities of the governments and regional social needs without creating "white elephants". These secondary land links should have the fundamental role of ensuring basic accessibility within the region, while the SSS corridors constitute a high-capacity transport network. Today, CA daily faces transport problems due to lack of infrastructure and congestion on insufficient roads. Multimodal platforms along the coast, the cornerstones of new distribution solutions, are attractive for companies in the vicinity. The grouping of cargo at coastal hubs enhances a better capacity use of SSS and relieves the pressure on the precarious road network.

There are many challenges at stake in combining the development towards a competitive economy with a better quality of life and a valuable environment. The advantages of SSS services lie in the better environmental performance than road transport and SSS services can be expected to take a leap forward with regard to emissions. These developments are particularly helpful for achieving the objectives of the Kyoto protocol in the effort to control climate change.

Strong political support for inter-regional cooperation and the set-up of public-private partnerships have to be launched in order to unlock the development potential of transport by water. A combination of measures by all stakeholders is the way forward for more sustainability.

Public transport policies will also have to consider a wide range of externalities, such as congestion, accidents, contamination, the connection of different parts of the country, regional integration with neighbouring countries, and the competitiveness of international or regional trade. Taking such aspects into account it is likely to justify public policies that promote coastal shipping, be this via the use of existing international Lift-on, lift-off (LoLo) liner services or additional Roll-on, roll-off (RoRo) ferry services, or both. Yet as road traffic continues its inexorable increase, and the environmental consequences of this become more evident, there is greater pressure to identify opportunities to transfer some of this traffic to the maritime option.[17] [18],

Viable transport market concepts, which recognize the precarious financial situation of public budgets and private and PPP initiatives and the rudimentary political integration, have to be developed. Innovative solutions adapted to local cultural needs in servicing cargo and passenger flows have to be provided.

The focus to develop these potentials includes the integration of maritime links and inland hinterland links with ports and their logistic centres and terminals as operating multimodal nodes. Moreover, the preparation and prioritizing of possible investments will contribute to the alleviation of missing links and the elimination of bottlenecks linking port infrastructures with their hinterlands. This improves the performance of maritime transport corridors and national transport

[17] Road safety is a great problem in the world today, but especially in low income countries, in terms of public health and related expenses. During the year 2000, 1.26 million people died in road accidents (of whom 1 million in low income countries). The World Heath Organization projects that road accidents will be the third cause of death in 2020. For more details see ECLAC (2004c).

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axes with intra-regional accessibility. An intermodal focus, then has to lead any evaluation of SSS potential. This means that RoRo- services have to be included in the option if the goal is found in bridging infrastructural gaps. SSS potentials are to be considered an integral part of the intermodal transport of the region rather than as competing with road transport. The entry of truckers as investors in regional coastal shipping would thus be an advantage.

SSS in CA cannot compete with truck drivers, but should create an incentive for them to use SSS. The European Union's Marco Polo Programme is a good example. In EU, 44% of all freight transport is waterborne. To start the idea, funding is required which would have to be embedded in a supranational authority (i.e. CAFTA). In spite of all the positive arguments, the process will be difficult to implement owing to national interests and lack of public financial resources. One idea could be to include funding for "Sea-Motorways" in highway funding as promoted in the US, but opposition from the trucking industry can be expected.

It is important to identify potential shipping routes between CA ports integrating national and regional demands. The identification of national transportation corridors has additional importance since earlier studies (Breulliet, Harding and West, 2002) identified that not all-regional routes carry significant trade, sufficient to justify the implementation of maritime services.

The challenge is to develop the commercially appropriate model for short sea shipping in Central America. This challenge must meet the inflexible demand of time sensitivity in a just-in-time commercial environment. The critical success factor for adopting the short sea shipping concept is that it must facilitate cargo movement as an inexpensive, seamless component of an integrated, intermodal transportation system. This model must also overcome the tyranny of current practices, which heightens resistance to change.

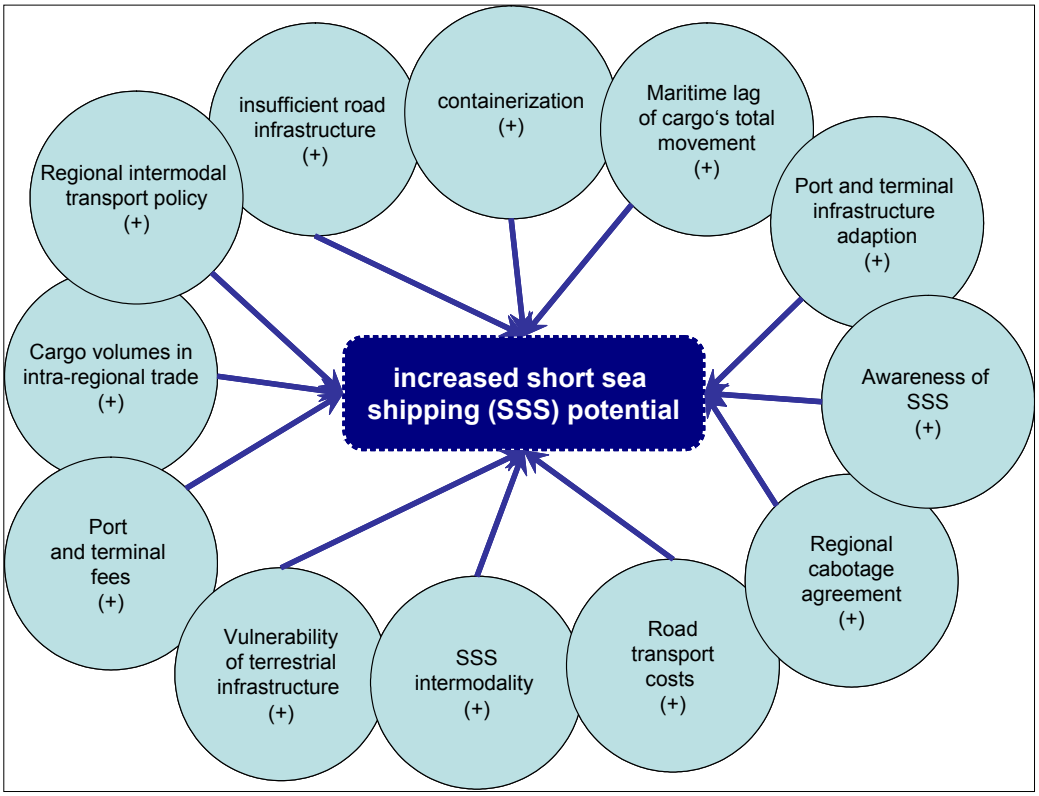
The next stage requires applied research to develop short sea shipping's commercially viable feasibility. Short sea shipping should investigate opportunities to gain market share, initially at the expense of current profits.

## E. Suggestions for potential policy schemes and instruments

Policy instruments must be pervasive and adequate because they will determine the success and effects of a new concept. Embedded in this expression are many issues and the required instruments have to act in the following fields. Some of the issues will be briefly discussed in this chapter such as the institutional set up, facilitation standards and port specific measures. Targets will be specified and appropriate measures will be given to increase the potential of SSS in Central America. The proposed measures are based on the current situation in the region under study and experiences from other regions such as the European Union. This is not an attempt to compare the European with the Central American, but rather try to show which measures might be adopted to increase the potential of SSS in Central America.

**Graphic 2**

**SHORT SEA SHIPPING CONCEPTUAL MODEL**




**Source:** Authors on the basis of Gary A. Lombardo, "Short Sea Shipping: Planning for its Future in the Western Hemisphere", World Wide Shipping, February-March 2004.

Two interrelated challenges exist: 1), to master an understanding of the short sea shipping concept and 2), to develop short sea shipping as an efficient and effective complement to the existing transportation system. The conceptual model depicts the fields of action and influencing factors to increase SSS potentials. The figure shall focus the discussion and eventually enhance understanding concerning the short sea shipping concept as an important milestone in future transport development.

## 1. Institutional set up

A working group for intermodal freight transport has to be created on the basis of the existing Technical Transport Commission, which is part of the Meso-American transport initiative of the PPP[19]. Currently, the different transport modes are treated separately in sub groups. There is no group that deals with intermodal transport. Such a group should be created to dedicate its work to SSS issues and should pursue intensive cooperation with the discussion group for maritime transport of the PPP. The authors further suggest that the goal of such an intermodal working group should be to create a "common transport policy". The need for a common regional transport has already been established in the ASEAN region (Wybrow and others, n/d) .

[19] The original name is the Technical Transport Commission (Formerly until February 2004 Road integration) of the Meso-American Transport Initiative of the Pueble-Panama Plan (PPP). For details see: http://www.iadb.org/ppp/

## 2. Facilitation

Unlike the European Commission, Central America does not have a legal framework for regional coastal shipping (Commission 2002). Regional coastal shipping is a project within the efforts and policies for the regional integration of Central America. Although the outlines of regional coastal shipping were present in the Multilateral Treaty for Free Trade and Integration signed in 1958, there still does not exist a legal framework specifically for regional coastal shipping. Panama, although a member of the Central American System for Integration, is not a signatory of the 1958 treaty (Breuillet, Harding and West, 2002). The potential to liberalize coastal shipping services in a regional context will have to be included in a general analysis of possible future policy steps. These policy steps have to be analysed with regard to their effects on sustainability. Amongst others, the ecological modernization capacity in freight transport has to be analysed.

For intra-regional and national maritime cargo, intensive controls, inspections, and paperwork are in place, often in excess of real needs. Road transport avoids many of the bureaucratic obstacles commonly associated with cargo moved through seaports. In a first step the countries could analyse the possibility of reducing such requisites for maritime cargo. Especially in the context of the proposed Central American Free Trade Agreement (CAFTA) such requirements could and should be minimized with respect to intra-regional traffic.

Customs regulations relating to the movement of goods in Central America and, as such, including coastal shipping are governed by the Standard Central American Tariff Code (CAUCA). Panama is a signatory of CAUCA. However, this document, which exists for regional road transport, does not have an equivalent for coastal shipping. For acceptable logistic management there is a need for the simplification of the procedures and associated paperwork, using the concepts of the single document and the single window.

Coastal shipping is necessarily an intermodal movement, and may also be a multimodal movement, that is to say, under a single responsibility. The Central American legislation does not include either the basic elements of multimodal transport or the FAL65 Convention (Breuillet, Harding and West, 2002).

With regard to financing, the biggest costs are operational rather than investment costs; working capital is an especially important element within overall costs. These are all costs that correspond to the private sector. The needs for investment in equipment and operational infrastructure in the ports may be realized through the private sector. Such financing could be provided using the private windows of international banks. Financial support for the basic infrastructure of intermodal transport could come from traditional sources.

## 3. Ports

Ports represent an essential link in intermodal transport, which includes coastal shipping. Distances between ports are short so that times in ports require rapidity and agility in procedures and port services. At present the ports offer no special facilities for regional coastal shipping. The ports require, however, adequate installations and equipment with modern and supportive working practices and an adequate organization of stevedoring. In addition, tariffs as applied to international traffic are not appropriate for coastal shipping.

There are complex logistical problems to be overcome, whether within larger companies or between smaller ones. There is the need to have as efficient a network of ports and operating capability as possible. This is likely to entail compromises between competitive and co-operative behaviour between ports. The required network structure is that of hub and spokes. In order to work efficiently, such a network will need to be carefully and sensitively regulated. The operation of the

developing CA port network requires a careful examination in order to optimize operations in all situations. This study includes future trade pattern developments across the CA region and globally.

## 4. Competitiveness with land transport

This implies that fuel and other taxes as well as road tolls should be implemented throughout the region in such a way that effectively avoids a cross subsidy from passenger cars or shipping to heavy weight road vehicles. Also strict enforcement concerning standard regional safety and environmental regulations, working hours, technical conditions and load limits need to be assured.

The Puebla-Panama Plan foresees the franchising of the constructed road infrastructure. The funds raised from charging users on the PPP highways located in central regions could then be used to develop or build sections required to cater for the traffic flows created by the introduction of SSS.[20]

## 5. Environmental and social minimum standards

Effective environmental standards have to be introduced for all modes. This includes, amongst others, effective emission standards and enforcement for all modes. Also, norms regarding waste management as well as effluent standards have to be revised. Even though standards regarding the discharge of effluents beyond the 20 miles zone exist, enforcement is difficult and would require a strengthening of enforcement capacity.

Further, effective implementation and enforcement of social regulations through the national labour offices have to be assumed. There should be information and communication with the work force on their rights. This factor applies especially to the road sector with respect to driving and rest times.

Lastly, it is necessary to apply international standards in planning and execution of physical infrastructure provision. In the case of CA, this entails the redesigning of the current network that allows vulnerability prevention and considers logistic distribution of people and freight by waterborne transport, and emphasizes the interoperability between waterborne and road transport.

The introduction of national environmental and social standards as complementary to the creation of a level playing field for all transport modes could be interpreted as introducing a new trade barrier from adjacent countries. Therefore, negotiations on regional coastal shipping liberalization will have to involve almost necessarily a discussion on the harmonization of relevant environmental and social freight-transport standards ( i.e. emissions standards for road transport).

[20] Declaration on the motorways of the sea issued by the Atlantic Arc Commission, Bilbao, 24th June 2004. page 2).

## 6. Information and communication

One key barrier is that users of the old system will not be very keen to operate in a new freight transport system as they cannot visualize its advantages yet. The European Commission recognized this difficulty and stated that:

"[…]lines will not develop spontaneously…they will have to be 'sign-posted' by granting European funds…to encourage start-up […]".[21]

However, the recognition of potential positive effects from the creation of multimodal SSS transport system (see example of Chilean Maritime Highways (CMH)) does not rely on political actors alone.[22] There are a number of important actors that influence freight transport development. These groups and actors are significantly separated by mode of transport in the freight sector, with each group being primarily interested to promote "its" mode of transport. The multimodal concept lacks recognition in the discussions and in transport policy approaches. In order to develop an effective and efficient transport policy a collective vision of these actors is necessary to visualize the problems and possibilities of the current transport system in all its facets.

In order to guarantee the essential flexibility in the logistical chain, it is necessary to think of the implementation of an EDI system for coastal shipping, compatible with the ports' systems, with road transport and with customs. A good system will contribute to the transformation of the traditional image of coastal shipping into that of a service which is both efficient and modern.

[21] (European Commission, 2001, p. 44). EC Transport White Paper, September 2001 [REF http://europa.eu.int/comm/energy_transport/library/lb_texte_complet_en.pdf ].

[22] For details see Baird, Hoffman and Wilmsmeier (2002).

# Conclusion

To conclude, the potential of SSS in CA depends to a great extent on tackling the physical geographical situation and regional trade pattern; in this sense many basic facts point towards the relevance of the SSS concept for the region. At the same time, important challenges to create a SSS facilitating policy framework remain, and will have to be addressed under the following three dimensions:

- A policy dimension, which includes the coordination and cooperation of different political sectors;
- A territorial dimension, which includes the different interests within the Central American region; and
- A governance dimension which reflects the recognition that governmental institutions today are less capable in problem solving without the cooperation of non-governmental institutions and entrepreneurs.

The analysis has shown that with CAs striving towards economic growth there are many forces at play to strengthen intraregional commerce and interconnectivity. Taking these conditions into account together with the vulnerability to natural disasters, the integration of SSS in regional transport policies and infrastructure development plans seems very reasonable.

In order to strengthen the potential of SSS in CA, it is important to initiate a process for the actors involved to create awareness of the need for combining transport policy measures with regional economic development initiatives. Transport policy-makers have to create

guidelines for the development of SSS transport corridors, focusing on corridors along the Caribbean and the Pacific coast. Moreover, a re-planning of the current road network is necessary to upgrade road conditions and further to develop an appropriate network under an innovative multimodal transport development framework, which serves the feeding of transport interfaces (i.e. ports) and creates standard accessibility within the region.

Politicians of different political levels have to be included in this awareness process to create political will. Private sector representatives have to be included in the awareness process to create willingness to co-finance transport and transport-related investments; public-private partnerships will be set up to prepare infrastructure investments and to develop and test innovative solutions in transport.

It is necessary to advance in an understanding of sectoral linkages between services and goods production in general, and transport and other productive sectors specifically. These sectoral linkages can be highly significant and will have to be taken into account in quantitative and qualitative assessments of potentials of SSS transport. The cost sharing between private and public sources require a systemic view. It is important to treat different modes of transport equally with regard to the evaluation of new investment projects – social evaluations should be the rule. More studies are urgently required.

The critical success factor for adopting the short sea shipping concept is that it must facilitate cargo movement as an inexpensive, seamless component of an integrated, intermodal transportation system. SSS must overcome the tyranny of current transport practices and sectoral structures which heighten resistance to change.

The characteristics of SSS services and their inherent advantages in terms of environmental performance, or investment needs in comparison to other modes make this transport mode highly valuable in view of the prevalent situation of land transport infrastructure deficits and high overland transport costs. The incorporation of SSS in the development of an integrated regional transport policy framework adds three important elements:

- Greater rationality in the allocation of financial resources to transport infrastructure;
- Improved possibilities for establishing an integrated transport policy throughout the political region and a joint vision for a regional diversified transport market, including sustainability issues, long-term planning, multimodal, intermodal and concepts, and criteria on resources allocation.
- Intermodal transport including SSS is a modern service, which, if offered in Central America with a regional scope, would bring economic and environmental benefits to the region and would provide an alternative means of communication, diminishing the vulnerability of regional transport to natural disasters, provided the right conditions can be made available in the ports.

The legal unification of coastal shipping services will be an important milestone to exploit the potential of SSS in Central America and cannot be carried out without a careful analysis of the impacts and the costs and benefits implied for each sub-sector. The services sector, specifically the transport sector, imposes great complexity due to its linkage to the other sectors, and due to the fact that liberalization measures are, in general, not straightforward tariff reductions, but consist of a wide range of different measures, which can be rather different for each mode of transport.

Harmonization of social and environmental standards at a regional level would be useful and in some cases urgently required. This applies especially with regard to vulnerability prevention in road transport through clear and concise construction and design standards. Security standards, emission standards and minimum labour standards should be harmonized in this sense.

A tariff reduction for environmental goods and services related to transport would be of advantage to foster cleaner transport. It should be pointed out that the ongoing WTO trade negotiations include a section on environmental goods and services. Important goods and services to be considered in the context of transport would include certified clean transport, energy efficient transport, transport based on renewable energy sources, catalytic converters amongst others. These goods and services should be part of the tariff and non-tariff barriers negotiations.

This study is once more a call for a vision of integrated transport as a basic requirement for development planning. In this context it also shows how important the generation and the accessibility of basic information are. This leads to the call for transparent processes and easy access to information in general, emphasizing the importance of implementation of the Aarhus Convention.

Lastly, in considering investment in transport infrastructure, it is advisable to go beyond simple economic cost and benefit analysis. It is important to leave national perspectives behind and move towards a regional vision. The regional dialogue is at a starting point. Short sea shipping finds itself at the nexus of a seamless intermodal transportation system that enjoys efficient cargo handling at each node. Short sea shipping is a beneficiary of technological advances related to the vessels it uses and the congested and increasingly costly land transport of goods. A fundamental question as to its viability exists: “Can short sea shipping survive without extensive government subsidies?” In the case of CA, this implies the creation of a balanced multimodal regional transport system using geographical conditions. SSS can play an important role in creating the pathway towards a more environmentally friendly, financially rational and sustainable transport system.

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